



Siemens Automotive Hydraulics boosts the development and set up phases of its latest proportional valve with Process Rules Discovery™



Siemens Automotive Hydraulics

- Joint venture between Siemens VDO Automotive, PSA Peugeot and Citroen created in 2000
- Design and manufacture a high-pressure pump with an innovative injection system to reduce fuel consumption
- 140 employees including 25 in R&D

Location

- France

The Challenge

- To improve understanding of performance during the production phase of a new product
- To perform a DoE by optimizing test batch
- To launch the product on time and...on budget

The Solution

- Pertinence Suite powered by Velocity Process Rules Discovery™ module

The Benefits

- Reduction of the number of prototypes needed from 400 to 50
- Better understanding of product performance
- Expected reduction of 10% of scrap in production
- Increased credibility with manufacturers

"We thought that Intercim's Process Rules Discovery™ was only effective on large volumes of data. However it proved its capacity to quickly and cleverly leverage the little data we had. This was at the end of the development stage for our latest innovation: a pressure and flow proportional valve for a high pressure gasoline pump compliant with the new European regulations. Thanks to Process Rules Discovery™ we have better visibility and are much more confident about the market launch." - **Dominique Véret, Director, Siemens Automotive Hydraulics**

As Europe enforces legislation to control and reduce the production of CO₂, the automotive industry and its suppliers need to take action. Manufacturers aim to radically reduce average CO₂ emission by 2008. Siemens VDO Automotive shares this objective by selling systems and components - including a very innovative high pressure pump - for direct injection gasoline.

"When we first saw Intercim's Process Rules Discovery™ module, the value it could bring to our division was not very clear. We had little data and were not in our production phase," Dominique Véret, Director of Studies at Siemens Automotive Hydraulics, states. "But a few months and two other presentations later, we changed our minds! Our first prototypes were completed and we didn't know what direction we were going in."

This was particularly true with regard to the performance we could expect from a specific proportional valve once in large scale production. Since this innovative product was completely new, we had no past experience to rely on."

A Design of Experiment made possible by Process Rules Discovery™

The Division's R&D team therefore decided to produce and test a first batch to conduct a sensitivity study of the proportional valve using a Design of Experiment (DoE). Given the complexity of the product (made up of around 20 components and subject to almost 70 parameters) they realized that the study would have to involve 400 samples to be significant. The number of samples necessary was far too high.

On the other hand, not conducting a DoE meant running the risk of having a very high scrap rate once production was started, as well as incurring additional costs to meet client orders.



Intercim *i*

SUCCESS STORY

OPERATIONAL EXCELLENCE FOR ALL

“...Reducing development costs is a major concern for the R&D team and Intercim helps us to doing just that...”

“At this point, Intercim’s software clearly became a potential solution for us and we bought Process Rules Discovery™ in June 2004,” explains Dominique Véret. “From the beginning, this product changed the way we worked: we had to rethink the data collection phase for the DOE. Process Rules Discovery™’s iterative approach enabled us to narrow our testing range down to 40 proportional valves, all with different characteristics.”

These different characteristics resulted in 2800 measured values. On top of which a thousand performance values were added at the end of the tests. “The tests were performed over 2 months in an iterative and interactive mode by three of our experts. These experts included an engineer trained by Intercim on Process Rules Discovery™ and two product specialists.”

At first, the experts chose the values they wanted to test. Then, as the tests were carried out Process Rules Discovery™ made suggestions on other data to be tested, gradually fine-tuning the rules. “Each time, we identified 3 types of rules: the obvious ones that our experts already knew about, the irrelevant ones which our experts could disregard, and, finally, the valuable rules, which are the added-value of Process Rules Discovery™.

The latter rules were not obvious for our experts and gave them something to think about. Sometimes the rules challenged their theories, but they always ended up being true. For instance, we had an acoustic problem that we were not able to solve with our traditional methods. Process Rules Discovery™ identified the precise setting ranges needed to eliminate the problem.”

About Intercim

Intercim is a global leader in Manufacturing Operations Management (MOM) solutions for the aerospace & defense, automotive, pharmaceutical and semiconductor industries. Our flagship product, the Pertinence Suite powered by Velocity, is a truly innovative software solution that bridges the gap between product design and supply chain. Our unique technology empowers distributed teams to collaborate on process planning, execution and quality to reduce manufacturing costs, time to market and cycle time. With 25 years experience Intercim operates from offices throughout the US and in Europe. Its customers include industry leaders like Airbus, Ball Aerospace, BMW, Boeing, Honeywell, Intel, Sanofi Pasteur. Partnerships with Dassault Systèmes, SAP and Microsoft support the company in its mission to provide operational excellence for all.

■ Corporate Headquarters

Intercim, LLC
1915 Plaza Drive
Eagan, MN 55122 USA
Phone +1 651-289-5700

■ European Headquarters

Intercim
32, Rue des Jeuneurs
75002 Paris, France
Phone: +33 1 44 76 81 81
www.intercim.com



Increased Credibility with Manufacturers

Siemens Automotive Hydraulics is currently launching the large-scale production of its pump. One thing is already certain: the tests run with Process Rules Discovery™ should reduce the initial scrap rate by around 10%. Usually, experts analyze the scrap. Once they understand what has happened, they make changes to the product, which gradually gains in robustness. With Process Rules Discovery™, the product is already fairly robust. Therefore, the experts do not need to spend much time analyzing the scrap. This reduces the costs related to the market launch. In addition, all this is possible within the tight deadlines imposed by car manufacturers – who themselves must comply with legislation.

“Reducing development costs is a major concern for the R&D team. Process Rules Discovery™ contributes to doing just that by helping us on our projects that are underway or those that are planned.” Dominique Véret concludes. “However, to succeed we have to be ready to question our certainties and work methods and follow unusual ways of thinking. In addition to the value brought to our R&D team, Process Rules Discovery™ has also been a real asset in improving our technical dialogue as now we can rely on fact-based information. This has had a direct and positive impact on our customer: our credibility has increased.”