



“Our challenge is to create models that relate SPC data to customer requirements and then leverage these models to obtain dimensional targets that consistently meet or exceed customer requirements”

- Tony Grichnik and Mike Seskin, Caterpillar Inc.

PROCEED™

Powered By **STATISTICA**



“What are the data telling us to do?”

The PROCEED™ software is a turnkey manufacturing software solution that distills fundamental causal relationships between your products and the processes that produce them, **using the data that you already collect and manage**. The PROCEED software implements the patent-pending approach developed and proven at Caterpillar Inc. and powered by the *STATISTICA Enterprise Analytics Software Platform*.

High tech manufacturing enterprises today collect vast amounts of data.

- Data about the production processes.
- Data about tests of raw materials, subassemblies, and materials in process.
- Data about the attributes of finished products critical to quality.

All of these data collection and storage efforts continue to be fueled by increases in automation, technology advances in the storage capabilities of data repositories, and the advances in sensors and other techniques for measurement. Today's manufacturers are sitting on a gold mine of information ... if only they are able to translate it into **actionable information**.

Collecting data is not sufficient to drive enterprise change. To create change, we need to translate these data into knowledge and then communicate that knowledge in a format that allows the people who are empowered to act on it. Now is the time to reap a **return on investment from this data using the PROCEED software**.

The PROCEED software combines novel and traditional knowledge extraction methods to:

- Derive and validate simple to complex causal relationships between manufacturing processes and product quality outcomes.
- Deploy actionable information to allow process owners and knowledge workers to compare what-if scenarios and simultaneously optimize multiple competing outcomes.



For more information about the PROCEED software and additional case studies, please visit PROCEED.statsoft.com

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Applications and Case Studies

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Industries

- Aerospace Manufacturing
- Automotive Manufacturing
- Industrial Manufacturing
- Heavy Equipment Manufacturing
- Power Equipment Manufacturing
- Transportation Manufacturing

Opportunities to apply the PROCEED software are equal to the number of data-driven decisions that need to be made throughout your organization, provided there is data to characterize the problem. However, it is far more practical to apply the PROCEED software to business critical decisions, especially those that have a direct line of sight to the goals and objectives of your organization.

The PROCEED software is the software platform to derive causal models from your enterprise's investment in data, translating them into actions that drive world-class manufacturing behavior.

The PROCEED software achieves results in any complex manufacturing situation. Below is a subset of the categories of applications to which the PROCEED software has been applied successfully:

Reduction or virtual elimination of expensive and time-consuming finished product testing by prediction of product quality from the manufacturing process parameters. ROI is derived from decreased investment in test equipment and personnel to perform the tests, increased product throughput from the reduction of the time-consuming testing, and reduction of expensive re-work and scrap by reducing the rate of product failures.

Reduction or virtual elimination of post-manufacturing product adjustments by optimizing the current manufacturing process. The PROCEED software predicts the manufacturing process parameters driving the need for expensive and time-consuming product adjustments. ROI is achieved through the cost savings from the reduction in personnel and time utilized previously in performing the adjustments.

Loosening of process or raw material tolerances where they do not contribute to finished product quality. ROI is achieved by the implementation of less expensive process steps or materials.



Solve manufacturing problems you could never solve before...

The Actionable Decision Environment™

PROCEED's Actionable Decision Environment™ is the mechanism for deploying knowledge into action. Process owners and decision-makers can manipulate process settings to observe the impact on outcomes. For example, setting a particular process parameter at its theoretical optimum may require a costly upgrade to the production process not justified by the benefits of the change or may be beyond the capabilities of the supplier of the materials. PROCEED provides that flexibility for process owners to interact with the model to inject their subject matter expertise to derive the "real" optimal settings.

"PROCEED Technology accelerates the return on investment from our data infrastructure by deploying actionable information."

- President of a Manufacturing Company

Patent-Pending Method Developed and Proven at Caterpillar Inc.

PROCEED implements a patented "recipe" for the application of novel and traditional knowledge discovery algorithms in a turnkey manufacturing software solution. The approach has been applied and proven to achieve results across a variety of manufacturing applications for optimizing manufacturing processes and product quality.

Capitalize on the Data that You Already Collect and Manage

High tech manufacturing enterprises have spent the last several years investing in measurement and data storage systems. PROCEED is unique in building on that framework to deliver actionable information from your existing data investment.

Recipe and model building process implemented as workflow

Increasing value from analytics is a direct relation of the ability to get people to understand and buy into their outcomes. PROCEED makes the predictive modeling process easier by implementing the steps in the recipe as a step-by-step workflow process.

PROCEED Monitors its Own Performance

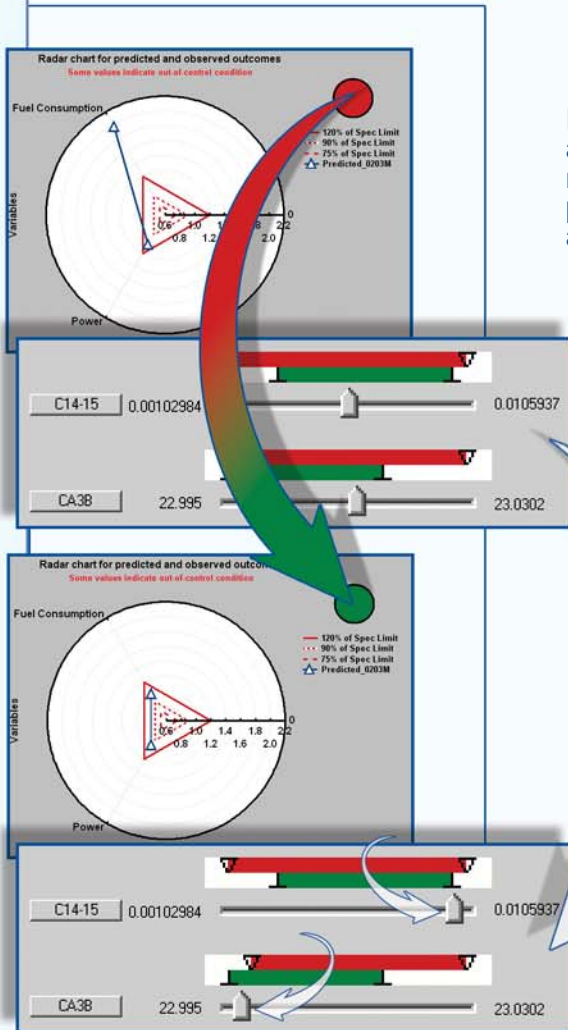
PROCEED includes an integrated sentinel to ensure continuous predictive accuracy.

Integrated Document Management and Audit Trails

PROCEED includes an integrated document management system and audit trails essential to your ISO 9000 and other quality management systems strategies.

Optimal solution is robust to variation

PROCEED allows for the simultaneous, competitive optimization of multiple outcomes along a set of process parameters. PROCEED derives the optimum settings for each parameter that allow the most variation, providing you with the most flexibility in implementing those settings in your manufacturing processes.



The PROCEED Actionable Decision Environment™ (ADE) is a leap forward in deploying analytics into action. The ADE deploys knowledge to decision makers. Decision makers are empowered to perform "what-if" analyses on the critical few parameters driving product quality to observe the predicted results on the product quality attributes.



PROCEEDTM

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"What are the data telling us to do?"TM

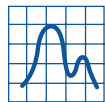
"Caterpillar is recognized worldwide for design and manufacturing of machines and engines. What is not so widely known is the tremendous amount of technology coming from our research and development team that makes those industry-leading products a reality."

Mark Pfloderer, CTO, Caterpillar Inc.

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Tomorrow's successful manufacturers accelerate learning from product and process data to deploy this knowledge as actionable information to:

- Model complex causal relationships
- Predict product performance while minimizing testing
- Understand action alternatives by exploring "what-if" scenarios
- Simultaneously optimize competing outcomes



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