DASSAULT SYSTEMES

Suzlon

Energy, Process and Utilities Case Study

SUZLON
POWERING A GREENER TOMORROW

Challenge
As global demand for wind power solutions continues to grow, wind turbine manufacturer Suzlon needed to optimize its development processes to increase competitiveness and win market share.

Solution
The company adopted Dassault Systèmes **3D**EXPERIENCE Platform, including the Sustainable Wind Turbines industry solution experience.

Benefits
SE Blades, a Suzlon Group company, has improved the blade design process of its blades, enhanced collaboration, and decreased development times enabling it to bring its products to market faster.

SE Blades, a Suzlon Group company – powering a sustainable, greener tomorrow
Suzlon Group, the world's fifth largest wind turbine manufacturer, aims to become the global leader in delivering profitable, end-to-end wind power solutions. "It is a goal we intend to reach, which is why we have made the necessary investments in technology and process improvements to secure the quality and cost of our blades to attract more customers in the years to come," Flemming Mortensen, Department Manager, Structural Blade Design, SE Blades Technology said.

Reducing turbine cost and keeping maintenance to a minimum
The key sales parameters for a wind turbine are high yield, low cost and minimum maintenance time. "At Suzlon, we strive to achieve this by making our blades as efficient as possible requiring minimum maintenance and at the same time reducing development times and material costs. This is how we bring quality products to market faster and increase our competitiveness," Mortensen added.

3DEXPERIENCE sets a new design standard
To reduce time to market and guarantee the design quality of its blades, SE Blades Technology engineers design the entire blade as a digital model. "Working in a fully virtual environment with the Sustainable Wind Turbine industry solution experience is an entirely new design experience for us," Mortensen said. "We can test different concepts early, foresee problems we would otherwise detect much later in the design process, and make the required design changes before blade prototyping manufacturing. Overall, we have a more streamlined and faster development process end to end."

Although blades look similar, they differ in size and shape. Bigger turbines generally produce more energy. However, increasing blade length also increases weight, requiring more material and hence higher costs. If you double the blade length, you get four times the amount of energy. "We therefore need to look for ways to get maximum yield from a turbine blade without driving up material costs. This is why we use composites, which are light materials, for the manufacture of turbine blades. With the Composites module in the Sustainable Wind Turbines industry solution experience from Dassault Systèmes, we have an end-to-end composites design process that enables us to come up with the optimum design, thereby satisfying the careful balance between yields and loads. With CATIA Version 6, we have a total solution that enables us to include, for example, composites manufacturing constraints early in the design process," Mortensen explained.

"On the first blade designed using the Composites module, the plies were checked using the draping algorithm and modified according to the findings to avoid wrinkles. The flattened plies from the Composite module were sent to our CNC cutter at the plant and directly cut into shape. This saved a lot of time compared to the ply preparation method used in the past. Afterwards the plies were positioned into the molds and fitted perfectly without wrinkles and without the need for modifying the plies in width and length as they were all cut into shape. Usually, some tailoring is required when the first blade is laid up and thus the Composites module from Dassault Systèmes saved us valuable time in relation to the prototyping and blade production. The prototype team was very impressed."

Unique designs based on existing templates
SE Blades Technology uses templates to automate and accelerate the design process. Although each blade is unique, its shape and how it is built is fairly standard. "We don't invent a new blade every time," Mortensen said. "We have developed a generic blade model, or template with CATIA, that can be reused for new designs. We then customize each blade to meet specific requirements with respect to size and wind conditions. We significantly reduce design time this way."

Working on a virtual model enables Suzlon to capitalize the design history from initial sketch to manufacture-ready drawings. To manage and automate the analysis tasks that are then processed by

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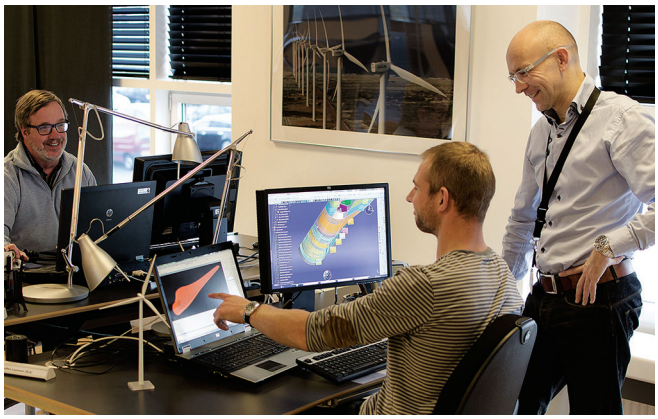
Flemming Mortensen, Department Manager, Structural Blade Design, SE Blades Technology

Wind blades



SE Blades Technology design team

the company's analysis solution, SE Blades Technology uses Simulation Lifecycle Management (SLM) from SIMULIA Version 6, the 3DS application for realistic simulation.

With the Sustainable Wind Turbines solution experience, design iterations as well as analysis results are stored directly in ENOVIA Version 6, the 3DS application for collaborative innovation. Like CATIA and SIMULIA, it is part of the **3D**EXPERIENCE Platform. ENOVIA enables traceability and secure access to information at every step of the process. Role-based workflow management ensures that the right people are identified throughout the process and that the design follows the company's predefined approval stages before being released to production. This digital thread, as it is known at SE Blade Technology, "details how a blade was designed, why it was designed in a certain way, who approved what, and why certain decisions were made," Mortensen explained.

Collaboration and the universal language of 3D

Engineers at SE Blades Technology's sites in Denmark, the Netherlands and India all have access to the same model and can work simultaneously on the same blade. "This is brand new," Mortensen explained. "We never had the ability to use the same model across borders before and communicated by manually delivering models to each from our different servers. Our engineers can now work as an integrated team. And although they all do not speak the same language, 3D is universal."

With the Sustainable Wind Turbines industry solution experience, engineers can easily see how changes made to one part of a design affect other parts of the blade. "Before, when a modification was made to one part, the effect it had everywhere else was not readily visible," Mortensen said. "As a result of this visibility, the reduction in costs and development time are considerable."

Instrumental to deploying the **3D**EXPERIENCE Platform at SE Blades Technology was 3DS partner Idé-Pro Engineering & Software. The company was responsible for delivering and implementing the integrated Version 6 applications. Training began early 2011 and methodologies were jointly defined by SE Blades Technology and Idé-Pro experts. Today, a total of 18 engineers have been trained to use the platform.

Focus on Suzlon

SE Blades Technology is a part of Suzlon Group, the world's fifth largest manufacturer of wind turbines.

Products: Design and manufacturing of wind blades
Employees: 13,000
Headquarters: Pune, India, and present in 32 countries around the world.

For more information
www.suzlon.com

Focus on Idé-Pro Engineering & Software A/S

Idé-Pro Engineering & Software is a leading consultancy and software specialist in Denmark. A Dassault Systèmes partner, Idé-Pro Engineering & Software provides customers with state-of-the-art solutions to support design, engineering and manufacturing processes to perform better in international competition. Idé-Pro has specific competencies within the areas involved – advanced composites design and manufacturing and the 3DEXPERIENCE Platform based on CATIA V6 and ENOVIA V6.

For more information
www.ipes.dk

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Dassault Systèmes, the **3D**EXPERIENCE Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 150,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit www.3ds.com.

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