

# 21st Century Airships

Increases design efficiency by 60% with DS PLM



## Overview



### ■ Challenge

*21st Century Airships needed to automate its design processes to improve accuracy and increase efficiency.*

### ■ Solution

*To transition from a paper-based design environment 21st Century Airships chose CATIA.*

### ■ Benefits

*Improved accuracy and increased efficiency by as much as 60%, raising quality, reducing costs and expanding capacity.*



“Leveraging CATIA has improved our efficiency and, in turn, our profitability. We’re producing higher-quality airships more quickly and cost-effectively, which helps us bring this very ‘green’ form of transportation to even more markets.”

Hokan Colting, President,  
21st Century Airships

### Designing earth-friendly airships more efficiently

21st Century Airships, based in Newmarket, Canada, designs helium-filled aircraft with distinct environmental advantages. The company, in business since 1988, has crafted airships for use in geo-surveys, military surveillance, weather monitoring and to support temporary infrastructure such as cellular towers during disasters.

Tim Buss, director of engineering at 21st Century Airships, says today’s airships are an earth-friendly, fuel-efficient and vibration-free alternative to conventional aircraft, offering the extended range, duration and stability required for remote access and sensitive monitoring operations.

“No power is required to keep an airship in the air,” Buss says. “Power from the engines is for propulsion only, not for lift, so they use far less fuel to do the same work as other aircraft.”

Since its inception, Buss says, 21st Century has researched and

developed approximately 18 unique airship designs, incorporating different configurations and levels of technology. Its latest offering, recently tested in Alabama, demonstrates a new hull design and bio-fuel capability. “This airship actually uses diesel fuel made from oil produced by algae,” he says.

Despite the innovative nature of 21st Century Airships’ business, it spent 18 years creating its designs on paper, scaling them up, and then building physical prototypes to uncover the small errors that became exaggerated when scaled. It was a slow, cumbersome process that required significant trial and error, time and materials.

### CATIA introduces new design era

In 2006, 21st Century left its paper-based methods behind in favor of computer-aided design (CAD). The company selected CATIA because it is the design standard throughout the aviation industry. “It was definitely the right platform for us to be using, particularly when you consider regulatory compliance,” Buss says.



“It’s what the FAA (Federal Aviation Administration) is used to dealing with.”

The transition to CATIA has enabled many efficiencies and improvements in the company’s processes. “The repeatability that comes with using CATIA is one of the key improvements we’ve seen,” he says. “Once we’ve designed the envelope (the airship’s outer shell) in CATIA and sectioned it up, we can repeat those same gores all the way around without error. Everything is an exact replica of the previous one. No flaws or errors are being perpetuated. We’re definitely producing a better quality airship with CATIA.”

Buss, who is not an engineer, says learning to use CATIA was easy. “I took a one-week course, and I definitely know enough to get by when our engineer is out,” he says.

CATIA also allows designers to use their previous practical experience to ensure structural support is incorporated in the right places and to perfect a ship’s design before it is built, saving time and the cost of discarded materials. By leveraging CATIA’s ability to factor in component properties, designers can ensure balance and accurately predict positioning of systems and loads.

### **CATIA opens new doors**

CATIA also has proven to be a significant advantage in dealing with the company’s partners. Engines, actuators and other components are provided by external suppliers. Because many of the company’s suppliers also design with CATIA, 21st Century Airships can pull its suppliers’ models for parts directly into its own designs.

In fact, 21st Century is merging with one of its manufacturing partners. Once the merger is complete, both companies will use CATIA to ease the transition from design to manufacture. They also are considering 3DVIA Composer, which generates fully associative product documentation directly from CATIA models, to produce assembly documentation.

“Efficiency’s gone way up,” Buss says. “We can handle a lot more projects at the same time and still keep track of everything. Using CATIA, we’ve improved efficiency by at least 60%, so we can take on more work with the same staff and improve our profitability.”



“Using CATIA, we’ve improved efficiency by at least 60% when you consider labor, overhead, construction costs and other factors, so we can take on more work with the same staff and improve our profitability.”

Tim Buss, Director of Engineering,  
21st Century Airships



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