

NX

## Simulation Designs

Enhanced visualization improves precision in design and CNC programming

### Industry

Aerospace and defense

### Business challenges

Shorter lead times

Customers' requirements for higher-precision components

### Keys to success

3D digital models

Tool path simulation

### Results

Productivity gains of 35 to 40 percent

Rework has been eliminated

Significant cost savings

Time savings of 100 percent compared to conventional process

Ability to win more high-precision jobs

### 3D models and NC simulation using NX eliminate rework and boost productivity by 35 to 40 percent

#### Precision machining

Simulation Designs India Pvt. Ltd. (Simulation Designs), established in 1996, is a manufacturer of high-precision components used in mission-critical systems aboard satellites, space vehicles and civil aircraft. In addition, the company's RF microwave components can be found in high-precision instrumentation for both ground and space applications. Examples of Simulation Designs' products include: fluid control systems, cockpit instrumentation components, flight actuator hardware, mechanisms for deploying solar cell arrays on satellites, structural items for satellites such as brackets and heat sinks, and launch vehicle flight control system hardware.

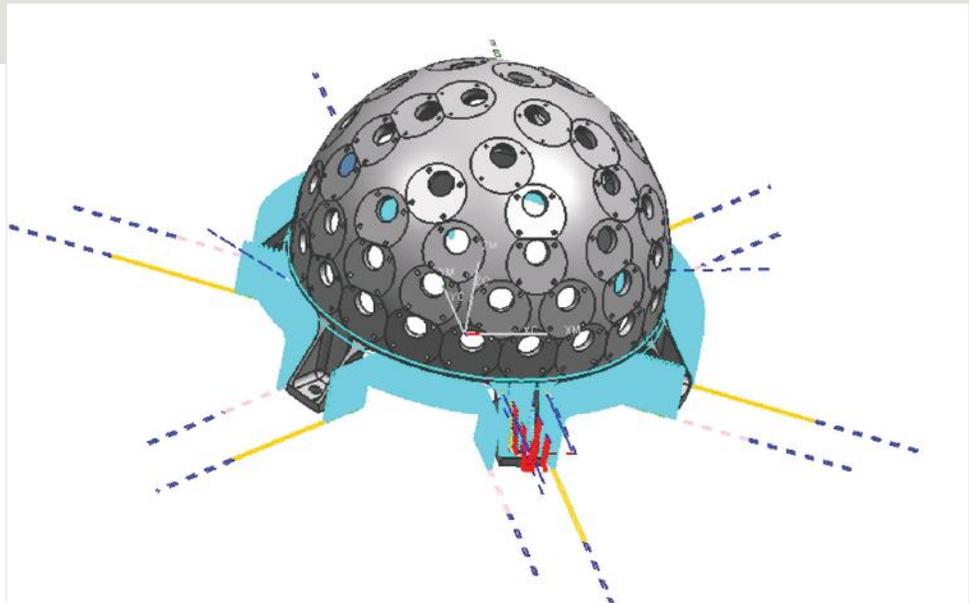
With 70 employees and 10 machining centers, Simulation Designs has the capability to machine any part within an envelope of 30 inches by 20 inches by 10 inches. Parts with such tight tolerances as five to six microns (0.0002 inch) have been made for Airbus and other aerospace companies. The company's machining centers include a 5-axis Deckel Maho machine and three computer numerical control (CNC) lathes. High-precision components are machined from aluminum, titanium and maraging steel.



#### When microns matter

Over the years that Simulation Designs has been in business, its customers have been demanding shorter lead times but also greater precision in the components they buy. Simulation Designs was able to meet the precision requirements through a great deal of trial and error, but was struggling to shrink its cycle times to what customers were demanding. At times, all the trial and error needed to achieve precision targets caused the company to miss delivery dates. This practice also increased development costs because of the rework it generated.

The only way the company could see to shrink its cycle times was to implement an advanced computer-aided design (CAD)/



computer-aided manufacturing (CAM) solution. After a comparison of Pro/Engineer® software from Parametric Technology Corporation and NX™ software from Siemens PLM Software, Simulation Designs implemented the 3D modeling and CAM functionality of NX. NX was selected for a number of reasons, but its tight CAD/CAM integration and aerospace expertise were especially important to the company.

“The strategy behind our implementation of NX was to use its visualization tools to improve process efficiencies,” says Ujval Deep, managing director at Simulation Designs.

#### **Visualization has dual benefits**

The visualization advantage of NX works in two ways. First, modeling complex parts and assemblies in 3D using NX gives everyone involved in a project a better understanding of what is being created. Designers can evaluate their work more effectively, and more easily detect problems early in the design cycle. Design reviews using NX digital assemblies give everyone, even those who are not adept at reading 2D drawings, a clear image to evaluate.

Another aspect of NX visualization that benefits Simulation Designs is the CAM

system’s animation of machine tool motion in context of the entire setup and material removal. Once a design has been finalized, the 3D geometry is used to generate tool paths using NX CAM. As the programmers work, they can preview their tool paths onscreen to detect errors such as fixture interferences or access angle difficulties. This simulation functionality is immediately accessible during the tool path creation process. NX CAM supports all of Simulation Designs’ machining capabilities, including 5-axis machining.

#### **NX opens doors to new business**

The deployment of NX has improved productivity at Simulation Designs and is helping the company meet customers’ demands for shorter lead times. “NX helped by providing better visualization, which leads to more foolproof CNC programs, which in turn gives us higher efficiencies in production,” says Deep. The company attributes productivity gains of 35 to 40 percent to its implementation of NX.

Another benefit of more accurate CNC programs is that costs related to scrap and rework are no longer an issue. “The quality yielded with the NX process is good; work and rejection rates have been virtually eliminated,” says Deep. “This represents a

### Solutions/Services

NX  
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### Customer's primary business

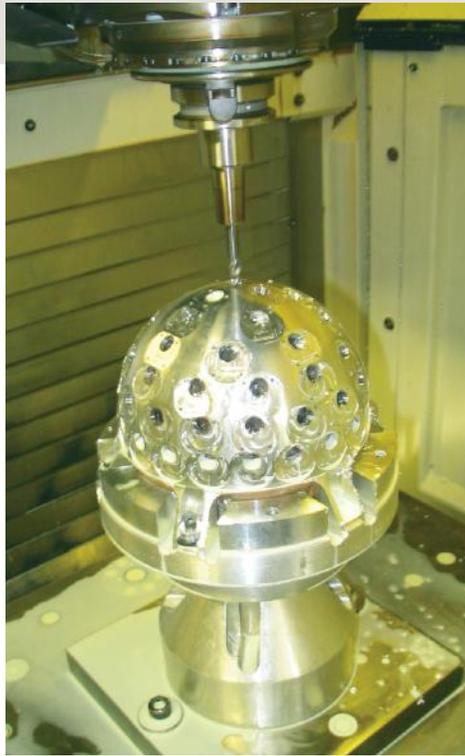
Simulation Designs India manufactures high-precision components used in mission-critical systems.  
[www.simulationdesigns.com](http://www.simulationdesigns.com)

### Customer location

Bangalore  
India

**"The main competitive advantage of NX is higher functional accuracies, with low risk."**

Ujval Deep  
Managing Director  
Simulation Designs



significant cost savings annually," he adds. Also, without the delays caused by the previous trial-and-error approach to creating complex components, Simulation Designs is able to deliver products sooner. Deep reports time savings of 100 percent over conventional methods.

Another important outcome of the move to NX is that Simulation Designs is now better equipped to win jobs that require higher precision. "The main competitive advantage of NX is higher functional accuracies, with low risk," says Deep. "For us, this has opened the door to manufacturing high-precision communication antennas."

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