

## Teamcenter

# Lockheed Martin Aeronautics

### Global F-35 aircraft coalition builds unique collaboration network

#### Industry

Aerospace and defense

#### Business challenges

Three primary industrial partners, plus up to 600 suppliers in 30 countries

As many as 3,000+ aircraft with at least three design variants

Goals include unprecedented design/build cycle reductions, lowest cost of sustainment for 30-year life of fleet

#### Keys to success

Create robust, scalable and secure digital collaboration solution that links partners and suppliers

Improve knowledge use/re-use among global OEMs, operators, logisticians and maintainers

Adopt open, web-centric solution as foundation for integrated digital environment

Use visualization capabilities to create digital mockups

Manage and automate development processes with workflow capabilities

The world's first truly international, integrated digital environment (IDE) supports the design, manufacture and sustainment of the Joint Strike Fighter F-35 aircraft

#### Collaboration challenge of unprecedented magnitude

The F-35 Joint Strike Fighter (JSF) aircraft is being built by a Lockheed Martin-led coalition of leading military aircraft manufacturers and suppliers around the world who must work as if they are one contiguous enterprise. The F-35 Program is designed to provide the United States' Air Force, Navy and Marine Corps, and the United Kingdom's Royal Navy and Royal Air Force with an affordable and stealthy tactical aircraft for the 21st century. Lockheed Martin Aeronautics (Lockheed Martin), which won the contract to produce the F-35, is developing an aircraft fleet that satisfies the diverse program requirements of the highest-profile program in the aerospace and defense industry's history. Lockheed Martin's strategy is to create a common design with affordable variants that meet the individual requirements of the different services.

Lockheed Martin is partnering with US and international aerospace leaders, including Northrop Grumman and BAE Systems. These three primary partners are supported by up to 600 suppliers. In all, the parties involved in the production of the



F-35 reside in more than 30 countries, spanning 17 time zones. Coordinating their efforts and fostering collaboration across the extended enterprise of companies with dissimilar development environments is a critical challenge for Lockheed Martin. Similarly, managing all of the multiple formats of design data involved in this project is equally crucial. The program is expected to produce as many as 3,000 plus aircraft, which will have life spans of up to 30 years. All design and manufacturing data for each aircraft configuration must be managed as well as the data required to support the planes during their lifetimes. This means that every design change needs to be validated against all possible configurations. There is an additional challenge here as well: A key program goal is achieving unprecedented cycle time reductions in both design and manufacturing.

## Results

Real-time online collaboration across 5 major partners and 35 design suppliers

Total users now 6,500

Product knowledge and development processes managed across all lifecycle domains

## Solutions/Services

Teamcenter

[www.siemens.com/teamcenter](http://www.siemens.com/teamcenter)

## Customer's primary business

Lockheed Martin Aeronautics builds the finest military aircraft in the world, including the F/A-22, the F-16, the C-130J, the F-117 and the next-generation fighter, the F-35.

[www.lmaeronautics.com](http://www.lmaeronautics.com)

## Customer location

Ft. Worth, Texas  
United States

## 21st-century PLM solution for a 21st-century aircraft

The Lockheed Martin-led F-35 team turned to 21st-century product lifecycle management (PLM) technology to meet the challenges of delivering the next generation of military aircraft. Lockheed Martin has adopted Teamcenter® software as the foundation for a global collaboration network supporting the F-35 Program. Based on military and emerging industry standards, Teamcenter supports the special requirements of aerospace and defense companies by providing proven, industry-specific PLM capabilities. The tailored industry solution is built on the Teamcenter open PLM foundation, which connects people and processes – creating, capturing and sharing product knowledge to power innovation and productivity. In order to connect the thousands of F-35 Program users, it was essential to have the scalability and robustness of Teamcenter.

The first phase of the F-35 Collaboration Network deployment linked 5,000 users at facilities owned by the three primary partners and Stork Fokker of the Netherlands. These users are connected to the system with appropriate security safeguards to ensure compliance with USA International Traffic in Arms Regulations (ITAR) requirements. Teamcenter rules ensure compliance with ITAR and proprietary control procedures. To date, more than 6,500 users across the extensive supplier network have also been brought online, totaling more than 130 sites worldwide (spanning seven countries and nine time zones). Most importantly, real-time online collaboration is a reality for both engineering in-process and released designs, across five major partners and 35 design suppliers. Lockheed Martin sees this as a critical achievement on the program.



## Complete tracking of every single part

With a storage area network (SAN) now containing more than five terabytes of product information, the Teamcenter implementation for the F-35 Program supports all users involved in design-related endeavors, including their workflow and design processes. The F-35's worldwide design operations require the robustness of Teamcenter data replication capability. Program participants store data locally for improved response time – currently 70,000 data items are replicated across 15,000 locations daily with Teamcenter. With replication taking place on this massive scale, the F-35 Program is the largest user of Teamcenter replication capability in the world. Lockheed Martin is currently managing the "As Designed," "Manufacturing" or "As Planned," and "As Built" bills of material inside of Teamcenter.

In addition to managing F-35 Program information, Teamcenter also manages a number of processes related to the aircraft's development. For example, Teamcenter workflow capabilities are used by Lockheed Martin to control development and release processes. Teamcenter also manages product options and variants with its robust configuration management engine. Teamcenter visualization capabilities enable program participants to view digital mockups and perform interference checks throughout the entire design cycle.

## Siemens Industry Software

Americas +1 800 498 5351  
Europe +44 (0) 1276 702000  
Asia-Pacific +852 2230 3333

[www.siemens.com/plm](http://www.siemens.com/plm)

© 2011 Siemens Product Lifecycle Management Software Inc. All rights reserved. Siemens and the Siemens logo are registered trademarks of Siemens AG. D-Cubed, Femap, Geolus, GO PLM, I-deas, Insight, JT, NX, Parasolid, Solid Edge, Teamcenter, Tecnomatix and Velocity Series are trademarks or registered trademarks of Siemens Product Lifecycle Management Software Inc. or its subsidiaries in the United States and in other countries. All other logos, trademarks, registered trademarks or service marks used herein are the property of their respective holders.  
Z3 5434 12/11 B