



AEROSPACE CORPORATION

A private, nonprofit corporation that provides technical risk management analysis and assessment for the U.S. Air Force.

Industry: Aerospace
Geography: United States

Deployment Summary

- Platform enables real-time monitoring of shuttles before and during launches.
- System provides remote control and 3-D visualization of remote launch sites.
- Open architecture lets analysis data flow back into applications for immediate use and gives Aerospace better understanding of critical information.

Benefits

- Real-time information flow drives data delivery times down by 99 percent – from 2 days to 40 milliseconds.
- Flexible platform design enables simple modifications to the system with less coding time.
- Remote control of launch sites cuts cost of employee travel.



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Aerospace Keeps the Skies Safer Using Real-Time Information

The Aerospace Corporation is a private, nonprofit organization that provides objective technical risk management analysis and assessment for the U.S. Air Force Space Command's Space and Missile Systems Center. Aerospace provides telemetry data designed to eliminate launch delays, failures, and in-space collisions of spacecraft – mishaps that carry a staggering price tag.

To ensure top air safety, Aerospace needs a reliable way to access, display, distribute, and analyze telemetry data. It also must accomplish these tasks in real time, so that the Air Force does not wait days or weeks for answers to mission-critical questions.

To support satellite launches at Cape Canaveral Air Force Station and Vandenberg Air Force Base, Aerospace developed the Spacelift Telemetry Acquisition and Reporting System (STARS). STARS monitors and analyzes the real-time performance of individual launch vehicle subsystems – and the rocket as a whole – before launch, on the day of launch, and during flight.

Delays in data delivery hinder effectiveness

When Aerospace began developing its real-time analysis system, it faced several challenges. First, the company suffered waits between two days and two weeks to gain visibility to critical

telemetry data because its only delivery mechanism was magnetic tape. Because delays can cost more than \$1 million each day that a launch vehicle sits idle on the pad pending analysis of a potential problem, Aerospace knew that tape could not handle the job.

Aerospace also needed a way to serve telemetry data to its distributed applications, including graphical user interfaces, databases, expert systems software, and custom analysis tools. Bruce Mau, senior project leader for STARS, says Aerospace preferred to focus on improving existing applications rather than on building enabling technologies from scratch.

“Writing all of that custom inter-process communication code ourselves would have been incredibly cumbersome and clearly not the best use of our analysts’ time,” Mau says. “We also wanted to get the system up and running fast.”

Aerospace sets sights on real-time data

To address these challenges, Aerospace turned to TIBCO Software Inc., a leading enabler of real-time business. Mau and his team chose TIBCO's messaging solution as the backbone of its STARS system. Mau says that his team found TIBCO to be the best solution for facilitating

complex process-to-process communication between the telemetry processing system, the telemetry distribution system, and Aerospace applications. Considering the fact that billions of dollars – and the safety of an elite fleet of astronauts – depend on the ability of Aerospace to deliver accurate, real-time data, the best solution is the only option.

“You only have one chance at launching a \$1 billion spacecraft,” Mau says. “TIBCO has been an integral part of Aerospace for nearly a decade, providing the government with greater assurance that billion-dollar spacecraft will get where they need to go without failure or problems.”

Fast deployment leads to immediate results

By managing much of the underlying complexity of the system, TIBCO’s messaging solution enabled Aerospace to get STARS up and running in a very short period of time as required. In the satellite command and control sector, rapid planning, development, and deployment of ground systems is a significant accomplishment.

“Starting with a blank slate, we monitored our first launch in real time just 18 months later,” Mau says. “We now can send fewer engineers to the launch site, saving Aerospace travel expenses.” The flexible design of TIBCO’s solutions also makes it easy for Aerospace to evolve the STARS system as the company’s requirements evolve over time.

With The Power of Now® at the core of the STARS system, Aerospace has reduced telemetry access times from 2 days to 40 milliseconds – a massive improvement in data delivery speed.

“That’s huge for the Air Force as well as launch vehicle contractors such as Lockheed and Boeing because instead of having to wait days or weeks for us to perform the analysis, we now can do it in real time,” Mau says. “That capability translates into fewer launch delays and losses that can consume billions of taxpayer dollars.”

Employee productivity takes off

The TIBCO solution also has helped to boost employee productivity. Aerospace analysts – several hundred nationwide – no longer waste time custom-coding their individual analysis tools to communicate with Aerospace’s telemetry server or modifying code every time they wish to add a new application.

“With TIBCO, our analysts can focus on what they do best and what we hired them to do: analysis,” Mau says. “That’s a big payoff from TIBCO.”

Aerospace also used the TIBCO solution to quickly implement a remote control feature that enables 3-D flight visualizations at remote launch sites to be directly controlled from Aerospace headquarters via a wide area network (WAN). Now, remote sites no longer need to dedicate valuable human resources to learn and run flight visualizations locally. Everyone monitoring a launch from coast to coast benefits from optimal viewing driven by the flight visualization experts.

Integration drives better understanding of enterprise data

Not only does the TIBCO solution unify multiple Aerospace systems, but it also feeds telemetry analysis results back into the pool of applications for further optimization.

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Looking ahead, Aerospace plans to take further advantage of TIBCO’s capabilities throughout the company’s IT infrastructure to continually improve and add value to the mission-critical STARS system. Based on the success of the first project, Mau says he would seize the chance to work with TIBCO again in the future.

“Hiring a TIBCO consultant for a week to help us with some integration work was worth every penny and more,” Mau says. “The consultant was extremely knowledgeable and gave us a huge head start in achieving our goals. We’d do it again in a heartbeat.”



TIBCO Software Inc. (NASDAQ: TIBX) is a provider of infrastructure software for companies to use on-premise or as part of cloud computing environments. Whether it’s optimizing claims, processing trades, cross-selling products based on real-time customer behavior, or averting a crisis before it happens, TIBCO provides companies the two-second advantage™ – the ability to capture the right information at the right time and act on it preemptively for a competitive advantage. More than 4,000 customers worldwide rely on TIBCO to manage information, decisions, processes and applications in real time. Learn more at www.tibco.com

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