

## Customer Case Study: Titan Aerospace & Contoso Engineering

### Overview

**Customer Name:** Titan Aerospace

**Industry:** Aerospace Component Manufacturing

**Location:** Houston, USA

**Project Name:** Titan Aerospace Manufacturing Facility Expansion

**Completion Date:** June 2024

**Contoso Engineering Services Provided:** Facility Design, Equipment Procurement and Installation, Automation Systems Integration, Safety Compliance, and Project Management

### Executive Summary

Titan Aerospace, a leading manufacturer of aerospace components, embarked on an ambitious project to expand its manufacturing capabilities by setting up a new facility in Houston, USA. The expansion was aimed at meeting the increasing global demand for aerospace components, particularly for commercial and defense sectors. The project involved not just the construction of the new facility but also the installation of advanced machinery and the integration of cutting-edge automation systems.

Titan Aerospace selected Contoso Engineering as their trusted partner to lead this expansion due to their expertise in industrial engineering, particularly in the aerospace sector. Over a span of 20 months, Contoso Engineering meticulously planned and executed the project, delivering a world-class facility equipped with the latest technology, enabling Titan Aerospace to significantly enhance its production capacity.

This case study details the challenges faced, the innovative solutions deployed by Contoso Engineering, and the outstanding results achieved, showcasing the successful collaboration between Titan Aerospace and Contoso Engineering.

### Challenges

The aerospace manufacturing industry demands the highest standards of precision, safety, and efficiency. Titan Aerospace faced several challenges that required specialized expertise:

1. **High Precision Requirements:** Aerospace components must be manufactured to extremely tight tolerances, requiring the installation of highly accurate and reliable machinery.
2. **Automation Integration:** The facility needed to incorporate advanced automation systems to streamline production processes and reduce human error.
3. **Regulatory Compliance:** The aerospace industry is heavily regulated, with stringent safety and quality standards that the new facility had to meet.
4. **Budget Constraints:** While the project was large in scale, it was essential to manage costs carefully to stay within the allocated budget.
5. **Complex Coordination:** The project involved coordinating with multiple international suppliers and ensuring that all equipment was delivered, installed, and operational according to the project timeline.

### Solutions

Contoso Engineering addressed these challenges through a comprehensive, multi-phased approach that combined cutting-edge engineering, strategic planning, and effective project management.

## 1. Facility Design and Layout

The first step in the project was to design a facility that would maximize efficiency and support the high-precision manufacturing processes required by Titan Aerospace. Contoso Engineering's design team worked closely with Titan Aerospace to create a layout that optimized space utilization, supported workflow efficiency, and allowed for future scalability.

The design incorporated separate zones for different stages of the manufacturing process, including material preparation, machining, assembly, and quality inspection. Each zone was equipped with the necessary infrastructure to support the advanced machinery and automation systems that would be installed.

## 2. Equipment Procurement and Installation

Given the high precision required for aerospace components, Contoso Engineering carefully selected the best equipment for the job. The procurement process involved:

- **5-Axis CNC Machines:** These machines were chosen for their ability to manufacture complex components with high accuracy.
- **Automated Assembly Lines:** Designed to reduce manual labor and improve consistency in the production of aerospace components.
- **Robotic Welding Systems:** Integrated for precision welding, ensuring strong and reliable joints in metal components.
- **Advanced Inspection Systems:** Including coordinate measuring machines (CMMs) and non-destructive testing (NDT) equipment to verify the integrity and quality of manufactured parts.

Contoso Engineering's technicians oversaw the installation and calibration of each piece of equipment, ensuring that it met the stringent requirements of aerospace manufacturing.

## 3. Automation Systems Integration

To achieve the level of automation required, Contoso Engineering integrated state-of-the-art automation systems into the facility. This included:

- **Robotics:** Deployed across various stages of the manufacturing process to handle repetitive tasks with high precision.
- **IoT Sensors:** Installed throughout the facility to monitor equipment performance and provide real-time data for predictive maintenance.
- **Manufacturing Execution System (MES):** Implemented to coordinate and control the entire production process, ensuring seamless operations and minimizing downtime.

These systems were designed to work together to enhance efficiency, reduce production time, and improve product quality, providing Titan Aerospace with a competitive advantage in the aerospace industry.

#### 4. Safety and Compliance

Safety and regulatory compliance were critical considerations throughout the project. Contoso Engineering conducted a comprehensive risk assessment and implemented a range of safety measures, including:

- **Fire Suppression Systems:** Installed throughout the facility to protect against potential fire hazards associated with high-precision machining and welding.
- **Hazardous Material Storage:** Specialized storage solutions were implemented for the safe handling and storage of hazardous materials used in the manufacturing process.
- **Employee Training:** Extensive training programs were conducted to ensure that all Titan Aerospace staff were well-versed in safety protocols and the operation of the new equipment.

These efforts ensured that the facility not only met but exceeded industry safety standards and regulatory requirements.

#### 5. Cost and Project Management

Contoso Engineering employed advanced project management techniques to keep the project on schedule and within budget. This involved:

- **Real-Time Budget Monitoring:** Continuous tracking of project expenses to identify and address potential cost overruns early.
- **Supplier Coordination:** Close collaboration with international equipment suppliers to ensure timely delivery and installation.
- **Regular Progress Reviews:** Weekly meetings and reports to keep all stakeholders informed and aligned on the project's progress.

Through diligent management and strategic decision-making, Contoso Engineering successfully delivered the project within the specified budget and timeline.

#### Results

The expansion of Titan Aerospace's manufacturing facility was a resounding success. The project achieved all of its objectives, delivering a state-of-the-art manufacturing facility that has enabled Titan Aerospace to:

- **Expand Production Capacity:** The new facility has increased Titan Aerospace's production capacity by 40%, allowing the company to meet the growing demand for its components.
- **Enhance Product Quality:** The integration of advanced automation and inspection systems has significantly improved product quality, reducing defects and ensuring compliance with stringent aerospace standards.
- **Improve Efficiency:** The automation systems have streamlined production processes, reducing lead times and increasing overall operational efficiency.

- **Ensure Safety and Compliance:** The facility's design and safety measures have created a secure working environment, ensuring compliance with all relevant regulations and minimizing the risk of accidents.

Titan Aerospace's management team has expressed their satisfaction with the project, highlighting the quality of Contoso Engineering's work and their ability to deliver on all project objectives.

### **Customer Testimonial**

#### **Emily Davis, COO of Titan Aerospace:**

"Contoso Engineering has been an exceptional partner throughout this project. Their expertise in industrial engineering, particularly in the aerospace sector, was evident in every phase of the project. They delivered a facility that not only meets our current production needs but also provides a solid foundation for future growth. We are extremely pleased with the outcome and look forward to continuing our partnership with Contoso Engineering."

### **Conclusion**

The successful expansion of Titan Aerospace's manufacturing facility underscores Contoso Engineering's commitment to delivering high-quality engineering solutions that meet the unique needs of their clients. By providing a facility that enhances production capacity, improves efficiency, and ensures safety and compliance, Contoso Engineering has once again demonstrated its ability to execute complex industrial projects to the highest standards.

For more information about Contoso Engineering's services or to discuss how we can support your next project, please contact us at [info@contosoengineering.com](mailto:info@contosoengineering.com) or visit our website at [www.contosoengineering.com](http://www.contosoengineering.com).