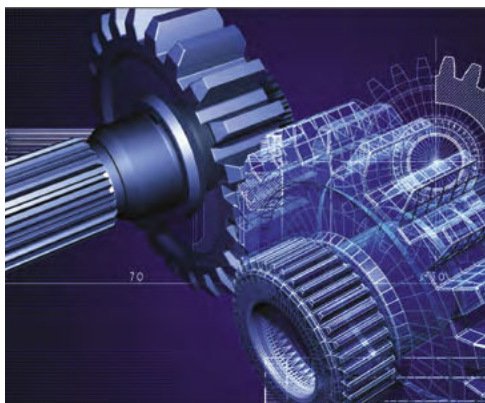


P3 VOITH AEROSPACE

ELECTRICAL WIRE HARNESS DESIGN CASE STUDY



Challenge

P3 Voith Aerospace needed to improve design efficiency and to collaborate with engineers who design the structure which supports its electrical systems.

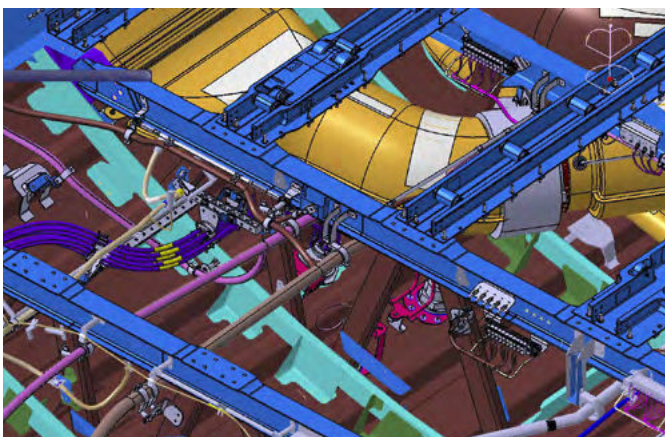
Solution

The company selected Dassault Systèmes' **3DEXPERIENCE** application CATIA Electrical for cabling and wire harness collaborative design.

Benefits

With CATIA Electrical, the harness design process is facilitated thanks to update capabilities when the aircraft's structure changes, thus enhancing the concurrent engineering.

Airplanes are complex machines and the sheer quantity of cables and wires running through an aircraft can be mind-boggling. While structure and aerodynamics are crucial to getting a plane off the ground, electrical systems are just as important and basically considered the life support of an airplane. So much depends on the hundreds of kilometers of wires and cables; they enable communication with ground crews and satellite systems, they pilot navigational controls, monitor air temperature, on-board entertainment and lighting, all essential to keeping the plane in proper working condition and passengers, flight attendants and pilots comfortable and basically breathing throughout the flight. "Electrical system design is a highly specialized discipline and aerospace OEMs prefer sourcing electrical harness design to their suppliers to take advantage of their expertise," Thomas Feuerstein, director, P3 Voith Aerospace France, said. "In this highly competitive market, P3 Voith Aerospace needs to propose innovative solutions and think out of the box if we want to capture the attention of our OEM customers," he said. "As a comprehensive service organization for the aerospace industry, we possess extensive skills in flight physics, system and structural engineering, configuration management, and cabin and cargo systems design. This has brought us prestigious customers, which include EADS Group including Airbus, Dassault Aviation, Embraer, Bombardier and helicopter manufacturers Eurocopter and Bell Helicopters."



TECHNOLOGY SUPPORTS SYSTEM DESIGN

The complex network of wires and cables requires highly skilled engineering and the technology to assist designers and engineers during the design and fitting of these systems in the structure of the aircraft. Economic hardships experienced by airline companies due to rising fuel prices, which gnaw at their profit margins, translate into strict requirements to reduce aircraft weight and space consumption to a minimum. As if these specifications were not demanding enough, electrical wiring is subject to electromagnetic forces and high temperatures challenging engineers even more to come up with efficient solutions so that these systems continue to ensure superior performance and are able to stand up to the harsh conditions of their environment.



"...With CATIA Electrical, adapting the electrical systems to the new layout when the structure's design changes, is fast and efficient."

Thomas Feuerstein, director, P3 Voith Aerospace France.

Thinking out of the box is what prompted P3 Voith Aerospace to seek technology that would enable it to innovate while optimizing product design, delivery schedules and costs. "This is why we turned to Dassault Systèmes' **3DEXPERIENCE** Platform," Feuerstein said. "Its collaborative capabilities, which help link our development organization with our customers to exchange ideas and solutions, and the superior design capabilities of the **3DEXPERIENCE** application CATIA, are now major assets to our development activities. We design wire harnesses with the CATIA Electrical Solutions and do all routing in 3D." For P3 Voith Aerospace, working in 3D presents huge advantages. "First of all, everyone understands 3D," he said. "There are no language barriers." The other reason is related to the design sequence of the aircraft. "Because the structure of the craft is already designed, we need to fit our electrical systems in this existing environment. Working with CATIA makes the job easier because it helps find the most optimum layout and enables us to detect interferences early on instead of further downstream when modifications are most expensive and risk generating delays. Moreover, with CATIA Electrical, adapting the electrical systems to the new layout when the structure's design changes, is fast and efficient."



MAJOR PROJECTS BENEFIT FROM CATIA ELECTRICAL

CATIA Electrical is employed in two major projects P3 Voith Aerospace is working on. The first one is the new Eurocopter program – the Eurocopter X4. “We designed over 150 electrical harnesses with CATIA Electrical, which represents over 5 km of cables, 700 connectors and that weigh 200Kg,” Feuerstein said. The other project is the new dual reactor business jet from Dassault Aviation – the SMS aircraft. P3 Voith Aerospace engineers collaborate with subcontractors and Dassault Aviation engineers on a virtual integrated platform dedicated to this project using CATIA V6 Electrical. All designs, specifications, and change history are on one platform and accessed by all stakeholders simultaneously. “A major advantage is the ability of mechanical and electrical engineers to work concurrently on different portions of the structure and electrical harness design, and to test different routing and layout configurations on the fly,” Feuerstein said. “Working in parallel has shaved 20% off our project schedule.”

With CATIA Electrical, P3 Voith Aerospace has the technology it needs to deliver competitive solutions to its OEM customers. “Stringent weight requirements and space optimization are just some of the expectations voiced by airline manufacturers. With CATIA Electrical, we can provide them with efficient and cost effective solutions to reduce mass by optimizing design layout and routing,” Feuerstein said. “By providing innovative solutions we continue to attract business and customer loyalty.”



Focus on P3 Voith Aerospace

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Employees: 900

Headquarters: Hamburg, Germany

For more information

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Our 3DEXPERIENCE Platform powers our brand applications, serving 12 industries

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