CASE STUDY: CADfix Empowers BAE SYSTEMS to Combat Electronic Interference in Advanced Military Aircraft

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- Paul Baker
BAE SystemsControl Systems

CADfix

CADfix removes barriers preventing the reuse of solid models. By providing an extensive set of geometry manipulation tools for importing, repairing and exporting data, CADfix maximizes the reuse of CAD data in downstream applications.

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ITI is the global leader providing reliable interoperability, validation, and migration solutions for product data and related systems. Our customers recognize the value in having a trusted solution partner that provides more than just software. ITI solves complex product data interoperability problems so that the world's leading manufacturers can focus on making great products. You need to keep your engineering initiatives moving forward.

Overview

Aviation has benefited more than most industries from the information revolution. The systems that keep aircraft in the air and guide them safely are increasingly reliant on electronics, both onboard the aircraft and elsewhere – on the ground or orbiting the planet. Ensuring that these systems work in harmony, with each other and with natural electromagnetic phenomena such as lightning, is a vital part of the aircraft manufacturer's job.

Military aircraft are even more reliant on electronics. In addition to navigation and flight control, they also must be able to locate, identify and pinpoint potential threats and targets. These activities sometimes involve powerful laser and radar systems with significant levels of electromagnetic radiation. It is therefore vital that the various systems do not interfere with each other or compromise the safety of the crew. The experts at BAE SYSTEMS must deal with these sensitive issues.

Challenges

The Electronic Engineering and Test department is responsible for BAE SYSTEMS' whole vehicle electromagnetic testing and analysis. This department reflects the planned change of remit from just aircraft to a broader base of land, sea and air vehicles. Such developments are likely to put a greater strain on the computation analysis team. "Our product portfolio already includes Nimrod and Eurofighter, both extremely complex aircraft in their own ways," says Chris Jones, Technologist Consultant in the Electromagnetic Engineering department.

"Each vehicle we deal with has probably been designed in a number of different locations and possibly with a number of different design systems. But the analyses we perform demand a single, accurate geometric representation, and the generation of this geometry is often the single biggest challenge. With new vehicles coming online it will be more vital than ever that we can maintain the integrity of our data – and fast."

Solution

BAE SYSTEMS EE&T uses CADfix, the leading data interoperability tool developed by ITI, as a central resource of geometric data. Because it offers a reliable link – either directly or via IGES – to every major CAD system on the market, CADfix provides the perfect platform for such a diverse range of data. In addition, it offers the perfect route from raw geometry to refined, analysis-ready mesh.

"CADfix is at the heart of everything we do," says Paul Baker, a BAE SYSTEMS Computational Electromagnetics (CEM) specialist. "In effect we use it as the hub of our operation, a central resource for all the geometry we have to work on. Whatever kind of analysis we need to perform, whatever mesh we need, the starting point is always the clean geometry that's been assembled inside CADfix."

Result

CADfix is responsible for enormous time savings. In addition to providing a central data resource, CADfix also directly generates meshes. A single wing previously took six to nine months; a whole plane can now be meshed in just three or four hours.

"Even with the powerful computers we use, an analysis of a complete aircraft can take about ten days," says Paul. "So the last thing we need is to spend ages building meshes. With CADfix we can generate new meshes in just a few hours so we are not restricted when it comes to trying a different kind of analysis."

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