A PLM Solution as the Heart of the IT System Environment

Aerodata meets the complex requirements of the aviation industry

- **Integration of M-CAD, E-CAD, ERP, and Microsoft Office**
- **Control and documentation of the approval of aviation products that require end-to-end audit trails**
- **Make sure that documents are securely exchanged with customers and regulatory authorities**

Flight inspection systems, mission systems, avionics equipment, or aircraft modifications are not your regular, off-the-shelf items. That is why almost every single one of Aerodata's products is unique – each customer gets their own customized variant or configuration. Given these vast amounts of parts and drawings, the company is dealing with highly complex BOM structures. What's more, they also have to invest significant time and resources in the documentation of their products in order to obtain approval for equipment, systems, or modifications.

Operation, installation, and maintenance manuals, test plans and reports, as well as proofs of qualification need to be created and stored in their then current status. The company's designers

work with ProE Wildfire, AutoCAD, Engineering Base, Pulsonix, and Orcad. Like many other companies, Aerodata used to rely on Windows Explorer to store drawings, BOMs, and any accompanying documents in the file system. The consequence: Poor structures and duplicate documents stored in different locations by different teams.

"We were looking for a smart software that allows us to store our mechanical and electrical design data in a structured manner. We also needed a document management solution that automatically assigns document numbers, issues conflict notifications, lets us document any additional modifications, etc.," explains Edward Boag, head of design and manufacturing at Aerodata.

Standardized, multi-level approval workflows

Back in 2010, Aerodata decided to implement a PLM solution in order to facilitate the management of all documents relevant to their high-end electronic systems and to also describe the engineering change processes in these systems. This was absolutely necessary as the complex requirements and approval procedures of aviation authorities and the rising quality management standards were making documentation a cumbersome task. Technical and other documents accompanying the product need to go through standardized, multi-level approval workflows, and performance records have to be kept throughout the process. All of this needs to be stored and managed in a thoroughly structured way.

PRO.FILE – the Product Data Backbone

Today, Aerodata relies on PRO.FILE to do the job. „We now have a single tool to manage all of our design documents, part master data, and accompanying Office and PDF documents," points out Michael Wolf, CAD/PRO.FILE manager at Aerodata. PROCAD's software stood out with the flexibility it provides by allowing customers to configure and design their own user interfaces, forms, lists, and reports. One of the core requirements was elegantly met by the possibility to build complex approval workflows.

Flight inspection systems by Aerodata

Aerodata headquarters in Braunschweig, Germany

The straightforward integration of PRO.FILE with the company's MiCLAS ERP system via the BizTalk Server was also a major factor in the decision, along with its strengths regarding the integration with ProE, AutoCAD, and Engineering Base.

Bidirectional integration with adjacent systems

As the heart of Aerodata's system environments, PRO.FILE is able to interact bidirectionally with all M-CAD and E-CAD solutions, the MiCLAS ERP solution, and with MS Office and stores the files for a number of other adjacent systems. The designers use the CAD system to create item and BOM master data, drawings, and models (or Visio files in Engineering Base), which are then automatically transferred to PRO.FILE. With the integration now in place, designers do not have to leave their familiar system environment to access any documents in the PLM systems that pertain to the drawings they are working on.

Automatic data transfer to the ERP system

Once a new part has gone through all approval levels, PRO.FILE transfers the master data and BOM to the ERP system. By this time, the part has become what the industry calls a "manufacturing file" that holds all the details needed on the production floor. This means that Aerodata no longer have to manually create part master data – it is automatically and accurately transmitted from the CAD/PLM environment.

> **"With PRO.FILE, we no longer have to manually create part master data – it is automatically transmitted from the CAD/PLM environment.** The bidirectional integration between the PLM system and the adjacent CAD and ERP systems makes work so much easier for us."

Michael Wolf,
CAD/PRO.FILE manager
at Aerodata

Why did they choose PROCAD?

Via configuration, PRO.FILE gives its users utmost flexibility in the design of interfaces, forms, lists, and reports. It allows Aerodata to map the complex approval workflows that are mandatory for all aviation manufacturers. What also worked in favor of PRO.FILE were its straightforward integration with the company's MiCLAS ERP system via the BizTalk Server and its strengths regarding the integration with ProE, AutoCAD, and Engineering Base.

Helicopter workstation by Aerodata

Once in the ERP system, this data can be supplemented with commercial information such as prices or supplier data. Since the PLM system is integrated with both the CAD and the ERP system, designers can also view this information from their familiar environments. Look-up fields are available to transfer information such as prices, stock levels, storage locations, and suppliers to PRO.FILE.

Different approval processes for 200 document types

The PRO.FILE PLM system has become essential to Aerodata's operations as it allows the company to map its complex approval workflows. Aerodata must first seek approval from the European Aviation Safety Agency (EASA) and sometimes other institutions for every modification to a part. They are required to document these modifications in their test plans, maintenance manuals, flight manuals, etc. In total, the company has set up roughly 200 different document types. For each document, there are up to three different approval processes it has to pass in order to determine whether all safety and approval aspects have been taken into consideration.

In line with EASA testing processes

Aerodata has implemented the approval process logics in PRO.FILE. These workflows sometimes have up to eleven levels to make sure that every internal department has signed off: airworthiness engineers, the Office of Airworthiness acting as the extended arm of the agency within the company, and ultimately EASA itself. The result: The PLM system provides detailed audit trails of who created and approved a document and when. Aerodata purchased 80 full use licenses and an additional 20 limited use licenses for its airworthiness officers. There is no need for them to create or modify documents as they just have to view them and to effect workflow status changes.

PROOM makes compliance easy

With PROOM, Aerodata has come to rely on yet another PROCAD product. PROOM provides virtual project rooms, via which documents can be exchanged with one or multiple partners.

The challenge

Aerodata needed a smart software solution to bring structure into the way they store mechanical and electrical design data. Another requirement was the ability to reliably document any modifications in compliance with industry regulations. On top of that, they wanted their long bills of materials to be automatically and accurately transferred to the ERP system.

The solution

PRO.FILE provides a single tool for the management and provision of all design documents, part master data, and accompanying Office and PDF documents.

The result

PRO.FILE has enabled Aerodata to meet the complex requirements and approval procedures of aviation authorities and the rising quality management standards it has to comply with. In the past, documentation used to be a daunting task for the company. With the PRO.FILE PLM and DMS solution, they now have a structured system in place that allows them to set up and manage standardized, multi-level workflows for technical and other documents, enabling them to keep end-to-end performance records throughout every step of the process.

Edward Boag and Michael Wolf helped PRO.FILE take flight at Aerodata

When it comes to special applications, renowned customers from all over the globe will eventually find their way to the Research Airport in Braunschweig, Germany. Founded in 1985, the Aerodata Group has been headquartered there since 1997. Aerodata AG found its niche early on and specialized in real-time data acquisition and process control. Today, it is the global market leader for flight inspection systems. It handles the complete process chain – whether it is the development of innovative solutions, systems manufacturing, the integration of the system within its own maintenance organization or training and after-sales services.

"As an aviation manufacturer, we are required by law to always keep our customers informed about any modifications relevant to aviation safety. To us, PROOM the perfect tool for that purpose."

Edward Boag,
head of design and manufacturing
at Aerodata

These project rooms can only be accessed after prior authorization by the project manager. All data movements are logged, i.e. every time a document is uploaded, read, or downloaded. This gives project managers one-click transparence of who has accessed safety-relevant documents and when.

Aerodata's engineers are managing customer projects world-wide, currently with a strong focus on Asia, and sending in their project documents to the German headquarters. Aerodata uses PROOM primarily to inform its customers about safety updates and product modifications and to provide them with accompanying documents such as manuals. Customers use PROOM to upload error logs that can then be immediately reviewed by headquarters.

"As an aviation manufacturer, we are required by law to always keep our customers informed about any modifications relevant to aviation safety," says Edward Boag. „We used to do this via snail mail or using CDs. The document exchange platform has made this so much more convenient."

Project rooms were set up for each customer. Aerodata is now able to document the receipt of every document it transmits to third parties, allowing it to keep complete audit trails to demonstrate its compliance with its duty to inform.
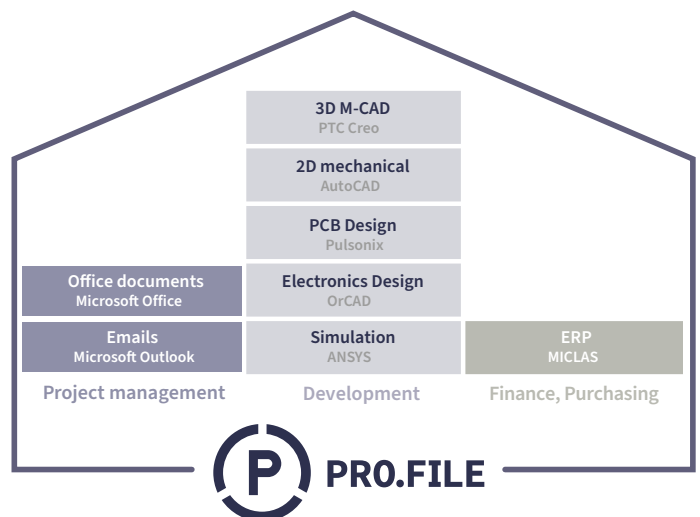
PRO.FILE not only integrates the data coming from development and project departments but also covers any commercial information.

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