CUSTOMER CASE STUDY

# Airbus Helicopter optimizes equipment testing with AVEVA™ System Platform

**Airbus Helicopters - www.airbus.com/helicopters**
**Industry - Manufacturing**

## Goals

- To create multipurpose and reliable test beds for increased testing capacity
- To reduce development and maintenance costs of testing procedures

## Challenges

- Replacing the existing system with a single, easy-to-use solution for supervising test beds and logistics
- Creating a system that can interface seamlessly with additional testing installations

## Solution

- AVEVA System Platform
- AVEVA™ InTouch HMI
- AVEVA™ Historian
- AVEVA™ Historian Client

## Results

- Testing development time was cut in half, from 600 to 800 hours to 300 to 400 hours, and will continue to decrease as the system evolves
- 40% efficiency gains from reusable visualizations and eliminating the need for scripting

Since its founding in 1992, Airbus Helicopter has been responsible for many technology "firsts" in the development of military, commercial, emergency service, and private helicopters. Located in southern France, Airbus Helicopters counts more than 12,000 helicopters in service with over 3,000 customers in more than 150 countries.

Combining speed and flexibility, helicopters are a popular means of transport, but their maintenance and operational costs are high, including the need to meet safety requirements. Therefore, before being put into service, all mechanical parts – and transmission systems in particular – are meticulously tested with exacting methods designed to meet stringent benchmark and flight measurement requirements.

To maintain the leadership position it has earned over the last 25 years, Airbus Helicopter required a robust software platform and process applications to accurately and efficiently operate its product testing benches. The company put its trust in AVEVA.

"At the Airbus Helicopter Marignane production site, test parameters have been created to reproduce conditions similar to those experienced during a real flight to check the conformity of components critical to the operation of the helicopter. During testing, which ranges from two hours to several hundred continuous hours, the gearboxes are subjected to extreme temperatures and conditions. This is an essential testing stage and part of the overall certification process."

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**David Asciutto**
Test Center Manager, Airbus Helicopters

## A new generation of testing protocols

Most helicopters are designed using a collection of critical mechanical components which work together to transfer the power of the engine to the main rotor and tail rotor. These feature several gearboxes including the main gearbox (MGB), the intermediate gearbox (IGB) and the tail rotor gearbox (TGB).

In 2006, the Airbus Helicopter testing center invested in automated technology to replace manual testing processes, and it established its first multipurpose, multi-version benchmark testing method in 2007.

"With these new, more advanced testing protocols in place, our team was able to use automated processes to test critical components of the EC225 and EC175 helicopter models. Previously, we used a separate test method for each type of main gearbox, which resulted in high development costs due to the need to create custom benchmarks and infrastructure programs."

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**Jean-Michel Pampuk**
Test Center Automation Specialist

## Choosing an open, reliable, and scalable solution

In 2011, the company commissioned a second equipment testing bench featuring a more scalable and customizable software program to enhance the new testing procedures.

"Over time, we realized that the supervisory software program in place for Bench 1 testing did not meet all of our requirements," said Jean-Michel Pampuk. "We found that when our team wanted to modify a program or add new functions, it was necessary to call in our suppliers. This cost us time and money due to the subsequent delay in conducting equipment testing. That is when we realized during the planning process of our second test bench, that we needed a scalable, open architecture solution, capable of catering to all our evolving needs. The new solution also had to be flexible so that we could add different test parameters when necessary."

The team found it quite a challenge to identify a system that combined the simplicity and robustness needed to manage Airbus Helicopter's extremely complex testing protocols. However, AVEVA System Platform offered the comprehensive functionality needed by the project team.

The team entrusted the project to Cofely Ineo, Groupe GDF SUEZ, an AVEVA systems and services integrator.

“Several criteria were decisive in choosing the software solution for the new bench test, starting with a solid partnership with Microsoft,” said David Asciutto, Test Center Manager at Airbus Helicopter. “We have PCs running Windows and wanted a standard supervisory system which could adapt to evolutions in Microsoft software. Therefore, it was important for us to use a software and integrator team that had direct links to Microsoft.”

An open architecture was equally important to enable the integration of specific functions when needed by the team. Object-oriented programming and strong reporting functions were other factors in the team’s decision. AVEVA System Platform leverages information technologies and provides process automation. It enables processes visibility, manages compliance, and enhances operational efficiency – all in real time. As a complete automation solution, System Platform can deliver 40% efficiency gains by eliminating the need for scripting or customization and by leveraging reusable visualizations.

In addition, System Platform is the world’s only responsive, scalable platform for supervisory, SCADA, MES, and IIoT applications that integrates the process across the overall enterprise. By providing a collaborative, standards-based foundation, the solution unifies team members, processes, and assets for continuous operational improvement and real-time decision support.

“AVEVA System Platform enables our teams to make better decisions in real time, operate equipment more efficiently, and collaborate more effectively across all departments.”

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**David Asciutto**

Manager of the Test Centre of Airbus Helicopters

## Implementation of testing benchmarks and logistics

In addition to creating a second testing bench, the team also needed to retrofit Bench 1 and update its entire logistics procedure.

“We created command control for Bench 2 by installing the AVEVA System Platform supervisory software on a new server. Information relating to data acquisition and test controls was then uploaded into the new system.”

During this phase, Bench 1 was still functioning on the old system. Therefore, the first step was to integrate the development of supervisory and control screens, as well as create a library of object components for distributed applications with AVEVA InTouch HMI. With InTouch HMI, the team at Airbus Helicopters can access a wide range of graphical symbols that are configurable to all the industrial processes, and at the same time, it can reduce development and maintenance costs. InTouch HMI is an open and extensible Supervisory HMI and SCADA solution that enables the rapid creation of standardized, reusable visualization applications for deployment across the entire enterprise. AVEVA InTouch HMI software delivers business value in engineering simplicity, operational agility, and real-time performance. This helps drive maximum performance, lowers costs, and provides additional security and reduced risk.

InTouch HMI enhances real-time visibility into testing processes. This results in improved operator effectiveness and increased control of processes to simplify and enforce standardization and change management.

“We developed standard functions that are identical on both Benches 1 and 2, making it possible to exchange scenarios between them, as well as increase the test capacity. Finally, the logistics system enables the team to prepare the MGBs and adaptation boxes for testing and transfer them onto the test bench.”

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**Pascal Bergé**

Operations Manager at Ineo PACA, a division of Cofely Ineo

## A customized functional architecture

Today, AVEVA System Platform makes it possible to manage reception and development testing of most MGBs manufactured in the Marignane facility. Designed to account for every step of a specific testing procedure, AVEVA System Platform architecture is deployed on three servers and a logistics client. In addition, the control room houses two servers to manage the acquisition and supervisory data from Benches 1 and 2.

“The flexibility of the test benches is made possible thanks to adaptation boxes that are specific to each MGB version,” said Jean-Michel Pampuk. “In addition, each has two screens, with numerous HMIs so that tests can be conducted safely and accurately.”

One screen shows spark lines and alarms, while another screen enables the team to follow the current test in real time, thanks to cameras mounted on each test bench. To ensure the precise and comprehensive acquisition of critical data for testing, Airbus Helicopter used AVEVA Historian and AVEVA Historian Client.

AVEVA Historian is a large-volume plant data historian that unites a high-speed data acquisition and storage system with a traditional relational database management system. This facilitates easy access to plant data using open database standards.

Historian combines advanced data storage and compression techniques with an industry-standard query interface to ensure open and easy access to stored time-series information. It enables process and production decisions to be evaluated and made in real time by Airbus Helicopter testing operators.

To gain better visibility into its operations processes, the company also installed AVEVA Historian Client, which generates real-time and historical data charts and reports directly from AVEVA Historian. Historian Client allows operators, engineers, and decision-makers to quickly visualize what is happening during the testing process.

In the preparation and assembly hall, the logistics client features a single screen that displays control and command of logistics residing on a PLC via a local ethernet network. The PLCs collect field information generated by the equipment (main engine, pumps, valves, etc.) and transmits this data in real time to supervision, which then launches piloting requests. Finally, a third server, shared between both test benches and logistics, manages the archiving of process, alarms, and event data in real time via Historian.

“Whichever bench is in use,” said David Asciutto, “the interface is the same for the operator and the logistics control system is much more intuitive. The best part is that it requires minimal training to move from one to the other.”

All information recorded during the test is stored, providing total traceability and comprehensive diagnostic capabilities.

## Achieving development and maintenance savings

The new system, with its intuitive interface and simplified, ergonomic display, greatly enhances the work of the operators. Airbus Helicopter now has a robust IT resource enabling it to manage different tests in parallel with approximately 200 test scenarios at its disposal.

“We have created three test benches in four years,” said Pascal Bergé. “Throughout the project, the solution has been constantly adjusted and fine-tuned to address specific industrial requirements of Airbus Helicopters. It was true partnership between our team, AVEVA and Cofely Ineo.”

Finally, development and integration time and costs were significantly optimized with the implementation of the new AVEVA software solutions.

## Progressive optimization

Airbus Helicopter plans to take advantage of all AVEVA System Platform has to offer and to optimize its use gradually according to the needs of the test center.

“The system’s communication protocols have so much potential to evolve and grow,” said Pascal Bergé. “Today we have approximately 5,000 variables that include measurements of pressure, temperature, speed, and stress. In the future, we plan to add sensors to collect more precise information within the same application, extending the ROI of our initial implementation.”

System Platform also opens future possibilities for the Airbus Helicopter team to access testing data and protocols, as well as other company processes via tablets or smartphones. The company could even transition to a mobile workforce if necessary. With AVEVA software, Airbus Helicopter has harnessed the power of a global supervisory system that centralizes all sensitive data for easy access and sharing, and at its test center, the company optimized critical operations and safety testing processes.

> “By implementing AVEVA software solutions, the time required to configure the intermediate gearbox and the tail rotor gearbox Bench, was cut in half, and as the systems evolve, these gains will increase.”
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> **Pascal Bergé**
> Operations Manager at Ineo PACA, a division of Cofely Ineo