

Streamlining the Weight Data Management Process to Improve Decision Making



Key Highlights

Industry

Aerospace

Challenge

Create an automatically updating standardized weight analytic reporting tool that would reduce data redundancy.

Altair Solution

Implementation of Altair's Weight Analytics Solution

Benefits

- Reduced data consolidation time by 80%
- Data Consistency and Transparency
- Make decisions faster

For the aerospace industry, the overall weight of an aircraft is a critical design requirement due to the impact just a few kilograms can have on fuel efficiency and Co2 emissions. Heavier aircraft can carry less cargo and use more fuel during flight which leads to increased running costs for the operator. As a result, the management of weight and balance data of an aircraft throughout the entire development process has become an ever more important factor for companies looking to keep weight under control.

Founded in 1992 through the merger of the helicopter divisions of Aérospatiale and Daimler-Benz Aerospace AG (DASA), Airbus Helicopters (previously Eurocopter) develops civil and military helicopter solutions to its customers who serve, protect, save lives and safely carry passengers in highly demanding environments. Airbus Helicopters is now established as the world-leading rotorcraft manufacturer with a turnover of 6.5 billion euros.

The weight and balance (W&B) team at Airbus Helicopters is tasked with collecting and analyzing data to forecast the weight of a product during the conceptualization phase. They must track weight changes throughout the development process, paying special attention to the center of gravity and the moment of inertia, and the corresponding effects on product performance and therefore its suitability for the mission it has been designed for.

In order to keep track of the W&B of Airbus Helicopters' products, the team collects weights data from across the company's product development departments in PLMs and must manually collate the information into a master document which can then be data mined and explored. In addition, the team also needs to collect similar data from its extensive global supply base that provides the company with components or complete systems for its aircraft.

Airbus Helicopters Success Story

"At every point during development, we can provide moment of inertia calculation as input for load computation. This previously took us 4 weeks preparation using Excel, now it takes us just 1 day."

Kai Thraene
Head of Weight & Balance
Airbus Helicopters

Collecting useful and up-to-date data in a standardized way from this wide group of stakeholders was proving to be a challenge for the W&B team, slowing down both the interrogation of data and the resulting decision making. With the manual upload of data, there was no way to create a standardized report that could be updated in real time, either internally by the different product development departments or externally by suppliers.

Implementing a Standard W&B Reporting Tool

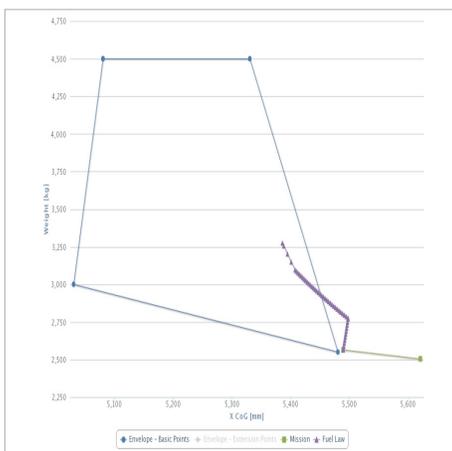
Airbus Helicopter was looking for a solution which could be implemented to establish a common W&B data management process which was expandable, required low maintenance, and be accessible across departments and relevant external

partners and suppliers. To find a solution, the company started an extensive review process where potential third party solutions were investigated and their suitability assessed. As a longtime client of Altair for both its HyperWorks suite of simulation tools and its engineering services division, Airbus Helicopters reviewed the suitability of Altair's Weight Analytics solution as part of this review process.

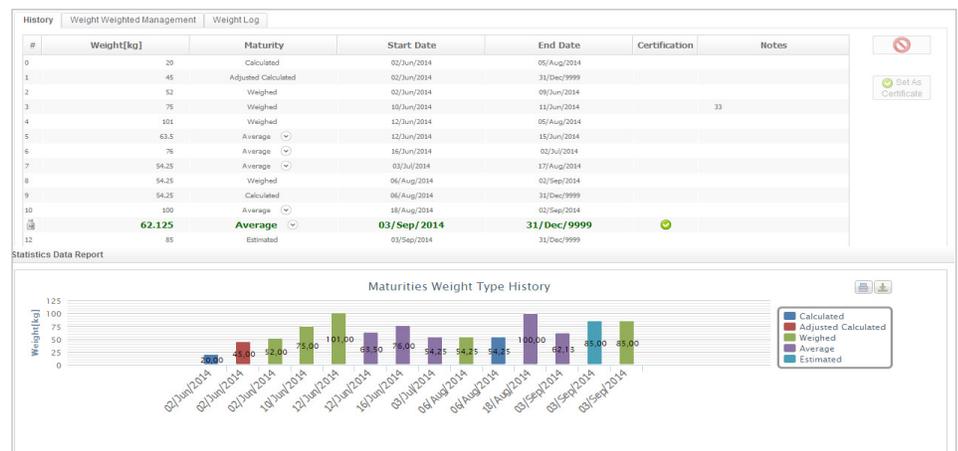
Weight Analytics is a highly configurable, open architecture solution that can be deployed as a common weight management tool across the enterprise. The solution intends to enable faster and more accurate decision-making by providing on-demand access to visualize, analyze and predict W&B data at any point during the entire product development lifecycle.

Following the review process, Airbus Helicopters selected Altair's Weight Analytics as it was the only solution that could fulfill the project brief in its entirety while still allowing secure access to its third party suppliers. Altair's services division, Altair ProductDesign, was awarded the contract and had 6 months to customize the solution to fit within Airbus Helicopters' development processes. To achieve this, Altair's Weight Analytics specialists worked onsite with the company's W&B team to get a full understanding of the current process to collect data from around the world as well as investigating how the solution could benefit from the decision making process to guide the development of customized reports.

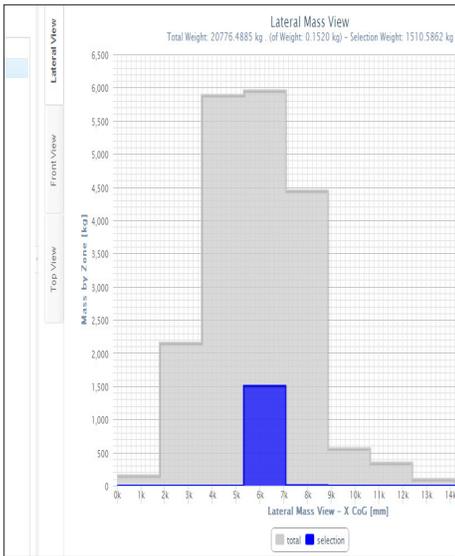
Once the Weight Analytics solution was set up, Altair's specialists supplied a



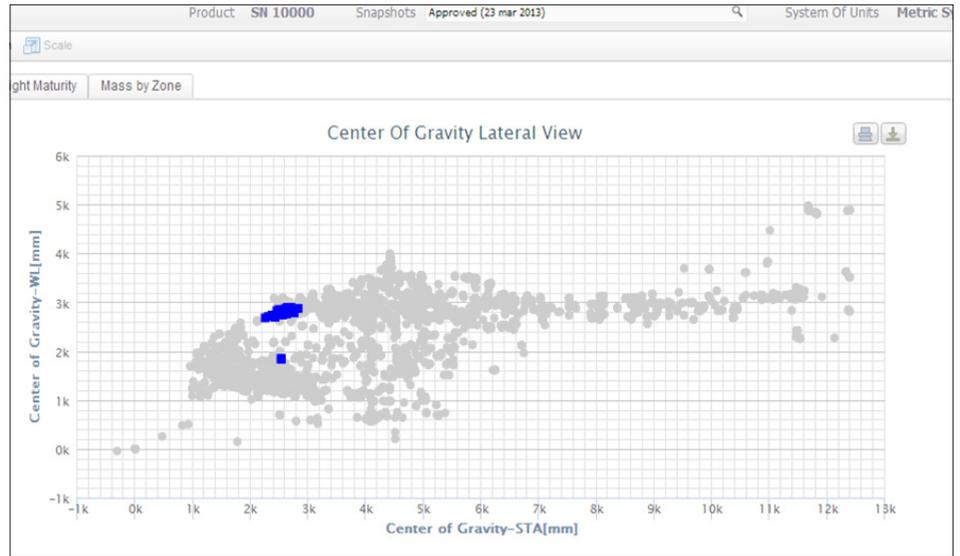
Mission Simulation Chart



Weight History Management



Mass by Zone



Mass Point Chart

comprehensive services package which included on-site training and support sessions to help the W&B team gain a full understanding of the solution and the processes involved in importing data and exporting reports. The solution was customized to support several different import templates and setup to automatically initiate a daily data import of each departments' and each suppliers' weights data in .csv format. Once imported, the data could be quickly checked by the Weight Managers and tracked in Weight Analytics.

Drastic Reduction in Data Consolidation Time

The W&B team are now able to estimate earlier the weight of the entire helicopter, not only the baseline version but for various configurations of the helicopter for different missions such as oil and gas applications, rescue missions, military use etc. The team was able to quickly add or remove different components to analyze the impact on W&B, enabling the team to generate "What if?" scenarios to investigate what the impact of a new configuration for a new mission would be. They could also keep track of center of gravity changes and equipment needs as weight fluctuated throughout the conceptualization and design phases. Product comparison snapshots could be created at different points of time, across products, and across development stages.

Thanks to this massive expansion in the data that was available to the weights team, Airbus Helicopters can generate Risk/Opportunity management reports by analyzing weight and pinpointing areas of risk, such as overweight systems or components, or opportunities to save weight and correct any issues before the product is manufactured.

By implementing Altair's Weight Analytics solution, Airbus Helicopters has been able to drastically reduce time required to consolidate data sources. Design and engineering decisions can now be made significantly faster than before, allowing the company to spend more time analyzing information to discover ways of achieving weight and balance targets. Thanks to the implementation of Weight Analytics, the weights team can now visualize, analyze, and predict risk and opportunities at any point in the product lifecycle and track and control the maturity of the product while running what-if scenarios that result in actionable information for key decision makers.

In addition, Airbus Helicopters was able to reduce the amount of time spent to configure Mission Simulation from 3 days to a few hours. This allowed AH to have reliable information well in advance of the maturity gate and to simulate and analyze the new fuel consumption laws impact on the balance of the product during the mission

earlier in the development process. Due to the success of the first service package with Altair ProductDesign, Airbus Helicopters are now working in partnership with Altair to build upon and improve the current features in Weight Analytics to generate more custom processes and increase training support as the company continues to expand the solution to more of its global supplier base.

"We now have much faster and more accurate decision making since we can start monitoring the specific product configurations and perform 'what if' analysis very early in the development process," said Kai Thraene, Head of Weight and Balance at Airbus Helicopters. **"At every point during development, we can provide moment of inertia calculation as input for load computation. This previously took us 4 weeks preparation using Excel, now it takes us just 1 day."**

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About Altair

Altair is focused on the development and broad application of simulation technology to synthesize and optimize designs, processes and decisions for improved business performance. Privately held with more than 2,600 employees, Altair is headquartered in Troy, Michigan, USA and operates more than 45 offices throughout 24 countries. Today, Altair serves more than 5,000 corporate clients across broad industry segments..

About Altair ProductDesign

Altair ProductDesign is a global, multi-disciplinary product development consultancy of more than 800 designers, engineers, scientists, and creative thinkers. As a wholly owned subsidiary of Altair Engineering Inc., this organization is best known for its market leadership in combining its engineering expertise with computer aided engineering (CAE) technology to deliver innovation and automate processes. Altair ProductDesign utilizes proprietary simulation and optimization technologies (such as Altair HyperWorks) to help clients bring innovative, profitable products to market on a tighter, more efficient time-scale.

www.altairproductdesign.com

About HyperWorks

HyperWorks is an enterprise simulation solution for rapid design exploration and decision-making. As one of the most comprehensive, open-architecture CAE solutions in the industry, HyperWorks includes best-in-class modeling, analysis, visualization and data management solutions for linear, nonlinear, structural optimization, fluid-structure interaction, and multi-body dynamics applications.

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