AgustaWestland Seats You

Helicopter Seating and Ergonomics Optimized with DELMIA

ARE YOU SITTING COMFORTABLY?
Today's helicopter crews are operating within one of the most advanced environments yet devised by engineers. And each year that working space becomes more sophisticated, more technical, and in the case of Agusta Westland's helicopters; more efficiently accorded to the bodies of those who operate them.

Russell Bond, human factors engineer, AgustaWestland, Yeovil, UK, deploys Dassault Systèmes DELMIA Human software to assess designs early in the development process. He explained his methodology, "Using digital human manikins in conjunction with digital 3D CATIA helicopter models, it is possible to analyze the man-machine interface and assess human performance within the design. Questions of visibility, task performance, physical accessibility, maintainability, and other factors are investigated. Design reviews are the forum for the results to be considered and because DELMIA presents the findings in highly visual and animated formats, the design and development teams are able to comprehend and incorporate them with ease."

He added, "Human issues are recognized early in the development process which means that later physical mock-ups, that represent the cockpit or airframe environment, are much more accurate and hence, more useful."

TOP OF THE FORM
"Another advantage of using digital manikins is that a full range of human forms can be assessed. This is not always possible using a physical prototype because of the problem of securing the services of expert users of different body types at the right times. DELMIA facilitates analysis using a complete range of possible pilots and crew in multiple size combinations so we are assured of developing aircraft to the correct specifications."

Russell continued, "Ergonomic and task simulation assessment along with postural and activity examination is speedily carried out using DELMIA Human and a feedback loop is generated with designers who are able to incorporate analysis findings into the designs which are carried forward to production. Since DELMIA digital manikins are very realistic, even to the extent of having anatomically jointed fingers, we are able to refine our designs to very high levels of detail. Even small adjustments to reach, vision, and comfort can make a considerable difference to ergonomic efficiency and to the ability to operate the equipment to its maximum advantage."

Dassault Systèmes DELMIA Human assesses designs early in the development process.

An AgustaWestland rescue at sea from one of their world-class helicopters.

Bond said, “Integration between DELMIA and CATIA offers considerable inter-departmental collaboration advantages since each department can be certain of data veracity within the PLM context. This helps enable progression of our work leading to improved comfort and safety levels for helicopter users.”

HOVER STORY

Integration with AgustaWestland’s CATIA design to production software allows Russell to utilize the latest iteration of the design, and for changes to be incorporated more efficiently. This leads not only to better designs, but also to considerable business benefits.

Bond said, “DELMIA is the only way to demonstrate anthropomorphic fit with percentages of the population. It saves enormous amounts of time and cost by reducing the reliance on physical mock-ups and availability of subject matter experts of specific sizes. Dassault Systèmes methodology removes the need for speculation and allows us to indicate, substantiate, and easily communicate ergonomic concerns, so that the optimum solution can be developed. It allows us to design the helicopter’s layout to make the best use of the available space, and to make the space work well. Use of DELMIA helps us to get it right first time knowing that design decisions are valid, verified, optimized and communicated to all stake holders”

CONSOLE

Bond pointed to an example of DELMIA in action. “A new helicopter mission console was presented as a blank space on which equipment could be positioned in the most effective way. Using DELMIA Human we optimized the design, taking into account the most frequently used apparatus in relation to minimizing operators’ negative or extreme posture. This was calculated across a full range of body types, to our customer’s specification, which will lead to an accurate declaration, including vision assessment. The software allowed us to measure the relative efficiencies of various design layouts and to accurately assess body types that would prove unsuitable for the design.”

AgustaWestland is a progressive enterprise dedicated to innovation and excellence in all of its activities. DELMIA Human is advancing innovation at AgustaWestland by enabling designers to use their time in the most efficient and effective ways. They can be sure, through analytical feedback, that their designs are on track and optimized allowing pilot and crew to function to their best capability. This allows crew stations under test to be operated at even greater levels of excellence with crews getting the most from the equipment; assured of ergonomic optimization.

In conclusion Bond said, “Integration between DELMIA and CATIA offers considerable inter-departmental collaboration advantages since each department can be certain of data veracity within the PLM context. This helps enable progression of our work leading to improved comfort and safety levels for helicopter users.” ■

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