Ansys

Cockpit of the Future: IT'S HERE NOW THROUGH OPTIMIZED HUMAN-MACHINE INTERFACES

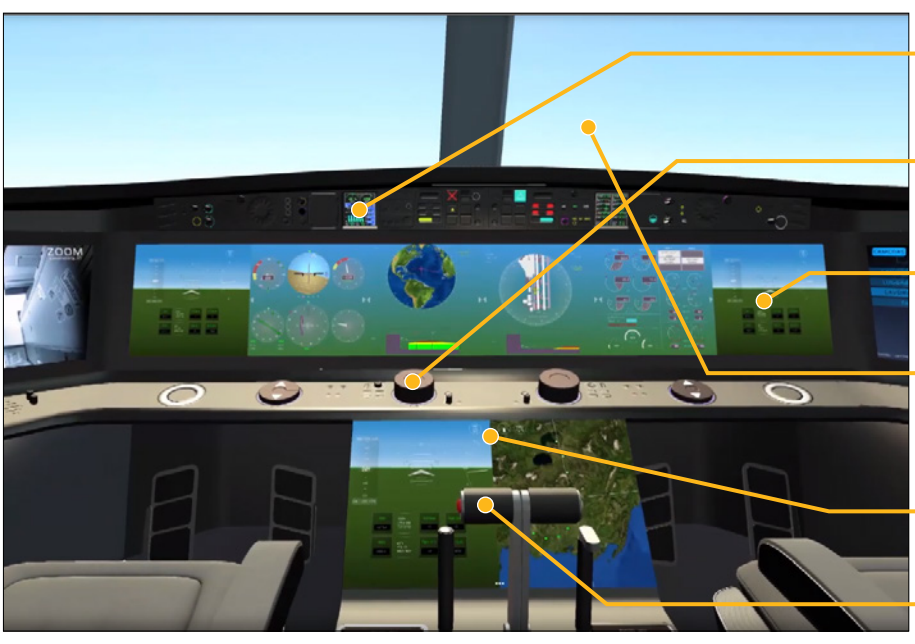
Today's digital aircraft is revolutionizing the cockpit. New controls, displays and touchscreens enable pilots to interact with innovative technology systems. Optimizing these human-machine interfaces (HMI) is incredibly complex.

HMI: Combining Science With Art

Pilots must be able to leverage the HMI that enable two-way interaction between pilots and sophisticated systems in the cockpit. The challenge is that these interfaces bring together science and the art of mastering less tangible human factors.

Simulation Is the Answer

By modeling the cockpit of the future in a virtual design space, engineers can optimize all human-machine interactions before investing in building or testing the cockpit or its components. This allows them to quickly and cost-effectively answer such critical questions as:



Are mission-critical messages and alerts easily available and understandable for pilots?

Is it simple for pilots to access the most crucial controls in the event of an emergency?

Are the cockpit layout, interactors and indicators designed to optimize cognitive load of the pilot?

Can pilots easily view the right level of information during a flight in all weather conditions?

Is the digital trend in cockpit and large multitouch screens convenient for pilot interactions during turbulence and other critical scenarios?

Are the most frequently used controls placed conveniently?

The Advantage of Ansys SCADE Solutions

The SCADE family of software solutions is the aerospace industry's tool of choice for generating the embedded software code that underlies complex electronics, including HMI. The benefits of using SCADE Suite and SCADE Display to model and generate qualified code for HMI include:

Tight alignment of the design process with safety standards and objectives

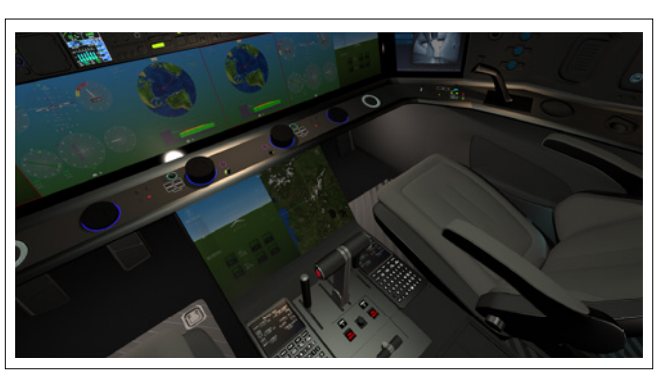
Reduction of development costs by 50%, on average

Elimination of embedded software failures caused by imperfect code and human errors

Acceleration of the embedded software code verification by a factor X2

Easily Replicate Real-World Conditions

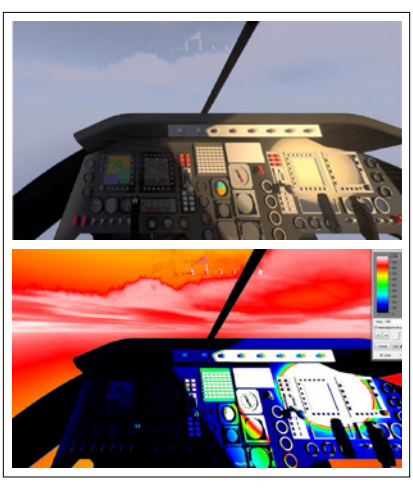
Ansys VRXPERIENCE brings the human element together with a 3D virtual model of the cockpit. Integrating VRXPERIENCE with the SCADE product family means:



- Significant reductions in the time and cost involved in cockpit design
- Straightforward workflow to turn CAD data into a fully interactive virtual cockpit – accurate and up to date
- Higher quality and more accurate prototypes, thanks to predictive physics-based lighting simulation
- Greater ease for designers to hand off tasks
- A closed-loop design cycle that ensures speed, accuracy and cost-effectiveness
- An innovative way of testing usability and workflows by running the embedded software in context with the pilot in the loop, early in the design process

A Clearer View: Simulating Cockpit Lighting

Ansys SPEOS offers a unique capability for engineers to anticipate and optimize the real-world performance of HMI displays:



- Simulate appearance of the displays by identifying and addressing such potential lighting issues as glare, reflection and display washout
- Simulate ambient lighting parameters
- Simulate the behavior of the human eye under a spectrum of lighting situations
- Ensure the safe, reliable performance of displays

Unparalleled Speed and Efficiency

In the global aerospace industry, innovation often happens slowly and incrementally — and for good reason. Aircraft manufacturers and suppliers need to meet extremely stringent regulations for passenger safety. At the same time, the entire worldwide aerospace industry races to make planes more electric, more autonomous and more sustainable. No manufacturer can afford to be left behind.

By leveraging simulation to engineer new marvels like the cockpit of the future, aerospace engineering teams can enjoy the best of both worlds: extreme innovation combined with extreme accuracy, speed and product confidence.

DOWNLOAD THE WHITE PAPER:

Ansys.com/resource-library/white-paper/making-cockpit-of-future-reality-via-optimized-hmi

WATCH OUR VIDEO:

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