AIG®

Managing the human-software interface
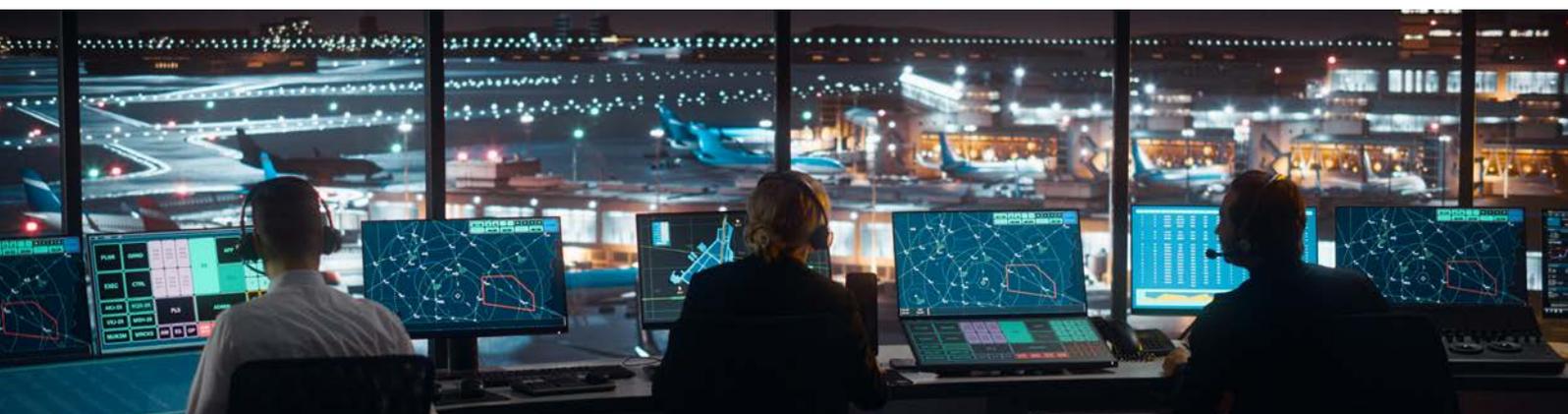
As technological advancements in automation and machine learning begin to transform the aviation sector and underwriting of aviation risks, organizations must learn how to balance the interface between human and machine activities to maintain the focus on risk management

As organizations increasingly look to technological solutions to improve efficiency, reduce the risk of human error, and automate manual tasks that can be more quickly completed with software or machinery, they must also consider the risks attached to greater reliance on technology.

This is equally true in the aerospace sector, where the human-software interface (HSI) – the bridge between the people in organizations and the computer technology deployed by organizations to assist in their operations – requires a careful balancing of risk versus reward.

However, designing effective and user-friendly interfaces is crucial if technological solutions are going to be both accessible and beneficial to organizations and their employees. Designing interfaces for error-free operations is not simple however, as the complexity of human biases, anxieties, cultural and social motivations and many other influences, can affect the efficacy of any information/outcomes produced by technology.

One of the most significant challenges that organizations face in implementing any new technology is achieving a sufficiently high level of trust and adoption by its human users.

Ensuring optimal performance

The graphic below represents a task performance bell curve with human performance linked to arousal (task engagement). Ideally, advances in technology should serve to reduce error-prone working tasks such as those with low arousal, known as underload, and those with extreme arousal, associated with burnout. This leaves human operatives with the value-added, engaging and enriching tasks that keep them motivated and which they can perform at an optimal level.
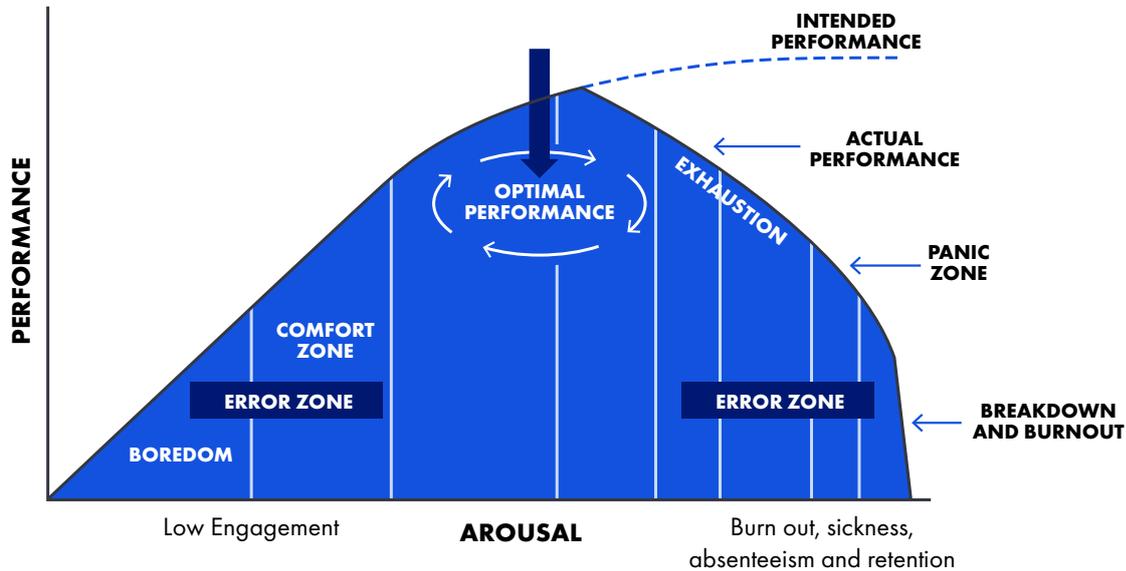
Clearly there remains a case for using technology that can automate or augment some of these lower-engagement or burnout-related tasks, while maintaining safety standards and effective risk management, but the challenge of trust and adoption by users remains.

The European Union Aviation Safety Agency (EASA) has paused research into single-pilot operations due to concerns about the safety of current technology and cockpit design in comparison to traditional two-pilot systems.[1]

The EASA research found that the current state of technology cannot yet demonstrate an equivalent level of safety for single-pilot operations, particularly regarding workload management, pilot health monitoring, and automated safety functions, effectively halting the aviation industry's push for single-pilot flights.

Integrating humans and technology in the workplace

Overcoming the integration challenge is one of the core issues facing the aviation sector. As workplaces across multiple industries and sectors enter a period of uncertainty and risk as technology increasingly take the strain, there seems to be very little discussion around exactly how this transition to a more automated workplace will happen.

Business leaders and managers are already struggling to adapt to hybrid workforces that comprise skilled human operators and automated functions, but the likelihood is that that senior employees will have received little, if any, training on how to manage this changing workplace dynamic.

This could be a chaotic, high-risk period for many industry sectors and it is an evolving situation that needs to be well prepared for.

[1] Gilbert, Gordon. "EASA Pauses Single-pilot Flight Operations Research." Aviation International News, 20 Jun 2025

Navigating technological change

Alongside the evolution of business sectors towards greater automation and use of technology, underwriters adapting to the impact of technology both on underwriting processes and the underlying risks of client industries impacted by technological change.

The aviation insurance sector is poised for transformative change brought about by evolving technology that presents opportunities and challenges in augmenting the performance of human underwriters.

One of the most promising opportunities is the potential to improve operational efficiency and precision by harnessing algorithms that will enable insurers to process vast amounts of data from aircraft operations, maintenance logs, and external environmental factors in real time.

This capability will allow for more accurate risk assessments and customized policy offerings, ultimately reducing claims and enhancing customer satisfaction.

Technology can also be used to automate routine tasks, freeing up human resources to focus on more strategic activities. Claims processing, for instance, can be streamlined using machine learning models that analyse image data and assess damage, enabling quicker claims settlements. This not only enhances productivity but also improves client relationships by speeding up response times.

Depersonalization and misinterpretation

Balanced against these benefits, growing reliance on automated systems poses certain threats to human performance. One significant risk is the potential depersonalization of client interactions. The aviation insurance industry is built on trust established through personal relationships. Carriers and intermediaries may struggle to maintain these connections and may lose trust if interactions become more automated.

Insurance businesses must therefore ensure that technological advances complement rather than replace the human touch in their organizations, emphasizing the importance of skilled professionals who can interpret data-driven insights and engage meaningfully with clients on their requirements.

Furthermore, the complexity of some of the technology used to generate risk and underwriting insights can lead to misinterpretations or over-reliance on automated outputs. Software and systems that provide data-driven insights are only as good as the data they are trained on, and biases or errors in data can propagate through decision-making processes.

Human oversight is essential to validate any software-generated conclusions, by assessing their relevance with reference to real-world contexts, and ensuring decisions based on these insights are ethically sound and legally compliant.

Balancing risk versus reward

As technology becomes more integrated into the aviation insurance sector, the skillset required for insurance professionals will inevitably evolve. The ability to work alongside advanced technologies, interpret data analytics, and make informed decisions will be crucial.

The gradual introduction of new technologies that can either automate or augment human functions is creating the need for hybrid workforce managers who can manage both human and software-driven operations.

This is a management skillset that remains as yet undefined and is poorly understood. This necessitates investment in training and development to equip insurance professionals with the necessary expertise to negotiate an evolving hybrid working environment.

The aim of integrating technology into aviation insurance is to enhance the performance of human employees; optimising processes and improving accuracy, while freeing up experienced professionals to focus on more complex risks and ultimately enhancing the customer experience.

The key to success lies in the ability to strike a harmonious balance between technological advancement and human expertise, through prioritizing training and collaboration and maintaining a strong focus on ethical considerations.
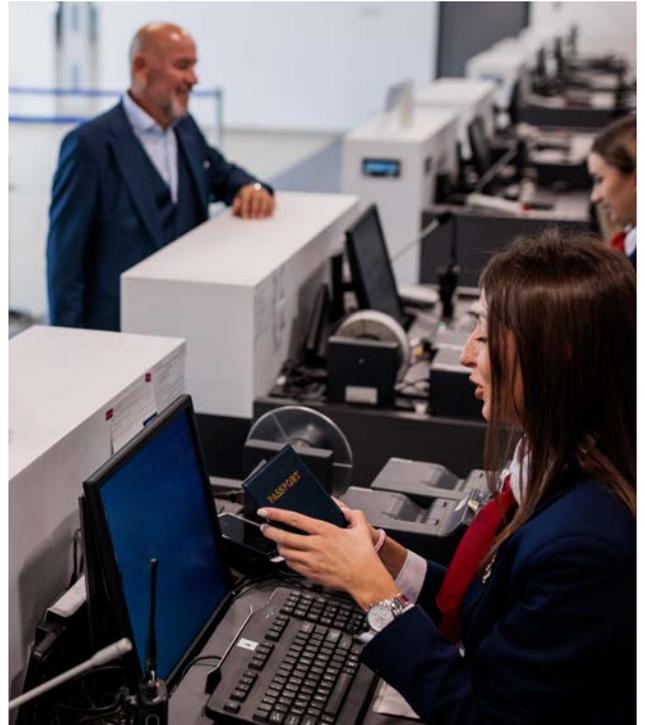
AIG recognises the current and future aviation environment creates challenges around regulatory compliance, safety, operational risk and organisational learning and performance. The need for a robust risk programme has never been greater. That is why we have partnered with GMR Human Performance Ltd to provide risk advisory and consultancy services for our clients. Our collaboration brings together people who care about what they do to develop solutions to real-world, operational problems.

This marketing material was authored by GMR Human Performance Ltd and published by AIG.

Brokers and insurance professionals can contact AIG Aviation for more information:

Paris Riseborough
Underwriting Manager Airline and Deductible UK
T: +44 (0)7566 763 667 | Paris.Riseborough@aig.com

Graham Allen
International Head of General Aviation
T: +44 (0)7843 803 213 | Graham.Allen@aig.com

Calum Duncan
UK Head of Manufacturers and Airports
T: +44 (0)7725 497 668 | Calum.Duncan@aig.com

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www.aig.co.uk

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