SQUIRE PATTON BOGGS

Aerospace Industry – Why Are Product Conformity Regimes Relevant to High-risk AI Systems Under the EU AI Act?

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Introduction

Artificial intelligence (AI) could be transformational in the aerospace sector. Recent publications by bodies such as the European Commission and trade associations in the sector cite numerous examples of AI already being used for design, validation and performance management connected with the manufacturing process.

In June 2025, the Aerospace Industries Association (AIA) published a report, in collaboration with Accenture, on "Artificial Intelligence in Aerospace and Defense" (AIA Report). The AIA Report analyses how automation and AI can help the industry face challenges related to limited capital availability for manufacturing capacity and meeting growing and changing customer demand; IT and operational technologies with technical debt; the requirement for deep expertise and new infrastructure to deploy new capabilities; and workforce challenges around the development of employees and loss of institutional knowledge.

In terms of current uses and projects "in the field", the AIA Report provides examples of an aerospace company that has deployed a generative AI assistant to help aircraft mechanics diagnose and resolve issues faster; engineers using AI-powered software to detect design flaws early and streamline production; and aerospace and defence companies introducing AI "co-pilots" across engineering, operations and manufacturing functions, to give employees faster access to data, automate routine tasks and improve productivity.

It is important to note at the outset that, if AI systems are placed on the market, put into service or used for military, defence or national security purposes, those are outside of scope of Regulation (EU) 2024/1689 (the EU AI Act). However, where an AI system is developed, placed on the market, put into service or used for military, defence or national security purposes, but is used outside those purposes temporarily or permanently for other purposes (for example, civilian or humanitarian purposes, law enforcement or public security purposes), such a system would fall within the scope of the EU AI Act.

In November 2025, a European Commission factsheet on AI in defence (EC Factsheet) noted that the European Defence Fund funds several AI-related projects and gives examples of projects currently in use, as well as projects expected to deliver results in the next two years.

It is certainly plausible that various AI project examples cited in the EC Factsheet could be used in the civilian context, in addition to any defence use, so while there is a general exemption for AI systems in the defence context, the EU AI Act may nevertheless be, or become, relevant to the defence sector.

Against that background, aerospace and defence businesses developing, supplying and/or using AI tools now, or planning to do so in future, should be aware of emerging legislation that may impose mandatory legal obligations on parties involved in the AI system life cycle.

Within the EU, for example, the EU AI Act was adopted in March 2024 and entered into force on 1 August 2024. It is a legislative framework relating to the development, placing on the market, putting into service and use of AI systems in the EU, partly with the intention of ensuring the protection of health and safety and "fundamental rights", such as democracy, the rule of law and environmental protection, as well as supporting the proper functioning of the internal market, including fair and undistorted competition.

The requirements of this legislation intersect with the more traditional realm of conformity assessment obligations for physical products. A key consequence is that many AI systems used in the aerospace sector are likely to be treated as "high-risk AI systems" under the EU AI Act, by virtue of being used within aircraft (and their engines, propellers, parts and equipment) subject to EU aviation type-certification regimes, or other harmonised legislative frameworks, creating many regulatory obligations on the providers (as well as deployers, importers and distributors) of such systems. Since the EU AI Act provides for significant penalties for infringement, it is important that any company operating in the sector that is using, or plans to use, AI systems, or products that include AI systems as components, is aware of its obligations and ensures effective compliance.

Overview of the EU AI Act

The EU AI Act lays down harmonised rules for the development, placing on the market, putting into service and use of AI in the EU, and there are obligations under the legislation for both providers and deployers (as well as importers and distributors) of AI systems in this context. The requirements are being introduced on a phased basis over a two-year period. Provisions relating to AI literacy and prohibited AI practices have applied since 2 February 2025. Aerospace businesses are, therefore, already required to ensure compliance with these provisions, where relevant.

Other key provisions of the EU AI Act, including those related to AI systems that are classified as "high-risk", mostly come into force on 2 August 2026, although the provisions relating to classification of an AI system as high-risk due to its being covered as a product, or safety component of a product, under certain EU harmonised legislation, and the corresponding obligations, do not apply until 2 August 2027.

The EU AI Act will impact businesses both inside and outside of the EU. To the extent that a non-EU business sells or otherwise places an AI system on the EU market, or if, when deployed, the output of an AI system developed by that business is intended to be used in the EU, the legislation will have extraterritorial effect. However, its application is role specific and does not necessarily attach to both ends of the supply chain in every scenario.

So, for example, if a business that develops software is based in the US, China or the UK and sells that software to an aerospace customer in France for integration into an aircraft or component part, the requirements under the EU AI Act will apply to that software (assuming that the software is an AI system within the meaning of the legislation and is within scope, and not otherwise exempt).

However, the non-EU developer may not be regarded, solely by virtue of development, as a "provider" under the EU AI Act. It might be the EU-based supplier of the aircraft or component that will be regarded as the provider of the AI system where it integrates the AI system or AI-enabled component into the aircraft or part, as applicable, and places the resulting AI-enabled aircraft or component part on the EU market under its own name or trademark (unless, for example, the non-EU software developer retains branding and/or name, defines the intended purpose, or otherwise assumes responsibility for conformity assessment).

Conversely, where a non-EU established supplier of a supplier-branded part embeds an AI system as a safety component of that part and supplies that part to an aerospace customer in France for use in aircraft that customer is manufacturing, the French customer of the non-EU business would likely be regarded as the "importer" of the relevant software, being a person located or established in the EU that first makes available the software for distribution or use on the EU market. Because importers must ensure that any high-risk AI system conforms with the requirements under the EU AI Act (by various means, including by verifying that the provider has appointed an authorised representative, established in the EU, with the authorised representative themselves separately obliged to verify certain matters and keep various records), the French customer should themselves insist that the non-EU provider supplies evidence of compliance, where relevant. Again though, the actual obligations and status of the customer would need to be assessed on a case-by-case basis, as the French customer could also potentially be a provider in some circumstances; for example, if they apply their own branding and/or name to the software, or if they have been involved in the development of the relevant AI system.

In addition, direct and certain downstream customers in the EU will be required to check that the non-EU provider has complied with the relevant requirements for an AI system, because there are additionally obligations for distributors (i.e. a person in the supply chain, other than the provider or the importer) in the EU under the legislation. To the extent that the direct and downstream customer is also using the relevant AI system, they will likely bear "deployer" obligations as well. There are various obligations for deployers, including in relation to appropriate technical and organisational measures to ensure use in accordance with relevant instructions; the appropriate assignment of human oversight; ensuring any input data is relevant and sufficiently representative; monitoring operation and informing relevant persons if they have a reason to consider that use will present a risk within the meaning of the legislation; retention of logs; and, in relation to high-risk AI systems, informing workers' representatives and affected workers.

Link Between the Basic Civil Aviation Regulation and High-risk Classification

In the EU (and the UK under provisions grandfathered over on Brexit) aircraft (and their engines, propellers, parts and equipment) must comply with essential requirements for airworthiness and environmental protection. The essential requirements, certification and approval processes related to this regime are set out in Regulation (EU) 2018/1139 (the Basic Civil Aviation Regulation). Since 2003, the European Union Aviation Safety Agency (EASA) is responsible for the certification of aircraft in the EU and for some non-EU European countries. This certifies that the type of aircraft meets the safety and environmental protection requirements set by the EU under the Basic Civil Aviation Regulation.

Against this background, aerospace businesses should note that where an AI system is itself a product covered by the Basic Civil Aviation Regulation, or is intended to be used as a safety component of a product covered by the Basic Civil Aviation Regulation, and as such, is required to undergo a third-party conformity assessment under that regime, the AI system will be categorised as high-risk under the EU AI Act, unless an exception applies.

Most of the provisions of the EU AI Act that relate to high-risk AI systems are actually disapplied for those AI systems that are products, or safety components of products, that are covered by the Basic Civil Aviation Regulation (or the Civil Aviation Security Regulation (EC) No 300/2008) (although the provisions will nevertheless apply if the relevant AI system would separately qualify as a high-risk AI system under Annex III of the EU AI Act, as detailed below). However, even where they are disapplied by the EU AI Act, the requirements for high-risk AI systems will very likely apply in practice, in any event.

This is because implementing and delegated acts under the Basic Civil Aviation Regulation, adopted by the European Commission under that legislation, must take into account certain requirements for high-risk AI under the EU AI Act.

These are implementing and delegated acts adopted by the European Commission relating to:

- Airworthiness (Art.17);
- Detailed rules for aircraft, including those relating to environmental protection, certification basis, conditions for compliance, conditions for issuing approvals, or for reasons of technical, operational or scientific developments or evidence in the field of airworthiness or environmental compatibility (Art.19);
- For the purposes of laying down detailed rules to take into account the provision of air traffic management (ATM) or air navigation services (ANS) and as regards ATM/ANS providers and organisations involved in the design, production or maintenance of ATM/ANS systems and ATM/ANS constituents (Art.43);
- Detailed rules with regards to various matters that can be dealt with under delegated powers (Art.47);
- Regulations as regards unmanned aircraft (Art.57); and
- Detailed rules with regards to various matters related to design, production and maintenance of unmanned aircraft that can be dealt with under delegated powers (Art.58).

Therefore, in practice, sector-specific laws under the Basic Civil Aviation Regulation are very likely to align with the requirements under the EU AI Act for high-risk AI in future. This means that businesses operating in the aerospace sector should ensure that they are familiar with and ready for requirements under the EU AI Act relating to the establishment and implementation of a documented risk management system; data and data governance; technical documentation; record-keeping; transparency and provision of information to deployers; human oversight; and accuracy, robustness and cybersecurity.

High-risk AI systems, which are high-risk because they are products, or safety components of products, that are covered by the Basic Civil Aviation Regulation are also subject to the obligation on the European Commission to review various aspects of the EU AI Act and the need for amendments by 2028 and every four years thereafter, which means that additional requirements could also be imposed on such high-risk AI systems in future, even though they are separately regulated under the civil aviation regime.

High-risk Classification of Components, Spare Parts and Products under Other Regimes

For AI systems that are, or are used in, components, spare parts and other products, which are not covered by the civil aviation type-certification regime outlined above, but are potentially governed by other product-compliance regimes, or which are covered by another product-compliance regime, in addition to the civil aviation type-certification regime, it will be necessary to consider whether the AI system could be classified as high-risk AI, on the basis of other provisions in Article 6 of the EU AI Act (assuming there is no relevant exemption under the legislation). If such AI is classified as high-risk AI, additional requirements will apply under the EU AI Act, from August 2026 or August 2027 (depending on the basis of classification).

One possible reason for such classification would be that the relevant AI system is included in the list of high-risk AI contained in Annex III of the EU AI Act (essentially, AI systems used within certain specific areas of use, such as permitted biometrics, or where used as safety components in critical infrastructure, including in the management and operation of critical digital infrastructure, which might be relevant to defence uses of AI). These examples, or other specified uses in the Annex III list are perhaps unlikely to be generally applicable to the aerospace industry, although there may be one or two exceptions for certain operators or certain types of use, where the Annex III list could be relevant. For instance, with rapidly emerging technology, increasing autonomy in drone and electric vertical takeoff and landing (eVTOL) operations (e.g. AI-based route planning and detect-and-avoid functions) and expanded biometric deployments in aviation environments (e.g. walk-through facial identification at checkpoints, where feasible from a privacy perspective), might be relevant to Annex III AI systems listed as high-risk, and this should be kept under ongoing review.

In any event, AI systems developed or used in the aerospace and (although not exclusively) defence sector (as well as others) will also be considered high-risk if (i) the AI system is covered as a product or as a safety component of a product by other harmonised EU legislation, which is specified in Annex I of the EU AI Act; and (ii) that product is required to undergo a third-party conformity assessment. One piece of harmonised EU legislation specified for this purpose under the EU AI Act that may well be relevant in the aerospace sector is the Radio Equipment Directive (Directive 2014/53/EU) (RED).

There has historically been some confusion over the applicability of RED alongside other product-regulatory regimes, but a guide from the European Commission on RED (RED Guide), published in 2018, provides that where RED is applicable simultaneously with other EU legislation covering the same hazard (safety or electromagnetic compatibility), the issue of overlap can be resolved by giving preference to the more specific legislation; and ground aviation radio equipment that might also be subject to EU legislation on civil aviation is a named example of equipment where RED is applicable simultaneously. The RED Guide also says that where radio equipment is installed in vehicles such as cars, caravans and trains (normally falling under a type-approval legislation) the radio equipment has to comply with RED, unless the specific equipment falls within any of the exceptions (under RED). This position is likely to be analogous for radio equipment installed in aerospace vehicles, i.e. various types of aircraft.

Therefore, if a component or spare part for an aircraft is covered by RED (even if that is in addition to or alongside the aviation type-certification regime) and it is required to be assessed by a notified body under the RED regime and incorporates an AI system within the meaning of the EU AI Act, that component or spare part may also be subject to the general requirements for high-risk AI systems under the EU AI Act (as well as the requirements under the RED). It is not clear within the legislation though how this potential crossover between products that are covered both by the aviation type-certification regime and RED should be navigated.

High-risk Classification of Other Equipment Used in Production

Other EU harmonised legislation that is contained in the list in Annex I of the EU AI Act includes legislation relating to machinery, personal protective equipment (PPE), pressure equipment and equipment intended for use in explosive atmospheres (ATEX Equipment) (in addition to various other pieces of EU product legislation, e.g. toys and medical devices).

While such product types are not obviously relevant to aircraft or defence equipment themselves (means of transport by air, on water and on rail networks, seagoing vessels and machinery designed for military purposes are generally excluded from the scope of the machinery regime, for example), they may have relevance to the aerospace sector, to the extent that businesses use, in the production process, machinery, PPE, pressure equipment and/or ATEX Equipment, in each case that is required to be conformity assessed by a notified body. The high-risk AI provisions could therefore be relevant for any AI system used, or to be used, as a safety component of such machinery, PPE, pressure equipment or ATEX Equipment. Aerospace operators should therefore ensure that they review the full list of harmonised legislation in Annex I of the EU AI Act and are aware of any relevant deployer obligations that they may bear under such legislation.

Other High-risk AI Systems

AI systems used in aviation otherwise than in hardware products or equipment could also be classed as high-risk AI, where they fall within the list set out in Annex III of the EU AI Act. For instance, an operator using certain AI systems for crew rostering/worker management (e.g. automated fatigue-risk scoring that materially affects duty assignments) or for passenger-processing decisions (e.g. AI-driven disruption prioritisation that changes rebooking/boarding outcomes) might fall under Annex III uses.

Conformity Assessment Processes for High-risk AI

Requirements for high-risk AI outside of the certificate-approval context under the Basic Civil Aviation Regulation will include (among other matters) requirements for technical documentation, conformity assessment, CE marking, declarations of conformity, name and address labelling and document retention under the EU AI Act itself (in addition to any similar requirements under other applicable product-compliance regime(s)). These types of requirements will likely be familiar to those in the aerospace and defence sector responsible for product compliance under other regimes, but less so to those involved before now in the development and supply of "pure" software.

Well ahead of the relevant in-force date, potentially affected businesses along the supply chain for the AI system should therefore consider how to ensure compliance with these and other requirements for high-risk AI under the EU AI Act.

One requirement of particular note is that the conformity assessment process under the EU AI Act for high-risk AI will need to be undertaken by a notified body, i.e. a third-party expert that will be responsible for performing testing, certification and inspection activities. This will be in addition to any conformity assessment that is required and/or undertaken under other harmonised EU legislation.

There is some concern across different industries that there might be insufficient notified bodies that have been assessed and designated under the EU AI Act in time for relevant conformity assessments to have been undertaken. In short, it is possible that demand for notified bodies will exceed supply. In certain sectors, therefore, there have already been calls for notified bodies to be designated swiftly, without delays at the EU or Member State level.

Conclusion

The penalties for noncompliance with the EU AI Act could be significant. Historically, EU product legislation did not commonly provide for enforcement or penalties (this being addressed by domestic legislation, which provides for enforcement in each relevant Member State).

However, (in common with other more recent EU legislation, such as that relating to deforestation and corporate sustainability due diligence), the EU AI Act provides that penalties must be effective, proportionate and dissuasive – and administrative fines for most forms of noncompliance under the legislation are specified to be up to €15 million, or up to 3% of total worldwide annual turnover for the preceding financial year, whichever is higher (except for SMEs where it is the lower figure that is relevant). Those are pretty eye-watering sums, but even those are not the highest penalties: for noncompliance with the prohibition of certain practices under the EU AI Act, the relevant sums are the higher of €35 million, or up to 7% of total worldwide annual turnover respectively (or, again, the lower of those figures for SMEs). Therefore, the impact on organisations that do not get this right could be very significant.

But even that is not where the story ends. Aerospace businesses must also take into account that the EU AI Act is just one piece of the puzzle that is the regulation of AI. Even those AI systems that are not classified as high-risk AI under the EU AI Act may be subject to requirements under other regimes (in addition to the requirements for lower-risk categories of AI under the AI Act).

For example, under general product safety legislation (which will apply to the extent that there are no specific provisions in EU harmonisation legislation with the same objective) the obligation to supply only safe products will be relevant to the supply or use of AI systems intended to be used by, or which can reasonably be expected to be used by, consumers. Indeed, one of the stated reasons for introduction of the EU General Product Safety Regulation (Regulation (EU) 2023/988) in place of the previous directive was to explicitly take into account new technologies that might substantially modify an original product through software updates, and also to take into consideration cybersecurity risks where sectoral legislation does not apply.

Of course, the requirements of the General Data Protection Regulation may also need to be considered; for example, where personal data will be processed by connected aircraft and the systems they interoperate with. Intellectual property laws may also be relevant if an AI system uses or generates content that is protected by third-party rights or which the business itself may wish to protect.

In the EU, the EU Data Act, which relates to "connected products", applies to vehicles, ships and aircraft; and private, civil or commercial infrastructure. There is an FAQ guidance, relating to the Data Act 2023/2854, which was published by the European Commission in September 2025, confirming that vehicles, aircraft and ships are within scope – but that the mere circulation of a ship or aeroplane on EU territory or in EU waters is not sufficient for a connected product to be considered as having been "placed on the EU market" because there has been no transfer of ownership. However, the EU Data Act does not affect the competences of member states concerning public security, defence or national security.

For all of these reasons, aerospace businesses should ensure that they fully understand the implications of the legal landscape well ahead of full implementation of the provisions of the EU AI Act, to be in the best position to comply and avoid potentially hefty penalties.

Contacts

Nicola A. Smith
Partner, Birmingham
T +44 121 222 3230
E nicola.smith@squirepb.com

David Naylor
Partner, London
T +44 20 7655 1668
E david.naylor@squirepb.com

Bartolome Martin
Partner, Madrid
T +34 91 426 4867
E bartolome.martin@squirepb.com