SIEMENS

Improved certification capabilities in the era of future Aerospace and Defence programs

siemens-fcas.com

Improving certification processes for companies in defence aerospace industry:

- Delivers more efficient and comprehensive safety record keeping
- Ensures all product development processes are monitored and controlled continuously
- Provides traceability of decisions throughout development and production
- Allows the right engineering choices to be made at the right time

Why should aerospace companies working on defence programs focus on certification?

In the past, product development and manufacture of complex products such as those of future combat aircraft, combat vehicle and defence systems, were carried out in a siloed way with poor traceability and superficial interaction between teams during design and development.

Systems were integrated towards the end of the development process, often creating issues in compatibility. With the implementation of more electrical weaponsystems and the massive utilization of software, the aircraft becomes very complex due to the explosion of interdependencies of functions.

A different approach is therefore needed, one where Model Based Software Engineering (MBSE) provides the digital thread to deliver a systematic pathway through the developmental process.

Who in the defence aerospace industry has most to gain from improved certification processes?

A Digital Transformation of the Certification process using MBSE approach will help Aircraft programs, aircraft integrators and their supply chain to meet customer and safety requirements in a more efficient way. This will result in lower program costs, will keep the program on schedule.

For those requiring certification before products can enter the market or become operational, the MBSE digital thread makes the proof of compliance much less onerous with tools facilitating compliance from component level up to the systems-of-systems level, expediting adherence to customer requirements and international as well as national regulations.

How might defence aerospace companies improve their certification capabilities?

The MBSE digital thread allows companies to harness and leverage digital assets from physical, electronic and software engineering processes through requirements definition, design, product manufacture, certification, operation and onwards through the entire product life cycle.

In such highly regulated industries, confirmation of compliance is an imperative; verification management is deeply rooted in MBSE and immediately available as and when needed for compliance audits.

Companies sometimes do not fully consider certification until late in the product development process which can cause significant challenges in proof of compliance. Product development can take many years and evidence can be lost if, for example, people who were essential in design and decision making have left the company.

MBSE's digital thread, which interlinks all data from beginning to the end of the product life cycle, allows companies to prepare for certification from the earliest stage of requirements specification. The system captures all data from the entire stakeholder set including supplier data, making every engineering decision traceable and verifiable for certification.

Any engineering data for proof of compliance is immediately accessible to the authorities in a digital format. The data presented to the authorities is presented "in context" of the requirements and the virtual and physical test data generated during the verification process.

What benefits might a defence aerospace company see through improved certification workflows and tools?

- Verification management is faster, less dependent on the presence of resources who built the proof of compliance, and less expensive
- Delivers consistency in data management and administration
- Promotes focus on compliance at every stage of the development process
- Delivers detailed traceability necessary to validate and verify particular requirements
- Prevents delays in data collection for verification
- Promotes better relationships with compliance authorities
- Promotes customer confidence in product compliance