EUROPEAN DEFENCE AGENCY

MILITARY AIRWORTHINESS

The European Defence Agency (EDA) works to foster European defence cooperation to become more cost efficient and increase capabilities. As an agency of the Council, we combine ministerial-level political influence with technical expertise to deliver capabilities, drawing on input from all stakeholders. Pooling & Sharing capabilities are cornerstones alongside collaborative efforts ranging from research through effective test, evaluation and procurement onto delivering hands-on capabilities.

Introduction

Airworthiness is essential to ensure the safety of personnel and passengers in the air and on the ground. Only a holistic approach can guarantee that all aspects of the aircraft are airworthy and thus safe. This holistic approach must not only include the design and physical condition of the aircraft but also all organisations including their personnel required to maintain them.

Harmonisation of Military Airworthiness

The European Aviation Safety Agency (EASA) and Member States Civil Aviation Authorities is are responsible for developing and maintaining the regulatory framework that ensures that all civil aircraft within Europe are airworthy and safe. This legal framework arising from the convention of the International Civil Aviation Organisation (ICAO) is detailed in EU regulations.

For national sovereignty reasons, military and state operated aircraft (e.g. police, coastguard) are exempted from this legislation. Each Member State is therefore individually responsible for ensuring through their own domestic regulations that the military and state aircraft they operate are airworthy and can be flown safely.

The result of this is that each EU Member State has developed its own unique national military airworthiness regulations for overseeing their military aircraft. This has resulted in little commonality betwee n the Member States' military airworthiness regulations which leads to barriers to achieving Pooling & Sharing opportunities in the military aviation domain

The European Defence Agency's (EDA) Military Airworthiness Authorities (MAWA) Forum was established in 2008 by Defence Ministers to harmonise European military airworthiness regulations. The MAWA Forum consists of representatives from the Military Airworthiness Authorities of the 27 EDA participating Member States (pMS) and industry representatives. It is chaired by the EDA.

Benefits

A common approach to the type-certification of military aircraft can act as a key enabler for future collaborative activities.

The benefits of developing a full suite of common military airworthiness requirements will offer tangible savings in terms of reduced development time, initial procurement costs and will support more efficient collaborative capability sustainment programmes with further whole life cost benefits.

The results of an EDA initiated study underlined that the use of harmonised certification procedures for the development phase of multinational military aircraft programmes could generate at least 10% cost savings on industry as well as on the government's side, and up to 50% reduction in the programme duration.

A European approach towards military airworthiness would also increase the effectiveness of support to military aircraft operations 'in-theatre' with a potentially wide pool of transnational engineering staff and shared common spare parts being available. It would also deliver positive effect on the levels of safety of European military aircraft due to the utilisation of harmonised best practises.

Current Status

Essential for the harmonisation work of the EDA is the "European Harmonised Military Airworthiness Basic Framework Document" which defines the role and functions of the MAWA Forum. Currently 22 Member States

have approved it nationally. The document clarifies the principles of a common approach to military airworthiness and addresses issues such as the mutual recognition between National Military Airworthiness Authorities which is essential to realise the expected benefits from regulatory harmonisation.

To date the MAWA Forum has developed and approved three sets of European Military Airworthiness Requirements (EMARs) that cover:

- Initial Aircraft Certification
- Aircraft Maintenance
- Maintenance Training Organisations

Further EMARs for Maintenance Personnel Licensing and Continuing Airworthiness Management are being finalised.

The necessary supporting documents have also been developed and approved that include:

- Definitions and acronyms
- Arrangements for recognition between national military airworthiness authorities.

Some Member States have already agreed to use EDA's harmonised EMARs for the in-service support phase of the A400M. The MAWA Forum has developed a European

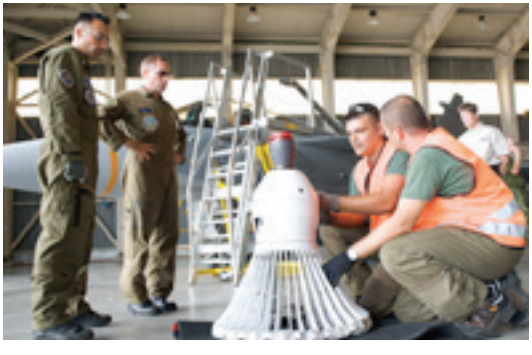
Military Airworthiness Certification Criteria (EMACC) handbook that can be used to establish the certification basis for any military aircraft including Remotely Piloted Aircraft Systems (RPAS).

In June 2013, EDA and EASA signed an arrangement for enhanced cooperation between the two agencies. The arrangement specifically covers the harmonisation of military aviation safety requirements with a primary focus on airworthiness. EDA and EASA expect benefits from this increased cooperation, especially in areas of 'dual use' aircraft, such as the A400M or RPAS. On invitation of EASA, EDA experts already participate as observers in EASA rulemaking groups on air traffic management, airworthiness and flight operations (RPAS).

At the Ministerial Steering Board on 19th November 2013, further impetus and momentum was given to the field of certification and airworthiness with the adoption of a Political Declaration which tasked the EDA, in close coordination with Member States and other relevant actors, to determine the European framework conditions necessary to support the certification of military RPAS. Further to this, the EDA was tasked to engage with the European Commission to develop harmonised certification standards that utilise, to the maximum extent possible, those that are used for civilian certification. It is anticipated that these activities will further optimise opportunities for greater collaboration and provide further benefits for the Member States.

Next Steps

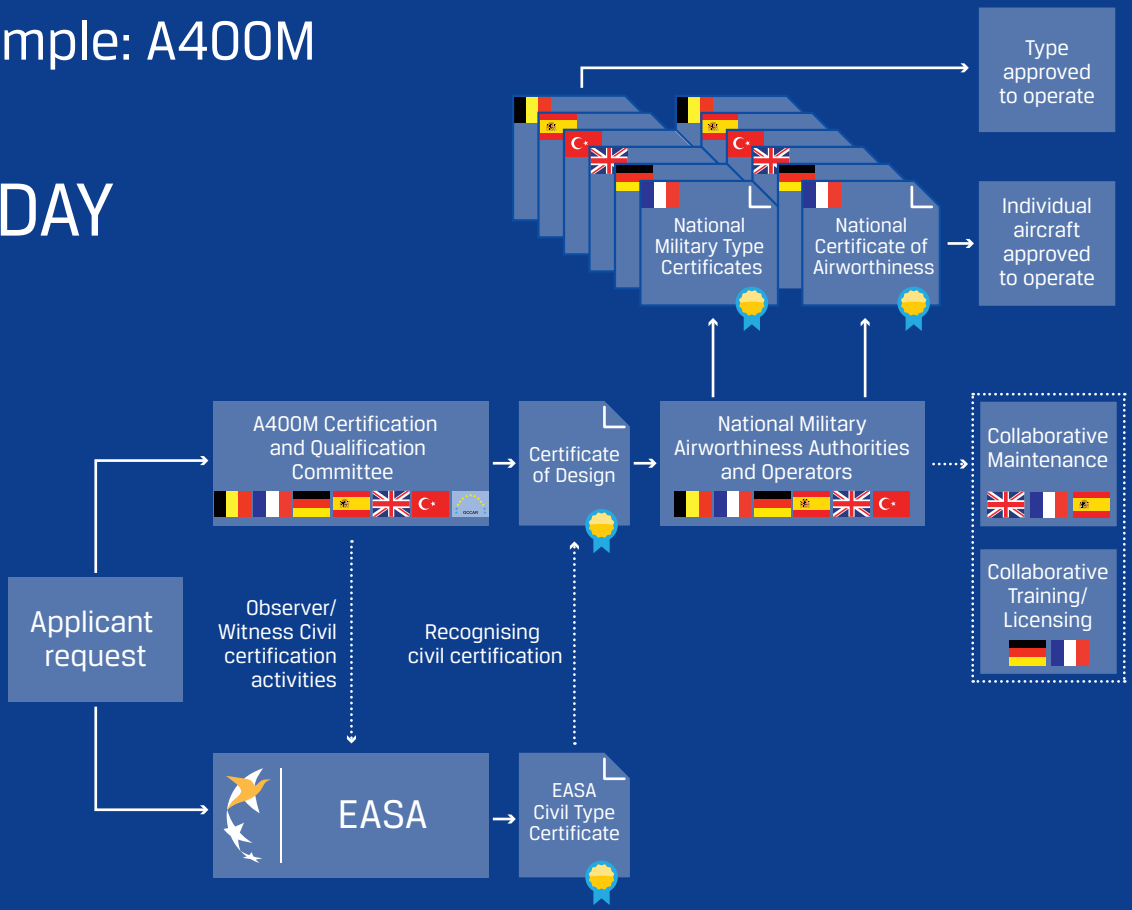
It is now essential that the already approved EMARs on type certification, maintenance and training are implemented into national military airworthiness regulations as soon as possible. This will allow for mutual recognition of type certificates for example between Member States, which will unlock potential Pooling & Sharing opportunities within military aviation.



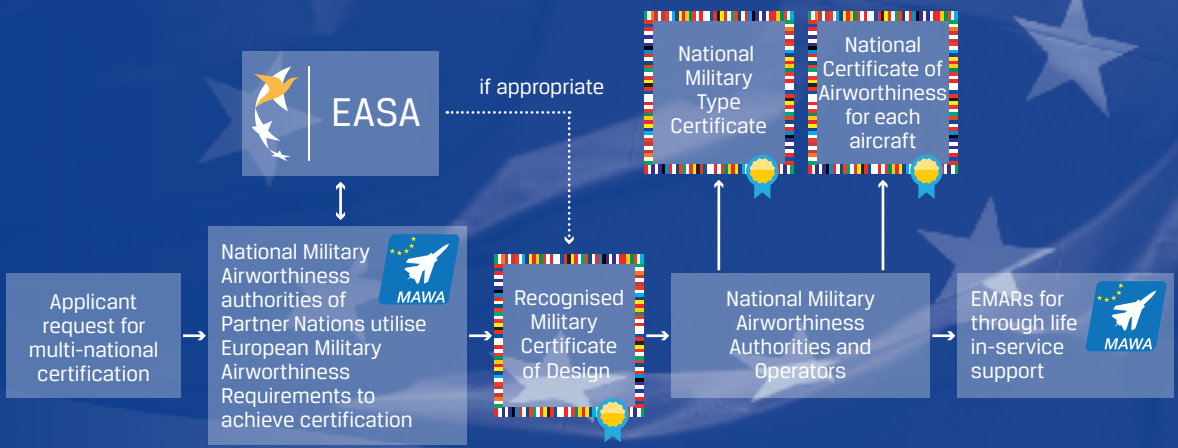
Military Airworthiness Certification

Example: A400M

TODAY



TOMORROW


EASA
if appropriate
National Military Type Certificate
National Certificate of Airworthiness for each aircraft
Applicant request for multi-national certification
National Military Airworthiness authorities of Partner Nations utilise European Military Airworthiness Requirements to achieve certification
MAWA
Recognised Military Certificate of Design
National Military Airworthiness Authorities and Operators
EMARs for through life in-service support
MAWA

Military Certification Process

For a new aircraft procurement or development programme, after the capability requirements for the aircraft have been established, the National Military Airworthiness Authority (NMAA) usually gets in contact with the design and manufacturing company . Their negotiations will determine the agreed airworthiness requirements for the aircraft which could be based upon civil standards, defence standards or a combination of these. The outcome will be an agreed Certification Basis that the company will be required to design the aircraft in accordance. During the design and development phase, if the company is not already an approved organisation, the NMAA will start the process to provide the company with a Design Organisation Approval. This approval is based upon an investigation and audit of the company to ensure that their processes, procedures and systems can be relied upon to design (and maintain the design) of the aircraft or sub-systems that they are responsible for. Depending upon the contractual arrangements it may be necessary for the NMAA to grant an approval for more than one company involved in the programme.

Towards the end of the design and development phase, the NMAA will be required to review and evaluate evidence from the company that the design meets the airworthiness requirements within the Certification Basis. Once sufficient evidence is provided by the company, the NMAA may provide the company with a Permit to Fly that will enable the company to fly a development aircraft within certain limits decided by the NMAA.

The test flying by the company will provide further evidence to substantiate that their product conforms with the Certification Basis until such time as when the NMAA declares and verifies that the aircraft is in compliance. The NMAA will then issue a Military Type Certificate for the aircraft to the company who becomes the Military Type Certificate Holder.

Prior to production and manufacture of the final product the company must also receive a Production Organisation Approval issued by the NMAA. This is once again based upon an investigation and audit of the company's processes, procedures and systems. After being granted a Production Organisation Approval the company is permitted to produce the aircraft.

This is not the end of the involvement of the NMAA as each individual aircraft must be checked by the NMAA to ensure that it conforms with the approved design.

After this has been achieved the NMAA issues a Certificate of Airworthiness for the individual aircraft and the aircraft can be registered in the national military aircraft register.

Continued Airworthiness

Once an aircraft programme enters the in-service phase the focus of the NMAA changes to ensuring that airworthiness of the design is sustained throughout the service life. The NMAA achieves this by having a system in place to monitor and report any unexpected problems with the aircraft during its service use. These problems could be due to an unexpected fault, an occurrence or incident that result in the need to repair or modify the aircraft in order to restore the airworthiness of the aircraft. The NMAA works closely with the approved company that designed and manufactured the aircraft to work to find a solution to the problem and promulgate this to all stakeholders. This could result in the need for the NMAA to impose short term limitations until a long term solution can be found.

It is also possible during the service life of an aircraft that there is a need to upgrade or change the aircraft's

capability. Once again the NMAA negotiates with the company that will modify the aircraft to determine the airworthiness requirements and redefine the certification basis. After the company produces sufficient evidence to satisfy the authority then the NMAA issues and updated Military Type Certificate for the new configuration.

Continuing Airworthiness

In order to sustain the airworthiness of an aircraft throughout its service life, there is also a need to ensure that each individual aircraft is physically airworthy. This is achieved by having a NMAA regulatory system to ensure that only organisations that have a Maintenance Organisation Approval issued by the NMAA are permitted to carry out maintenance on aircraft registered in their nation. The NMAA approves these maintenance organisations by carrying out audits and assessments.

In order to ensure that only personnel with the appropriate qualifications, training and experience are permitted to carry out maintenance on aircraft, the NMAA has a regulatory system in place to approve Maintenance Training Organisations. In addition, the NMAA has a system and an approved syllabus and training standards against which they provide a Military Aircraft Maintenance License to aircraft maintenance personnel.

To ensure that the airworthiness of in-service aircraft is managed correctly the NMAA also has a regulatory system in place to nominate and approve a Continuing Airworthiness Management Organisation (CAMO) within the aircraft operators organisational structure. The CAMO once approved by the NMAA will be responsible for ensuring that all maintenance activities are correctly scheduled and carried out by approved maintenance organisations. The CAMO is also responsible for gathering in-service data and for reporting any unexpected faults or occurrences to the Military Type Certificate Holder and the NMAA.

Glossary

Approved Organisation	That which has been assessed by the Authority and deemed to meet prescribed criteria.
Aviation Authority	Qualified body that functions as the regulatory body for all aviation related activities in a country.*
Certificate of Airworthiness	Certificate granted by the competent authority, accepting an aircraft conform to its type design and is in condition for safe operation.*
Certification	Recognition that a product, part or appliance, organisation or person complies with the applicable airworthiness requirements followed by the declaration of compliance.
Civil Aviation Authority	Qualified body that functions as the regulatory body for all civil aviation related activities in a country.*
Continuing Airworthiness	All of the processes ensuring that, at any time in its operating life, the aircraft complies with the airworthiness requirements in force and is in a condition for safe operation.
Continued (design) airworthiness	All tasks to be carried-out to verify that the conditions under which a type-certificate or a supplemental type-certificate has been granted continue to be fulfilled at any time during its period of validity.
European Aviation Safety Agency (EASA)	Agency responsible for civil aviation safety in Europe.
International Civil Aviation Organisation (ICAO)	Specialized agency of the United Nations charged with coordinating and regulating international air travel.*
Military Type Certificate	Recognition that a product complies with the applicable airworthiness requirements.
National Military Airworthiness Authorities (NMAA)	National authority responsible for the definition and oversight of military airworthiness regulation.
Permit to Fly	Permit generally issued when a certificate of airworthiness is temporarily invalid, for example as the result of a damage, or when a certificate of airworthiness cannot be issued for instance when the aircraft does not comply with the essential requirements for airworthiness or when compliance with those requirements has not yet been shown, but the aircraft is nevertheless capable of performing a safe flight.*
Type Certification Basis	An agreed set of airworthiness requirements a product must be compliant with in order to obtain a Type Certificate.

* Definitions received from the European Aviation Safety Agency

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