



Regulatory requirements for installing FLARM in aircraft

Published 27 November 2015

When installing any type of equipment in a type-certificated aircraft, there are mainly two types of legal requirements: First, the equipment has to be approved, and second, the installation itself has to be approved. These two requirements are distinct and commonly mixed up even by aviation professionals. This white paper explains those two requirements and how they relate to the installation of FLARM.

Note: The requirements discussed herein refer to rules for EASA aircraft, i.e. aircraft registered, designed, or manufactured in an EASA member state or where the operator resides in an EASA member state. Aircraft listed in Annex II to the Basic Regulation are however not affected (e.g. military, historic, and ultralight aircraft).

Note: It should also be noted that EASA regulations cover gliders and powered aircraft alike. How many engines an aircraft has (including none) does not have an effect on the installation requirements.

Parts approval

The first requirement relates to approval of the equipment, or part, itself and does not take into consideration the specific aircraft into which it is to be installed. Parts approval is regulated in Part-21 Subpart K. Normally, when parts are installed in an aircraft, they are installed because there is a requirement to do so. Examples are transponders, radios, and altimeters. Required equipment have to conform to an ETSO (European Technical Standard Order). Since FLARM is not legally required in any aircraft, there is no ETSO for FLARM and neither is it required in any type of aircraft.

Independently from the ETSO requirement, there is a requirement for evidence of the part having been manufactured in conformity to approved design data. This is called an authorized release certificate, or EASA Form 1. By issuing a Form 1 with each individual part, the manufacturer certifies that it manufactured the part according to the instructions from the designer of the part. Parts with a Form 1 are automatically eligible for installation. Most FLARM devices however do not come with a Form 1. How is it then possible to install FLARM?

Part-21 prescribes two exemptions from the rule: Standard parts and parts installed in airplanes with MTOM not exceeding 2.000 kg (ELA2 aircraft). For gliders and powered gliders, basically everything that is non-required equipment is considered a standard part. For powered airplanes not exceeding 2.000 kg, the other exemption applies. The difference



between the two exemptions is just an administrative one: For powered airplanes, the owner has to sign a document stating that he takes responsibility for the installation in his aircraft. That document is not required for gliders.

For aircraft not falling under one of the exemptions (powered airplanes above 2.000 kg and helicopters), EASA can approve equipment without a Form 1 being installed as part of an individual Minor Change Approval (MCA). FLARM Technology is also currently working with OEMs to have a FLARM device with Form 1 on the market in 2016.

It's important to note that just because a part has a Form 1 or is covered by one of the exemptions doesn't mean that the part can be installed in a specific aircraft. For that the installation itself has to be approved as well.

Installation approval

When something is installed in an aircraft, the aircraft and the basis for its type certificate is changed. It's the installer's responsibility to ensure that the installation is safe and that the aircraft conforms to the applicable certification specifications also after the change to the aircraft has been made. The change also normally has to be approved by EASA. This is regulated in Part-21 Subpart D.

Changes are classified as minor or major. Minor changes require an MCA (Minor Change Approval) and major changes require an STC (Supplemental Type-Certificate). FLARM is considered a minor change.

A minor change encompasses two parts: Design and approval. First, the installer has to design the actual installation, taking the applicable certification specifications and the specific aircraft into account. The instructions for continued airworthiness have to be updated and an Aircraft Flight Manual Supplement (AFMS) needs to be composed. When that is all done, an application is sent to EASA with all the documents and an MCA is eventually received.

As an alternative to the MCA approval process, certain installations can be carried out as a Standard Change (SC). The design part of the change is still required, but instead of an individual approval, EASA has pre-approved certain installations under prescribed conditions. EASA is a strong supporter of FLARM, and has as such published an SC for FLARM installations. The SC for FLARM lists the requirements for the design work and the operating limitations with FLARM installed.

It's important to note that an SC does not change the work required to design the installation, assess the updates needed to the instructions for continued airworthiness, and to compose the AFMS. An SC only replaces the approval process but not the design requirement. The SC makes it possible for installers to approve their own work. The purpose with standard changes is to decrease the administrative burden when installing common equipment, without affecting safety.



FLARM Technology has developed an MCA for FLARM installations covering all ELA2 airplanes that are also EASA aircraft. The MCA is approved by EASA, includes the design work, and can be used to install FLARM straightaway. The MCA covers PowerFLARM Core, compatible displays, and external antennas. Included in the MCA are, among others, the following documents which are also required for an SC installation: AFMS (18 pages) including limitations defined by the manufacturer, installation instructions/requirements as defined by the manufacturer, and instructions for continuing airworthiness as defined by the manufacturer. The complete set of documents are listed on the following page:

<http://flarm.com/shop/easa-minor-change-approval-mca/>

The documents included in the MCA can also be used as the required design work and paperwork needed for an SC installation. However, since the MCA is already approved by EASA, there is not much sense in doing so. When the MCA documents have been acquired from FLARM Technology, that includes the authorization to install FLARM as a minor change. The SC is also limited to VFR day, which is not the case with the MCA.

Finally, it should be noted that FLARM may only be installed by Part-66 certifying staff (non-commercial light aircraft) or by a maintenance organization, according to Part-M. To be correct, any competent person can do the actual installation, but Part-66 certifying staff have to release the aircraft to service (certificate of release to service, or CRS) when satisfied that the installation has been properly carried out. It is not permitted to install FLARM under pilot-owner maintenance. ■