Continuing Airworthiness (CAW) aspects for STC

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STC WORKSHOP
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CAW aspects for STC

Applicants / STC holders responsibilities

- Occurrence Reporting to EASA http://www.aviationreporting.eu/AviationReporting/
- Corrective Actions SBs and ADs or Monitored Retrofit
- Instructions for Continued Airworthiness

Practical Examples of CAW issues on specific products for STC installation

- Cabin Interior, Cargo Conversion, Electrical Issues, Big Antennas,
- Monitoring of design developments and safety issues related to the basic product

Change of Ownership (Transfer of STC certificate)

Flight Conditions for STC certification required for flights under a Permit to Fly

STC holder obligations for CAW

SUBPART B — TYPE-CERTIFICATES AND RESTRICTED TYPE-CERTIFICATES

21.A.44 Obligations of the holder

Each holder of a type-certificate or restricted type-certificate shall:

(a) undertake the obligations laid down in points **21.A.3A, 21.A.3B**, 21.A.4, 21.A.55, 21.A.57, **21.A.61** and 21.A.62; and, for this purpose, shall continue to meet the qualification requirements for eligibility under point 21.A.14; and

SUBPART E — SUPPLEMENTAL TYPE-CERTIFICATES

21.A.118A Obligations and EPA marking

Each holder of a supplemental type-certificate shall:

(a) undertake the obligations:

1. laid down in points **21.A.3A, 21.A.3B,** 21.A.4, 21.A.105, 21.A.119, **21.A.120A** and 21.A.120B;

2. implicit in the collaboration with the type-certificate holder under point 21.A.115(d)(2); and for this purpose continue to meet the criteria of point 21.A.112B;

STC holder obligations for CAW

21.A.3A Failures, malfunctions and defects

GM 21.A.3A(a) The system for collection, investigation and analysis of data

GM 21.A.3A(b) Occurrence reporting

AMC 21.A.3A(b)(2) Reporting to the Agency

AMC No 1 to 21.A.3A(a) Collection, investigation and analysis of data related to Flammability Reduction Means (FRM) reliability

AMC No 2 to 21.A.3A(a) Collection, investigation and analysis of data related to ETOPS significant occurrences

21.A.3B Airworthiness directives

AMC 21.A.3B(b) Unsafe condition

GM 21.A.3B(b) Determination of an unsafe condition

GM 21.A.3B(d)(4) Defect correction – Sufficiency of proposed corrective action

STC holder obligations for CAW

Practical examples of STC holder Post-TC tasks

- Maintain relations to TC holder, as necessary (in case there was a need for TC-holder support for certification)
- Maintain relations to POA to keep production data up to date and receive feedback about production issues, if any.
- Request feedback from all installations performed i.a.w. approved instructions. Adaptation of STC for individual deviations discovered during installation. (minor/major changes to the STC)
- Keep all relevant documents up to date, as necessary (AFM, ICA, OSD, Installation Instructions)
- Keep a list of all STC installations.
- Maintain customer relations to all STC operators to assure problem reporting as relevant to the STC. Issue Service Letters, if necessary.
- Report to EASA, if problem reports indicate that potential safety risks may exist and/or corrective actions could become necessary.

STC holder obligations for CAW

Miscellaneous STC holder Post-TC tasks

- Application for foreign validations as necessary, if
  - the STC is intended to be installed on Non-EU products or
  - an aircraft that incorporates the STC changes to Non-EU register.

- Development and application for AMOCs to support operators in case the STC interferes with corrective actions mandated by an aircraft AD.

STC holder obligations for CAW

Practical examples of in-service problems / issues

- functional difficulties,
- unexpected wear,
- corrosion,
- interference with other systems,
- repairs and replacement of COTS parts that require partial re-qualification.
- modifications and corrective actions of the basic type design that may require STC adaptation.

Practical Experience

Electrical Installations - General

- For non-essential installations it is good practice to provide reliable load shedding features to isolate the installation in case of electrical malfunctions.

Modifications using Essential Busses or Battery Busses in STC installations

- Such design solutions should be avoided because otherwise the capability to maintain safe flight and landing without normal generated power could be compromised.
- Some TC holders have issued specific information to prevent that STC design is affecting busses that are already close to minimum compliance standards with respect to loads and bus integrity.

Modifications that resulted in fire and smoke in Cockpit.

- In 1998 a Swiss MD11 was lost due to an electrical fire that could not be controlled.
- The accident report contains with reference to the STC installation for the inflight entertainment system that "….there was no minimum level of quantitative "integration" analysis required by FAR 25.1309, to ensure the system's compatibility with aircraft type-certified procedures, such as emergency load-shedding"

Practical Experience

Failures of USB power receptacles

Such devices installed under minor changes approval have resulted in limited fire and smoke in the cockpit.

The specific failure scenario is typically not hazardous and could be managed in flight using standard procedures. The design approval holder is currently working on an improved design.

EASA has agreed that the certification of an improved USB receptacle can be performed as minor change under the company procedures and will be followed within the CAW processes. Once the new and improved (short-circuit protection) USB receptacle is approved it is intended to mandate its installation (replacing the old one).

The AD may affect several aircraft types including installation in A320, A330, A340, ATR72, B737, B757, B767, B777, CL 600 (Challenger), DHC-8, F28, and F27 that have such USB sockets installed.

Practical Experience

Cabin interior refurbishment / VIP interior STCs

Flammability substantiation for veneer used was incorrect due to production issues.

Non-compliance to certification basis, EASA AD 2013-0106 issued for to several aircraft type mandating retrofit for all affected aircraft within an agreed compliance time between 96 and 144 month).

Cargo Conversion STC

Cracks of the lower frames and reinforcing angles of the main deck cargo door were identified as early as after 3 years in service.

EASA adopted FAA AD US-2004-03-23 mandating inspections and replacement of parts.

In addition EASA had determined that the modifications introduced by FAA as optional terminating action must be required to enhance the safely level of the affected aeroplanes and issued EASA AD 2011-0223.

Practical Experience

Helicopter Air Conditioning STC

Possible overheated and melted connectors in the air conditioning wiring

SAIB - The Federal Aviation Administration (FAA) recommends that all owners and operators of helicopters listed in the previous table, with the associated air-conditioning STCs installed, implement the actions outlined in the listed Service Bulletins.

Helicopter Litter Kit STC

Inference of certain lanyards with Flight Controls could develop.

Transport Canda issued an airworthiness directive CF-2017-037 that requires modification.

Helicopter Cockpit Stowage compartment STC

Inference with Pilot Seats due to production tolerances resulted in accidential damage to the seat.

Only 5 helicopters were affected and those were inspected and repaired without an AD.

Practical Experience

Monitoring of design developments and safety issues related to the basic product

- Airbus Extended Service Goal / OIT 999.0025/17 Rev 01 issued 15-FEB-2018

  The purpose of this OIT is to provide operators with information related to introduction of STCs (Supplemental Type Certificates) /TPDCs (Third Party Design Changes) involving the modification of aircraft structural component with regard to Airbus certified ESG (Extended Service Goal).

  ESG certification could be compromised by structural modification introduced by STCs/TPDCs. As an example, Airbus has been informed of the existence of STCs/ TPDCs modifying significantly structural components for installing SATCOM antennae on Airbus aircraft.

  The installation of structural provision for SATCOM antenna may have an impact on Load, Fatigue and Damage Tolerance.

  When structural modification introduced by STCs/TPDCs is performed, Airbus considers that the aircraft is no longer in accordance with the Airbus certified ESG Modification and that ESG capability could be compromised.

  Consequently re-assessment of ESG capability is required.

  It is the owner/operator responsibility to contact the STCs/TPDCs holder and to demonstrate that the STCs/TPDCs is compliant with the ESG figures and modification.

- Inspection thresholds and intervals need to be reviewed
- If changes to ICAs (ALS) are necessary, those are considered as major changes to the STC.

Practical Experience

The Extended operational life 60000FC or 120000FH (referenced in ALS parts) will be granted to aircraft on which this Service Bulletin will be implemented.

The Extended operational life is published in ALS Parts.

It is under the customer responsibility to ensure that all ALS Parts requirements are fulfilled.

The Extended service life certification is based on the aircraft configuration as known by AIRBUS (first aircraft delivery configuration and modified by the reported incorporation of AIRBUS Service Bulletins).

Prior to Service Bulletin embodiment, specific attention must be paid to structural damage that may exist, as well as to all repairs and to Supplemental Type Certificate (STCs)/ Third Party Design Changes (TPDCs) performed on the aircraft as they may be affected by the Extended Service Life. Compliance of all allowable damage limits, recorded repairs (repairs performed outside of the SRM or other items which would require specific support to complete evaluation) and STCs/TPDCs must be verified.

5 DATE: Mar 07/14 SERVICE BULLETIN No.: A320-02-1001

REVISION No.: 22 - Dec 21/17 Page: 1

A318/A319/A320/A321

SERVICE BULLETIN
SUMMARY

For the review of the repairs defined by AIRBUS through RDAS, AIRBUS Customer Services should be contacted. For other repairs or STCs/TPDCs, it is the customer's responsibility to contact the originator of the repair or STCs/TPDCs and of their approval, to do the review and demonstrate that they are compliant with the ESG figures.

There may be additional or modified maintenance requirements, such as temporary limits or additional inspections that apply with respect to the Extended Service Goal. AIRBUS disclaims any liability for the potential consequences that the Extended Life may have on the repairs and STCs/TPDCs not correctly assessed, performed on the aircraft prior to the embodiment of the Service Bulletin (Refer to OIT No. 999.0025/17).

CUSTOMER SERVICES DIRECTORATE
1 ROND POINT MAURICE BELLONTE
31707 BLAGNAC CEDEX FRANCE
TELEPHONE + 33 (0)5 61 93 33 33

AIRBUS

OPERATORS INFORMATION TRANSMISSION - OIT

SUBJECT: ATA 00 – Extended Service Goal capability re-assessment in case of STCs/TPDCs structural modification embodiment

AIRCRAFT TYPE: A300,A300-600,A310,A319,A320,A321,A330,A340

OUR REF.: 999.0025/17 Rev 01 dated 15-FEB-2018.

OIT CATEGORY: GENERAL INFORMATION

NOTICE: This OIT provides general Maintenance and Engineering information. It is left to each Operator's discretion whether to distribute this OIT, or to distribute the information contained in this OIT, to all of their applicable Maintenance and Engineering organizations for information.

REFERENCED DOCUMENTS:
N/A

1. PURPOSE
The purpose of this OIT is to provide operators with information related to introduction of STCs (Supplemental Type Certificates) /TPDCs (Third Party Design Changes) involving the modification of aircraft structural component with regard to Airbus certified ESG (Extended Service Goal).

2. BACKGROUND
ESG certification could be compromised by structural modification introduced by STCs/TPDCs. As an example, Airbus has been informed of the existence of STCs/ TPDCs modifying significantly structural components for installing SATCOM antennae on Airbus aircraft.
The installation of structural provision for SATCOM antenna may have an impact on Load, Fatigue and Damage Tolerance.

3. DESCRIPTION
When structural modification introduced by STCs/TPDCs is performed, Airbus considers that the aircraft is no longer in accordance with the Airbus certified ESG Modification and that ESG capability could be compromised.

Consequently re-assessment of ESG capability is required.

It is the owner/operator responsibility to contact the STCs/TPDCs holder and to demonstrate that the STCs/TPDCs is compliant with the ESG figures and modification.

Under specific technical, contractual and commercial conditions, it might be possible for the STCs/TPDCs holder to request support from Airbus through the Engineering Data Provision (EDP) service.

Practical Experience

Monitoring of design developments and safety issues related to the basic product

ATA 71 – Power Plant – Monolithic Fan Cowl Doors – Modification

Prevention of Fan Cowl Loss events

Following several in-service events of flights with engine cowl doors not properly closed and opening in flight, EASA issued in 2016 two ADs to mandate specific improved latches with an unlocking key on the Airbus SA Fleet.

However these ADs were not applicable to alternative parts which have been installed under an STC.

Consequently, a similar design change had to be developed for those doors and was also mandated in 2017.

https://ad.easa.europa.eu/ad/2017-0178

Practical Experience

Monitoring of design developments and safety issues related to the basic product

ATA 34 – Navigation – Traffic Collision Avoidance System Processor – Modification (Software Update) / Replacement

EASA issued AD 2017-0091 to address the unsafe condition on aeroplanes that had the TCAS processor installed by Airbus major change or SB.

However, part of the fleet had the same P/N installed by STC.

The relevant STC approval holders have been notified and modification instructions can be obtained from those companies.

For the reason described above, this AD requires modification or replacement of the TCAS processors. This AD also prohibits installation of those processors on post-mod aeroplanes.

https://ad.easa.europa.eu/ad/2017-0196

Change of Design Approval Holder

Transfer of STC certificate

- A STC can be transferred from DOA 1 to DOA 2 provided DOA 2 has appropriate DOA privileges for the STC takeover.
- Design and compliance data package that has been transferred from DOA 1 to DOA 2.

- The current STC holder will apply for STC transfer to the new STC holder with EASA form 38
- The new STC holder needs to accept the transfer of the STC and accepts the obligations of 21A.118A and confirms eligibility of the holder i.a.w. 21A.112.

Flight Condition Approval for PtF

STC applicants will need to perform limited flight testing for development and certification and sometimes customer demonstrations before the STC is approved.

The flight conditions must be approved by

- EASA or
- DOA with respective privileges

For an EASA approval the applicant must apply with EASA form 37 (incl. form 18B)

It is a good practice to plan and agree the timeline development test, certification tests, EASA involvement and customer/training flights, as required with the PCM responsible for the STC.

The flight test program and limitations, and flight crew selection must be in line with the classification of the flight testing. The application will normally be allocated to the PCM responsible for the STC approval.

Note: An application for approval of flight conditions related to an STC may require detailed review and cannot by considered as urgent as applications related to AOG.

EASA
European Aviation Safety Agency

Thank you.

Questions ?

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