

Fuel Tanks Safety Training / SFAR88 Training Needs Analysis

This course is to be aware of the target audience and also of the requirement for Initial and Continuation Training.

EASA Target Audiences as per Easy Access Rules for Continuing Airworthiness (Regulation (EU) No 1321/2014) - Appendix IV to AMC5 145.A.30(e) and AMC2 145.B.200(a)(3) —Fuel Tank Safety Training

Persons from affected organisations who should receive training: Appendix IV to AMC5 145.A.30(e) and AMC2 145.B.200(a)(3) —Fuel

Tank Safety Training

Phase 1 only:

- The group of persons representing the maintenance management structure of the organisation, the compliance monitoring manager, the safety manager and the staff who are directly involved in monitoring the compliance of the organisation.
- Personnel of the competent authorities who are responsible for the oversight of Part-145 approved maintenance organisations that are responsible for the oversight of the Part-145 approved organisations involved in the maintenance of aeroplanes specified in the following sub paragraph highlighted in *italics* and fuel system components installed on such aeroplanes when the maintenance data are affected by CDCCL.
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the Agency (CS-25) and certified after 1 January 1958 with a maximum type certified passenger capacity of 30 or more or a maximum certified payload capacity of 7500 lbs (3402 kg) cargo or more, and*
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the Agency (CS-25) which contains CS-25 amendment 1 or later in their certification basis.*

Phase 1 & Phase 2 & Recurrent Training:

- Personnel of the Part-145 approved maintenance organisation who are required to plan, perform, supervise, inspect and certify the maintenance of the aircraft and fuel system components specified in the following sub paragraph highlighted in *italics* and fuel system components installed on such aeroplanes when the maintenance data are affected by CDCCL.
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the Agency (CS-25) and certified after 1 January 1958 with a maximum type certified passenger capacity of 30 or more or a maximum certified payload capacity of 7500 lbs (3402 kg) cargo or more, and*
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the Agency (CS-25) which contains CS-25 amendment 1 or later in their certification basis.*

CAA Target Audiences as UK Regulation (EU) No 1321/2014 Annex II (Part 145) Appendix IV to AMC to 145.A.30(e) and 145.B.10(3) & Appendix IV to AMC5 145.A.30(e) and AMC2 145.B.200(a)(3) — Fuel Tank Safety Training

Persons from affected organisations who should receive training:

Phase 1 only:

- The group of persons representing the maintenance management structure of the organisation, the compliance monitoring manager, the safety manager and the staff who are directly involved in monitoring the compliance of the organisation.
- Personnel of the competent authorities who are responsible for the oversight of Part-145 approved maintenance organisations that are responsible for the oversight of the Part-145 approved organisations involved in the maintenance of aeroplanes specified in the following sub paragraph highlighted in *italics* and fuel system components installed on such aeroplanes when the maintenance data are affected by CDCCL.
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the CAA (CS-25) and certified after 1 January 1958 with a maximum type certified passenger capacity of 30 or more or a maximum certified payload capacity of 7500 lbs (3402 kg) cargo or more, and*
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the CAA (CS-25) which contains CS-25 amendment 1 or later in their certification basis.*

Phase 1 & Phase 2 & Recurrent Training:

- Personnel of the Part-145 approved maintenance organisation who are required to plan, perform, supervise, inspect and certify the maintenance of the aircraft and fuel system components specified in the following sub paragraph highlighted in *italics* and fuel system components installed on such aeroplanes when the maintenance data are affected by CDCCL.
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the CAA (CS-25) and certified after 1 January 1958 with a maximum type certified passenger capacity of 30 or more or a maximum certified payload capacity of 7500 lbs (3402 kg) cargo or more, and*
 - *Large aeroplanes as defined in Decision 2003/11/RM of the Executive Director of the CAA (CS-25) which contains CS-25 amendment 1 or later in their certification basis.*

EASA & UK CAA Phase 1 Training Needs Syllabus:

It should be a course at the level of familiarisation with the principal elements of the subject.

Objectives

1. be familiar with the basic elements of the fuel tank safety issues,
2. be able to give a simple description of the historical background and the elements requiring a safety consideration, using common words and showing examples of non-conformities,
3. be able to use typical terms.

Content

The course should include:

- a short background showing examples of FTS accidents or incidents,
- the description of concept of fuel tank safety and CDCCL,
- some examples of manufacturers documents showing CDCCL items,
- typical examples of FTS defects,
- some examples of TC holders repair data,
- some examples of maintenance instructions for inspection

EASA & UK CAA Phase 2 Training Needs Syllabus:

It should be a detailed course on the theoretical and practical elements of the subject.

Objectives

The attendant should, after the completion of the training:

- have knowledge of the history of events related to fuel tank safety issues and the theoretical and practical elements of the subject, have an overview of the FAA regulations known as SFAR (Special FAR) 88 of the FAA and of JAA Temporary Guidance Leaflet TGL 47, be able to give a detailed description of the concept of fuel tank system ALI (including Critical Design Configuration Control Limitations CDCCL, and using theoretical fundamentals and specific examples;
- have the capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner;
- have knowledge on how the above items affect the aircraft;
- be able to identify the components or parts or the aircraft subject to FTS from the manufacturer's documentation,
- be able to plan the action or apply a Service Bulletin and an Airworthiness Directive.

Specific Needs to be covered in Phase 2 Training:

- (a) understanding of the background and the concept of fuel tank safety,
 - (b) how the mechanics can recognise, interpret and handle the improvements in the instruction for continuing airworthiness that have been made or are being made regarding the fuel tank system maintenance,
 - (c) awareness of any hazards especially when working on the fuel system, and when the Flammability Reduction System using nitrogen is installed.
- The training should include a representative number of examples of defects and the associated repairs as required by the TC/STC holders' maintenance data.

Paragraphs a), b) and c) above should be introduced in the training programme addressing the following issues:

- (i) The theoretical background behind the risk of fuel tank safety: the explosions of mixtures of fuel and air, the behaviour of those mixtures in an aviation environment, the effects of temperature and pressure, energy needed for ignition etc, the 'fire triangle', - Explain 2 concepts to prevent explosions:
 - (1) ignition source prevention and
 - (2) flammability reduction,
- (ii) The major accidents related to fuel tank systems, the accident investigations and their conclusions,
- (iii) SFAR 88 of the FAA and JAA Interim Policy INT POL 25/12: ignition prevention program initiatives and goals, to identify unsafe conditions and to correct them, to systematically improve fuel tank maintenance),
- (iv) Explain the briefly concepts that are being used: the results of SFAR 88 of the FAA and JAA INT/POL 25/12: modifications, airworthiness limitations items and CDCCL,
- (v) Where relevant information can be found and how to use and interpret this information in the applicable maintenance data as defined in 145.A.45(b),
- (vi) Fuel Tank Safety during maintenance: fuel tank entry and exit procedures, clean working environment, what is meant by configuration control, wire separation, bonding of components etc,
- (vii) Flammability reduction systems when installed: reason for their presence, their effects, the hazards of an FRS using nitrogen for maintenance, safety precautions in maintenance/working with an FRS,
- (viii) Recording maintenance actions, recording measures and results of inspections.

The training includes a representative number of examples of defects and the associated repairs as required by multiple TC/STC holders' maintenance data.

FAA Target Audiences:

Operators should provide training to maintenance, inspection, and engineering personnel, including persons who write and edit job cards and EOs.

FAA AC 120-97A SFAR 88 Section 3-10 & 3.4 FUEL TANK SYSTEM IGNITION PREVENTION TRAINING.

3.10 (c) Operator Training Program. The operator training program should emphasize the importance of accomplishing the fuel tank system airworthiness limitations, CDCCLs, inspections, and other procedures while accomplishing scheduled and unscheduled maintenance. (See subparagraphs 3-4b, c, d, and e for further guidance on this subject.)

3.4 (b) The following features must be maintained during pump replacement per the manufacturer's AMM: • Install two bonding straps between the pump motor impeller end-cap and structure, and • Verify that the motor impeller bonding resistance to structure is 0.0004 ohms (0.4 milliohms) or less. (2) These CDCCLs must be incorporated and adhered to as written. Any proposed operator changes to the CDCCL must be approved by the DAH Oversight Office.

c. Inspection in a Hangar Environment. Traditionally structural airworthiness limitations have a specific task and interval and are performed as part of a scheduled inspection in a hangar environment. Most fuel system airworthiness limitations will also involve access requirements that are generally only available in a hangar environment during a scheduled maintenance visit.

d. Critical Design Feature Maintenance. For example, there will also be times when a fuel system CDCCL will involve unscheduled maintenance such as a fuel pump change due to Par 3-4 Page 11 AC 120-97A 5/25/12 pump failure at a line station overnight. The CDCCL requires that the critical design feature identified in subparagraph 3-4b(1) above must be maintained during the fuel pump change.

e. Fuel System Airworthiness Limitations That Include CDCCLs. Accomplishment of fuel system airworthiness limitations that include CDCCLs relates directly to safety of flight similar to the Required Inspection Item (RII) requirement in the part 121 rule. Operators must consider CDCCLs with the same safety consideration and emphasis, whether the work occurs during scheduled or unscheduled maintenance, or it arises at an inconvenient time or location.

(1) Operators must have procedures in their maintenance program that ensure that any airworthiness limitation critical design feature that is affected is maintained whether it's during scheduled or unscheduled maintenance.

(2) CDCCLs are intended to identify only critical features of a design that must be maintained. For example, certain components of a fuel pump (or all components) may include critical features that are identified as CDCCLs. These critical features would be identified in the ALS of the ICA and in the component maintenance manual (CMM) as CDCCLs.

(3) Although not intended by the introduction of CDCCLs and other fuel system airworthiness limitations, there are also DAH that have created certain airworthiness limitations CDCCLs that include both the critical design feature as well as the tasks associated with maintaining the CDCCL. Typically these

airworthiness limitations require adhering to a specific CMM at a specific revision level when repairing or overhauling fuel system components. In this case, operators are required to adhere to all elements of the CMM specified in the CDCCL. Any deviations from CMMs specified in the CDCCL, including using later revisions of those CMMs, must be approved by the FAA Oversight Office. The operator should submit its proposed changes through the PI, who may add comments and forward them to the FAA Oversight Office for approval. Deviations from CMMs specified in the CDCCL may also involve an AMOC to an AD. (See the CMM deviation definition in Appendix 3, Definitions.)

Initial Training:

The course we provide at OAT.aero shall meet Level 2 requirements and be considered as a detailed course on the theoretical and practical examples shown for the subject. It shall include all requirements of and exceed the needs for Level 1 general familiarisation for Fuel Tanks Safety Training meaning the course is both Level 1 and 2 compliant.

NOTE Level 1 is initial only as Level 1 does NOT require continuation training.

Continuation Training:

The course we provide at OAT.aero shall meet Level 2 requirements and be considered as a detailed course on the theoretical and practical elements of the subject. Level 1 material is not required to be covered in continuation training as level 1 persons do not require refresher training.

Course General Requirements:

This course is intended to be a learning course with **6-8 learning hours**.

This course covers only **theoretical knowledge** and while picture and video might be used as required it shall not be intended for practical assessment or instruction.

Online Questions are based on modular learning and shall be presented following completion of a module – it shall be possible to progress modules without completing the associated questions although no certificate or course completion will be considered without all module questions accomplished to a minimum **pass rate of 75%**.

Queries and concerns on examination material shall only be addressed by examination manager.

Specifications course taught to:

Course is taught to achieve regulations as specified in

EASA ED Decision 2009/007/R, Continuing Airworthiness (Regulation (EU) No 1321/2014) - Appendix IV to AMC5 145.A.30(e) and AMC2 145.B.200(a)(3) — Fuel Tank Safety Training

UK CAA Regulation (EU) No 1321/2014 Annex II (Part 145) Appendix IV to AMC to 145.A.30(e) and 145.B.10(3) & Appendix IV to AMC5 145.A.30(e) and AMC2 145.B.200(a)(3) — Fuel Tank Safety Training

FAA AC 120-97A SFAR 88.