Part-26

Ageing Aircraft Structures

STC Holder Info Session

14 April 2021
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Objectives of the Regulation
Objective of the regulation

Prevent the catastrophic failure of large ageing aeroplanes due to fatigue and corrosion
Objectives

How is the objective met?

By setting specific objectives to address each of the following areas of risk:

→ Fatigue of the basic type design
→ Widespread fatigue damage (WFD)
→ Corrosion
→ Adverse effects of changes and repairs
→ Continued operation with unsafe levels of fatigue cracking
Objectives

To prevent catastrophic fatigue failure of the basic type design

The TCH is required to perform a Fatigue and Damage Tolerance Evaluation (DTE) and include the results in the ALS or in a Supplemental Structural Inspection Programme (SSIP).

The operator includes these inspections in the AMP.
Objectives

Rationale for damage tolerance evaluation and inspections:

Early fatigue requirements, such as ‘fail safe’ regulations, did not provide for timely inspection of an aircraft’s critical structure to ensure that damaged or failed components could be dependably identified and then repaired or replaced before hazardous conditions developed.

Aeroplanes certificated to fatigue requirements pre JAR 25 Change 7 / FAR Amdt. 25-45, did not address damage tolerance and still operate in Europe.

Many TCHs have developed supplemental inspection programmes (SSIPs) based on damage tolerance for these older aeroplanes, but this is not the case for all large aeroplanes.
Objectives

To prevent widespread fatigue damage

Certain TCHs are required to establish a Limit of Validity (LoV) of the Structural Maintenance Programme and establish maintenance actions based on a WFD evaluation of the type design.

The operator must include the LOV in the AMP and subsequently implement the maintenance actions
Objectives

Rationale for LoV and WFD evaluation:

It was generally assumed when fatigue and fail-safe rules were first implemented that any cracking that occurs on an aircraft operated up to the DSG will occur in isolation, originating from a single source, such as a random manufacturing flaw or a local design detail.

WFD in a structure is characterised by the simultaneous presence of cracks at multiple structural details that are of sufficient size and density whereby the structure will no longer meet the applicable residual strength requirements.

The F&DT requirements (JAR 25.571 Change 7 and CFR 14 § 25.571 Amdt 45 onward) and associated inspections were intended by Authorities to find and correct all forms of fatigue damage before they become critical and a similar approach to F&DT was used as a basis for the SSIDs.

Nonetheless, it has become apparent that as aircraft have approached and exceeded their DSG not all maintenance programmes have adequately addressed WFD and subsequent voluntary action by some TCHs to address WFD did not result in a uniform application of state of the art WFD prevention principles described in AMC 20-20 and the risk presented by WFD remains.
Objectives

To prevent structural failure due to corrosion

The TCH is required to develop a baseline corrosion prevention and control programme (CPCP).

The operator incorporates a CPCP in the AMP taking into account the baseline CPCP
Objectives

Rationale for CPCP:

Typically, existing large aeroplane structures are vulnerable to corrosion and most, but not all are subject to a CPCP. A CPCP is a systematic approach to prevent and to control corrosion in the aircraft’s structure.

The objective of a CPCP is to limit the deterioration due to corrosion to a level necessary to maintain airworthiness (typically Level 1 corrosion or better) and where necessary to restore the corrosion protection schemes for the structure.

An effective CPCP not only limits the direct effects of corrosion, but helps prevent fatigue failures initiated by corrosion and the detrimental effects of fatigue and corrosion in combination.
Objectives

To prevent structural fatigue failure due to the adverse effects of changes and repairs

Fatigue and damage tolerance evaluations (DTE) and associated damage tolerance based inspections (DTI) are required for existing repairs and changes.

This requires a coordinated effort between the design approval holders and the operators upon whose aircraft the repairs or changes are implemented, to ensure the continued structural integrity of all relevant modified and repaired structure, based on damage tolerance principles, consistent with the safety level provided by the SSID or ALS as applied to the baseline structure.
Objectives

Rationale for DTE and DTI of repairs and changes:

Early fatigue or fail-safe requirements (pre-Amdt 45) did not necessarily provide for timely inspection of critical structure so that damaged or failed components could be dependably identified and repaired or replaced before a hazardous condition developed.

Repairs and changes can have an adverse effect on the fatigue and damage tolerance of the baseline structure of an aircraft by affecting fatigue cracking behaviour and the effectiveness of existing inspections.

SSIDs generally only addressed baseline structure. Furthermore, it is known that application of later fatigue and damage tolerance requirements to repairs and even some changes was not always fully implemented according to the relevant certification bases.

The DTE of repairs and changes is therefore required to maintain the level of safety intended by the implementation of SSIDs and ALS applicable to baseline structure.
Objectives

To reduce the probability of continued operation with unsafe levels of fatigue cracking

A process is required to be developed by TCHs that ensures the continued structural integrity programme remains valid and mandatory changes are implemented in cases where inspection alone is not reliable enough.
Objectives

Rationale for reducing the probability of continued operation with unsafe levels of fatigue cracking:

Service experience has demonstrated that there is a need to have continuing updated knowledge concerning the structural integrity of aircraft, especially as they become older.

Although damage tolerance based inspections are the state of the art for setting up an effective maintenance programme to ensure continued safe operation, they are only reliable if the assumptions on which they are based remain valid.
Background – influential accidents

→ Comet DH-106 fuselage fatigue failures - 1954
  → Changes in requirements to fail-safe

→ B707 Lusaka tailplane failure - 1977
  → Changes in requirements to damage tolerance based inspections

→ B737 Aloha - 1988
  → Changes in requirements to better address WFD and corrosion
Background to the regulation

→ In the EU, additional airworthiness requirements for operations started with JAR 26

→ However most of these requirements were simple, and sufficient approved design data was known to exist to support them

→ In the US, for more complex requirements such as occurred with SFAR 88 (Fuel Tank Safety) it was found that operators could fail to meet the requirements if not adequately supported by TCHs

→ Therefore the regulations for ageing aircraft structures were amended to place requirements on design approval holders in addition to operators to ensure timely compliance
Background to the regulation (2)

→ In the US, additional airworthiness requirements for DAHs were introduced in CFR14 Part 26 in 2008 for repairs and alterations and 2011 for LOV and WFD evaluation similar to Part-26.

→ FAA used airworthiness directives for SSIDs and CPCPs

→ Part 121 was amended to require operators to implement the LOV and prior to that implement DTI programmes including means to address repairs and alterations
Definitions
Definitions

→ CS-Definitions

→ ‘Large aeroplane’ means an aeroplane of more than 5 700 kg (12 500 pounds) maximum certificated take-off weight. The category ‘Large Aeroplane’ does not include the commuter aeroplane category (For commuter aeroplane category, see CS 23.1 and CS 23.3).
Definitions and abbreviations


Baseline Structure - refers to the structure that is designed under the type certificate for that aeroplane model (that is, the ‘as delivered aeroplane model configuration’)

CPCP - ‘Corrosion prevention and control programme (CPCP)’ means a document reflecting a systematic approach to prevent and to control corrosion in an aeroplane’s primary structure, consisting of basic corrosion tasks, including inspections, areas subject to those tasks, defined corrosion levels and compliance times (implementation thresholds and repeat intervals). A baseline CPCP is established by the type certificate holder, which can be adapted by operators to create a CPCP in their maintenance programme specific to their operations.

DTE - ‘Damage tolerance evaluation (DTE)’ is a process that leads to a determination of maintenance actions necessary to detect or preclude fatigue cracking that could contribute to a catastrophic failure. When applied to repairs and modifications, a DTE includes the evaluation of the repair or modification and the fatigue critical structure affected by the repair or modification.
Definitions and abbreviations

**DTI** - ‘Damage tolerance inspections (DTIs)’ means a documented inspection requirement or other maintenance action developed by holders of a type-certificate or restricted type-certificate as a result of a damage tolerance evaluation. A DTI includes the areas to be inspected, the inspection method, the inspection procedures (including the sequential inspection steps and acceptance and rejection criteria), the inspection threshold and any repetitive intervals associated with those inspections. DTIs may also specify maintenance actions such as replacement, repair or modification.

**FCS** - ‘Fatigue-critical structure (FCS)’ means a structure of an aeroplane that is susceptible to fatigue cracking that could lead to catastrophic failure.

**FCBS** - ‘Fatigue-critical baseline structure (FCBS)’ means the baseline structure of an aeroplane that is classified by the type certificate holder as a fatigue-critical structure.

**FCMS** - ‘Fatigue-critical modified structure (FCMS)’ means any fatigue critical structure of an aeroplane introduced or affected by a change to its type design and that is not already listed as part of the fatigue-critical baseline structure.

**LOV** - ‘Limit of validity (LOV)’ means, in the context of the engineering data that supports the structural maintenance programme, a period of time, stated as a number of total accumulated flight cycles or flight hours or both, during which it is demonstrated that widespread fatigue damage will not occur in the aeroplane.
Definitions and abbreviations

**REG** - ‘Repair evaluation guideline (REG)’ means a process established by the type certificate holder that guides operators to establish damage tolerance inspections for repairs that affect fatigue-critical structure to ensure the continued structural integrity of all relevant repairs.

**WFD** - ‘Widespread fatigue damage (WFD)’ means a simultaneous presence of cracks at multiple locations in the structure of an aeroplane that are of such size and number that the structure will no longer meet the fail-safe strength or residual strength used for certification of that structure.

Ageing Aircraft Structures

Your safety is our mission.
Regulation (EU) 2020/1159

→ amending Part M and Part-26

→ Adopted on 5 August 2020

→ Published in the OJ on 6 August 2020

→ Entered into force on 26 August 2020

→ Became applicable ..... for ageing aircraft on 26 February 2021

→ and becomes applicable for conv. Class D compartments on 26 August 2023
Opinion 12/2016 vs Reg. (EU) 2020/1159

→ Regulatory proposal compared to EASA Opinion 12/2016

Split into a delegated act and an implementing act to reflect the new delegation provisions in the basic Regulation 2018/1139

Restructured to improve legal clarity

Exclusion criteria encompassed directly in Part-26

→ NO IMPACT on rights and obligations of the regulated entities
<table>
<thead>
<tr>
<th>Opinion 12/2016</th>
<th>Reg. (EU) 2020/1159</th>
<th>Remarks</th>
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<tr>
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<td>26.300(f)</td>
<td>21.A.65</td>
<td>Delegated act for future applications</td>
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<td>26.370</td>
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Overall view

TC holders: establish a continuing structural integrity programme

Operators: incorporate ageing aircraft related tasks/actions in the AMP, including plan to address the adverse effects of repairs and modifications

TC/STC holder: Damage Tolerance Evaluation of existing changes and published repairs to FCS

Part 26 & Part M

TC/STC applicants: mandatory compliance with ageing aircraft structures requirements for future changes/repairs

Part 21
26.300-> 26.306 Continuing Structural Integrity for ageing aircraft structures — General requirements

Who?

What?

(R)TCHs

Compliance plan

Fatigue and damage tolerance evaluations

Limit of Validity (LOV) determination

Identify existing maintenance actions further actions to preclude widespread fatigue damage (WFD)

Baseline Corrosion prevention and control programme (CPCP)

A process to ensure continued validity of the structural integrity programme

Identification of Fatigue critical baseline structure (FCBS)

Compliance time: specific for each point, ranging from 3 to 60 months from applicability.
26.307-26.309 Damage tolerance data for existing repairs and existing changes to fatigue-critical structure

Who?

(R)TCH

What?

- Compliance plan (in point 26.301)
- Identify all changes that affect FCBS
- List FCMS
- Perform DTE and develop DTI
- Establish an implementation schedule that provides timelines for conducting aircraft surveys, DTI and incorporate this in maintenance programme

Compliance time: specific for each point, from 3 to 24 months

FCMS: fatigue-critical modification structure
DTE: damage tolerance evaluation
DTI: damage tolerance inspection
26.330->26.334 Damage tolerance data for existing STCs, other existing major changes and existing repairs affecting those changes or STCs

Who?

STCH

What?

- Review the changes and identify those that affect FCBS
  - List changes affecting FCBS
  - List FCMS
- Perform DTE and develop DTI

Compliance time: specific for each point, from 6 to 24 months

FCMS: fatigue-critical modified structure
DTE: damage tolerance evaluation
DTI: damage tolerance inspection
26.370 Continuing airworthiness tasks and aircraft maintenance programme

Who?
- Operator / Owner

What?
- Include in the AMP an approved damage tolerance-based inspection programme.
- Address adverse effects of repairs and modifications on fatigue-critical structure and on inspections.
- CPCP
- Limitations on the use of the maintenance programme (e.g. LOV)

Compliance time: **specific for each point, from 6 to 36 months**
Material supporting implementation

→ Part 26 is a Regulation of the EU, it contains the requirements to be complied with by regulated entities
  ➢ Who has to do what and by when...

→ To support the application of this ‘hard law’, EASA develops
  ➢ Certification specifications (CS-26)
  ➢ Guidance Material (GM)

which can be used by regulated entities and competent authorities
CS-26

→ CS-26 is the standard means to show compliance of product with the requirements of Part-26.

→ When CS-26 exists, regulated entities may follow it to demonstrate compliance with the related requirement of Part-26.

→ When the contents of CS-26 is properly implemented by the regulated entity, the related requirements of Part-26 shall be considered as met (=> presumption of compliance).
GM-26

→ Guidance Material (GM)

- Illustrate the meaning of a Part-26 point
- Supports the interpretation of it (e.g. explanations, examples, background..)
- Has (differently from CS-26) no presumption of compliance
ED Decision 2020/023/R

→ Amending CS-26, AMC-20 and AMC/GM to Part-M
→ Published on 15 December 2020
→ Entered into force on 17 December 2020

• AMC-20 amended to introduce the latest available material and to align it with the new ageing aircraft requirements
• CS-26 amendment contains new GM-26
Part-M

Changes in Regulation (EU) 1321/2014

M.A.302 Aircraft Maintenance Programme (AMP)

- a new bullet point is added to clarify that the AMP must also establish compliance with the applicable provisions of Part 26.
**Next Step - Part 21**

→ **Expected changes in Regulation (EU) 748/2012**

- **21.A.44 Obligations of the holder**
  - amended to add reference to the new point 21.A.65

- **21.A.65: Continuing structural integrity for aeroplanes structures**
  - New point requiring TCHs of large aeroplanes to ensure that the continuing structural integrity programme remains valid throughout the operational life of the aeroplane

- **21.A.101 TC basis, OSD certification basis and EP requirements for a major change to a type-certificate**
  - new bullet has been added to ensure that the level of safety achieved by compliance with the ageing aircraft rule is maintained for future structural changes to the product (large aeroplanes only).

- **21.A.433 Requirements for approval of a repair design**
  - new bullet has been added to ensure that the level of safety achieved by compliance with the ageing aircraft rule is maintained for future structural repairs to the product (large aeroplanes only).
→ “21.A.65 Continuing structural integrity for aeroplanes structures

→ The holder of the type-certificate or restricted type-certificate for a large aeroplane shall ensure that the continuing structural integrity programme remains valid throughout the operational life of the aeroplane, taking into account service experience and current operations”
Expected amendment of point 21.A.101

→ “(b) Except as provided in point (h), by derogation from point (a), an earlier amendment to a certification specification referred to in point (a) and to any other certification specification which is directly related may be used in any of the following situations, unless the earlier amendment became applicable before the date at which the corresponding certification specifications incorporated by reference in the type-certificate became applicable:”;

........................................

→ “(h) For large aeroplanes subject to point 26.300 of Annex I to Regulation (EU) 2015/640*, the applicant shall comply with certification specifications that provide at least an equivalent level of safety to points 26.300, 26.320 and 26.330 of Annex I to Regulation (EU) 2015/640, except for applicants for supplemental type-certificates who are not required to take into account point 26.303.”
→ in point 21.A.433(a) the following point (5) is added:
→ “5. when, for a repair to an aeroplane subject to point 26.302 of Annex I to Regulation (EU) 2015/640, it has been demonstrated that the structural integrity of the repair and affected structure is at least equivalent to the level of structural integrity established for the baseline structure by point 26.302 of Annex I to Regulation (EU) 2015/640.”
Focus on requirements for STCHs
STCH Rule Applicability

→ 26.330 Damage tolerance data for existing supplemental type-certificates (STCs), other existing major changes and existing repairs affecting those changes or STCs

→ (a) A holder of a STC issued before 26 February 2021 for a major change, or a holder of a major change that has been deemed approved in accordance with Article 4 of Regulation (EU) No 748/2012, for large aeroplanes certified on or after 1 January 1958 to carry 30 or more passengers or that have a payload capacity of 3 402 kg (7 500 lbs) or more, shall support operators required to comply with point 26.370(a)(ii) by addressing the adverse effects of those changes and repairs to those changes on the aeroplane structure and shall comply with the requirements set out in points 26.331 to 26.334.
Applicability

→ Applicability turbine powered large aeroplanes

→ CS-Definitions

→ ‘Large aeroplane’ means an aeroplane of more than 5 700 kg (12 500 pounds) maximum certificated take-off weight. The category ‘Large Aeroplane’ does not include the commuter aeroplane category (For commuter aeroplane category, see CS 23.1 and CS 23.3).
STCH Exceptions to applicability

→ (b) Paragraph (a) shall not apply to major changes and repairs to an aeroplane model first certified prior to 26 February 2021 when that aeroplane model meets any of the following conditions:

→ (i) it is listed in Table A.1 of Appendix 1 (to Part-26);
→ (ii) it does not operate anymore after 26 February 2021;
→ (iii) it has not been certified to conduct civil operation with a payload or passengers;
→ (iv) it has a restricted TC and have been certified in accordance with damage tolerance requirements, provided that it is not operated beyond 75 % of its design service goal and is primarily operated in support of the restricted TC holders manufacturing operation;
→ (v) it is certified with a restricted TC and is designed primarily for firefighting;
## List of aeroplanes not subject to 1 or more requirement

<table>
<thead>
<tr>
<th>TC Holder</th>
<th>Type</th>
<th>Models</th>
<th>Not applicable Part-26 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Boeing Company</td>
<td>707</td>
<td>All</td>
<td>26.301 to 26.334</td>
</tr>
<tr>
<td>The Boeing Company</td>
<td>720</td>
<td>All</td>
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<td>DC-10</td>
<td>DC-10-10, DC-10-30, DC-10-30F</td>
<td>26.301 to 26.334</td>
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<tr>
<td>The Boeing Company</td>
<td>DC-8</td>
<td>All</td>
<td>26.301 to 26.334</td>
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<tr>
<td>The Boeing Company</td>
<td>MD-90</td>
<td>MD-90-30</td>
<td>26.301 to 26.334</td>
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<td>FOKKER SERVICES B.V.</td>
<td>F27</td>
<td>Mark 100, 200, 300, 400, 500, 600, 700</td>
<td>26.301 to 26.334</td>
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<td>GULFSTREAM AEROSPACE CORP.</td>
<td>G-159</td>
<td>G-159 (Gulfstream I)</td>
<td>26.301 to 26.334</td>
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<td>GULFSTREAM AEROSPACE CORP.</td>
<td>G-II, III, IV, V</td>
<td>G-1159A (GIII), G-1159B (GIIB), G-1159 (GII)</td>
<td>26.301 to 26.334</td>
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<td>CONVAIR 340/440</td>
<td>440</td>
<td>26.301 to 26.334</td>
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<td>LOCKHEED MARTIN CORPORATION</td>
<td>1329</td>
<td>All</td>
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<td>NA-265-65</td>
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<td>TUPOLEV PUBLIC STOCK COMPANY</td>
<td>TU-204</td>
<td>204-120CE</td>
<td>26.301 to 26.334</td>
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</table>
(c) Paragraph (a) shall not apply to major changes and repairs to an aeroplane first certified prior to 26 February 2021 when the changes or repairs are not, and will not be, embodied on any aeroplane in operation on or after 26 August 2022.

(d) The exceptions provided for in paragraph (b)(ii) to (b)(v) and (c) shall apply only after the change approval holder submits a list of changes that affect fatigue-critical baseline structure, together with information supporting the reasons why each change has been included in the list, to the Agency before 26 February 2022 for approval.
STCH Exceptions to applicability

- GM1 26.300(c) and 26.330(c) Substantiation of change and repair status
- The demonstration that a change or repair will not be incorporated into any other aeroplane can be achieved by:
  - (a) providing evidence that there are no available kits for such changes or repairs; or
  - (b) providing evidence that if kits are available, they will not be sold; or
  - (c) ensuring that no future production of such change/repair kits is permitted; or
  - (d) limiting the applicability of the changes and repairs subject to point 26.300(c) of Part-26 by updating the associated instructions for continued airworthiness.
STCH Compliance plan rule

→ **26.331 Compliance Plan for STC holders** A holder of a change approval shall:

→ (a) **establish a compliance plan** that addresses the requirements of points 26.332 to 26.334;

→ (b) **submit** the compliance plan referred in paragraph (a) to the Agency before 25 August 2021, for approval.

→ Note: No action is required for STCHs that do not hold design approvals for changes that affect FCBS
Means of compliance and guidance material

→ CS-26

→ CS 26.1 Purpose and scope

→ This CS is the standard means to show compliance of products with the requirements of Annex I (Part-26) to Commission Regulation (EU) 2015/640.

→ Book 1 specifies means of compliance

→ GM (Guidance Material) is found in Book 2 of CS-26
STCH Compliance plan MoC

→ CS 26.331 Compliance plan for STC holders
→ Compliance with point 26.331 of Part-26 is demonstrated when a compliance plan exists that includes:
→ (a) a project schedule identifying all the major milestones for meeting the compliance times specified in points 26.332 to 26.334 of Part-26;
→ (b) an explanation of how the changes that affect the FCS will be identified and presented;
→ (c) a proposed means of compliance with the DTE required by points 26.333 and 26.334 of Part-26;
→ (d) a plan for submitting drafts of all the compliance items required by point 26.330 of Part-26 for review by EASA not less than 60 days before the applicable compliance date.
The applicable rules and time lines are dependent on the date of issue of the STC approval.

- **STCs approved prior to 1 Sept 2003**
  - follow points 26.332(a) and (c) and 26.334

- **STCs approved on or after 1 Sept 2003**
  - follow points 26.332(a) and (b) and 26.333
Changes approved on or after 1 September 2003

→ 26.332 (a) and (b) and 26.333 Identification of changes affecting fatigue critical structure, FCMS and DT data for those changes

→ The holder of these change approvals shall:

→ list all changes that affect FCBS
→ list FCMS for each of those changes
→ before 26 February 2022 submit the lists to the Agency for approval
→ identify any published repairs to those changes (see CS-26, GM1 26.332(a)(iii))
→ perform DTE of those changes and for published repairs to those changes
→ establish and document DTI for those changes
→ before 26 February 2023 submit* the DT data (DTE plus DTI) to the agency for approval (or, if later and only for a change without DT in the certification basis, before the aeroplane operates in accordance with Annex IV (Part-CAT) to Regulation (EU) No 965/2012)

→ *unless the DT data is already complete and approved under the STC as allowed under 26.333(b)
→ make approved data available to operators
Changes approved before 1 September 2003

26.332 (a) and (c) Identification of changes affecting fatigue critical structure

The holder of these change approvals shall

- list changes that affect FCBS (Note: if it is not easy to confirm in time whether FCBS is affected, the change should be included in the list with that doubt annotated)
- before 26 February 2022, submit the list of changes to the Agency
- make the list available to operators required to comply with paragraph (b)(ii) of point 26.370
- pay attention to requests from operators for identification of FCMS and DT data for a change on that list
26.334 Damage tolerance data for STCs and other changes and repairs to those changes approved before 1 September 2003

Per Annex I of regulation (EU) 2020/1159 amending 2015/640

(a) A holder of a change approval that was issued before 1 September 2003 shall:
(i) for changes and published repairs identified in accordance with paragraph (a)(i) of point 26.332 and paragraph (a)(ii) of point 26.332 perform a damage tolerance evaluation;
(ii) establish and document the associated damage tolerance inspection, unless it has already been done;

(b) The holder of a change approval shall submit the damage tolerance data resulting from the evaluation performed in accordance with paragraph (a)(i) to the Agency, within the following deadlines, whichever occurs later, for approval:
(i) prior to an aeroplane with that change embodied being operated in accordance with Annex IV (Part-CAT) to Regulation (EU) No 965/2012; or
(ii) before 26 February 2023.

Superseded by (EU) 2021/97.............
26.334 Damage tolerance data for STCs and other changes and repairs to those changes approved before 1 September 2003

Per Annex II of regulation (EU) 2021/97, in point 26.334 of Annex I of regulation (EU) 2015/640, points (a) and (b) are replaced by the following:

(a) Upon request of an operator required to comply with point 26.370(a)(ii), a holder of a change approval that was issued before 1 September 2003 shall:

(i) for changes and published repairs identified in accordance with paragraph (a)(i) of point 26.332 and paragraph (a)(iii) of point 26.332, perform a damage tolerance evaluation;
(ii) establish and document the associated damage tolerance inspection, unless it has already been done.

(b) The holder of a change approval shall submit the damage tolerance data resulting from the evaluation performed in accordance with paragraph (a)(i) to the Agency:

(i) within 24 months from receipt of a request, for requests received prior to 26 February 2023, for approval; or

(ii) before 26 February 2025 or within 12 months from receipt of a request, whichever occurs later, for requests received on or after 26 February 2023, for approval.’
Changes approved before 1 September 2003

26.332 (a)(ii), (c)(ii) and 26.334 List of FCMS and DT data for changes

- IF REQUESTED BY AN OPERATOR required to comply with paragraph (b)(ii) of point 26.370, the change approval holder shall
  - list FCMS for the change
  - within 12 months of the request submit the list to the Agency for approval
  - identify any published repairs to those changes
  - perform DTE of those changes and for published repairs to those changes
  - establish and document DTI for those changes
  - submit the DT data (DTE plus DTI) to the agency
  - within 24 months from receipt of a request, for requests received prior to 26 February 2023, for approval; or
  - before 26 February 2025 or within 12 months from receipt of a request, whichever occurs later, for requests received on or after 26 February 2023, for approval.
- make approved data available to operators
Part-26 compliance for STCHs

STC or change

FCBS affected?

Yes

Issued before Sept 2003?

Yes

• List changes affecting FCBS (26.332(a)(i))
• Submit to Agency for approval before 26 Feb 2022 (26.332(c)(i)).

Make approved data available to persons and operators required to comply with 26.370(b)(ii) (26.332(c)(iii)).

Operator request?

Yes

• List FCMS (26.332(a)(ii)),
• Submit to Agency within 12 months of request for approval (26.332(c)(ii)).

Make approved STC data available to persons and operators required to comply with 26.370(b)(ii) (26.332(c)(iii)).

No

No further action

Yes

DTE required in change certification basis?

Yes

• Perform DTE and identify DTI, if not already done (26.333(a)), for
  • The change and published repairs to the change
  • Submit to Agency before 26-Feb 2023 for approval (26.333(b))
  • UPON APPROVAL MAKE AVAILABLE (26.30(c))

No

No further action

FCBS affected?

No

No further action

List changes affecting FCBS (26.332(a)(i)),
• identified FCMS (26.332(a)(ii))
• Submit to Agency for approval before 26 Feb 2022 (26.332(b)).

Make approved data available to persons and operators required to comply with 26.370(b)(ii) (26.332(b)).

Operator request?

No

No further action

Perform DTE and identify DTI, if not already done (26.333(a)), for
• The change and published repairs to the change
• Submit to Agency for approval before 26 Feb 2022 or prior to operation i.a.w. Part-CAT if later ((26.333(c))
• UPON APPROVAL MAKE AVAILABLE (26.30(c))
Changes that affect FCBS

→ CS 26.332(a)

→ Compliance with points 26.332(a)(i) and 26.332(b) or 26.332(c)(i) of Part-26 is demonstrated when the changes affecting the FCBS are identified in compliance with AMC 20-20A Appendix 3 paragraph 4, and the list of changes has been submitted to EASA for approval.
Changes that may adversely affect FCBS

→ (1) Passenger-to-freighter conversions (including addition of main deck cargo doors).
→ (2) Gross weight increases (increased operating weights, increased zero fuel weights, increased landing weights, and increased maximum take-off weights).
→ (3) Installation of fuselage cut-outs (passenger entry doors, emergency exit doors or crew escape hatches, fuselage access doors, and cabin window relocations).
→ (4) Complete re-engine or pylon modifications.
→ (5) Engine hush kits.
→ (6) Wing modifications such as installing winglets or changes in flight control settings (flap droop), and modification of wing trailing edge structure.
→ (7) Modified skin splices.
→ (8) Antenna installations.
→ (9) Any modification that affects several stringer or frame bays.
→ (10) Any modification that covers structure requiring periodic inspection by the operator’s maintenance programme.
→ (11) Any modification that results in operational mission change that significantly changes the manufacturer’s load or stress spectrum (e.g. passenger-to-freighter conversion).
→ (12) Any modification that changes areas of the fuselage that prevents external visual inspection (e.g. installation of a large external fuselage doubler that results in hiding details beneath it).
→ (13) In general, attachment of interior monuments to FCS. Interior monuments include large items of mass such as galleys, closets, and lavatories.

→ REF Annex 5 of AMC 20-20A Appendix 3
Identifying and listing FCMS

→ CS 26.332(b)

→ FCMS has been identified in compliance with AMC 20-20A Appendix 3 paragraph 4, and the list of the FCMSs clearly describing the location and the extent of the FCMSs has been submitted to EASA for approval.
Identifying and listing FCMS

→ CS 26.332(b)

→ FCMS has been identified in compliance with AMC 20-20A Appendix 3 paragraph 4, and the list of the FCMSs clearly describing the location and the extent of the FCMSs has been submitted to EASA for approval.
Using existing CFR14 Part 26 compliance data to support compliance

<table>
<thead>
<tr>
<th>Part-26</th>
<th>CFR 14 §</th>
<th>Explanation</th>
<th>Comment on use of CFR 14 data</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.330</td>
<td>N/A</td>
<td>Generic compliance requirement</td>
<td></td>
</tr>
<tr>
<td>26.331</td>
<td>26.49</td>
<td>Same intent for CP</td>
<td>CP can refer to compliance with 26.47 for DTE.</td>
</tr>
<tr>
<td>26.332</td>
<td>26.47(b)</td>
<td>FCMS/FCAS Same intent for existing STCs only.</td>
<td>Where approved FCAS exists it can be used directly to support compliance. For STCs approved by FAA after 11 Jan 2008 no FCAS list was required by 26.47. For compliance with 26.332 these STCs will need FCMS lists.</td>
</tr>
<tr>
<td>26.333</td>
<td>26.47(c)</td>
<td>DT data for STCs EASA approved 1 Sept 2003 onward</td>
<td>FAA approved DT Data can be used directly to support compliance.</td>
</tr>
<tr>
<td>26.333</td>
<td>26.47(d)</td>
<td>DT data for published repairs to STCs approved Sept 2003 onward</td>
<td>FAA approved DT Data can be used directly to support compliance.</td>
</tr>
<tr>
<td>26.334</td>
<td>26.47(c)</td>
<td>DT data for STCs approved before Sept 2003</td>
<td>FAA approved DT Data can be used directly to support compliance.</td>
</tr>
<tr>
<td>26.334</td>
<td>26.47(d)</td>
<td>DT data for published repairs to pre-Sept 2003 STCs</td>
<td>FAA approved DT Data can be used directly to support compliance.</td>
</tr>
</tbody>
</table>
Approval of data
Time lines for data submittal STC approved before Sept 2003

- **DT 334**
  - Request Before 26 Feb 2023
  - 24 months

- **DT 334**
  - Request On or After 26 Feb 2023
  - But not before 26 Feb 2025
  - 12 months

- **FCMS 332**
  - 12 months

- **LIST CHANGE 332**
  - 12 months

- **CP 331 300**
  - 6 months

Months from 26 Feb 2021 for list of changes and from operator request for other data

Requirements:
- Time lines for data submittal STC approved before Sept 2003
- But not before 26 Feb 2025
Time lines for data submittal
STCs approved Sept 2003 onward

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Months from 26 Feb 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT 333</td>
<td>24</td>
</tr>
<tr>
<td>FCMS 332</td>
<td>12</td>
</tr>
<tr>
<td>LIST CHANGE 332</td>
<td>12</td>
</tr>
<tr>
<td>CP 331</td>
<td>6</td>
</tr>
<tr>
<td>300</td>
<td>0</td>
</tr>
</tbody>
</table>
Approval of DT data

→ Change approvals issued after 1st Sept 2003
→ If no changes are required to the existing DT data; i.e. the DT data is already complete and approved under the STC as allowed under 26.333(b))
→ and the DT data is already approved by EASA
→ then there is no need to submit the DT data for approval (Ref. point 26.333)
→ i.e. compliance is shown by the original compliance data that was accomplished in accordance with acceptable damage tolerance requirements of the applicable certification basis or a later amendment (see CS-26)
→ This approach should be detailed in the CP, referencing the original DT data documentation.
Approval of DT data (2)

→ If a new DTE is required or changes are required to the existing DT data or the change approval was issued prior to Sept 2003

→ Then the data will need to be submitted to EASA for review and approval

→ For non-EU STCHs, in particular for those where compliance data exists for similar requirements, e.g. DT Data approved according to CFR14 §26.47 or equivalent regulation by the state of design can be used directly to support compliance findings with points 26.333 and 26.334.

→ (Note: CFR14 §26.47 does not require FCAS for future STCs i.e. after Jan 2008 so FCMS lists will need to be developed to comply with point 26.332)

→ EASA anticipates delegating approvals to the aviation authority of the state of design to the maximum possible extent allowed by the respective TIPs.
Submittal of deliverables

→ Several options are being reviewed to ensure the process for compliance plan and data submittal and approval is proportionate and as efficient and cost effective as possible for STCHs and the Agency

→ Further information on how to submit compliance plans and other deliverables will be provided in the coming weeks
Next steps

→ Refer to Ageing Aircraft Structure Web Page for updates

→ Please send queries to EASA ageing aircraft mail box
→ ageing-aircraft@easa.europa.eu

→ EASA will collate and summarise Q and As from this session and make them available
Thank you for your attention