European Aviation Safety Agency
The Executive Director

DECISION NO. 2003/1/RM

OF THE EXECUTIVE DIRECTOR OF THE AGENCY

of 17 October 2003

on acceptable means of compliance and guidance material for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations ("AMC and GM to Part 21")

THE EXECUTIVE DIRECTOR OF THE EUROPEAN AVIATION SAFETY AGENCY,

Having regard to Regulation (EC) No 1592/2002 of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency[1] (hereinafter referred to as the "Basic Regulation"), and in particular Article 13 thereof.

Having regard to the Commission Regulation (EC) No 1702/2003 of 24 September 2003 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances,[2] as well as for the certification of design and production organisations.

Whereas:

(1) The Agency should issue certification specifications, including airworthiness codes and acceptable means of compliance, as well as any guidance material for the application of the Basic Regulation and its implementing rules.

(2) The Agency has, pursuant to Article 43 of the Basic Regulation, consulted widely interested parties on the matters which are subject to this Decision and following that consultation provided a written response to the comments received,

[1] OJ L 240, 7.09.2002, p. 1.

[2] OJ L 243, 27.09.2003, p. 6.

HAS DECIDED AS FOLLOWS:

Article 1

The acceptable means of compliance and guidance material to be used in the airworthiness certification of products, parts and appliances and the approval of organisations involved in their design or manufacture are those laid down in the Annex to this Decision, unless otherwise provided in certification specifications.

Article 2

This Decision shall enter into force on 17 October 2003. It shall be published in the *Official Publication of the Agency*.

Done at Brussels, 17 October 2003.

For the European Aviation Safety Agency,

Patrick GOUDOU

Executive Director

European Aviation Safety Agency

AMC and GM to Part 21

Acceptable Means of Compliance and Guidance Material for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations

PART 21
Acceptable Means of Compliance and Guidance Material

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TERMINOLOGY

For information purposes:

The “Basic Regulation” means Regulation (EC) No 1592/2002 of 15 July 2002.

“Certification Specifications” (CS) refers when used in the text to the airworthiness codes and associated acceptable means of compliance developed by the Agency in accordance with Articles 13(b) and 14.2(a) of the Basic Regulation.

“Acceptable Means of Compliance” (AMC) illustrate a means, but not the only means, by which a specification contained in an airworthiness code or a requirement in an implementing rule can be met.

“Guidance Material” (GM) helps to illustrate the meaning of a specification or requirement.

“Competent Authority” should be understood in accordance with 21.1 (see Part 21).

SECTION A
Subpart A - General

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

In the context of that requirement the word "Collection" means, the setting up, of systems and procedures which will enable relevant malfunctions, failures and defects to be properly reported when they occur.

GM 21A.3(b)
Occurrence reporting

For occurrence reporting, refer to AMC 20-8, in AMC 20.

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

Within the overall limit of 72 hours the degree of urgency for submission of a report should be determined by the level of hazard judged to have resulted from the occurrence.

Where an occurrence is judged by the person identifying the possible unsafe condition to have resulted in an immediate and particularly significant hazard the Agency (or the competent authority of the Member State as required) expects to be advised immediately and by the fastest possible means (telephone, fax, email, telex, etc.) of whatever details are available at that time. This initial report must be followed up by a full written report within 72 hours. A typical example would be an uncontained engine failure resulting in damage to aircraft primary structure.

Where the occurrence is judged to have resulted in a less immediate and less significant hazard, report submission may be delayed up to the maximum of three days in order to provide more details.

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

This GM provides guidelines to assist in establishing rectification campaigns to remedy discovered defects.

1. STATUS

This document contains GM of a general nature for use in conjunction with engineering judgement, to aid airworthiness engineers in reaching decisions in the state of technology at the material time.

While the main principles of this GM could be applied to small private aeroplanes, helicopters, etc. the numerical values chosen for illustration are appropriate to large aeroplanes for public transport.

2. INTRODUCTION

2.1 Over the years, target airworthiness risk levels underlying airworthiness requirements have developed on the basis of traditional qualitative airworthiness approaches; they have been given more precision in recent years by being compared with achieved airworthiness levels (judged

from accident statistics) and by the general deliberations and discussions which accompanied the introduction of rational performance requirements, and more recently, the Safety Assessment approach in requirements. Although the target airworthiness risk level tends to be discussed as a single figure (a fatal accident rate for airworthiness reasons of not more than 1 in 10,000,000 flights/flying hours for large aeroplanes) it has to be recognised that the requirements when applied to particular aircraft types will result in achieved airworthiness levels at certification lying within a band around the target level and that thereafter, for particular aircraft types and for particular aircraft, the achieved level will vary within that band from time to time.

2.2 The achieved airworthiness risk levels can vary so as to be below the target levels, because it is difficult if not impossible to design to the minimum requirements without being in excess of requirements in many areas; also because aircraft are not always operated at the critical conditions (e.g., aircraft weight, cg position and operational speeds; environmental conditions - temperature, humidity, degree of turbulence). The achieved level may vary so as to be above the target level because of undetected variations in material standards or build standards, because of design deficiencies, because of encountering unforeseen combinations of failures and/or combinations of events, and because of unanticipated operating conditions or environmental conditions.

2.3 There is now a recognition of the need to attempt to monitor the conditions which tend to increase the level and to take appropriate corrective action when the monitoring indicates the need to do so in order to prevent the level rising above a predetermined "ceiling".

2.4 The Agency also has a duty in terms of providing the public with aviation services and therefore should consider the penalties associated with curtailment or even removal (by "grounding") of aviation services when establishing the acceptability of any potential variation in airworthiness level.

2.5 Thus, the purpose of this GM is:

(a) To postulate basic principles which should be used to guide the course of actions to be followed so as to maintain an adequate level of airworthiness risk after a defect has occurred which, if uncorrected, would involve a potential significant increase of the level of risk for an aircraft type.

(b) For those cases where it is not possible fully and immediately to restore an adequate level of airworthiness risk by any possible alleviating action such as an inspection or limitation, to state the criteria which should be used in order to asses the residual increase in risk and to limit it to an appropriate small fraction of the mean airworthiness through life risk.

3. DISCUSSION

3.1 Several parameters are involved in decisions on safety matters. In the past the cost of proposed action has often been compared with the notional 'risk cost', i.e. the cost of a catastrophe multiplied by its probability of occurrence.

3.2 This can be a useful exercise, but it should be held within the constraint of acceptable airworthiness risk levels, i.e., within airworthiness risk targets which represent the maximum levels of risk with which an aircraft design must comply, i.e., in the upper part of the 'band'. Currently for large aeroplanes the mean airworthiness risk level is set at a catastrophe rate for airworthiness reasons of not more than one in every ten- million flights/flying hours. The constraint is overriding in that any option, which could be permitted on risk cost considerations, or other grounds, is unacceptable if it leads to significant long-term violation of this safety requirement.

3.3 While it should clearly be the objective of all to react to and eliminate emergency situations, i.e., those involving a potentially significant increase of airworthiness risk levels, without unreasonable delay, the Agency should be able finally to rule on what is a minimum acceptable

campaign programme. It has therefore seemed desirable to devise guidelines to be used in judging whether a proposed campaign of corrective actions is sufficient in airworthiness terms, and clearly this ought to be based on determining the summation of the achieved airworthiness risk levels for the aircraft and passengers during any periods of corrective action and comparing them with some agreed target.

3.4 As the period of corrective action will not be instantaneous (unless by grounding), there is potentially an increase in the achieved airworthiness risk level possibly to and, without controls, even above the higher part of the 'band', and the amount by which the level is above the mean target figure, and the period for which it should be allowed to continue, has been a matter of some arbitrary judgement.

3.5 It would appear desirable to try to rationalise this judgement. For example, if an aircraft were to spend 10% of its life at a level such that the risk of catastrophe was increased by an order of magnitude, the average rate over its whole life would be doubled which may not be in the public interest. A more suitable criterion is perhaps one which would allow an average increase in risk of, say one third on top of the basic design risk when spread over the whole life of the aircraft an amount which would probably be acceptable within the concept (See Figure 1). It would then be possible to regard the 'through life' risk to an aircraft - e.g., a mean airworthiness target of not more than one airworthiness catastrophe per 10 millions (10^7) hours, as made up of two parts, the first being 3/4 of the total and catering for the basic design risk and the other being 1/4 of the total, forming an allowance to be used during the individual aircraft's whole life for unforeseen campaign situations such as described above.

3.6 Investigation has shown that a total of ten such occasions might arise during the life of an individual aircraft.

3.7 Using these criteria, there could then be during each of these emergency periods (assumed to be ten in number) a risk allowance contributed by the campaign alone of:

1×10^{-7} for 2.5% of the aircraft's life; or

5×10^{-7} for 0.5% of the aircraft's life; or

1×10^{-6} for 0.25% of the aircraft's life; or

1×10^{-5} for 0.025% of the aircraft's life, etc.

Without exceeding the agreed 'allowance' set -aside for this purpose.

3.8 Thus a 'reaction table' can be created as indicated in Table 1 (the last two columns assuming a typical aircraft design life of 60,000 hours and an annual utilisation of 3000 hours per annum) showing the flying or calendar time within which a defect should be corrected if the suggested targets are to be met.

Table 1

Estimated catastrophe rate to aircraft due to the defect under consideration (per a/c hour)	Average reaction time for aircraft at risk (hours)	On a calendar basis
4×10^{-8}	3750	15 months
5×10^{-8}	3000	12 months
1×10^{-7}	1500	6 months
2×10^{-7}	750	3 months
5×10^{-7}	300	6 weeks
1×10^{-6}	150	3 weeks
1×10^{-5}	15	Return to base

3.9 These principles may be applied to a single aircraft or a number of aircraft of a fleet but in calculating risk, all the risk should be attributed to those aircraft which may carry it, and should not be diluted by including other aircraft in the fleet which are known to be free of risk. (It is permissible to spread the risk over the whole fleet when a source is known to exist without knowing where). Where a fleet of aircraft is involved Column 2 may be interpreted as the mean time to rectification and not the time to the last one.

3.10 There is one further constraint. However little effect a situation may have on the 'whole life' risk of an aircraft, the risk should not be allowed to reach too high a level for any given flight. Thus while a very high risk could be tolerated for a very short period without unacceptable degradation of the overall airworthiness target, the few flights involved would be exposed to a quite unacceptable level of risk. It is therefore proposed that the Table 1 should have a cut-off at the 2×10^{-6} level so that no flight carries a risk greater than 20 times the target. At this level the defect is beginning to contribute to a greater likelihood of catastrophe than that from all other causes, including non-airworthiness causes, put together. If the situation is worse than this, grounding appears to be the only alternative with possibly specially authorised high-risk ferry flights to allow the aircraft to return to base empty. Figures 2 and 3 show a visualisation chart equivalent to Table 1, giving average rectification time (either in flight hours or months) based on probability of defect that must be corrected.

3.11 It will be seen that the above suggestions imply a probability of catastrophe from the campaign alone of 1.5/10,000 per aircraft during each separate campaign period (i.e., p = 0.015 per 100 aircraft fleet).

3.12 In addition, in order to take into account large fleet size effect, the expected probability of the catastrophic event during the rectification period on the affected fleet shall not exceed 0.1. See Figure 4.

3.13 It should also be noted that in assessing campaign risks against 'design risk', an element of conservatism is introduced, since the passenger knows only 'total risk' (i.e. airworthiness plus operations risks) and the fatal accident rate for all reasons is an order of magnitude greater than that for airworthiness reasons only (i.e., 10^{-6} as against 10^{-7}). The summated campaign risk allowance proposed by this GM is therefore quite a small proportion of the total risk to which a passenger is subject. When operating for short periods at the limit of risk proposed (2×10^{-6} per hour) the defect is however contributing 100% more risk than all other causes added together.

3.14 A similar approach is proposed to cover the case of defects associated to hazardous failure conditions for which the safety objectives defined by the applicable airworthiness requirements are not met. According to CS 25.1309, the allowable probability for each hazardous failure condition is set at 10^{-7} per flight hour compared to 10^{-9} per flight hour for a catastrophic failure condition. Figure 5 is showing a visualisation chart giving average rectification time based on probability of defect that should be corrected. This is similar to figure 2 but with lower and upper boundaries adapted to cover the case of hazardous failure conditions (probabilities of 10^{-7} and 2×10^{-4} respectively).

3.15 In addition, in order to take into account large fleet size effect, the expected probability of the hazardous event during the rectification period on the affected fleet shall not exceed 0.5. See Figure 6.

4. GUIDELINES

4.1 The above would lead to the following guidelines for a rectification campaign to remedy a discovered defect associated to a catastrophic failure condition without grounding the aircraft:

(i) Establish all possible alleviating action such as inspections, crew drills, route restrictions, and other limitations.

(ii) Identify that part of the fleet, which is exposed to the residual risk, after compliance has been established with paragraph (i).

(iii) Using reasonably cautious assumptions, calculate the likely catastrophic rate for each aircraft carrying the risk in the affected fleet.

(iv) Compare the speed with which any suggested campaign will correct the deficiency with the time suggested in Figure 2. The figure should not be used beyond the $2x10^{-6}$ level, except for specially authorised flights.

(v) Also ensure that the expected probability of the catastrophic event during the rectification period on the affected fleet is in accordance with Figure 4.

4.2 Similarly, the following guidelines would be applicable for a rectification campaign to remedy a discovered defect associated to a hazardous failure condition without grounding the aircraft:

(i) Establish all possible alleviating action such as inspections, crew drills, route restrictions, and other limitations.

(ii) Identify that part of the fleet, which is exposed to the residual risk, after compliance has been established with paragraph (i).

(iii) Using reasonably cautious assumptions, calculate the likely hazardous rate for each aircraft carrying the risk in the affected fleet.

(iv) Compare the speed with which any suggested campaign will correct the deficiency with the time suggested in Figure 5.

(v) Also ensure that the expected probability of the hazardous event during the rectification period on the affected fleet is in accordance with Figure 6.

4.3 It must be stressed that the benefit of these guidelines will be to form a datum for what is considered to be the theoretically maximum reaction time. A considerable amount of judgement will still be necessary in establishing many of the input factors and the final decision may still need to be tempered by non-numerical considerations, but the method proposed will at least provide a rational 'departure point' for any exercise of such judgement.

4.4 It is not intended that the method should be used to avoid quicker reaction times where these can be accommodated without high expense or disruption of services.

Figure 1

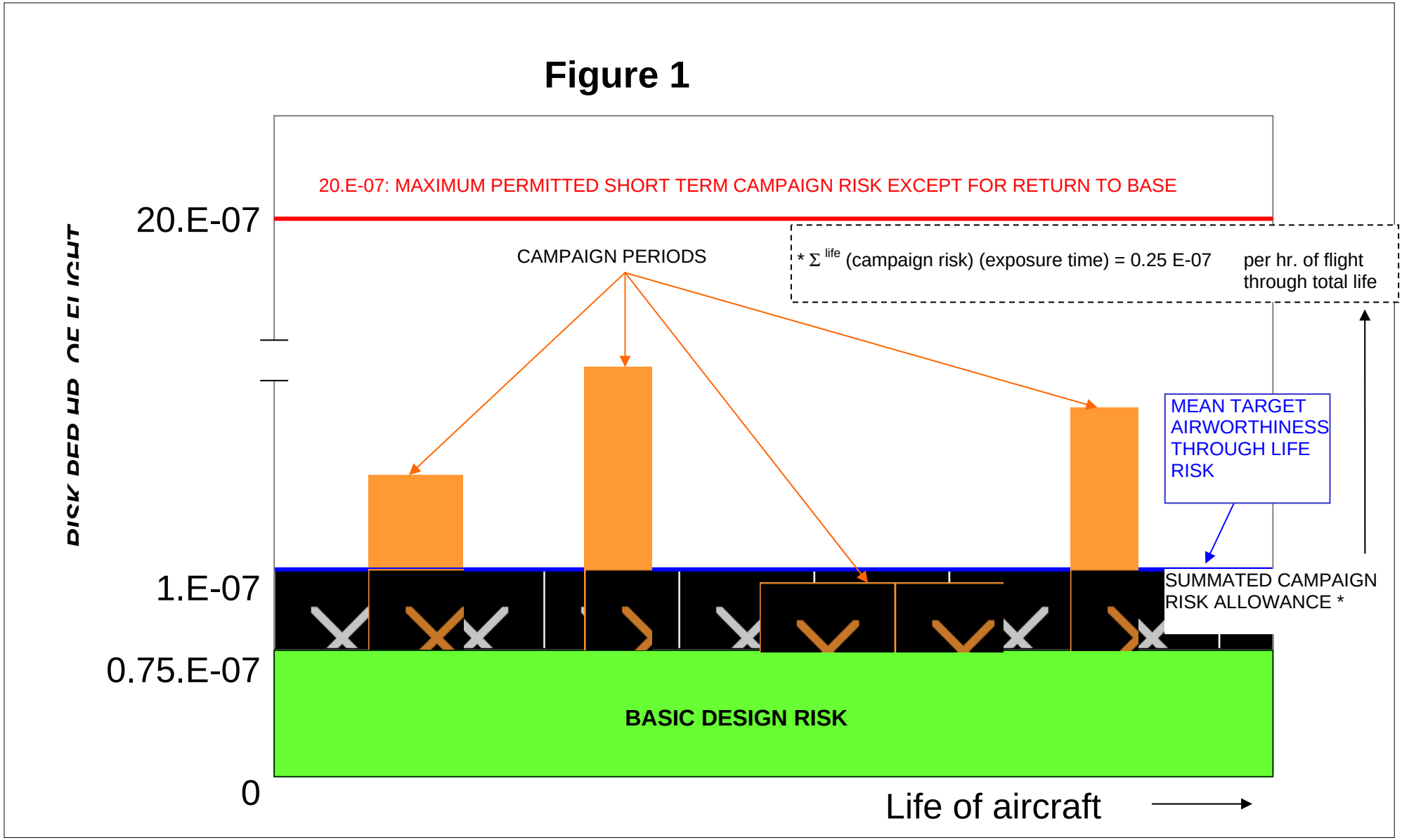

20.E-07: MAXIMUM PERMITTED SHORT TERM CAMPAIGN RISK EXCEPT FOR RETURN TO BASE
20.E-07
CAMPAIGN PERIODS
* Σ life (campaign risk) (exposure time) = 0.25 E-07
per hr. of flight through total life
MEAN TARGET AIRWORTHINESS THROUGH LIFE RISK
SUMMATED CAMPAIGN RISK ALLOWANCE *
1.E-07
0.75.E-07
BASIC DESIGN RISK
0
Life of aircraft

Figure 2 - Visualisation Chart for CS-25 (Flight hours)

Assumptions: - aircraft life of 60,000 hours
- 10 ‘catastrophic events’ campaigns

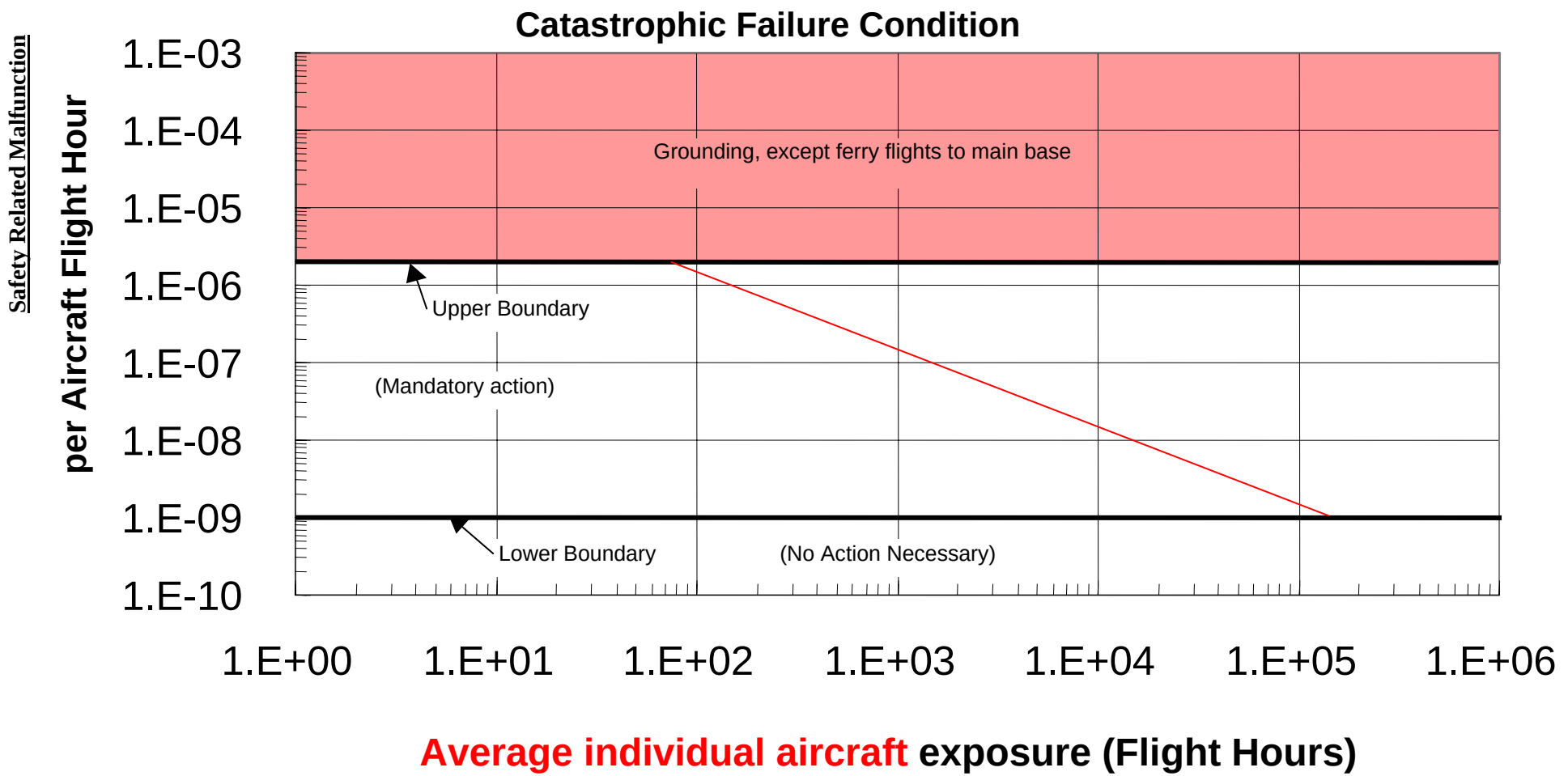


Figure 3 - Visualisation Chart for CS-25 (Calendar basis)

Assumptions: - aircraft life of 60,000 hours, 3000 hours per year
- 10 'catastrophic events' campaigns

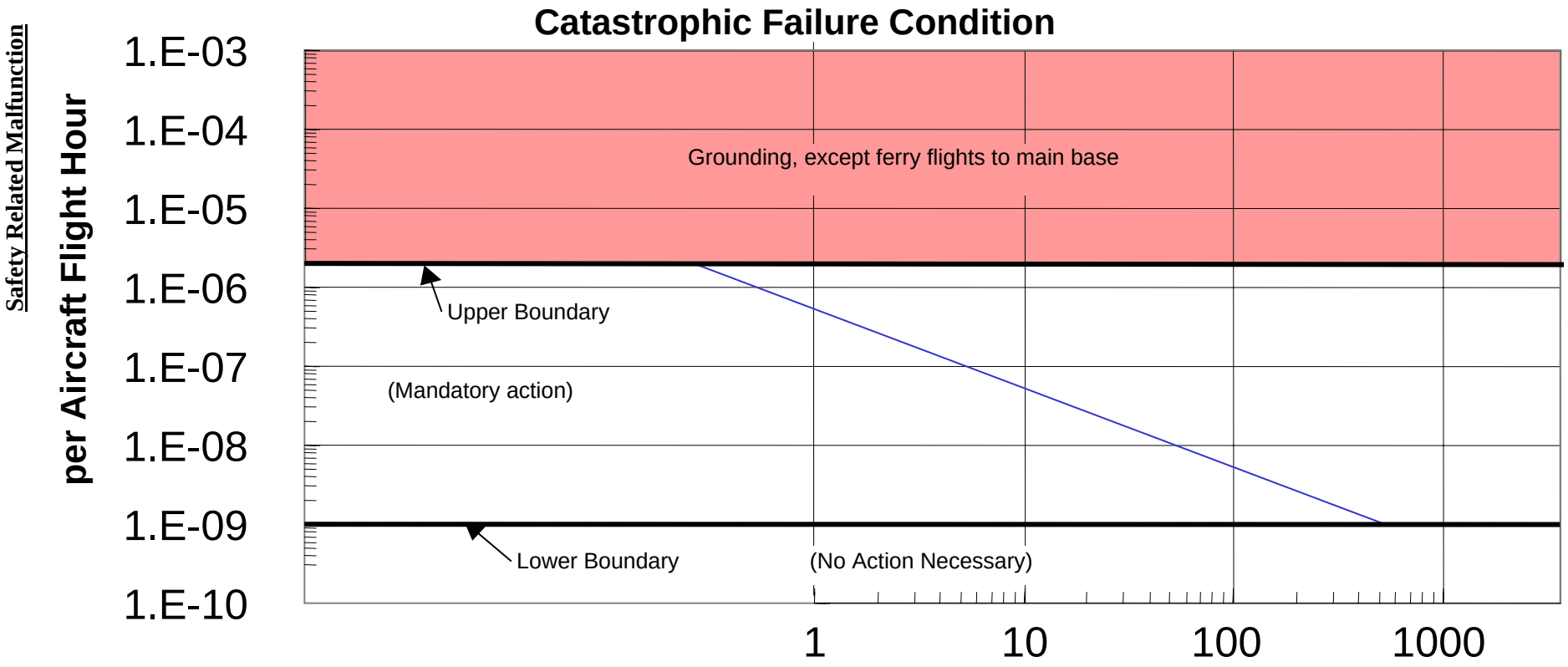


Figure 4 - Visualisation Chart for CS-25 (Flight Hours)

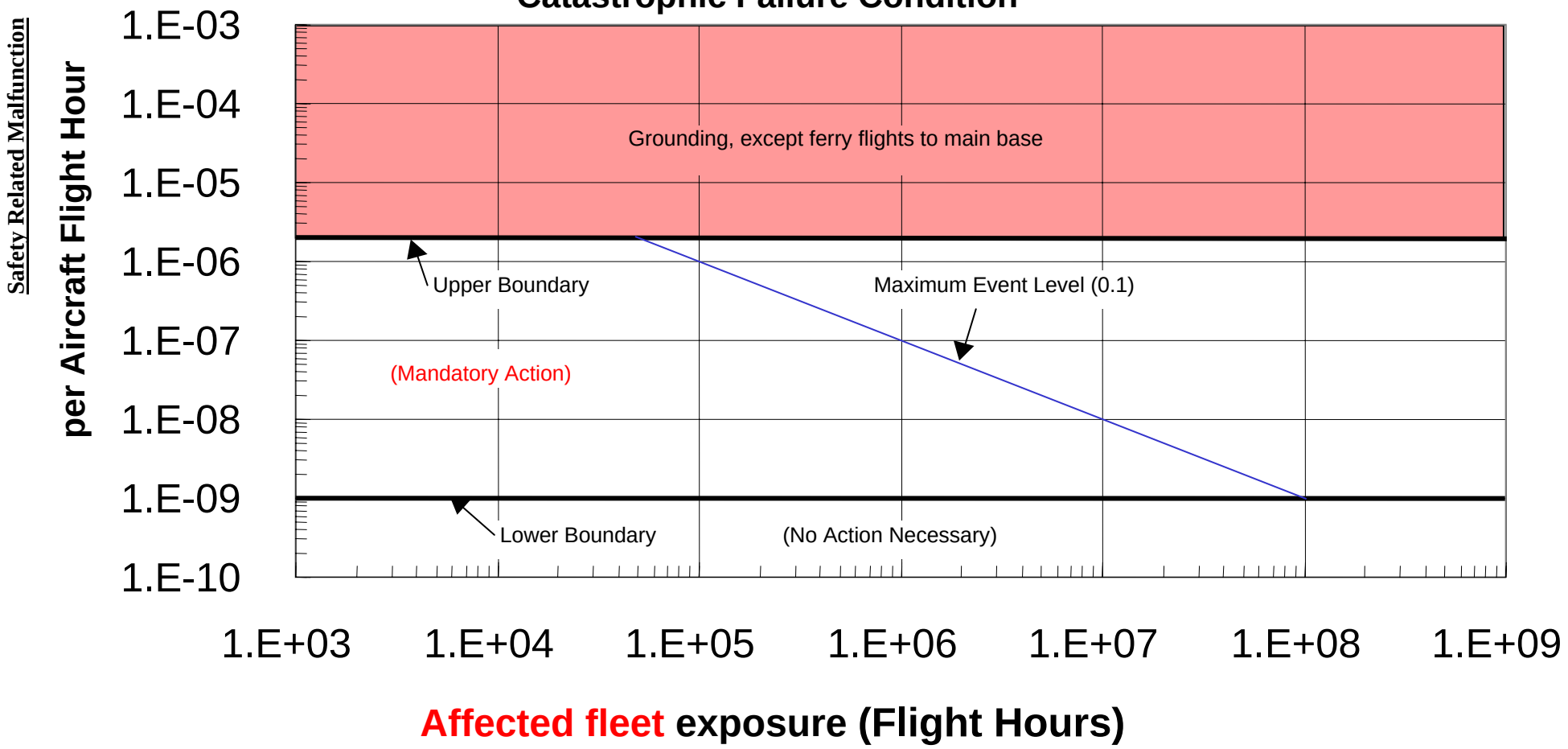


Figure 5 - Visualisation Chart for CS-25 (Flight hours)

For Hazardous Failure Condition

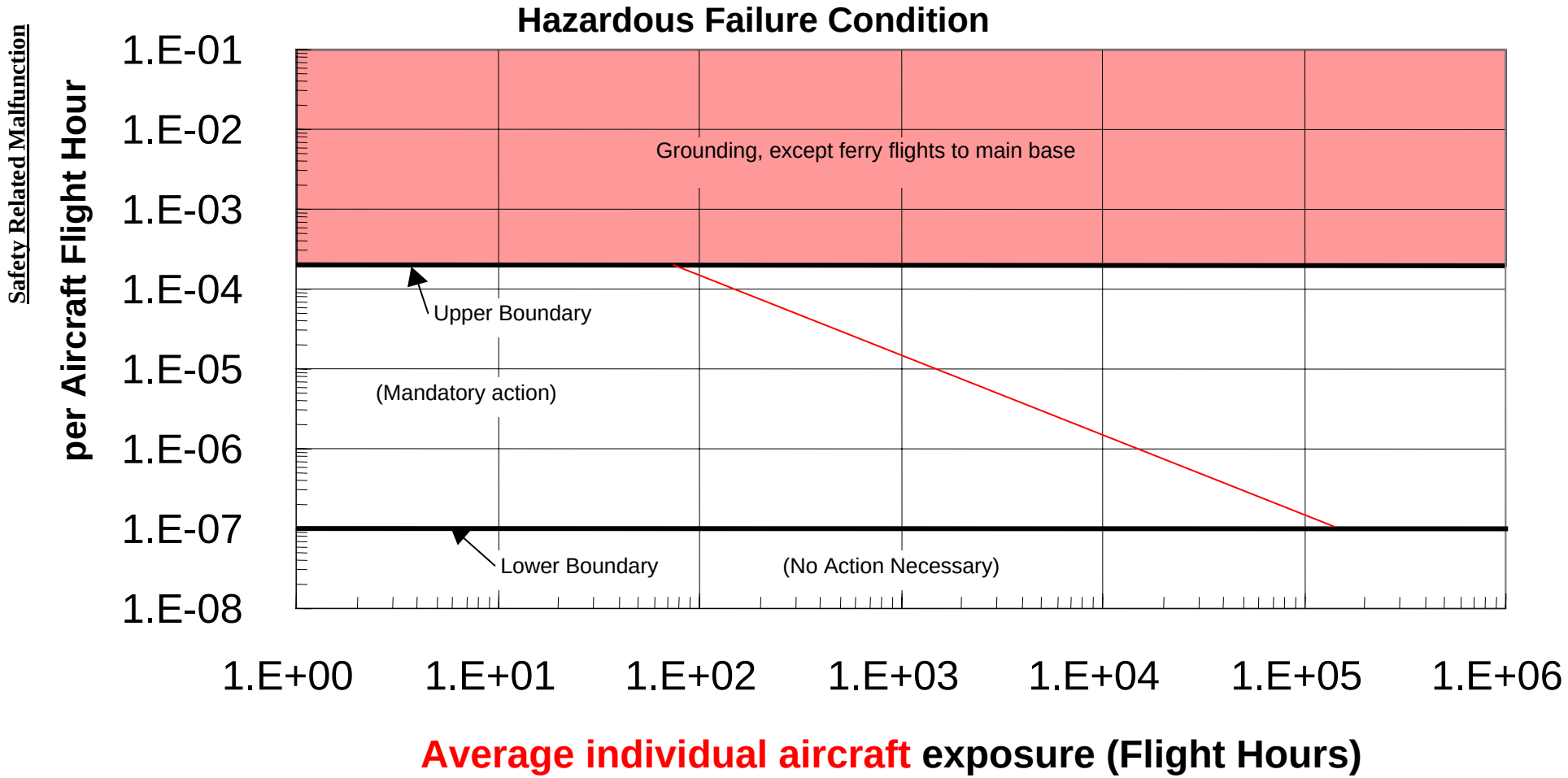
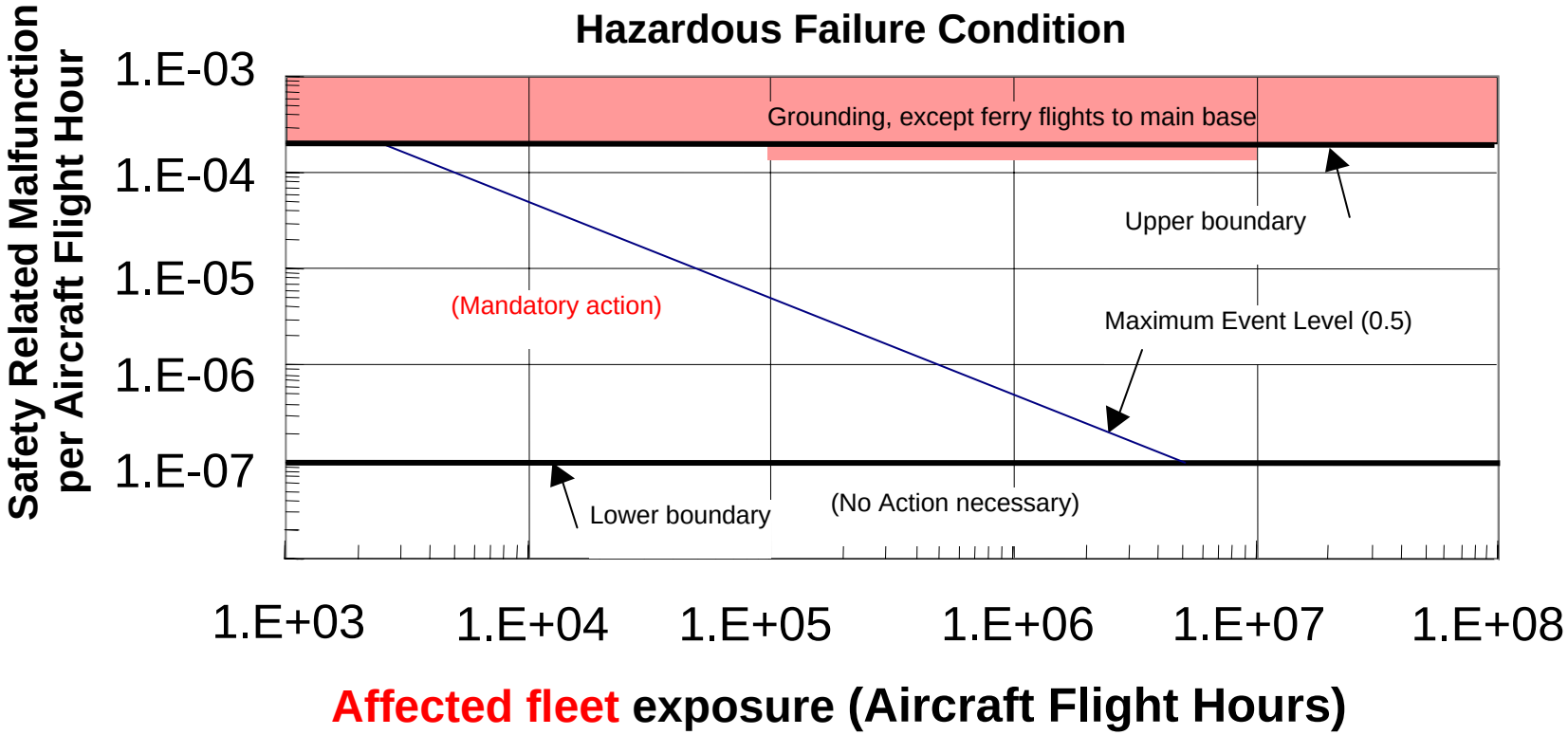


Figure 6 - Visualisation Chart for CS-25 (Flight Hours)



AMC 21A.3B(b)
Unsafe condition

An unsafe condition exists if there is factual evidence (from service experience, analysis or tests) that:

(a) An event may occur that would result in fatalities, usually with the loss of the aircraft, or reduce the capability of the aircraft or the ability of the crew to cope with adverse operating conditions to the extent that there would be:

(i) A large reduction in safety margins or functional capabilities, or

(ii) Physical distress or excessive workload such that the flight crew cannot be relied upon to perform their tasks accurately or completely, or

(iii) Serious or fatal injury to one or more occupants

unless it is shown that the probability of such an event is within the limit defined by the applicable airworthiness requirements, or

(b) There is an unacceptable risk of serious or fatal injury to persons other than occupants, or

(c) Design features intended to minimise the effects of survivable accidents are not performing their intended function.

Note 1: Non-compliance with applicable airworthiness requirements is generally considered as an unsafe condition, unless it is shown that possible events resulting from this non-compliance do not constitute an unsafe condition as defined under paragraphs (a), (b) and (c).

Note 2: An unsafe condition may exist even though applicable airworthiness requirements are complied with.

Note 3: The above definition covers the majority of cases where the Agency considers there is an unsafe condition. There may be other cases where overriding safety considerations may lead the Agency to issue an airworthiness directive.

Note 4: There may be cases where events can be considered as an unsafe condition if they occur too frequently (significantly beyond the applicable safety objectives) and could eventually lead to consequences listed in paragraph (a) in specific operating environments. Although having less severe immediate consequences than those listed in paragraph (a), the referenced events may reduce the capability of the aircraft or the ability of the crew to cope with adverse operating conditions to the extent that there would be, for example, a significant reduction in safety margins or functional capabilities, a significant increase in crew workload, or in conditions impairing crew efficiency, or discomfort to occupants, possibly including injuries.

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

It is important to note that these guidelines are not exhaustive. However, this material is intended to provide guidelines and examples that will cover most cases, taking into account the applicable certification requirements.

1. INTRODUCTION

Certification or approval of a product, part or appliance is a demonstration of compliance with requirements which are intended to ensure an acceptable level of safety. This demonstration however includes certain accepted assumptions and predicted behaviours, such as:

- fatigue behaviour is based on analysis supported by test,
- modelling techniques are used for Aircraft Flight Manual performances calculations,
- the systems safety analyses give predictions of what the systems failure modes, effects and probabilities may be,
- the system components reliability figures are predicted values derived from general experience, tests or analysis,
- the crew is expected to have the skill to apply the procedures correctly, and
- the aircraft is assumed to be maintained in accordance with the prescribed instructions for continued airworthiness (or maintenance programme), etc.

In service experience, additional testing, further analysis, etc., may show that certain initially accepted assumptions are not correct. Thus, certain conditions initially demonstrated as safe, are revealed by experience as unsafe. In this case, it is necessary to mandate corrective actions in order to restore a level of safety consistent with the applicable certification requirements.

See AMC 21A.3B(b) for definition of "unsafe condition" used in 21A.3(b).

2. GUIDELINES FOR ESTABLISHING IF A CONDITION IS UNSAFE

The following paragraphs give general guidelines for analysing the reported events and determining if an unsafe condition exists, and are provided for each type of product, part or appliance subject to a specific airworthiness approval: type-certificates (TC) or supplemental type-certificates (STC) for aircraft, engines or propellers, or European Technical Standard Orders (ETSO).

This analysis may be qualitative or quantitative, i.e. formal and quantitative safety analyses may not be available for older or small aircraft. In such cases, the level of analysis should be consistent with that required by the airworthiness requirements and may be based on engineering judgement supported by service experience data.

2.1 Analysis method for aircraft

2.1.1 Accidents or incidents without any aircraft, engines, system, propeller or part or appliance malfunction or failure

When an accident/incident does not involve any component malfunction or failure but when a crew human factor has been a contributing factor, this should be assessed from a man-machine interface standpoint to determine whether the design is adequate or not. Paragraph 2.5 gives further details on this aspect.

2.1.2 Events involving an aircraft, engines, system, propeller or part or appliance failure, malfunction or defect

The general approach for analysis of in service events caused by malfunctions, failures or defects will be to analyse the actual failure effects, taking into account previously unforeseen failure modes or improper or unforeseen operating conditions revealed by service experience.

These events may have occurred in service, or have been identified during maintenance, or been identified as a result of subsequent tests, analyses, or quality control.

These may result from a design deficiency or a production deficiency (non conformity with the type design), or from improper maintenance. In this case, it should be determined if improper maintenance is limited to one aircraft, in which case an airworthiness directive may not be issued, or if it is likely to be a general problem due to improper design and/or maintenance procedures, as detailed in paragraph 2.5.

2.1.2.1 Flight

An unsafe condition exists if:

- There is a significant shortfall of the actual performance compared to the approved performance (taking into account the accuracy of the performance calculation method), or

- The handling qualities, although having been found to comply with the applicable airworthiness requirements at the time of initial approval, are subsequently shown by service experience not to comply.

2.1.2.2 Structural or mechanical systems

An unsafe condition exists if the deficiency may lead to a structural or mechanical failure which:

- Could exist in a Principal Structural Element that has not been qualified as damage tolerant. Principal Structural Elements are those which contribute significantly to carrying flight, ground, and pressurisation loads, and whose failure could result in a catastrophic failure of the aircraft.

  Typical examples of such elements are listed for large aeroplanes in AMC 25.571(a) "damage tolerance and fatigue evaluation of structure", and in the equivalent material for rotorcraft.

- Could exist in a Principal Structural Element that has been qualified as damage tolerant, but for which the established inspections, or other procedures, have been shown to be, or may be, inadequate to prevent catastrophic failure.

- Could reduce the structural stiffness to such an extent that the required flutter, divergence or control reversal margins are no longer achieved.

- Could result in the loss of a structural piece that could damage vital parts of the aircraft, cause serious or fatal injuries to persons other than occupants.

- Could, under ultimate load conditions, result in the liberation of items of mass that may injure occupants of the aircraft.

- Could jeopardise proper operation of systems and may lead to hazardous or catastrophic consequences, if this effect has not been taken adequately into account in the initial certification safety assessment.

2.1.2.3 Systems

The consequences of reported systems components malfunctions, failures or defects should be analysed.

For this analysis, the certification data may be used as supporting material, in particular systems safety analyses.

The general approach for analysis of in service events caused by systems malfunctions, failures or defects will be to analyse the actual failure effects.

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As a result of this analysis, an unsafe condition will be assumed if it cannot be shown that the safety objectives for hazardous and catastrophic failure conditions are still achieved, taking into account the actual failure modes and rates of the components affected by the reported deficiency.

The failure probability of a system component may be affected by:

- A design deficiency (the design does not meet the specified reliability or performance).

- A production deficiency (non conformity with the certified type design) that affects either all components, or a certain batch of components.

- Improper installation (for instance, insufficient clearance of pipes to surrounding structure).

- Susceptibility to adverse environment (corrosion, moisture, temperature, vibrations etc.).

- Ageing effects (failure rate increase when the component ages).

- Improper maintenance.

When the failure of a component is not immediately detectable (hidden or latent failures), it is often difficult to have a reasonably accurate estimation of the component failure rate since the only data available are usually results of maintenance or flight crew checks. This failure probability should therefore be conservatively assessed.

As it is difficult to justify that safety objectives for the following systems are still met, a deficiency affecting these types of systems may often lead to a mandatory corrective action:

- back up emergency systems, or

- fire detection and protection systems (including shut off means).

Deficiencies affecting systems used during an emergency evacuation (emergency exits, evacuation assist means, emergency lighting system ...) and to locate the site of a crash (Emergency Locator Transmitter) will also often lead to mandatory corrective action.

2.1.2.4 Others

In addition to the above, the following conditions are considered unsafe:

- There is a deficiency in certain components which are involved in fire protection or which are intended to minimise/retard the effects of fire / smoke in a survivable crash, preventing them to perform their intended function (for instance, deficiency in cargo liners or cabin material leading to non-compliance with the applicable flammability requirements).

- There is a deficiency in the lightning or High Intensity Radiated Fields protection of a system which may lead to hazardous or catastrophic failure conditions.

- There is a deficiency which could lead to a total loss of power or thrust due to common mode failure.

If there is a deficiency in systems used to assist in the enquiry following an accident or serious incident (e.g., Cockpit Voice Recorder, Flight Data Recorder), preventing them to perform their intended function, the Agency may take mandatory action.

2.2 Engines

The consequences and probabilities of engine failures have to be assessed at the aircraft level in accordance with paragraph 2.1, and also at the engine level for those failures considered as Hazardous in CS E-510.

The latter will be assumed to constitute unsafe conditions, unless it can be shown that the consequences at the aircraft level do not constitute an unsafe condition for a particular aircraft installation.

2.3 Propellers

The consequences and probabilities of propeller failures have to be assessed at the aircraft level in accordance with paragraph 2.1, and also at the propeller level for those failures considered as hazardous in CS P-70.

The latter will be assumed to constitute unsafe conditions, unless it can be shown that the consequences at the aircraft level do not constitute an unsafe condition for a particular aircraft installation.

2.4 Parts and appliances

The consequences and probabilities of equipment failures have to be assessed at the aircraft level in accordance with paragraph 2.1.

2.5 Human factors aspects in establishing and correcting unsafe conditions

This paragraph provides guidance on the way to treat an unsafe condition resulting from a maintenance or crew error observed in service.

It is recognised that human factors techniques are under development. However, the following is a preliminary guidance on the subject.

Systematic review should be used to assess whether the crew or maintenance error raises issues that require regulatory action (whether in design or other areas), or should be noted as an isolated event without intervention. This may need the establishment of a multidisciplinary team (designers, crews, human factors experts, maintenance experts, operators etc.)

The assessment should include at least the following:

- Characteristics of the design intended to prevent or discourage incorrect assembly or operation;
- Characteristics of the design that allow or facilitate incorrect operation,
- Unique characteristics of a design feature differing from established design practices;
- The presence of indications or feedback that alerts the operator to an erroneous condition;
- The existence of similar previous events, and whether or not they resulted (on those occasions) in unsafe conditions;
- Complexity of the system, associated procedures and training (has the crew a good understanding of the system and its logic after a standard crew qualification programme?);
- Clarity/accuracy/availability/currency and practical applicability of manuals and procedures;

- Any issues arising from interactions between personnel, such as shift changeover, dual inspections, team operations, supervision (or lack of it), or fatigue.

Apart from a design change, the corrective actions, if found necessary, may consist of modifications of the manuals, inspections, training programmes, and/or information to the operators about particular design features. The Agency may decide to make mandatory such corrective action if necessary.

AMC 21A.4
Transferring of information on eligibility and approval status from the design holder to production organisations

Where there is a need to provide (normally outside the design organisation) a visible statement of approved design data or airworthiness or environmental protection data associated with the approved design data, the following minimum information must be provided. The need for a visible statement may be in relation to Company holding a production organisation approval (POA) in relation to 21A.163(c).

The procedures related to the use of forms or other electronic means to provide this information must be agreed with the Agency.

Information to be provided:

Company Name: the name of the responsible design organisation (TC, STC, approval of repair or minor change design, ETSO authorisation holder) issuing the information.

Date: the date at which the information is released.

Eligibility: indicate the specific products or articles, in case of ETSO authorisation, for which data have been approved.

Identification: the part number of the part or appliance. Preference should be given to the use of the Illustrated Parts Catalogue (IPC) designation. Alternatively the reference to the instruction for continued airworthiness (e.g., SB, AMM, etc.) could be stated. Marking requirements of Part 21 Section A Subpart Q should be taken into account.

Description: the name or description of the part or document should be given. In the case of a part or appliance preference should be given to use of IPC designation. The description is to include reference to any applicable ETSO authorisation or EPA marking, or previous national approvals still valid.

Purpose of data: the reason for the provision of the information should be stated by the design approval holder.

Examples:

a) Provision of approved design data to a production organisation to permit manufacture (AMC No 1 to 21A.133(b) and (c))

b) Information regarding eligibility for installation (replacement parts, repair, modification, etc.)

c) Direct Delivery Authorisation (AMC No 1 to 21A.133(b) and (c))

If the data is in support of a change or repair, then reference to the aircraft level approval should be given (make reference to the approved STC, change or repair).

Limitations/Remarks: state any information, either directly or by reference to supporting documentation that identifies any particular data or limitations (including specific importing requirements) needed by a production organisation to complete Block 13 of the EASA Form 1.

Approval: provide reference information related to the approval of the data (Agency document or DOA privilege).

Authorised signature: name and hand-written normal or electronic signature of a person who has written authority from the design organisation, as indicated in the procedures agreed with the Agency.

Subpart B – Type-certificates

GM 21A.14(b)
Eligibility for alternative procedures

Design organisations approved under Part 21 Section A Subpart J ("Subpart J DOA") should be the normal approach for type certification, supplemental type certification, approval of major changes to type design or approval of major repair design, except when agreed otherwise by the Agency in accordance with 21A.14, 21A.112B and 21A.432B.

The acceptance of alternative procedures, as defined in AMC 21A.14(b), should be limited where the Agency finds it more appropriate for the conduct of type certification, supplemental type certification, approval of changes to type design, approval of repair design.

AMC 21A.14(b)
Alternative Procedures

Alternative procedures are an acceptable means to demonstrate design capability in the cases described in 21A.14, 21A.112B or 21A.432B. This concept is the implementation, in the context of specific projects, of procedures required in Subpart J DOA, to ensure that the applicant will perform relevant activities as expected by the Agency, but without the requirements on the organisation itself that can be found in Subpart J. The establishment of these alternative procedures may be seen as a starting phase for a Subpart J DOA, allowing at a later stage, at the discretion of the applicant, to move towards a full Subpart J DOA by the addition of the missing elements.

1 Scope

1.1 As alternative to DOA, a manual of procedures must set out specific design practices, resources and sequence of activities relevant for the specific projects, taking account of Part 21 requirements.

1.2 These procedures must be concise and limited to the information needed for quality and proper control of activities by the applicant/holder, and by the Agency.

2 Management of the (supplemental) type certification process

2.1 For a particular project, at the beginning of the process, the applicant must propose to the Agency for acceptance a certification programme that includes:

Part 1 Procedures for the management of the certification programme: creation and update all along the certification process to integrate the progress of the activities, distribution.

This part must also include the milestones of the project development up to the type certification or approval of the major change, with the minimum administrative delays imposed by the Agency when necessary.

Part 2 The attribution of responsibilities, as follows:

- names of the persons having specific responsibilities in the frame of the certification programme
- the description of their tasks, responsibilities and associated competences
- scope of authority of signatories.

Part 3 The airworthiness requirements applicable to the project, corresponding interpretations, and the equivalence of safety or other specific cases related to the applicable requirements.

Part 4 Working methods for showing of compliance and providing to the Agency the means by which such compliance has been shown.

This includes all or part of the following, depending on the complexity of the product:

- the means by which compliance will be shown (means of compliance), in relation with the requirements and/or their detailed interpretation
- the technical criteria associated with the means of compliance
- milestones specific to particular technical areas in relation with the general planning of the project
- the decision process, especially the key points where an Agency decision is needed before further action
- the flow of information to the Agency
- the configuration control, especially of the test specimen used to show compliance
- the organisation of the work for the interfaces or multidisciplinary subjects
- those compliance documents that will be subject to verification by the Agency
- the establishment of the compliance documentation, including the time schedule and availability to the Agency
- the control of the time schedule, for the accomplishment of the tasks in due time.

The applicant must submit all revisions of the certification programme to the Agency for acceptance.

2.2 The applicant must establish procedures for creating compliance documents in such a way that:

- the kind of document and the technical objectives for each document are determined at the beginning of the process
- the production of the documents is carefully managed all along the process, in accordance with the milestones defined in the certification programme
- the various issues of a document are controlled.

Each document must contain:

- the reference of the requirements covered by the document
- data showing compliance and a statement by the applicant declaring compliance with these requirements

A numbering system to identify the compliance documents must be defined in order to have an adequate link with the certification programme.

Except as otherwise agreed with the Agency, all compliance documents must be produced before issuance of the final statement of compliance required by 21A.20(b) or 21A.97(a)(3).

2.3 There are no privileges associated with alternative procedures, however the Agency will decide on the extent of its involvement in the verification of compliance documents. This involvement may vary according to the Agency knowledge of the applicant from previous and on-going activities and the resulting assessment of competence, and must be addressed in the certification programme.

3 Management of design changes

3.1 Approval of changes to type design, repairs and production deviations from the approved design data

The TC or STC applicant must provide procedures acceptable to the Agency for classification and approval of changes to type design (see paragraphs 3.2 and 3.3), and repairs and production deviations from the approved design data (see paragraph 3.4).

3.2 Classification

3.2.1 Content

The procedure must address the following points:

- identification of changes to type design
- airworthiness classification
- changes to type design initiated by subcontractors
- documents to justify the classification
- authorised signatories

Criteria used for classification must be in compliance with 21A.91 and corresponding interpretations.

3.2.2 Identification of changes to type design

The procedure must indicate how the following are identified:

- major changes to type design
- those minor changes to type design where additional work is necessary to show compliance with the airworthiness requirements
- other minor changes to type design requiring no further showing of compliance.

3.2.3 Airworthiness classification

The procedure must show how the effects on airworthiness are analysed, from the very beginning, by reference to the applicable requirements.

If no specific requirements are applicable to the change, the above review must be carried out at the level of the part or system where the change is integrated and where specific requirements are applicable.

3.2.4 Control of changes to type design initiated by subcontractors

The procedure must indicate, directly or by cross-reference to written procedures, how changes to type design initiated by subcontractors are controlled.

3.2.5 Documents to justify the classification

All decisions of classification of changes to type design must be documented and approved by the Agency. It may be in the format of meeting notes or register.

3.2.6 Authorised signatories

The procedure should identify the persons authorised to sign the proposed classification before release to the Agency for approval.

3.3 Approval of changes to type design

3.3.1 Content

The procedure must address the following points:

- compliance documentation
- approval process
- authorised signatories

3.3.2 Compliance documentation

For major changes and those minor changes to type design where additional work to show compliance with the applicable airworthiness requirements is necessary, compliance documentation must be established following guidelines of paragraph 2.2.

3.3.3 Approval process

A For the approval of major changes to type design, a certification programme as defined in paragraph 2.1 must be established.

B For major changes and those minor changes to type design where additional work to show compliance with the applicable airworthiness requirements is necessary, the procedure should define a document to support the approval process.

This document must include at least :

- identification and brief description of the change and its classification
- applicable requirements
- reference to the compliance documents
- effects, if any, on limitations and on the approved documentation
- authorised signatory

C For the other minor changes, the procedure must define a means:

- to identify the change
- to present the change to the Agency for approval.

3.3.4 Authorised signatories

The procedure must identify the persons authorised to sign the change before release to the Agency for approval.

3.4 Repairs and production deviations from the approved design data

A procedure following the principles of paragraphs 3.2 and 3.3 must be established for the classification and approval of repairs and unintentional deviations from the approved design data occurring in production (concessions or non-conformance's). For repairs, the procedure must be established in accordance with Part 21 Section A Subpart M and associated acceptable means of compliance (AMC) or guidance material (GM).

4 Issue of information and instructions to owners

4.1 General

The information or instructions issued by a TC, STC, approval of changes to type design, approval of repair design holder are intended to provide the owners of a product with all necessary data to implement a change on the product, or a repair, or to inspect it.

The information or instructions may be issued in a format of a Service Bulletin as defined in ATA 100 system, or in Structural Repair Manuals, Maintenance Manuals, Engine and Propeller Manuals, etc.

The preparation of this data involves design, production and inspection. The three aspects should be properly addressed and a procedure should exist.

4.2 Procedure

The procedure should address the following points:

- preparation
- verification of technical consistency with corresponding approved change(s), repair(s) or approved data, including effectivity, description, effects on airworthiness, especially when limitations are changed
- verification of the feasibility in practical applications.

The persons authorised to sign before release of information and instructions to the Agency for approval should be identified in the procedure.

The procedure should include the information or instructions prepared by subcontractors or vendors, and declared applicable to its products by the TC, STC, approval of changes to type design or approval of repair design holders.

4.3 Statement

The information and instructions should contain a statement showing Agency approval.

5 Obligations addressed in 21A.44 (TC holder), 21A.118A (STC holder) or 21A.451 (repair design approval holder)

The applicant should establish the necessary procedures to show to the Agency how it will fulfil the obligations required under 21A.44, 21A.118A or 21A.451, as appropriate.

6 Control of design subcontractors

The applicant should establish the necessary procedures to show to the Agency how it will control design subcontractors.

GM 21A.16B
Special Conditions

21A.16B introduces 3 categories of Special Conditions:

1 Novel and unusual design features;
2 Unconventional use of product;
3 Service experience has shown that unsafe conditions may exist.

However, the need for a Special Condition based on in-service experience should be judged by using the following points as benchmarks:

- The words “unsafe conditions” are used in GM 21A.3B(b) to justify the basis for an airworthiness directive.

- The words “continued safe flight and landing”, according to AMC 25.1309, mean the capability for continued controlled flight and landing, possibly using emergency procedures, but without requiring exceptional pilot skill or strength. Some aircraft damage may be associated with a failure condition, during flight or upon landing.

GM 21A.33
Investigation and Tests

The requirements of 21A.33(a) should not preclude the applicant requesting the Agency to make flight or other tests of particular aspects of the product during its development and before the type design is fully defined and a Declaration of Compliance can be issued for all the applicable certification specifications (CS). However in case of flight test the applicant should have performed subject tests before the Agency tests and should ensure that no features of the product preclude the safe conduct of the evaluation requested. The Agency may require to repeat any such tests once the type design is fully defined to ensure that subsequent changes have not adversely affected the conclusions from any earlier evaluation. A statement of compliance with sub-paragraph 21A.33(b) is also required for the above tests.

GM 21A.35
Flight Tests

Detailed material on flight testing is included in the applicable CS.

GM 21A.35(b)(2)
Objective and Content of Function and Reliability Testing

1 OBJECTIVE

The objective of this testing is to expose the aircraft to the variety of uses, including training, that are likely to occur when in routine service to provide an assurance that it performs its intended functions to the standard required for certification and should continue to do so in service.

2 CONTENT OF FUNCTION AND RELIABILITY TESTING

The testing should cover both routine operations and some simulation of abnormal conditions. The details of the programme should be agreed with the Agency prior to commencement of testing.

It may be possible to combine this testing with any required to show compliance with the applicable CS. This will be agreed on a case-by-case basis with the Agency.

Where possible, testing conditions should be defined with the co-operation of an operator.

A substantial proportion of the flying should be on a single aircraft. The flying should be carried out to a continuous schedule on an aircraft that is very close to the final type design, operated as though it were in service and should include a range of representative ambient operating conditions and airfields.

GM 21A.35(f)(1)
Flying Time for Function and Reliability Testing

All flying carried out with engines and associated systems not significantly different from the final type-certificate standard may count towards the 300 hours airframe flight time required by 21A.35(f)(1). At least 150 of the 300 flying hours should be conducted on a dedicated production configured aircraft. The requirement for 300 hours relevant flight time whenever a new turbine engine is incorporated applies regardless of whether the airframe/engine combination is subject to a new type-certificate or is to be certificated as a change or supplement to an existing type-certificate.

GM 21A.35(f)(2)
Flying Time for Function and Reliability Testing

All flying carried out on an aircraft not significantly different from the final type design may count towards the 150 hours airframe flight time required by 21A.35(f)(2).

(Subpart C – Not applicable)

Subpart D – Changes to type-certificates

GM 21A.91
Classification of changes to a type design

1. PURPOSE OF CLASSIFICATION

Classification of changes to a type design into MAJOR or MINOR is to determine the approval route to be followed in Part 21 Subpart D, i.e., either 21A.95 or 21A.97, or alternatively whether application and approval has to be made in accordance with Part 21 Subpart E.

2. INTRODUCTION

2.1 21A.91 proposes criteria for the classification of changes to a type design as minor and major.

(i) This GM is intended to provide guidance on the term appreciable effect affecting the airworthiness of the product from 21A.91, where "airworthiness" is interpreted in the context of a product in conformity with type design and in condition for safe operation.. It provides complementary guidelines to assess a design change in order to fulfil the requirements of 21A.91 and 21A.117 where classification is the first step of a procedure.

Note: For classification of Repairs see GM 21A.435.

(ii) Although this GM provides guidance on the classification of major changes, as opposed to minor changes as defined in 21A.91, the GM and 21A.91are deemed entirely compatible.

2.2 For an ETSO authorisation, 21A.611 gives specific additional requirements for design changes to ETSO articles.
For APU, this GM should be used.

3 ASSESSMENT OF A DESIGN CHANGE FOR CLASSIFICATION

3.1 Changes to the type design

21A.31 defines what constitutes the type design. Alteration to any of the data included within the scope of 21A.31 is considered a change to the type design.

3.2 Classification Process (see attached diagram)

21A.91 requires all changes to be classified as either major or minor, using the criteria of 21A.91 and the complementary guidance of paragraph 3.3.

On some occasions, the classification process is initiated at a time when some data necessary to make a classification decision are not yet available. Therefore, the applicant should wait for availability of data before making a decision.

Wherever there is doubt as to the classification of a change, the Agency should be consulted for clarification.

When the strict application of the paragraph 3.3 criteria results in a major classification, the applicant may request re-classification, if justified, and Agency could take the responsibility in re-classifying the change.
A simple design change planned to be mandated by an airworthiness directive may be re-classified minor due to the involvement of the Agency in the continued airworthiness process.

Reasons for a classification decision should be recorded.

3.3 Complementary guidance for classification of changes.

A change to the type design is judged to have an "appreciable effect on other characteristics affecting the airworthiness of the product" and therefore should be classified major, in particular but not only, when one or more of the following conditions are met:

(i) Where the change requires an adjustment of the type-certification basis (such as special condition, equivalent safety finding, elect to comply, exemption, reversion, later requirements).

(ii) Where the applicant proposes a new interpretation of the requirements used for the type type-certification basis, that has not been published as AMC material or otherwise agreed with the Agency.

(iii) Where the demonstration of compliance uses methods that have not been previously accepted as appropriate for the nature of the change to the product or for similar changes to other products designed by the applicant.

(iv) Where the extent of new substantiation data necessary to comply with the applicable airworthiness requirements and the degree to which the original substantiation data has to be re-assessed and re-evaluated is considerable.

(v) The change alters the Airworthiness Limitations or the Operating Limitations.

(vi) The change is made mandatory by an airworthiness directive or the change is the terminating action of an airworthiness directive (ref. 21A.3B). See note 1.

(vii) Where the change introduces or affects functions where the failure effect is classified catastrophic or hazardous.

Note 1: The design change previously classified minor and approved prior to the airworthiness directive issuance decision needs no re-classification. However, the Agency retains the right to review the change and re-classify/re-approve if found necessary.

Note 2: These above conditions are an explanation of the criteria noted in 21A.91.

For an understanding of how to apply the above conditions it is useful to take note of the examples given in Appendix A to GM 21A.91.

Appendix A to GM 21A.91: Examples of Major Changes per discipline

The information below is intended to provide a few major change examples per discipline, resulting from application of 21A.91 and paragraph 3.3 conditions. It is not intended to present a comprehensive list of all major changes. Examples are categorised per discipline and are applicable to all products (aircraft, engines and propellers). However a particular change may involve more than one discipline, e.g., a change to engine controls may be covered in engines and systems (software).

Those involved with classification should always be aware of the interaction between disciplines and the consequences this will have when assessing the effects of a change (i.e., operations and structures, systems and structures, systems and systems, etc.; see example in paragraph 2 (ii).

Specific rules may exist which override the guidance of these examples.

In the Part 21 a negative definition is given of minor changes only. However in the following list of examples it was preferred to give examples of major changes.
Where in this list of examples the words “has effect” or “affect(s)” are used, they have always to be understood as being the opposite of “no *appreciable* effect” as in the definition of minor change in 21A.91. Strictly speaking the words “has appreciable effect” and “appreciably affect(s)” should have been used, but this has not been done to improve readability.

1 Structure

(i) changes such as a cargo door cut-out, fuselage plugs, change of dihedral, addition of floats;

(ii) changes to materials, processes or methods of manufacture of primary structural elements, such as spars, frames and critical parts;

(iii) changes that adversely affect fatigue or damage tolerance or life limit characteristics;

(iv) changes that adversely affect aeroelastic characteristics.

2 Cabin Safety

(i) changes which introduce a new cabin layout of sufficient change to require a re-assessment of emergency evacuation capability or which adversely affect other aspects of passenger or crew safety.

Items to consider include, but are not limited to, :

- changes to or introduction of dynamically tested seats.
- change to the pitch between seat rows.
- change of distance between seat and adjacent obstacle like a divider.
- changes to cabin lay outs that affect evacuation path or access to exits.
- installation of new galleys, toilets, wardrobes, etc.
- installation of new type of electrically powered galley insert.

(ii) changes to the pressurisation control system which adversely affect previously approved limitations.

3 Flight

Changes which adversely affect the approved performance, such as high altitude operation, brake changes that affect braking performance.

Changes which adversely affect the flight envelope.

Changes which adversely affect the handling qualities of the product including changes to the flight controls function (gains adjustments, functional modification to software) or changes to the flight protection or warning system.

4 Systems

For systems assessed under CS 25.1309, the classification process is based on the functional aspects of the change and its potential effects on safety.

(i) Where failure effect is 'Catastrophic' or 'Hazardous', the change should be classified as major.

(ii) Where failure effect is 'major', the change should be classified as major if:

- aspects of the compliance demonstration use means that have not been previously accepted for the nature of the change to the system; or
- the change affects the pilot/system interface (displays, controls, approved procedures); or
- the change introduces new types of functions/systems such as GPS primary, TCAS, Predictive windshear, HUD.

The assessment of the criteria for software changes to systems also needs to be performed. When software is involved, account should be taken also of the following guidelines:

Where a change is made to software produced in accordance with the guidelines of EUROCAE ED12B/RTCA DO-178B "Software Considerations in Airborne Systems and Equipment Certification", the change should be classified as major if either of the following apply, and the failure effect is Catastrophic, Hazardous or Major:

(1) the executable code for software, determined to be Level A or Level B in accordance with the guidelines, is changed unless that change involves only a variation of a parameter value within a range already verified for the previous certification standard; or

(2) the software is upgraded to or downgraded from Level A, Level B or Level C; or

(3) the executable code, determined to be level C, is deeply changed, e.g., after a software reengineering process accompanying a change of processor.

For software developed to guidelines other than ED-12B/DO-178B, the applicant should assess changes in accordance with the foregoing principles.

For other codes the principles noted above may be used. However, due consideration should be given to specific requirements/interpretations.

5 Propellers

Changes to:

(i) diameter

(ii) airfoil

(iii) planform

(iv) material

(v) blade retention system, etc.

6. Engines

Changes:

(i) that adversely affect operating speeds, temperatures, and other limitations.

(ii) that affect or introduce parts identified by CS E-510 where the failure effect has been shown to be hazardous.

(iii) that affect or introduce engine critical parts (CS E-515) or their life limits.

(iv) to a structural part which requires a resubstantiation of the fatigue and static load determination used during certification.

(v) to any part of the engine which adversely affects the existing containment capability of the structure.

(vi) that adversely affect the fuel, oil and air systems, which alter the method of operation, or require reinvestigation against the type-certification basis.

(vii) that introduce new materials or processes, particularly on critical components.

7 Rotors and drive systems

Changes that:

(i) adversely affect fatigue evaluation unless the service life or inspection interval are unchanged. This includes changes to materials, processes or methods of manufacture of parts, such as

- rotor blades
- rotor hubs including dampers and controls
- gears
- drive shafts
- couplings

(ii) affect systems the failure of which may have hazardous or catastrophic effects. The design assessment will include:

- cooling system
- lubrication system
- rotor controls

(iii) adversely affect the results of the rotor drive system endurance test, the rotor drive system being defined in CS 27/29-917.

(iv) adversely affect the results of the shafting critical speed analysis required by CS 27/29-931.

8 Environment

A change that introduces an increase in noise or emissions.

9 Power plant Installation

Changes which include:

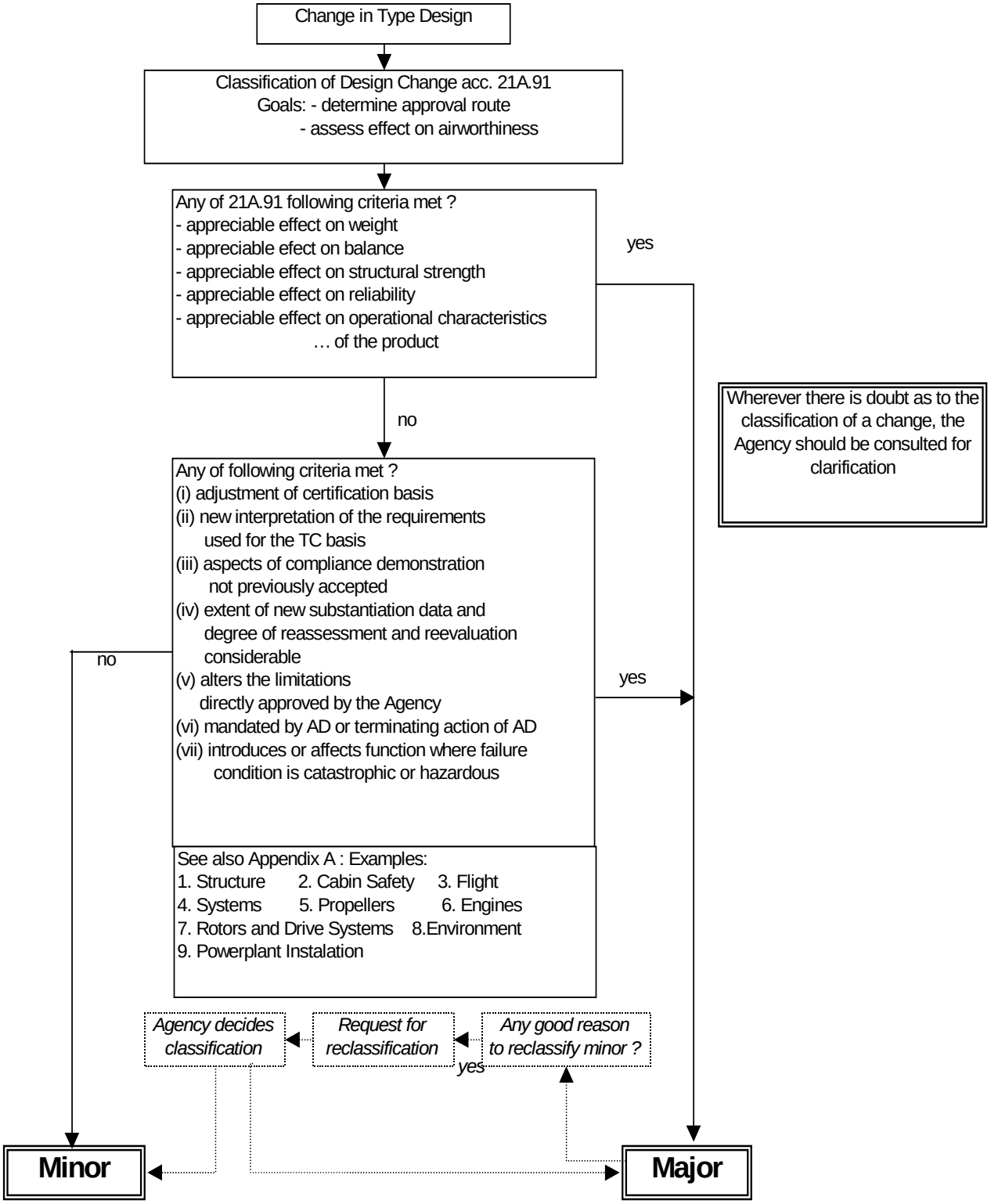
(i) control system changes which affect the engine/propeller/airframe interface;

(ii) new instrumentation displaying operating limits;

(iii) modifications to the fuel system and tanks (number, size and configuration);

(iv) change of engine/propeller type.

Classification process



GM 21A.93(b)
Major Changes: Application

Identification of re-investigations necessary to show compliance does not mean the showing of compliance itself, but the list of affected type design requirement paragraphs for which a new demonstration is necessary, together with the means (calculation, test or analysis) by which it is proposed to show compliance.

GM 21A.101 Establishment of the type-certification basis of Changed Aeronautical Products

1. PURPOSE

a. This GM provides guidance for establishing the type-certification basis for changed aeronautical products and identifying the conditions under which it will be necessary to apply for a new type-certificate. 21A.19 identifies the conditions under which an applicant for a design change is required to make application for a new type-certificate. 21A.101 requires an applicant for a change to a type-certificate to meet the latest requirements except where the change is not significant, where areas of the product are not affected, where it would be impractical, or where it would not contribute materially to the level of safety of the changed product. This GM explains the criteria of 21A.19 and 21A.101, and their application.

(1) It provides guidance as to the assessment of “significant” vs. “not significant” changes to the type-certificated product. This document also provides guidance for the determination of “substantial” vs. “significant” changes.

b. The intent of 21A.101 is to enhance safety through the incorporation of the latest requirements in the type-certification basis of changed products. This GM describes the application of the latest airworthiness requirements for the certification of significant design changes to aircraft, aircraft engines and propellers. Significant changes are generally distinct from the vast majority of major changes. In the assessment of whether a level change is significant, all previous relevant design changes need to be taken into consideration along with any previous updates to the type-certification basis. All changes must be approved by the Agency. An applicant may comply with earlier amendments of the requirements based upon a finding by the Agency that the change is not significant, an area is not affected by a change or compliance with the latest requirements is impractical or does not materially contribute to the level of safety. Each change must be judged on its own merit when making the final determination of the type-certification basis.

2. APPLICABILITY

a. This GM is applicable to all major changes to type design of aircraft, engines and propellers. For the purposes of this GM an application for a change to a type-certificate (type design) described in 21A.101(a) and 21A.90 is considered as an application for a major change. Minor changes as defined in 21A.91 are considered to have no appreciable effect on airworthiness and are therefore by definition not significant. This GM applies equally to applications made for type-certificates amendments, supplemental type-certificates, or amended supplemental type-certificates.

b. This GM is also applicable to all significant changes to aircraft (other than rotorcraft) of 2722 kg (6,000 lbs.) or less maximum weight, or to a non-turbine rotorcraft of 1361 kg (3,000 lbs.) or less maximum weight. Unless the Agency finds the change significant in an area, an applicant may show that the changed product complies with the requirements incorporated in the type-certificate.

3. RELATED PART 21 PARAGRAPHS

a. 21A.16B Special Conditions
b. 21A.17 Type-certification basis
c. 21A.19 Changes requiring a new type-certificate

d. 21A.91 Classification of changes in type design
e. 21A.101 Applicable CS and environmental protection requirements

4. EXPLANATION OF TERMINOLOGY

The following is a summary of the terminology used throughout this advisory or guidance material. Further explanations of some of these terms can be found in paragraphs 5, 6, 7, and 8.

a. Type-certification basis: the applicable airworthiness codes as established in 21A.17 and 21A.101, as appropriate, special conditions, equivalent level of safety findings; and exemptions applicable to the product to be certificated.

Note: This GM is not intended for determining the applicable aircraft noise, fuel venting and engine emissions requirements for changed products.

b. Earlier requirements: the requirements in effect prior to the date of application for the change, but not prior to the existing type-certification basis.

c. Existing type-certification basis: the requirements incorporated by reference in the type-certificate of the product to be changed.

d. Latest requirements: the requirements in effect on the date of application for the change.

e. Previous relevant design changes: previous design changes, the cumulative effect of which could result in a product significantly or substantially different from the original product or model, when considered from the last time the latest requirements were applied.

f. Product level change: a change or combination of changes that makes the product distinct from other models of the product (e.g., range, payload, speed). Product level change is defined at the aircraft, engine or propeller level of change.

g. Significant change: a product level change to the type-certificate to the extent that it changes one or more of the following: general configuration; principles of construction; or the assumptions used for the certification criteria, but not to the extent to be considered a substantial change. Not all product level changes are significant.

h. Substantial change: a product level design change which is so extensive that a substantially complete investigation of compliance with the applicable requirements is required, and consequently a new type-certificate, in accordance with 21A.19.

5. GENERAL OVERVIEW OF 21A.101

a. 21A.19 specifies changes that require a new type-certificate. When a new type-certificate is required, 21A.17 specifies the applicable type-certification basis for the changed product.

b. When an application for a new type-certificate is not required by 21A.19, 21A.101 defines the designation of applicable requirements for determining the type-certification basis for the changed product.

c. 21A.101(a) requires a change to a type-certificated product to comply with the latest requirements, unless the change meets the criteria for the exceptions identified in 21A.101(b) and (c). The type-certification basis should not be dependent on whether the holder of a type-certificate or an applicant for a supplemental type-certificate is originating the change. Where compliance with a later amendment for a significant change does not contribute materially to the level of safety, would be impractical, or is in an area not affected by the change, the applicant may comply with earlier requirements. However the applicant may not use requirements prior to those specified by the existing type-certification basis.

d. 21A.101(b) pertains to changes for which earlier requirements provide adequate standards. Earlier requirements may be used when the change is not significant. In cases where design changes that involve features that have no associated regulatory standards in the existing type-certification basis, the Agency will review the proposed certification plan to ensure adequacy of the requirements against the proposed design change.

e. 21A.101(b)(1) allows the applicant to show compliance with an earlier amendment when the Agency determines the change is not significant. 21A.101(b)(1)(i) and (ii) pertains to changes that meet the automatic criteria where the change is significant. 21A.101(b)(2) and (b)(3) allows the use of earlier requirements for significant changes for areas of the product not affected by the change and for cases where compliance to the latest requirements would not contribute materially to the level of safety or would be impractical. Note that earlier amendments may not precede the corresponding requirement incorporated in the type-certificate.

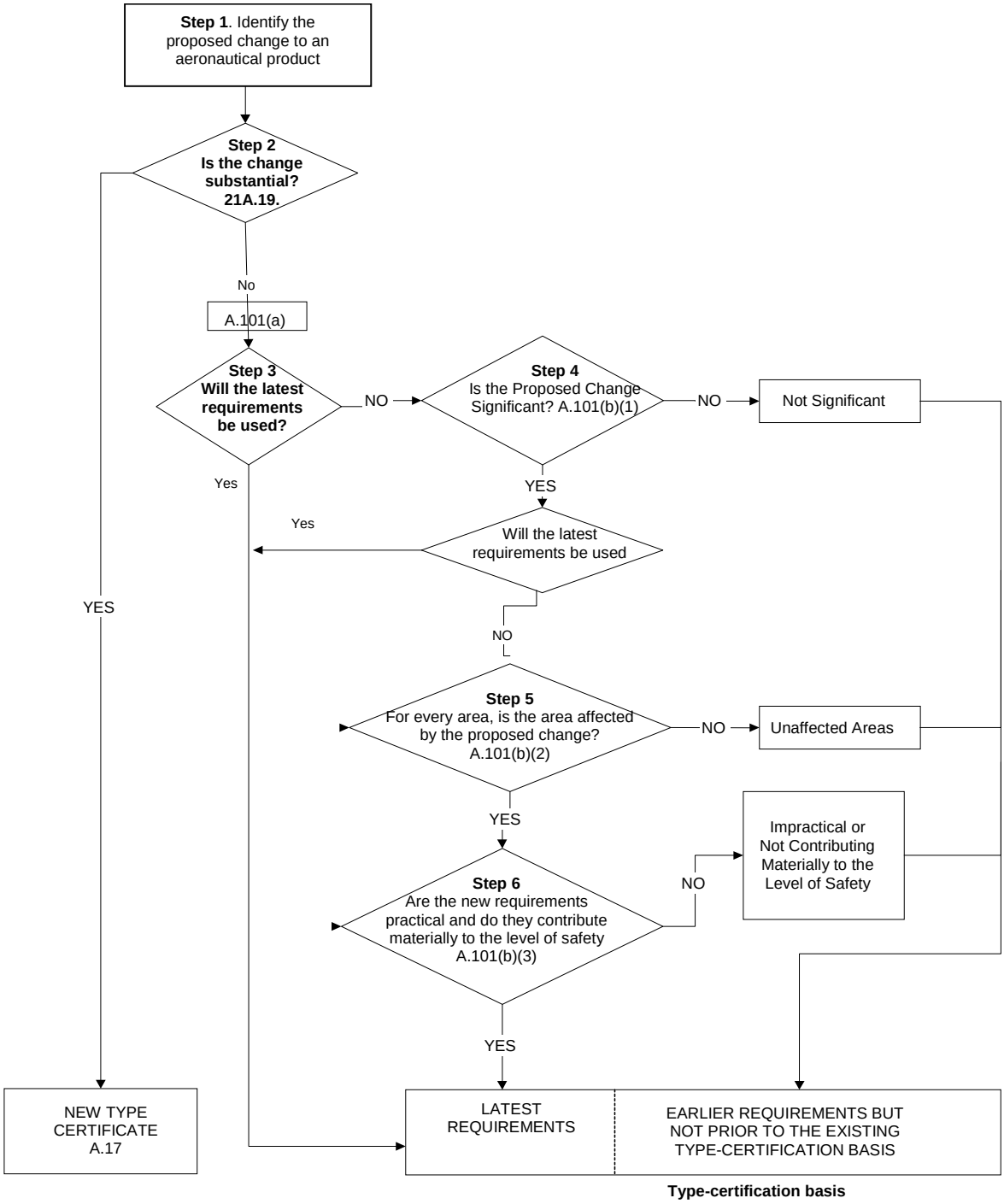
f. 21A.101(c) provides an exception to the requirements of 21A.101(a). An applicant for a change to an aircraft (other than rotorcraft) of 2 722 kg (6 000 lbs) or less maximum weight, or to a non-turbine rotorcraft of 1 361 kg (3 000 lbs) or less maximum weight may show that the changed product complies with the type-certification basis incorporated by reference in the type-certificate. The applicant may elect to comply with the later requirements. If the Agency finds that the change is significant in an area, the Agency may designate compliance with a later amendment to the requirements incorporated by reference in the type-certificate that applies to the change and any requirement the Agency finds is directly related. Reference paragraph 9.

g. 21A.101(d) provides for the use of special conditions as prescribed under 21A.16B when the existing type-certification basis or the latest requirements do not provide adequate standards with respect to the proposed change.

h. 21A.101(e) prescribes the effective period an application to remain valid for a change to a type-certificate, which is consistent with the requirements of 21A.17 for a new type-certificate.

i. Figure 1 provides a flowchart of the process to determine the applicable type-certification basis for a proposed design change under 21A.101, following a determination that the proposed design change is not substantial under 21A.19.

Figure 1: Establishing the type-certification basis for changed products



Note 1: In the vast majority of cases the applicant will proceed to Step 4 as the initial step in the process. See paragraph 6 for guidance.

Note 2: For excepted products under 21A.101(c) see paragraph 9. For special conditions under 21A.101(d) see paragraph 10.

6. Establishing the type-certification basis for changed products, 21A.101(b)(1).

a. The administrative burden for the applicant is to demonstrate, and the Agency to find, that a change to a product is significant or not significant, and to determine the resulting type-certification basis. The type-certification basis can vary depending on the magnitude and scope of the change. The steps below present a streamlined approach of making this determination. In addition to assisting in the determination of significance, this guidance will help establish the appropriate amount of co-ordination required between the applicant and the Agency.

b. Classifications of typical changes are provided in the tables of Appendix 1 to GM 21A.101. For instructions on how to use Appendix 1 to GM 21A.101 tables, proceed to step 4 below. In cases where the classification in Appendix 1 is not applicable or immediately obvious for the proposed change, the following steps should be used in conjunction with Figure 1 to determine the appropriate type-certification basis for the changed product.

Step 1 of Figure 1. Identify the Proposed Change to an Aeronautical Product.

a. The applicant must, as a first step, identify the proposed change to the aeronautical product. An applicant for a change to a type-certificate must consider all previous related design changes to the aeronautical product. Changes to a product can include physical design changes, changes to an operating envelope, and/or performance changes. The change may be a single change, or a collection of changes.

b. For each change, it is important that the effects of the change on other systems, components, equipment, or appliances of the product are properly assessed. The characteristics affected by the change are not only physical changes. The intent is to encompass all aspects where there is a need for re-evaluation, that is, where the substantiation presented for the product being changed should be reviewed, updated, or re-written. All other areas of the aircraft are considered to be unchanged or not affected by the change.

Step 2 of Figure 1. Is the Change Substantial?

a. 21A.19 requires that an applicant obtain a new type-certificate for a changed product if the change in design, power, thrust, or weight is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. A new type-certificate could be required for either an extensive change to a previously type-certificated product or for a new design derived through a series of design changes from a previously type-certificated product. The need for a new type-certificate may be obvious when the change is first considered or may need a more extensive evaluation through application of 21A.101.

b. A "substantially complete investigation" of compliance is required when most of the existing substantiation is not applicable to the changed product. The question of whether a change is substantial should be addressed at the beginning of the process. However, if at any point while developing the type-certification basis, it becomes clear that the proposed change is a substantial change, the process ceases to be an amendment process under Part 21 Subpart D and becomes a new type-certification process under Part 21 Subpart B.

c. If it is not initially clear that a new type-certificate is required, Appendix 1 to GM 21A.101provides some examples of substantial changes to aid in this classification.

d. In considering the above, a substantial change will require a new type-certificate; 21A.19 applies. If the change is not substantial, 21A.101 applies.

Step 3 of Figure 1. Will the Latest Requirements Be Used?

a. Where the latest requirements are used, the intent of 21A.101 has been met including the case where the applicable requirements have not changed since the previous update of the type-certification basis or where the applicant elects to comply with the latest amendments.

Step 4 of Figure 1. Is the Proposed Change Significant? 21A.101(b)(1)

a. Significant changes are product level changes and by their very nature, distinct from the vast majority of major changes. In general, these changes are either the result of a accumulation of changes or occur through an isolated extensive major change rising to the product level that make the changed product distinct from others. Additionally, 21A.101(b)(1) defines a significant change based on whether or not one or more of three automatic criteria applies: (1) the general configuration is not retained, (2) the principles of construction are not retained, and (3) the assumptions used for certification of the product do not remain valid. In many cases a significant change will involve more than one of these criteria and will, by its very nature, be obvious and distinct from other product improvements or production changes.

b. The applicant may use the tables in Appendix 1 to GM 21A.101 and the criteria described in paragraph 7 as guidance to make the classification of significance.

c. Previous relevant design changes of the product can trigger one or more of the automatic criteria listed in 21A.101(b)(1)(i) and (ii) for the proposed design change. When assessing the design change, either singularly or collectively, the cumulative effect of previous relevant design changes should be considered. These design changes may have been incorporated through earlier changes in the type-certificate on areas related to the current proposed change and the associated areas, systems, components, equipment, or appliance. The collective result may be a product considerably different from the latest updated type-certification basis for the product or model. Two examples of previous relevant aeroplanes design changes address those incremental increases in weight or thrust that, while individually not significant (e.g., 2%, 4%, 5% discrete increases), can, through a series of changes, achieve a significant product level change.

d. The assessment of a proposed design change together with any previous relevant design changes is based on whether any of the three automatic criteria are triggered. 21A.101(b) states that changes that meet one of the three criteria are automatically considered significant. The examples of significant and not significant changes in Appendix 1 to GM 21A.101 are predicated upon more than 10 years international certification experience. The concept of having only three criteria fits these examples and is therefore considered that no other criteria apply. Therefore, only when one or more of the three criteria is affected is the design change considered significant. The starting point to begin accumulating previous relevant design changes is the time the latest applicable requirements were applied in the affected area, system, component, equipment, or appliance.

e. Typically, a change to a single area, system or component will not result in a product level change. However, there may be distinct cases where the change to a single system or component may result in a significant change due to its effect on the product level certification assumptions.

7. USING THE CRITERIA TO DETERMINE SIGNIFICANCE (21A.101(b)(1)(i) and (ii)) (Step 4):

a. Typically, significant product level changes result in a model change necessitating an amendment to the type-certificate or an STC that rises to the level of an amended type-certificate. Note that applications for a new model not associated with hardware changes, i.e., commercial considerations are not an indication of a significant change under 21A.101. All changes are considered in light of the change itself and its classification.

b. The following definitions build upon the criteria identified in Part 21and provide additional guidance on how to apply the criteria when classifying product level changes. In cases of doubt, and to ensure a consistent outcome, the applicant is encouraged to seek the advice of the Agency.

(1) Changes Where the General Configuration Is Not Retained (Significant Change to General Configuration)

A change to the general configuration at the product level that is likely to require a new model designation because of the need to distinguish the different product with other product models, e.g., performance, interchangeability of major components, etc.

(2) Changes Where the Principles of Construction Are Not Retained (Significant Change to Principles of Construction)

A change at the product level to the materials and/or construction methods that affects the overall product's operating characteristics or inherent strength and would require extensive re-investigation to show compliance.

(3) Changes That Invalidate the Assumptions Used for Certification (Significant Change to the Assumptions Used for Certification)

A change to the product level assumptions associated with the compliance demonstration, performance, or operating envelope that by itself is so different that the original assumptions are invalidated.

Examples may include:

(a) Change of an aircraft from an unpressurised to pressurised fuselage,

(b) Change of operation of a fixed wing aircraft from land based to water based, and

(c) Operation envelope expansions that are outside the existing design parameters and capabilities.

Note: Merely operating a product to an expanded envelope for which it was originally designed is generally not a significant change. In this case, the assumptions used for certification of the basic product remain valid and the results can be applied to cover the changed product with predictable effects or can be demonstrated without significant physical changes to the product.

NOTE: The word "assumptions" in 21A.101 bears a meaning different from CS E-30 and CS-P-30. CS-E and CS-P address the conditions that may be imposed on the engine or propeller when it is eventually installed in the aircraft and are published in the installation manual.

c. The above criteria are used to determine if a change is significant. In applying the automatic criteria and the examples in Appendix 1, the applicant must concentrate on the change itself. Consideration of only the latest certification requirements is not reason enough to cause a classification of significance under 21A.101.

d. Appendix 1 includes tables of typical changes for large aeroplanes, small aeroplanes, rotorcraft, and engines/propellers that meet the definition of significant change for each product line. The appendix also includes typical changes that do not achieve the significant level. The tables may be used in one of two ways:

(1) To classify a proposed change that is listed in the table, or

(2) In conjunction with the three automatic criteria, to help classify a proposed change not listed in the table.

e. If, based on Appendix 1 and/or the automatic criteria, the change is classified as:

(1) Significant (21A.101 (b) (1) and (2)). The applicant will comply with the latest amendments of the applicable requirements for the certification of the changed product. The applicant can use the exceptions provided in 21A.101(b)(2) and/or (3) to show compliance with earlier amendments The final type-certification basis may consist of a combination of the latest, and earlier or existing requirements for the change.

(2) Not significant (21A.101(b)(1).The applicable requirements are those contained in the existing type-certification basis. The applicant may elect to comply with later amendments.

Note: In cases where no regulatory standards are defined in the existing type-certification basis for the design change but applicable regulatory standards exists in a subsequent amendment to the requirements, the subsequent amendment will be made part of the type-certification basis.

f. Making the Classification
A classification of significant or not significant can be made (the application of 21A.101(b)) in one of two ways;

(1) By the Agency agreeing to appropriate controls and procedures that enable the applicant to make a declaration of not significant. In all cases the Agency retains the option to become involved. An appropriate declaration by the applicant to the Agency would be acceptable for this purpose.

(2) By the Agency accepting the determination of significance relevant to a major modification based on the applicant's submission.

At this point the determination of "significant" or "not significant" has been made. For significant changes, if the applicant proposes to show compliance with an earlier requirement, the procedure outlined in Section 8 should be used.

8. SHOWING COMPLIANCE WITH AN EARLIER REQUIREMENT, 21A.101(b) (2) and (3)

a. For a design change that has been determined to be significant, 21A.101(b)(2) and (3) provide the exceptions from the requirement of 21A.101(a) to meet the latest requirements for design changes.

b. 21A.101(b)(2) and (3) identify conditions under which an applicant may show that the changed product complies with an earlier amendment level or with the existing type-certification basis and, therefore, would not be required to comply with latest requirements. The earlier amendment level with which the applicant intends to show compliance may not precede the corresponding requirements in the existing type-certification basis. An applicant may elect to show compliance with an earlier amendment level or with the existing type-certification basis for areas not affected by the change, and areas affected by the change for which compliance with the latest requirements would not contribute materially to the level of safety or would be impractical. It is incumbent upon the applicant to demonstrate to the Agency that compliance with the latest requirements does not materially contribute to the level of safety, or is impractical.

c. The following steps should be used in conjunction with Figure 1, when an applicant wishes to comply with an earlier requirement for a significant change.

Step 5 of Figure 1. For every area, is the area affected by the proposed change? 21A.101 (b)(2).

a. A “not affected area” is any area, system, component, equipment, or appliance that is not affected by the proposed product level change. For a product level change, it is important that the effects of such change on other systems, components, equipment, or appliances of the product are properly assessed because areas that have not been changed may be affected. If the significant change does not affect the area, then the type-certification basis for that area need not be revisited.

b. In assessing not affected areas, it may be necessary to identify secondary changes resulting from a product level change. The secondary changes may be changes in both physical aspects and/or performance characteristics that are not part of, but consequential to, the overall product level change. Secondary changes may be evaluated to the existing type-certification basis for the product being changed; however, care should be taken to ensure that affected areas are not overlooked. The intent is to encompass all aspects where there is a need for re-evaluation.

c. The following aspects of a product level change should be considered:

(1) Physical aspects. The physical aspects include, but are not limited to, structures, systems, equipment, components and appliances (physical aspects can cover both "hardware" and "software"). When evaluating the physical aspects, it is necessary to make a distinction between the product level change and the resulting secondary effects. An example of a secondary effect may be the lengthening and re-routing of the various aeroplane circuits as a result of the fuselage plug.

(2) Performance/functional characteristics. The less obvious aspect of the word "areas" covers general characteristics of the type-certificated product such as performance features, handling qualities, emergency provisions, fire protection, structural integrity, aero elastic characteristics, or crashworthiness. These characteristics may be affected by a product level change. For example, adding a fuselage plug could significantly affect performance and handling qualities

d. All areas affected by the proposed design change should comply with the latest requirements, unless the applicant shows that demonstrating compliance with an amendment of a requirement would not contribute materially to the level of safety or would be impractical. Step 6 provides further explanation.

Step 6 of Figure 1. Are the new requirements practical and/or do they contribute materially to the level of safety, 21A.101(b) (3)?

a. Not contributing materially to the level of safety. Compliance with the latest requirements could be considered “not to contribute materially to the level of safety” if the change to type design and/or relevant experience demonstrates a level of safety comparable to that provided by the latest requirements, or if compliance may compromise the existing level of safety for that particular changed product. The applicant should provide sufficient justification to allow the Agency to make this determination. This exception could be applicable in the situations described in the paragraphs below.

(1) Design. This provision gives the opportunity to consider the consistency of design. For example, when a small fuselage plug is added, additional seats and overhead bins are likely to be installed, and the lower cargo hold extended. These additional seats, bins, extended lower cargo hold and structural plug may be identical to the existing parts. Applying the latest requirements only to the changed parts may not contribute materially to the level of safety, as the entire design as modified may not necessarily be any safer than the original design. It also may be inappropriate to require compliance to the latest requirements for the entire fuselage, seats, bins, doors and cargo holds. For this reason, compliance of the new fuselage structure, seats, bins

and cargo hold area with the requirements in effect when the original fuselage, seats, bins and cargo hold area were certified may be acceptable.

(2) However, the extent of the fuselage change may be large relative to the original certificated structure, seats, bins, doors and cargo compartment, and/or the change may require a new compliance substantiation that is comparable with that required for a new model aeroplane. Here, it would be expected that the proposed type-certification basis would encompass the requirements in effect at the date of application for the entire fuselage, seats, bins, doors and cargo hold.

In the example above, it would be incumbent upon the applicant to show that compliance with the latest requirements does not materially contribute to the level of safety.

(3) Service experience

(a) This provision permits the use of relevant service experience, such as fleet hours, to demonstrate that compliance with the latest requirements would not contribute materially to the level of safety, and as such the use of earlier requirements may be appropriate. Appendix 3 provides additional guidance on the use of service experience, along with examples.

(b) There may be cases for rotorcraft and small aeroplanes where sufficient and relevant data may not be available because of the reduced utilisation and the different amount and type of data available. In such cases, other service history information may provide sufficient data to justify the use of earlier requirements, such as: warranty, repair and parts usage data; accident, incident and service difficulty reports; service bulletins; airworthiness directives; or other pertinent and sufficient data collected by the manufacturers, authorities, or other entities.

(c) The service experience levels necessary to demonstrate the appropriate level of safety as they relate to the proposed design change would have to be reviewed and agreed to by the Agency.

(4) Other exceptions. Compliance with later requirements would not be required where the amendment is of an administrative nature and has been made only to correct errors or omissions, consolidate text or clarify an existing requirement.

b. Impractical. Compliance with the latest requirements may be considered impractical if the applicant can substantiate that it would result in additional resource requirements that are not commensurate with the safety benefits. The additional resource requirements could include those arising from design changes required for compliance and the effort required to demonstrate compliance, but would not include resource expenditures for prior product changes.

(1) Substantiating data and analyses must support an applicant's position that compliance is impractical, and the Agency must agree with this position. In evaluating an applicant's position and substantiating data regarding impracticality the Agency may consider other factors (e.g., the costs and safety benefits for a comparable new design).

(2) A review of transport category projects showed that in certain cases, where an earlier amendment to applicable requirements was allowed, design changes were made to nearly comply with the latest amendments. In these cases the applicant successfully demonstrated that full compliance would require a substantial increase in the outlay of resources with a very small increase in the level of safety. These cases reflect an appropriate application of "impracticality" to a changed product.

(3) A proposal that a product design change would be impractical would be used, in most cases, where compliance with the latest requirements would contribute materially to the level of safety, but this contribution may not be commensurate with the associated resource expenditures.

(4) Appendix 2 to GM 21A.101provides additional guidance and examples for determining impracticality.

c. This completes the step by step process used in the determination of the type-certification basis for the changed product.

9. EXCEPTED PRODUCTS UNDER 21A.101(c)

a. An applicant for a change to an aircraft (other than rotorcraft) of 6 000 pounds or less maximum weight, or to a non-turbine rotorcraft of 3 000 pounds or less maximum weight may show that the changed product complies with the requirements incorporated by reference in the type-certificate. The applicant may elect to comply with the later requirements. If the Agency finds that the change is significant in an area, the Agency may designate compliance with an amendment to the type-certification basis incorporated by reference in the type-certificate that applies to the change and any requirement that the Agency finds is directly related. Beginning with the existing type-certification basis, the Agency will step through each progressive requirement to determine the amendment appropriate for the change. However, if the Agency also finds that compliance with the amendment or requirement would not contribute materially to the level of safety of the changed product, or would be impractical, the Agency may allow compliance with an earlier amendment to that requirement initially designated or with the existing type-certification basis, depending on the proposed design change.

b. For a change that contains new design features that are novel and unusual, the Agency will designate the applicable special conditions at the appropriate amendment level beginning with the existing type-certification basis and progress to the most appropriate later amendment level for the change. For a change that contains new features, which are not covered in the existing type-certification basis, the Agency will designate the applicable airworthiness requirements at the appropriate amendment level, beginning with the existing type-certification basis and progress to the most appropriate later amendment level for the change.

c. The exception for products under 21A.101(c) applies at the aircraft level only. Design changes to engines and propellers installed on these excepted aircraft are assessed as separate products using 21A.101(a) and (b).

10. SPECIAL CONDITIONS, 21A.101(d).

21A.101(d) allows for the application of special conditions, or for changes to existing special conditions, to address the changed design. The objective is to achieve, for the significant change, a level of safety consistent with that provided by the requirements in effect on the date of application for the design change. The application of special conditions to a design change is not in itself a reason for it to be classified as either a substantial change or a significant change. When the change is not significant, the Special Conditions should be consistent with the agreed type-certification basis.

11. EFFECTIVE PERIOD FOR AN APPLICATION TO CHANGE A TYPE-CERTIFICATE, 21A.101(e).

21A.101(e) is intended to ensure that, at the time the changed product is certificated, no longer than three or five years, as appropriate to the product, has elapsed from the date of application. This is to

ensure that the type-certification basis for the changed product is as current as practical. This is consistent with the requirements of 21A.17 for a new type-certificate and prescribes the process of updating the type-certification basis if these limits are exceeded.

12. DOCUMENTATION

All changes that result in a revision to the product's type-certification basis should be reflected on the type-certificate data sheet. Similarly, the type-certification basis should be noted on all STCs.

Appendix 1 to GM 21A.101
CLASSIFICATION OF CHANGES

Appendix 1 includes tables of typical changes for small aeroplanes (figure 1), large aeroplanes (figure 2), rotorcraft (figure 3), and engines/propellers (figure 4) that meet the definition of a significant change or substantial change for each product line. The Appendix also includes typical changes that do not achieve the significant level.

a) The examples in the tables were developed from data collected from regulatory files and included industry review and input. They clearly are changes that we have seen in the past and will likely continue to see in the future. The Agency has made the determination, based on applying the automatic criteria, that these changes are significant or not significant.

b) The columns "Change to General Configuration", "Change to Principles of Construction" and "Assumptions of Certification" reflect the automatic criteria of 21A.101(b)(1)(i) and (ii). The "Notes" column provides typical rationales that are considered in evaluating the designation of the criteria.

c) The tables may be used in one of two ways:

(i) to classify a proposed change that is listed in the table, or

(ii) in conjunction with the three automatic criteria, to understand the logic used in the table to help classify a proposed change not in the table.

d) The classification may change due to cumulative effects and/or combinations of individual changes.

Figure 1. Table of examples of changes for Small Aeroplanes:

The following are examples of substantial changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Change in wing location (tandem, forward, canard, high/low)	Yes	No	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.
Fixed wing to tilt wing	Yes	Yes	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.
Increase in the number of engines from one to two	Yes	Yes	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.
Replacement of piston or turbo-prop engines with turbojet or turbofan engines	Yes	Yes	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.
Change in engine configuration (tractor to pusher)	Yes	Yes	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.
Change from an all metal airplane to all composite primary structure (fuselage, wing, empennage).	No	Yes	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable

				requirements is required.
Increase from subsonic to supersonic flight regime	Yes	No	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.

The following are examples of significant changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Conventional tail to T-tail or Y-tail, or vice versa	Yes	No	Yes	Change in general configuration. Requires extensive structural, flying qualities and performance re-investigation. Requires new AFM to address performance and flight characteristics.
Changes in wing configuration (addition of tail strakes or change in dihedral, or changes in wing span, flap or aileron span, angle of incidence of the tail, addition of winglets, or wing sweep of more than 10%	Yes	No	Yes	Change in general configuration . Likely requires extensive changes to wing structure. Requires new AFM to address performance and flight characteristics. Note: Small changes to wingtip are not significant changes. See table for not significant changes.
Tricycle / tailwheel undercarriage change or addition of floats	Yes	No	No	Change in general configuration. Likely, at airplane level, general configuration and certification assumptions remain valid.
Increase in seating capacity resulting in a different certification category (e.g., from normal to commuter category where configuration or principles of construction changes or assumptions do not remain valid.	Yes	Yes	Yes	Change in general configuration. Change in principles of construction. Requires extensive construction re-assessment. Change in certification assumptions. Requires new AFM and pilot type rating.
Passenger to	Yes	No	Yes	Change in general

freighter configuration conversion which involves the introduction of a cargo door or an increase in floor loading of more than 20%, or provision for carriage of passengers and freight together				configuration affecting load paths, aeroelastic characteristics, aircraft related systems, etc. . Change in design assumptions.
A fuselage stretch would be considered significant if it would invalidate the existing substantiation, or would change the primary structure, aerodynamics, or operating envelope sufficiently to invalidate the assumptions of certification	Yes	No	Yes	Likely extensive changes to fuselage structure, aerodynamics, aircraft systems performance, and operating envelope. Requires new AFM to address performance and flight characteristics.
Replace reciprocating engines with the same number of turbo-propeller engines where the operating envelope is expanded	No	No	Yes	Invalidates certification assumptions. Requires new AFM to address performance and flight characteristics.
Addition of a turbo-charger that changes the power envelope, operating range, or limitations appreciably.	No	No	Yes	Invalidates certification assumptions due to changes in operating envelope and limitations. Requires new AFM to address performance and flight characteristics.
The replacement of an engine of higher rated power or increase thrust would be considered significant if it would invalidate the existing substantiation, or would change the primary structure, aerodynamics, or operating envelope sufficiently to invalidate the	No	Yes	Yes	Invalidates certification assumptions. Requires new AFM to address performance and flight characteristics. Likely changes to primary structure. Requires extensive construction re-investigation.

assumptions of certification				
A change in the type of material, such as composites in place of metal (or one composite fibre material system with another (e.g., carbon for fibreglass), for primary structure would normally be assessed as a significant change.	No	Yes	Yes	Change in principles of construction and design from conventional practices . Likely change in design/certification assumptions.
Change involving appreciable increase in design speeds Vd, Vmo, Vc, or Va	No	No	Yes	Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics.
STOL kit	No	No	Yes	Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics.
A change in the rated power or thrust is likely to be regarded as significant if the design speeds are thereby changed so that compliance needs to be re-justified with a majority of requirements.	No	No	Yes	Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics.
Fuel state: such as compressed gaseous fuels, or fuel cells. This could completely alter the fuel storage and handling systems and possibly affect the aeroplane structure.	No	No	Yes	Changes in design/certification assumptions. Extensive alteration of fuel storage and handling systems.
A design change that alters the aircraft flight characteristics or performance from the type design would normally be significant if it appreciably changes the kinematics or dynamics of the aeroplane.	No	No	Yes	Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics.

Weight increase which places the aircraft into the commuter category (i.e., above 12500 lbs.)	No	No	Yes	Certification assumptions invalidated. Requires new AFM.
A change in the flight control concept for an aircraft, for example to fly by wire (FBW) and side-stick control, or a change from hydraulic to electronically actuated flight controls, would in isolation normally be regarded as a significant change.	No	No	Yes	Changes in design and certification assumptions. Requires extensive systems architecture and integration re-investigation. Requires new AFM.
Addition of cabin pressurisation	No	Yes	Yes	Extensive airframe changes affecting load paths, fatigue evaluation, aero elastic characteristics, etc. Requires extensive construction re-investigation. Invalidates design assumptions.
Changes in types and number of emergency exits or an increase in passenger capacity in excess of maximum passenger capacity demonstrated for the aircraft type.	No	No	Yes	Emergency egress requirements exceed those previously substantiated. Invalidates assumptions of certification.
A change in the required number of flight crew, which necessitates a complete cockpit re-arrangement, and/or an increase in pilot workload would be a significant change.	No	No	Yes	Extensive changes to avionics and aircraft systems. Invalidates certification assumptions. Requires new AFM.
An appreciable expansion of an aircraft's operating envelope or operating capability would normally be a significant change. e.g., an increase in maximum altitude limitation, approval for flight in known	No	No	Yes	Invalidates certification assumptions. Requires new AFM to address performance and flight characteristics.

icing conditions, an increase in airspeed limitations				
A major flight deck upgrade	No	No	Yes	Extensive changes to avionics and electrical systems design. Invalidates certification assumptions. Extensive re-assessments of systems integration, flight crew workload, human factors evaluation are required. Requires new AFM.
Introduction of autoland	No	No	Yes	Invalidates original design assumptions.
Conventional tail to T-tail or Y-tail, or vice versa	Yes	No	Yes	Change in general configuration. Requires extensive structural, flying qualities and performance re-investigation. Requires new AFM to address performance and flight characteristics.

The following are examples of not significant changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Addition of wingtip modifications (not winglets)	No	No	No	Although a major change to the airplane. Likely the original general configuration, principles of construction and certification assumptions remain valid.
Installation of skis or wheel skis	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
FLIR or surveillance camera installation.	No	No	No	Additional flight or structural evaluation may be necessary but the change does not alter basic airplane certification.
Litter, berth and cargo tie down device installation	No	No	No	Not an airplane level change.
Increased tire size, including tundra tires	No	No	No	Not an airplane level change.
Replacement of one propeller type with another (irrespective of increase in number of blades)	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
Addition of a turbo-charger that does not appreciably change the power envelope, operating range, or limitations (e.g., a turbo—normalised engine), (e.g., where the additional power is used to enhance high altitude or hot day performance.)	No	No	No	Not an airplane level change.
Replace a petrol engine with a diesel	No	No	No	Although a major change to the

engine or approximately the same horsepower.				airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
Substitution of one method of bonding for another (e.g., change in type of adhesive)	No	No	No	Not an airplane level change.
Substitution of one type of metal for another	No	No	No	Not an airplane level change.
Any change in construction or fastening not involving primary structure	No	No	No	Not an airplane level change.
A new fabric type for fabric skinned aircraft	No	No	No	Not an airplane level change.
Increase in flap speed or undercarriage limit speed	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
Structural strength increases	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
IFR upgrades involving installation of components (where the original certification does not indicate that the aeroplane is not suitable as an IFR platform, e.g., special handling concerns).	No	No	No	Not an airplane level change.
Fuel lines, where engine horsepower is increased but fuel flow is not increased beyond the certified maximum amount.	No	No	No	Not an airplane level change.
Fuel tanks, where fuel is changed from gasoline to diesel	No	No	No	Not an airplane level change.

fuel and tank support loads are small enough that an extrapolation from the previous analysis would be valid. Chemical compatibility would have to be substantiated				
Limited changes in a pressurisation system, e.g., number of outflow valves, type of controller, or size of pressurised compartment, but the system must be re-substantiated if the original test data is invalidated.	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
Install a quieter exhaust system	No	No	No	Not an airplane level change.
Changes in engine cooling or cowling	No	No	No	Not an airplane level change.
Fuel type: AvGas to Diesel/Jet A, AvGas to Ethanol/Methanol. Changing to Multiple fuel systems containing fuel types (other than systems used for starting): such systems using as AvGas/Ethanol, or Jet A/Autogas (turbine). Unrestricted mixtures in one fuel system of different fuel types: Such as AvGas/Diesel or Jet A/Ethanol.	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
Fuels of substantially the same type: Such as AvGas to AutoGas, AvGas (80/87) to AvGas (100LL), Ethanol to Isopropyl Alcohol, Jet B to Jet A (although Jet A to Jet B may be considered significant due to the fact that Jet B is considered	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.

potentially more explosive).				
Fuels that specify different levels of "conventional" fuel additives that do not change the primary fuel type. Different additive levels (controlled) of MTBE, ETBE, Ethanol, Amines, etc. in AvGas would not be considered a significant change.	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
A change to the maximum take-off weight of less than 5% unless assumptions made in justification of the design are thereby invalidated.	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
An additional aileron tab (e.g. on the other wing)	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
Larger diameter flight control cables with no change in routing, or other system design	No	No	No	Not an airplane level change.
Autopilot installation (for IFR use, where the original certification does not indicate that the aeroplane is not suitable as an IFR platform)	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid.
Increased battery capacity or relocate battery	No	No	No	Not an airplane level change.
Replace generator with alternator	No	No	No	Not an airplane level change.
Additional lighting (e.g., navigation lights, strobes)	No	No	No	Not an airplane level change.
Higher capacity brake assemblies	No	No	No	Not an airplane level change.
Increase in fuel tank capacity	No	No	No	Not an airplane level change.
Addition of an oxygen system	No	No	No	Not an airplane level change.
Relocation of a galley.	No	No	No	Not an airplane level change.

Passenger to freight (only) conversion with no change to basic fuselage structure.	No	No	No	Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. Requires certification substantiation applicable to freighter requirements.
Installation of new seat belt or shoulder harness	No	No	No	Not an airplane level change.
A small increase in cg range.	No	No	No	At airplane level, no change in general configuration, principles of construction & certification assumptions.
APU Installation that is not flight essential	No	No	No	A major change to the airplane level, likely the original general configuration, principles of construction and certification assumptions remain valid. Requires certification substantiation applicable to APU installation requirements.
An alternative autopilot	No	No	No	Not an airplane level change.
Addition of Class B Terrain Awareness and Warning Systems (TAWS)	No	No	No	Not an airplane level change.

Figure 2. Table of examples of changes for Large Aeroplanes

The following are examples of substantial changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Change in the number or location of engines, e.g., four to two wing-mounted engines or two wing-mounted to two body-mounted engines.	Yes	No	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.
Change from a high wing to low wing configuration.	Yes	No	Yes	Proposed change in design is so extensive that a

				substantially complete investigation of compliance with the applicable requirements is required.
Change from an all metal airplane to all composite primary structure (fuselage, wing, empennage).	Yes	Yes	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.

The following are examples of significant changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Derivative model, e.g., increased passenger payload, freighter version or complete update of a certified aeroplane.	Yes	Yes	Yes	Multiple changes packaged into a new model. Increased payload new freighter would change the general configuration and assumptions. Updated aeroplane could change principles of construction.
Reduction in the number of flight crew (In conjunction with flight deck update).	Yes	No	No	Extensive changes to avionics and aircraft systems. Impact to crew workload and human factors, pilot type rating.
Modify an aeroplane for flight in known icing conditions by adding systems for ice detection and elimination	Yes	No	Yes	New aircraft operating envelop. Requires major new systems installation and aircraft evaluation. Operating envelope changed.
Conversion – passenger or combi to all freighter including cargo door, redesign floor structure and 9g net or rigid barrier	Yes	No	Yes	Extensive airframe changes affecting load paths, aeroelastic characteristics, aircraft related systems for fire protection, etc. Design assumptions changed from passenger to freighter.
Change to pressurized cabin including the introduction of a pressurization system.	No	No	Yes	Essentially a re-certification of airframe and systems associated with operating envelope change.

Addition of leading edge slats	Yes	No	No	Requires extensive changes to wing structure, adds aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics.
Fuselage length change – lengthen or shorten fuselage	Yes	No	No	Requires extensive changes to fuselage structure, affects aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics.
Extensive structural airframe modification, such as installation of a large telescope with large opening in fuselage.	Yes	No	No	Requires extensive changes to fuselage structure, affects aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics.
Changing the number of axles or number of landing gear done in context with a product level change which involves changing the aeroplane gross weight.	Yes	No	No	Requires extensive changes to aircraft structure, affects aircraft l systems and requires AFM changes..
Primary structure changes from metallic material to composite material.	No	Yes	No	Change in principles of construction and design from conventional practices.
Typically, an increase in design weight of more than 10%	No	No	Yes	When it requires extensive re-substantiation of aircraft structure, aircraft performance and flying qualities and associated systems.
Wing changes in span, sweep, and tip designs or wing chord. (Note: Potentially substantial if it is a change from a high wing to a low wing, or a new wing.)	Yes	No	No	When it requires extensive changes to wing structure, adds aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics.
Change in type or number of emergency exits in conjunction with an increase in the number of passengers demonstrated.	No	No	Yes	The new emergency egress requirements exceed those previously substantiated.
Comprehensive	No	No	Yes	Affects avionics and

flight deck upgrade.				electrical systems integration and architecture concepts and philosophies. This drives a re-assessment of flight crew workload and other human factors issues, and requires a re-evaluation of the original design assumptions used for the cockpit.
Change in primary flight controls to fly by wire (FBW) system. (Some airplanes have some degree of FBW. Achieving full FBW may be a not significant change on some airplanes.)	Yes	No	Yes	When the degree of change is so extensive that it affects basic aircraft systems integration and architecture concepts and philosophies. This drives a complete re-assessment of flight crew workload, handling qualities, and performance evaluation, which are different from the original design assumptions.
Replace reciprocating with turbo-propeller engines	Yes	No	No	Requires extensive changes to airframe structure, adds aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics.
Typically a thrust increase of more than 10%	No	No	Yes	When it requires extensive re-substantiation of powerplant installation, and has a marked effect on aircraft performance and flying qualities.
Initial installation of an autoland system	No	No	Yes	Baseline airplane not designed for autoland operation, potential crew work load and systems compatibility issues
Installation of a new fuel tank, e.g., horizontal stabilizer tank or auxiliary fuel tank in the fuselage outside the wing in conjunction with increased maximum takeoff weight and takeoff thrust.	No	No	Yes	Requires changes to airframe, systems and AFM. Results in performance changes.
Main deck cargo door installation.	Yes	No	No	Redistribution of internal loads, change in aeroelastic characteristics, system changes.
Conversion from a passenger floor to a cargo floor and	No	No	Yes	Completely new floor loading and design. Redistribution of internal loads,

installation of a cargo handling system.				change in cabin safety requirements, system changes.
Initial installation of an APU essential for aircraft flight operation.	No	No	Yes	Changes emergency electrical power requirements, change in flight manual and operating characteristics.

The following are examples of not significant changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Alternate engine installation or hush kit at same position	No	No	No	Although an aeroplane level change, it is not significant so long as there is not more than a 10% increase in thrust or a change in the principles of propulsion.
Fuselage length change – lengthen or shorten fuselage	No	No	No	A small change in fuselage length due to re-fairing the aft body or radome for cruise performance reasons, where such changes do not require extensive structural, systems or AFM changes
Re-fairing of wing tip caps (e.g., for lights, fuel dump pipes) and addition of splitter plates to the trailing edge thickness of the cruise airfoil.	No	No	No	Does not require extensive structural, AFM, or systems changes.
Additional power used to enhance high altitude or hot day performance	No	No	No	Usually no change in basic operating envelope. Existing cert data can be extrapolated. Could be significant product change if the additional power is provided by installation of a rocket motor or additional, on demand engine due to changes in certification assumptions.
General avionics changes.	No	No	No	These modifications are generally adaptive* in nature, and do not change the original certification assumptions, alter basic cockpit design

				architecture concepts and philosophies, and do not have a major impact on crew workload or man/machine. *Adaptive means the change adapts to the existing airplane buses, power, structure, …
Initial installation of an autopilot system	No	No	No	Modification is generally adaptive in nature, with no change to original certification assumptions.
Integrated modular avionics	No	No	No	The basic functionality of the systems are unchanged. No change from analogue to digital.
Installation or rearrangement of an interior in an aircraft.	No	No	No	Special conditions could be used for new and novel features
Change from assembled primary structure to monolithic or integrally machined structure	No	No	No	Method of construction is well understood.
Modification to ice protection systems	No	No	No	Re-certification required, but type-certification basis is adequate.
Brakes: design or material change, e.g., steel to carbon	No	No	No	Re-certification required, but type-certification basis is adequate.
Redesign floor structure	No	No	No	By itself, this is not a significant product level change. It could be a significant change if part of a cargo converted passenger airplane.
Novel or unusual method of construction of a component.	No	No	No	Special conditions could be required if there are no existing requirements that adequately address these features. The component change does not rise to the product level change
Initial installation of a non-essential APU	No	No	No	A stand-alone initial APU installation on an airplane originally designed to use ground/airport supplied electricity, and air-conditioning. In this case, the APU would be an option to be independent of airport power.

Figure 3. Table of examples of Changes for Rotorcraft

The following are examples of substantial changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Change from the number and or configuration of rotors (e.g., main & tail rotor system to two main rotors.	Yes	No	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.
Change from an all-metal rotorcraft to all composite rotorcraft.	Yes	Yes	Yes	Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required.

The following are examples of significant changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Comprehensive Flight Deck Upgrade	Yes	No	Yes	The degree of change is so extensive that it affects basic avionics and electrical systems integration and architecture concepts and philosophies. This drives a complete reassessment of flight crew workload and other human factor issues, and requires a re-evaluation of the original design assumptions used for the cockpit.
Certification for flight into known icing conditions.	No	No	Yes	
(Fixed) flying controls from mechanical to fly by wire	Yes	Yes	Yes	

Addition of an engine; e.g., from single to twin or reduction of the number of engines; e.g., from twin to single	Yes	No	Yes	May be Substantial - depend upon project details
A fuselage modification that changes the primary structure, aerodynamics, or operating envelope sufficiently to invalidate the certification assumptions.	Yes	No	Yes	
Application of an approved primary structure to a different approved model (e.g., installation on a former model of the main rotor approved on a new model that results in increase performance	No	Yes	Yes	
Extensive Primary structure changes from metallic material to composite material.	No	Yes	Yes	Change in principles of construction and assumptions used for certification for the product level change. Changes of a few individual elements from metal to composite are not typically considered a significant change .
Emergency Medical Service Configuration with primary structural changes sufficiently to invalidate the certification assumptions	Yes	No	Yes	Any EMS configuration will not be classified as significant. Modifications made for EMS is typically internal and the general external configuration is normally not affected. These changes should not automatically be classified as significant.
Skid landing gear to wheel landing gear or wheel landing to skid	Yes	No	Yes	If the rotorcraft is such that the skid or wheel configuration is inherent in the basic certification design, the change may be not significant.
Change of the number of rotor blades	Yes	No	No	The addition/deletion of rotor blades may not be significant provided the remainder of the basic propulsion system remains

				essentially unchanged.
Change tail anti-torque device (e.g., tail rotor, ducted fan or other technology)	Yes	Yes	No	

The following are examples of not significant changes:

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Emergency floats	No	No	No	Must Comply to the specific applicable requirements for emergency floats. This installation, in itself, does not change the rotorcraft configuration, overall performance, or operational capability. Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger carrying operations to external load operations, or flight over water, or operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level.
FLIR or surveillance camera installation	No	No	No	Additional flight or structural evaluation may be necessary but the change does not alter the basic rotorcraft certification
Helicopter Terrain Awareness Warning System (HTAWS) for operational credit	No	No	No	Certified per rotorcraft HTAWS AC guidance material
Health Usage Monitoring System (HUMS) for Maintenance Credit	No	No	No	Certified per rotorcraft HUMS AC guidance material
Expanded limitations with minimal or no design changes, following further	No	No	No	Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger

tests/justifications or different mix of limitations (CG limits, oil temperatures, altitude, minimum/maximum weight, minimum/max external temperatures, speed, ratings structure)				carrying operations to external load operations, or flight over water, or operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level.
Installation of a new engine type, equivalent to the former one; leaving a/c installation and limitations substantially unchanged	No	No	No	Refer to AC 27-1 or AC 29-2 for guidance
Windscreen installation	No	No	No	Does not change the rotorcraft overall product configuration
Snow skis, "Bear Paws"	No	No	No	Must comply with specific requirements associated with the change. Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger carrying operations to external load operations, or flight over water, or operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level.
External Cargo Hoist	No	No	No	Must Comply to the specific applicable requirements for external loads. This installation, in itself, does not change the rotorcraft configuration, overall performance, or operational capability. Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger carrying operations to external load operations, or flight over water, or

				operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level.
IFR upgrades involving installation of components (where the original certification does not indicate that the rotorcraft is not suitable as an IFR platform, e.g., special handling concerns).	No	No	No	Not a rotorcraft level change.
An upgrade to CAT A certification approval	No	No	No	Typically these are engine and drive systems rating changes appropriate for CAT A and rotorcraft performance requirements. Rotorcraft modifications, if any necessary, do not typically invalidate the certification assumptions, or change the general configuration of principles of construction.
Reducing the number of pilots for IFR from 2 to 1	No	No	No	May be significant if there are extensive equipment and design changes such that the certification assumptions are invalidated or the general configuration of the rotorcraft is changed.

Figure 4. Engines and Propellers

The following are examples of significant changes:

Turbine engines

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Traditional turbofan to geared-fan engine	Yes	No	Yes	This change would affect the engine in terms of FOD ingestion,

				containment, etc… Note that this change is most likely substantial under 21A.19
Low bypass ratio engine to high bypass ratio engine with an increased inlet area.	Yes	No	Yes	Change in general configuration Likely change in model designation Not interchangeable Assumptions for certification may no longer be valid in terms of ingestion, icing, etc. Note that this change is l most likely substantial under 21A.19
Turbojet to Turbofan	Yes	No	Yes	Change in general configuration Likely change in model designation Not interchangeable Assumptions for certification may no longer be valid ingestion, icing, blade out criteria, etc. Note that this change is l most likely substantial under 21A.19
Turbo-shaft to turbo-propeller	Yes	No	Yes	Change in configuration such as an additional gearbox Change in model designation. Change in mission profile. Assumptions for certification may no longer be valid in terms of flight envelope, ratings, etc Note that this change is l most likely substantial under 21A.19
Conventional ducted fan to unducted fan	Yes	Yes	Yes	Change in configuration Change in Type. Not interchangeable Assumptions for certification may no longer be valid Note that this change is l most likely substantial under 21A.19
Conventional engine for subsonic operation to after-burning engine for supersonic operation	Yes	Yes	Yes	Change in configuration Change in Type Not interchangeable Assumptions for certification may no longer be valid Change in operating envelope Note that this change is l most likely substantial under 21A.19

Increase/decrease in the number of compressor/turbine stages with resultant change in approved limitations*. (* excludes life limits)	No	No	Yes	Change is associated with other changes that would affect performance envelope and may affect the dynamic behaviour in terms of backbone bending, torque spike effects on casing, surge and stall characteristics, etc.
New design fan blade and fan hub, or a bladed fan disk to a blisk or a fan diameter change that could not be retrofitted,	Yes	No	Yes	Likely change in model designation Change is associated with other changes that would affect engine thrust/power limitations and have affected the dynamic behaviour of the engine in terms of backbone bending, torque spike effects on casing, foreign object ingestion behaviour, burst model protection for the aircraft. If there is a diameter change, installation will be also affected.
Hydro-Mechanical to FADEC/EEC without hydro-mechanical backup	Yes	Yes	Yes	Change in engine control configuration Likely change in model designation Not interchangeable. Likely fundamental change to engine operation. Assumptions used for certification are no longer valid or were not
A change in the containment case from hard-wall to composite or vice-versa, that could not be retrofitted without additional major changes to the engine or restrictions in the initial limitations in the installation manual	No	Yes	No	Change in methods of construction that have affected inherent strength, backbone bending, blade to case clearance retention, containment wave effect on installation, effect on burst model, torque spike effects.
Replacement of the gas generator (core) with a different one that is associated with changes in approved	No	No	Yes	Change is associated with other changes that would affect performance envelope and may affect the dynamic behaviour of the engine Assumptions used for

limitations* (* excludes life limits)				certification may no longer be valid

Piston engines

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Convert from Mechanical to Electronic Control System	Yes	Yes	No	Change in engine control configuration. : Installation interface of engine changed Changes to principles of construction: Digital controllers and sensors require new construction techniques and environmental testing.
Add Turbocharger that increases performance and changes in overall product	Yes	No	Yes	Change in general configuration: Installation interface of engine changed (exhaust system) Certification assumptions invalidated. Change in engine configuration Change in operating envelope and performance
Convert from air-cooled cylinders to liquid cooled cylinders.	Yes	No	Yes	Change in general configuration: Installation interface of engine changed (cooling lines from radiator, change to cooling baffles) Certification assumptions invalidated. Change in operating envelope and engine temperature requirements.
Convert from spark-ignition to compression-ignition	Yes	No	Yes	Change in general configuration: Installation interface of engine changed (no mixture lever) Certification assumptions invalidated: Change in operating envelope and performance.

Propellers

Description of change	Is there a Change to the	Is there a Change to the	Have the assumptions	Notes

	General Configuration? 21A.101(b)(1)(i)	Principles of Construction? 21A.101(b)(1)(i)	used for Certification been invalidated? 21A.101(b)(1(ii)	
Introduction of a different principle of blade retention	Yes	Yes	No	Change in propeller configuration Likely change in model designation Propeller's operating characteristics and inherent strength require re-evaluation

Figure 4. Engines and Propellers

The following are examples of not significant changes:

Turbine engines

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Change in the material from one type of metal to another type of metal of a compressor drum	No	No	No	No change in performance No likely change in model designation Assumptions are still valid
Increase/decrease in the number of compressor/turbine stages without resultant change in performance envelope	No	No	No	No change in performance Model designation may or may not change Assumptions are still valid
New components internal to the FADEC/EEC the introduction of which does not change the function of the system	No	No	No	No change in configuration Retrofitable Assumptions used for certification are still valid Possible changes in principles of construction are insignificant
Software changes	No	No	No	
Rub-strip design changes	No	No	No	Component Level Change
A new combustor that does not change the approved limitations*, or dynamic behaviour (* excludes life limits)	No	No	No	Component Level Change
Bearing changes	No	No	No	Component Level Change
New blade designs with similar material that can be retrofitted	No	No	No	Component Level Change
Fan blade re-design that can be retrofitted	No	No	No	Component Level Change
Oil tank re-design	No	No	No	Component Level Change
Change from one hydro-mechanical	No	No	No	Component Level Change

control to another hydro-mechanical control				
Change to limits on life limited components	No	No	No	Component Level Change
Changes to limits on exhaust gas temperature	No	No	No	
Changes in certification maintenance requirements (CMR) with no configuration changes	No	No	No	
Bump ratings within the product's physical capabilities that may be enhanced with gas path changes that are limited to such changes as blade re-stagger, cooling hole patterns, blade coating changes, etc.	No	No	No	
A change in principal physical properties and mechanics of load transfer of a material of primary structure or highly loaded components. For example, change from traditional metal to either an exotic alloy or a composite material on a highly loaded component	No	No	No	Component Level Change

Piston engines

Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
A change in principal physical properties and mechanics of load transfer of a material of primary structure or highly	No	No	No	Component Level Change

loaded components. For example, change from traditional metal to either an exotic alloy or a composite material on a highly loaded component				
New or redesigned cylinder head, or valves or pistons.	No	No	No	Component Level Change
Changes in crankshaft	No	No	No	Component Level Change
Changes in crankcase	No	No	No	Component Level Change
Changes in carburettor	No	No	No	Component Level Change
Changes in mechanical fuel injection system	No	No	No	No controversy-No comments
Changes in mechanical fuel injection pump	No	No	No	Component Level Change
Engine model change to accommodate new airplane installation. No change in principles of operation of major subsystems; no significant expansion in power or operating envelopes or in limitations	No	No	No	
No change in basic principles of operation, or a simple mechanical change. For example, change from dual magneto to two single magnetos on a model	No	No	No	
Subsystem change produces no change in base input parameters, and previous analysis can be reliably extended. For example, a change in turbocharger where induction system inlet conditions remain unchanged, or if changed, the	No	No	No	

effects can be reliably extrapolated				
Change in material of secondary structure or not highly loaded component. For example, a change from metal to composite material in a non-highly loaded component, such as an oil pan that is not used as a mount pad	No	No	No	Component Level Change
Change in material that retains the physical properties and mechanics of load transfer. For example, a change in trace elements in a metal casting for ease of pouring or to update to a newer or more readily available alloy with similar mechanical properties	No	No	No	Component Level Change

Propellers

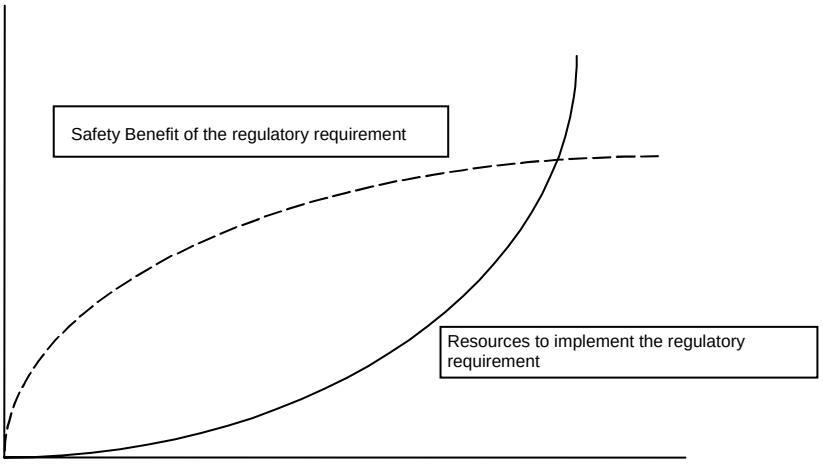
Description of change	Is there a Change to the General Configuration? 21A.101(b)(1)(i)	Is there a Change to the Principles of Construction? 21A.101(b)(1)(i)	Have the assumptions used for Certification been invalidated? 21A.101(b)(1(ii)	Notes
Change in the material of a blade bearing	No	No	No	Component Level Change
Change to a component in the control system	No	No	No	Component Level Change
Change to a de-icer boot	No	No	No	Component Level Change

Appendix 2 to GM 21A.101 PROCEDURE FOR EVALUATING IMPRACTICALITY OF APPLYING LATEST REQUIREMENTS TO A CHANGED PRODUCT

1. INTRODUCTION

The basic tenet of the changed product rule is that compliance of significant changes with the latest requirements will enhance the level of safety of these aviation products. However, in certain cases the cost of complying fully with a later requirement may not be commensurate with a small safety benefit achieved. It is also understood that the existing fleet and newly produced aeroplanes, engines and propellers are safe, and that any unsafe condition is immediately addressed through the airworthiness directive process. These concepts form the basis of finding it to be impractical to comply with a later requirement, allowing compliance with an earlier requirement is acceptable. This appendix gives one method of determining if compliance with a later requirement is impractical; however this does not preclude the use of other methods that have as a goal improving the safety of aeronautical products.

This GM recognises that other procedures have been used for some products and have been historically been accepted on a case-by-case basis. These procedures have not been fully harmonised and may not be acceptable for all products. It is envisaged that other methods will be developed and become part of this GM. Regardless of which method is used, the fundamental premise of these methods must be for the applicant to demonstrate a resource effective type-certification basis showing a positive safety benefit for the overall product. In this regard, any method used must also encourage incorporating the safety enhancements that will have the most dramatic impact on the accident rate and recognize the effective utilization of limited resources. This important point is illustrated graphically in the accompanying figure. This figure notionally shows the interrelation between the total resources required for incorporating each potential safety enhancement with the corresponding net increase in safety benefit. Typically one will find that there are proposals that will produce a positive safety benefit that can be introduced very resource effectively. Conversely, there are those that may produce small safety benefit but may require a large amount of resources to implement. Clearly, there will be a point where a large percentage of the potential safety benefit can be achieved with a reasonable expenditure of resources. The focus of the methods used should be to determine the most appropriate set of safety-significant regulatory standards relative to the respective cost to reach this point.



This Appendix to GM 21A.101 provides procedural guidance that maybe used as a starting point to determine the practicality of applying a requirement at a particular amendment level to a changed product. This guidance can be used for evaluating the safety benefit and resource impact of implementing the latest airworthiness requirements in the type-certification basis of a changed product. The procedure is generic in nature and describes the steps and necessary inputs that any applicant may use on any project to develop a position.

a. The procedure is intended to be used, along with good engineering judgement, to evaluate the relative merits of a changed product complying with the latest requirements.

b. This procedure provides a means, but not the only means, for an applicant to present its position in regards to impracticality.

c. The type-certification basis for a change to a product will not be at an amendment level earlier than the existing type-certification basis. Therefore, when determining the impracticality of applying a requirement at the latest amendment level only the increase in safety benefits and costs beyond compliance with the existing type-certification basis should be considered.

d. The following are steps to determine the impracticality of applying a requirement at a particular amendment level. The first step will be to identify the regulatory change being evaluated.

Step 1: Identify the Regulatory Change Being Evaluated

In this step it will be necessary to document:

The specific requirement (e.g., CS 25.365),
The amendment level of the existing type-certification basis for the requirement, and
The latest amendment level of the requirement.

Step 2: Identify the Specific Hazard that the Requirement Addresses

a. Each requirement and requirement amendment is intended to address a hazard or hazards. In this step the specific hazard(s) are identified. This identification will allow for a comparison of the effectiveness of amendment levels of the requirement at addressing the hazard.

b. In many cases the hazard and the cause of the hazard will be obvious. When the hazard and its related cause are not immediately obvious it may be necessary to review the explanatory note and comment/response document to the NPA and discuss the hazard with the Agency.

Step 3: Review the Consequences of the Hazard(s)

a. Once the hazard has been identified it is possible to identify the types of consequences that may occur because of the presence of the hazard. More than one consequence can be attributed for the same hazard. Typical examples of consequences would include, but not be limited to,:

(1) Incidents where only injuries occurred,

(2) Accidents where less than 10% of the passengers succumbed to their injuries,

(3) Accidents where 10% or more passengers succumbed to their injuries, and

(4) Accidents where a total hull loss occurred.

b. The explanatory note and comment/response document to the NPA may provide useful information regarding the consequences of the hazard the requirement is intended to address.

Step 4: Identify the Historical and Predicted Frequency of each Consequence

a. Another input in determining impracticality is the historical record of the consequences of the hazard that led to a requirement or an amendment to a requirement. From this data a frequency of occurrence for the hazard can be determined. It is important to recognise that the frequency of occurrence may be higher or lower in the future. Therefore, it also is necessary to predict the frequency of future occurrences.

b. More than one consequence can be attributed for the same hazard. Therefore, when applicable, the combination of consequences and frequencies of those consequences should be considered together.

c. The explanatory note and comment/response document to the NPA may provide useful information regarding the frequency of occurrence.

Step 5: Determine How Effective Full Compliance with the Latest Amendment of the Requirement would be at Addressing the Hazard

a. When each amendment is promulgated it is expected that compliance with the requirement would be completely effective at addressing the associated hazard. It is expected that the hazard would be eliminated, avoided, or dealt with. However, in a limited number of situations this may not be the case. It is also possible that earlier amendment levels may have addressed the hazard but were not completely effective. Therefore, in comparing the benefits of compliance with the existing type-certification basis to the latest amendment level it is useful to estimate the effectiveness of both amendment levels in dealing with the hazard.

b. It is recognised that the determination of levels of effectiveness is normally of a subjective nature. Therefore, prudence should be exercised when making these determinations. In all cases it is necessary to document the assumptions and data that support the determination.

c. The following five levels of effectiveness are provided as a guideline.

(1) Fully effective in all cases
Compliance with the requirement eliminates the hazard or provides a means to completely avoid the hazard.

(2) Considerable potential for eliminating or avoiding the hazard
Compliance with the requirement eliminates the hazard or provides a means to completely avoid the hazard for all probable or likely cases. However it does not cover all situations or scenarios.

(3) Adequately deals with the hazard
Compliance with the requirement eliminates the hazard or provides a means to completely avoid the hazard in many cases. However, the hazard is not eliminated or avoided in all probable or likely cases. Usually this action only addresses a significant part of a larger or broader hazard.

(4) Hazard only partly addressed
In some cases compliance with the requirement partly eliminates the hazard or does not completely avoid the hazard. The hazard is not eliminated or avoided in all probable or likely cases. Usually this action only addresses part of a hazard.

(5) Hazard only partly addressed but action has negative side effect
Compliance with the requirement does not eliminate or avoid the hazard or may have negative safety side effects. The action is of questionable benefit.

Step 6: Determine Resource Costs and Cost Avoidance

a. There is always a cost associated with complying with a requirement. This cost may range from minimal administrative efforts to the resource expenditures necessary to support full scale testing or the redesign of a large portion of an aircraft. However, there are also potential cost savings from compliance with a requirement. For example, compliance with a requirement may avoid aircraft damage or accidents and the associated costs to the manufacturer for investigating accidents. Compliance with the latest amendment of a requirement may also facilitate certification of a product by the competent authority of a third country.

b. When determining the impracticality of applying a requirement at the latest amendment level only the increase in costs, and safety benefits from complying with the existing type-certification basis should be considered.

c. When evaluating the cost, it may be beneficial for the applicant to compare the increase in cost to comply with the latest requirements to the cost to incorporate the same design feature in a new aeroplane. In many cases, an estimate for the cost of incorporation in a new aeroplane is provided in the regulatory evaluation by the Agency that was presented when the corresponding requirement was first promulgated. Incremental costs of retrofit/incorporation on existing designs may be higher than that for production. Examples of costs may include, but are not limited to,:

(1) Costs: The accuracies of fleet size projections, utilisation, etc. may be different than that experienced in actuality for derivative product designs and must be validated.

(a) Labour: Work carried out in the design, fabrication, inspection, operation or maintenance of a product for the purpose of incorporating or demonstrating compliance with a proposed action. Non-recurring labour requirements, including training should be considered.

(b) Capital: Construction of new, modified or temporary facilities for design, production, tooling, training or maintenance.

(c) Material: Cost associated with product materials, product components, inventory, kits and spares.

(d) Operating Costs: Costs associated with fuel, oil, fees and expendables.

(e) Revenue/Utility Loss: Costs resulting from earning/usage capability reductions from departure delays, product downtime, capability reductions of performance loss due to seats, cargo, range or airport restrictions.

(2) Cost Avoidance

(a) Avoiding cost of accidents including investigation of accidents, lawsuits, public relations activities, insurance, and lost revenue.

(b) Foreign Certification: Achieve a singular effort that would demonstrate compliance with the requirements of most competent authorities , thus minimising certification costs.

Step 7: Document Conclusion Regarding Practicality

a. Once the information from previous steps has been documented and reviewed, the applicant's position and rationale regarding practicality can be documented. Examples of possible positions would include, but are not limited to:

(1) Compliance with the latest requirement is necessary. The applicant would pursue the change at the latest amendment level.

(2) Compliance with an amendment level between the existing type-certification basis and the latest amendment would adequately address the hazard at an acceptable cost, while meeting the latest amendment level would be impractical. The applicant would then propose the intermediate amendment level of the requirement.

(3) The increased level of safety is not commensurate with the increased costs associated with meeting the latest amendment instead of the existing type-certification basis. Therefore, the applicant would propose the existing type-certification basis.

(4) The results of this analysis were inconclusive. Further discussions with the Agency are warranted.

NOTE: This process may result in a required type-certification basis that renders the proposed modification economically not viable.

2 EXAMPLES

The following examples are for large aeroplanes and are illustrative of the typical process followed by an applicant. The process will be the same for all product types.

2.1 Example 1: § 25.963 Fuel Tank Access Covers

(NOTE: This example is taken from a FAA certification, so references are made to FAR sections and amendments.)

a. This change is part of a significant transport aeroplane model change that increases passenger payload and gross weight by extending the fuselage 20 feet. The model change will feature increased thrust engines, strengthened wing and fuselage, and a completely redesigned landing gear. To accommodate the higher design weights, increased braking requirements and to reduce runway loading, the applicant will change the landing gear from a two-wheel to four-wheel configuration. The new model aeroplane will be required to comply with the latest applicable requirements based on the date of application.

b. The wing will be strengthened locally at the side of the body and at the attachment of engines and landing gear, but the applicant would not like to alter wing access panels and the fuel tank access covers. Although the applicant recognises that the scatter pattern and impact loading on the wing from debris being thrown from the landing gear will change, it proposes that it would be impractical to redesign the fuel tank access covers.

c. The applicant proposes to change the landing gear from a two-wheel configuration to a four-wheel configuration. This changes the debris scatter on the wing from the landing gear.

Step 1: Identify the Regulatory Change Being Evaluated

a. The existing type-certification basis of the aeroplane that is being changed is part 25 prior to amendment 69.

b. Amendment 25-69 added the requirement that fuel tank access covers on transport category aeroplanes be designed to minimise penetration by likely foreign objects, and be fire resistant.

Step 2: Identify the Specific Hazard that the Requirement Addresses

Fuel tank access covers have failed in service due to impact with high-energy objects such as failed tire tread material and engine debris following engine failures. In one accident, debris from the runway impacted a fuel tank access cover, causing its failure and subsequent fire, which resulted in fatalities and loss of the aeroplane. Amendment 25-69 will ensure that all access covers on all fuel tanks are designed or located to minimise penetration by likely foreign objects, and are fire resistant.

Step 3: Review the History of the Consequences of the Hazard(s)

Occurrences with injuries, and with more than 10% deaths

Step 4: Identify the Historical and Predicted Frequency of Each Consequence

a. In 200 million departures of large jets,
(1) 1 occurrence with more than 10% deaths, and
(2) 1 occurrence with injuries.

b. There is no reason to believe that the future rate of accidents will be significantly different than the historical record.

Step 5: Determine How Effective Full Compliance with the Latest Amendment of the Requirement would be at addressing the Hazard

Considerable potential for eliminating or avoiding the hazard
Compliance with amendment 25-69 eliminates the hazard or provides a means to completely avoid the hazard for all probable or likely cases. However, it does not cover all situations or scenarios

Step 6: Determine Resource Costs and Cost Avoidance

a. Costs:
(1) For a newly developed aeroplane there would be minor increases in labour resulting from design and fabrication.

(2) There would be a negligible increase in costs related to materials, operating costs, and revenue utility loss.

b. Cost avoidance:

(1) There were 2 accidents in 200 million departures. The applicant believes that it will manufacture more than 2000 of these aeroplanes or derivatives of these aeroplanes. These aeroplanes would average 5 flights a day. Therefore, statistically there will be accidents in the future if the hazard is not alleviated. Compliance will provide cost benefits related to avoiding lawsuits, accident investigations and public relation costs.

(2) There are cost savings associated with meeting a single type-certification basis for FAA and foreign requirements.

Step 7: Document Conclusion Regarding Practicality

It is concluded that compliance with the latest requirement increases the level of safety at a minimal cost to the applicant. Based on the arguments and information presented by the applicant through the issue paper process, the Agency determined that meeting the latest amendment would not be impractical.

2.2 Example 2: § 25.365 Pressurised Compartment Loads

(NOTE: This example is taken from a FAA certification, so references are made to FAR sections and amendments.)

a. For the product change described in Example 1, the lengthened fuselage affects the size of the main deck passenger compartment and the lower centre cargo compartment. The applicant plans to comply fully with the latest pressurised compartment loads except for one interior partition for which the applicant believes compliance would be impractical.

b. The applicant proposes to increase the length of the fuselage by installing fuselage plugs. This change affected the size of the main deck passenger compartment and the lower centre cargo compartment.

Step 1: Identify the Regulatory Change Being Evaluated

a. The existing type-certification basis of the aeroplane that is being changed includes § 25.365 at amendment 25-54. The initial release of § 25.365 required that interior structure of passenger compartments be designed to withstand the effects of a sudden release of pressure through an opening resulting from the failure or penetration of an external door, window, or windshield panel, or from structural fatigue or penetration of the fuselage, unless shown to be extremely remote.

b. Amendment 25-54 revised § 25.365 to require that the interior structure be designed for an opening resulting from penetration by a portion of an engine, an opening in any compartment of a size defined by § 25.365(e)(2), or the maximum opening caused by a failure not shown to be extremely improbable.

c. Amendment 25-71 extended the requirement to all pressurised compartments, not just passenger compartments, and to the pressurisation of unpressurised areas. The later requirement had previously been identified as an unsafe feature under § 21A.21(b)(2).

Step 2: Identify the Specific Hazard that the Requirement Addresses

The hazard is a catastrophic structure and/or system failure produced by a sudden release of pressure through an opening in any compartment in flight. This opening could be caused by an uncontained engine failure, an opening of a prescribed size due to the inadvertent opening of an external door in flight, or by an opening caused by a failure not shown to be extremely improbable. The opening could be produced by an event that has yet to be identified.

Step 3: Review the History of the Consequences of the Hazard(s)

Occurrences with injuries, less than 10% deaths, and more than 10% deaths

Step 4: Identify the Historical and Predicted Frequency of Each Consequence

a. In 200 million departures of large jets,

(1) 2 occurrences with more than 10% deaths,

(2) 1 occurrence with less than 10% deaths, and

(3) 1 occurrence with injuries.

b. There is no reason to believe that the future rate of accidents will be significantly different than the historical record.

Step 5: Determine How Effective Full Compliance with the Latest Amendment of the Requirement would be at addressing the Hazard

a. Fully effective in all cases
Compliance with amendment 25-71 eliminates the hazard or provides a means to completely avoid the hazard.

b. Considerable potential for eliminating or avoiding the hazard

Compliance with amendment 25-54 eliminates the hazard or provides a means to completely avoid the hazard for all probable or likely cases. However, it does not cover all situations or scenarios.

c. Adequately deals with the hazard
Compliance with the original type-certification basis eliminates the hazard or provides a means to completely avoid the hazard in many cases. However, the hazard is not eliminated or avoided in all probable or likely cases. Usually this action only addresses a significant part of a larger or broader hazard.

d. Design changes made to the proposed derivative aeroplane bring it nearly into compliance with § 25.365 amendment 25-71. Analyses show that one interior partition would fail when subjected to the pressure differential defined by the latest requirement. However, its failure would not have an impact on continued safe flight and landing. This is because none of the critical or essential systems are affected by failure of this partition and its failure would not present a hazard to a crewmember. Design solutions were considered for this partition, including structural reinforcement and additional venting area, but all were found to require substantial changes. With this design the applicant believes that most of the safety benefits have been achieved and that no appreciable increase in safety would be achieved by complying fully with amendment 25-71.

Step 6: Determine Resource Costs and Cost Avoidance

a. Costs:

(1) For a newly developed aeroplane there would be a significant increase in costs related to labour and capital to comply with amendment 25-71 instead of the original type-certification basis.

(2) There would be a negligible increase in costs related to materials, operating costs, and revenue utility loss.

(3) There would be savings in both labour and capital costs if compliance were shown to amendment 25-54 instead of amendment 25-71.

b. Cost Avoidance:

(1) There were 4 accidents in 200 million departures. The applicant believes that it will manufacture more than 2000 of these aeroplanes or derivatives of these aeroplanes. These aeroplanes would average 5 flights a day. Therefore, statistically there will be accidents in the future if the hazard is not alleviated. Compliance will provide cost benefits related to avoiding lawsuits, accident investigations and public relation costs.

(2) There are cost savings associated with meeting a single type-certification basis for FAA and foreign requirements.

Step 7: Document Conclusion Regarding Practicality

The design is in compliance with §25.365 amendment 25-54, and nearly in full compliance to amendment 25-71. The design would adequately address the hazard at an acceptable cost. Therefore, based on arguments of impracticality discussed in an issue paper, the Agency accepts the applicant's proposal to comply with §25.365 amendment 25-54.

Appendix 3 to GM 21A.101
THE USE OF SERVICE EXPERIENCE IN THE CERTIFICATION PROCESS.

1. INTRODUCTION

Service experience may be utilised to support the application of an earlier type-certification basis if the earlier type-certification basis in conjunction with the applicable service experience and other compliance measures provides a level of safety comparable to that provided by the latest requirements. It is incumbent on the applicant to provide sufficient substantiation to allow the Agency to make this determination. A statistical approach may be used, subject to the availability and relevance of data, however sound engineering judgement must be used. For service history to be acceptable, the data must be both sufficient and pertinent.

The essentials of the process involve:

a. A clear understanding of the requirement change and the purpose for the change;
b. A determination based on detailed knowledge of the proposed design feature;
c. The availability of pertinent and sufficient service experience data, and
d. A comprehensive review of that service experience data.

2. GUIDELINES

The Certification Review Item (CRI) procedure would be used and the applicant should provide documentation to support the following:

a. The identification of the differences between the requirement in the existing basis and the requirement as amended, and the effect of the change in the requirement.

b. A description as to what aspect of the latest requirements the proposed changed product would not meet.

c. Evidence showing that the proposed type-certification basis for the changed product, together with applicable service experience, provides a level of safety consistent with complying with the latest requirements.

d. A description of the design feature and its intended function

e. Data for the product pertinent to the requirement:

(1) Service experience from such sources as the following

(a) Accident Reports
(b) Incident Reports
(c) Service Bulletins
(d) Airworthiness directives
(e) Repairs
(f) Modifications
(g) Flight hours/cycles for fleet leader and total fleet
(h) World Airline Accident Summary (WAAS) Data
(i) Service Difficulty Reports
(j) Reports from Accident Investigation Bureaux
(k) Warranty, repair and parts usage data

(2) Show that the data presented represents all relevant service experience for the product, including the results of any operator surveys, and is comprehensive enough to be representative

(3) Show that the service experience is relevant to the issue.

(4) Identification and evaluation of each of the main areas of concern, with regard to:

(a) recurring and/or common failure modes
(b) cause
(c) probability, by qualitative reasoning
(d) measures already taken and their effects

(5) Relevant data pertaining to aircraft of similar design and construction may be included

(6) Evaluation of failure modes and consequences through analytical processes. The analytical processes should be supported by:

(a) A review of previous test results; and
(b) Additional detailed testing.

f. A conclusion that draws together the data and the rationale

g. These guidelines are not intended to be limiting, either in setting required minimum elements or in precluding alternative forms of submission. Each case may be different, based on the particulars of the system being examined and the requirement to be addressed.

3. EXAMPLE

The following example is for large aeroplanes and is illustrative of the typical process followed by an applicant. The process will be the same for all product types.

a. Transport Aeroplanes: § 25.1141(f) Auxiliary Power Unit (APU) Fuel Valve Position Indication

(NOTE: This example is taken from a FAA certification, so references are made to FAR sections and amendments.)

b. This example comes from a new generation model transport aeroplane where extensive changes where made to the main airframe components, engines and systems. The baseline aeroplane has an extensive service history. The purpose of the example is to show how the use of service experience is used to support a finding that compliance with the latest requirement would not contribute materially to the level of safety, and that application of the existing type-certification basis (or earlier amendment) would be appropriate. The example is for significant derivatives of transport aeroplanes with extensive service history. It is provided to illustrate the process, following the guidelines given in this Appendix, but does not include the level of detail that would normally be required.

(1) The differences between the requirement in the existing type-certification basis and the requirement as amended, and the effect of the change in the requirement.

The existing type-certification basis of the aeroplane that is being changed is the initial release of part 25. Amendment 25-40 added the requirement §25.1141(f) that power-assisted valves must have a means to indicate to the flight crew when the valve is in the fully open or closed position, or is moving between these positions.

(2) What aspect of the latest requirements the proposed changed product would not be met.

The proposed APU fuel valve position indication system does not provide the flight crew with fuel valve position or transition indication, and therefore does not comply with the requirements of §25.1141(f).

(3) Evidence that the proposed type-certification basis for the changed product, together with applicable service experience and other compliance measures provide an acceptable level of safety.

The APU fuel shut off valve and actuator are unchanged from those used on the current family of aeroplanes, and have been found to comply with the earlier amendment 25-11 of §25.1141(f). The existing fleet has achieved approximately xx flights during which service experience of the existing design has been found to be acceptable. If one assumes a complete APU cycle, i.e. start up and shutdown for each flight, the number of APU fuel shut off valve operations would be over 10^8 cycles, which demonstrates that the valve successfully meets its intended function and complies with the intent of the requirement. In addition, the system design for the changed product incorporates features, which increase the level of functionality and safety.

(4) A description of the design feature and its intended function.

The fuel shut off valve, actuator design, and operation is essentially unchanged, with the system design ensuring that the valve is monitored for proper cycling from closed to open at start initiation. If the valve is not in the appropriate position (i.e., closed) then the APU start is terminated, an indication is displayed on the flight deck and any further APU starts are prevented. Design improvements using the capability of the APU Electronic Control Unit (ECU) have been incorporated in this proposed product change. These design changes ensure that the fuel valve indication system will indicate failure of proper valve operation to the flight crew, albeit the system does not indicate valve position as required by §25.1141(f).

(5) Data for the product pertinent to the requirement.

An issue paper was co-ordinated which included data, or referenced reports, documenting relevant service experience that has been compiled from incident reports, fleet flight hour/cycle data, and maintenance records. The issue paper also discussed existing and proposed design details, failure modes, and analyses showing to what extent the proposed aeroplane complies with the latest amendment of §25.1141. Information is presented to support the applicant's argument that compliance with the latest amendment would not materially increase the level of safety. Comparative data pertaining to aircraft of similar design and construction are also presented.

(6) Conclusion drawing together the data and rationale.

The additional features incorporated in the APU fuel shut off valve will provide a significant increase in safety to an existing design with satisfactory service experience. The applicant proposes that compliance with the latest amendment would not materially increase the level of safety, and that compliance with §25.1141 at amendment 25-11 would provide an acceptable level of safety for the proposed product change.

Subpart E – Supplemental type-certificates

GM 21A.112B
Demonstration of capability for supplemental type-certificate cases

See also AMC 21A.14(b) for the details of the alternative procedures.

The following examples of major changes to type design (ref: 21A.91) are classified in two groups. Group 1 contains cases where a design organisation approved under Part 21 Subpart J ("Subpart J DOA") should be required, and Group 2 cases where the alternative procedure may be accepted. They are typical examples but each STC case should be addressed on its merits and there would be exceptions in practice. This classification is valid for new STCs, not for evolution of STCs, and may depend upon the nature of the STC (complete design or installation).

Product	Discipline	Kind of STC	Group
CS-23 (products where J DOA is required for TC)			
Notes : * STC which leads to reassess the loads on large parts of primary structure should be in group 1. * 2/1 means that an assessment of consequences in terms of handling qualities, performance or complexity of showing of compliance may lead to classification in group 1.			
	Aircraft		
		Conversion to tail wheel configuration	1
		Auxiliary fuel tank installations	2/1
		Glass fibre wing tips	2/1
		Fairings: nacelle, landing gear	2
		Gap seals: aileron, flap, empennage, doors	2
		Vortex generators	2/1
		Spoiler installation	1
		Increase in MTOW	1
	Structures		
		Stretcher installation	2
		Change to seating configuration	2
		Windshield replacement (heated, single piece, etc)	2
		Light weight floor panels	2
		Ski installations	2/1
	Propulsion		

Product	Discipline	Kind of STC	Group
		Engine model change	1
		Fixed pitch propeller installation	2
		Constant speed propeller installation	2/1
		Installation of exhaust silencer	2
		Installation of Graphic engine monitor	2
		Installation of fuel flow meter	2
		Accessory replacement (alternator, magnetos, etc.)	2
		Inlet modifications: oil cooler; induction air	2
	Equipment		
		Avionics upgrades (EFIS, GPS, etc)	2/1
		Engine instrument replacements	2
		Carburettor ice detection system	2
		Autopilot system installation	1
		Wing tip landing light; recognition lights	2
		WX radar installation	2
		Aeromedical system installations	2
		De- and anti-ice system installations	1
		Emergency power supply installations	2
CS-25			
	Cabin Safety		
Note : Basically all changes related to cabin configuration should be in Group 2.		Cabin layout (installation of seats (16G), galleys, single class or business / economy class, etc)	2
		Floor path marking	2
		Crew rest compartment	1
		Change of cargo compartment classification (from class D to class C)	1
	Structure		
Note : STC which leads to reassess the loads on large parts of primary structure should be in Group 1.		Cargo door	1
		Change from Passenger to Freighter configuration	1
	Avionics		

Product	**Discipline**	**Kind of STC**	**Group**
Notes : For CS-25 products, the existence of ETSO is not taken into account for the classification ; Impact on aircraft performance, and influence of aircraft performance are criteria to assess the classification ; Subjective assessment of human factors is considered for determination of classification.		CVR	2
		VHF	2
		NAV (ADF, VOR, GPS, BRNAV)	2
		Autopilot, HUD, EFIS, FMS	1
		DFDR	2/1
		Meteo radar	2
		ILS Cat 3	1
		RVSM	1
		TCAS, EGPWS	1
		GPWS	2
	Powerplant		
		Auxiliary fuel tanks	1
		Thrust Reverser system	1
		Hushkit	1
		Fire detection	1
		Fuel gauging	1
		Change of Engine or Propeller	1
CS-27 or 29	**All disciplines**		
Note : 2/1 means that an assessment of consequences in terms of handling qualities and performance may lead to classification in Group 1.		Main rotor or tail rotor blades replacement	1
		Autopilot	1
		Engine type change	1
		GPS installation	2
		Jettisonable overhead raft installation	2
		Utility basket installation	2/1
		Nose or side mount camera installation	2/1
		Passenger access step installation	2/1
		Protection net & handle installation (parachuting)	2
		VIP cabin layout	2
		Navigation system installation	2
		Fuel boost pump automatic switch-on installation	2
		Decrease of maximum seating capacity	2
		Agricultural spray kit installation	2/1
		Long exhaust pipe installation	2
		Flotation gear installation	2/1
		Wipers installation	2
		Engine oil filter installation	2

Product	Discipline	Kind of STC	Group
		Skid gear covering installation	2/1
		Gutter installation (top pilot door)	2
		Cable cutter installation	2
		Auxiliary fuel tank fixed parts installation	2
		Cabin doors windows replacement	2
		Radio-altimeter aural warning installation	2
		Stand-by horizon autonomous power supply	2
		Fire attack system	2/1
		Hoisting system installation	2/1
		External loads hook installation	2
		Emergency flotation gear installation	2/1
		Heating/demisting (P2 supply)	2

Subpart F – Production without production organisation approval

GM No. 1 to 21A.121
Applicability - Individual product, part or appliance

In this context, "demonstrating the conformity with the applicable design data of a product, part and appliance" means that conformity with the applicable design data has to be established and shown for each and every product, part, appliance, or material produced.

GM No. 2 to 21A.121
Applicability – Applicable design data

Applicable design data is defined as all necessary drawings, specifications and other technical information provided by the applicant for, or holder of a design organisation approval, TC, STC, approval of repair or minor change design, or ETSO authorisation (or equivalent when Part 21 Section A Subpart F is used for production of products, parts or appliances, the design of which has been approved other than according to Part 21), and released in a controlled manner to the manufacturer producing under Part 21 Subpart F. This should be sufficient for the development of production data to enable manufacture in conformity with the design data.

Prior to issue of the TC, STC, approval of repair or minor change design or ETSO authorisation, or equivalent, design data is defined as 'not approved', but parts and appliances may be released with an EASA Form 1 as a certificate of conformity.

After issue of the TC, STC, approval of repair or minor change or ETSO authorisation, or equivalent, this design data is defined as 'approved' and items manufactured in conformity are eligible for release on an EASA Form 1 for airworthiness purposes.

AMC No. 1 to 21A.122
Eligibility – Link between design and production

An "arrangement" is considered suitable if it is documented and satisfies the Competent Authority that co-ordination is satisfactory.

To achieve satisfactory co-ordination the documented arrangements must at least define the following aspects irrespective of whether the design organisation and the person producing or intending to produce under Part 21 Subpart F are separate legal entities or not:

1 The responsibilities of a design organisation which assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.);

2 The responsibilities and procedures of the manufacturer for receiving, managing and using the applicable design data provided by the design organisation.

3 The responsibilities and procedures of the manufacturer for developing, where applicable, its own manufacturing data in compliance with the applicable design data package.

4 The responsibilities of the manufacturer to assist the design organisation in dealing with continuing airworthiness matters and for required actions (e.g., traceability of parts in case of direct delivery to users, retrofitting of modifications, traceability of processes' outputs and approved deviations for individual parts as applicable, technical information and assistance, etc.);

5 The scope of the arrangements covering Subpart F requirements , in particular: 21A.126(a)(4) and 21A.129(d) and (f) and any associated GM or AMC.

6 The responsibilities of the manufacturer, in case of products prior to type certification to assist a design organisation in showing compliance with CS (access and suitability of production and test facilities for manufacturing and testing of prototype models and test specimen);

7 The procedures to deal adequately with production deviations and non conforming parts;

8 The means to achieve adequate configuration control of manufactured parts, to enable the manufacturer to make the final determination and identification for conformity or airworthiness release and eligibility status;

9 The identification of responsible persons/offices who controls the above.

10 The acknowledgment by the holder of the TC/STC/repair or change approval/ETSO authorisation that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.

In many cases the person producing or intending to produce under Part 21 Subpart F may receive the approved design data through an intermediate production organisation. This is acceptable provided an effective link between the design approval holder and the production organisation can be maintained to satisfy the intent of 21A.122.

When the design organisation and the manufacturer are two separate legal entities a Direct Delivery Authorisation should be available for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.

Where there is no general agreement for Direct Delivery Authorisation, specific permissions may be granted (see AMC 21A.4).

AMC No. 2 to 21A.122
Eligibility – Link between design and production

In accordance with AMC No.1 to 21A.122 the person producing or intending to produce under Part 21 Subpart F should demonstrate to the authority that it has entered into an arrangement with the design organisation. The arrangement must be documented irrespective of whether the two organisations are separate legal entities or not.

The documented arrangement must facilitate the person producing or intending to produce under Part 21 Subpart F to demonstrate compliance with the requirement of 21A.122 by means of written documents agreed.

In the case where the design organisation and the person producing or intending to produce under Part 21 Subpart F are part of the same legal entity these interfaces may be demonstrated by company procedures accepted by the Competent Authority.

In all other cases to define such a design/production interface the following sample format is offered:

<table>
<tr><td colspan="2">ARRANGEMENT
i.a.w. 21A.122</td></tr>
<tr><td>The undersigned agree on the following commitments:</td><td>relevant interface procedures</td></tr>
<tr><td>The design organisation [NAME] takes responsibility to
• assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.) to the person producing under Part 21 Subpart F [NAME]
• provide visible statement(s) of approved design data</td><td></td></tr>
<tr><td>The person producing under Part 21 Subpart F [NAME] takes responsibility to
• assist the design organisation [Name] in dealing with continuing airworthiness matter and for required actions
• assist the design organisation [Name] in case of products prior to type certification in showing compliance with airworthiness requirements
• develop, where applicable, its own manufacturing data in compliance with the airworthiness data package</td><td></td></tr>
<tr><td>The design organisation [Name] and the person producing under Part 21 Subpart F [Name] take joint responsibility to
• deal adequately with production deviations and non conforming parts in accordance with the applicable procedures of the design organisation and the manufacturer producing under Part 21 Subpart F.
• achieve adequate configuration control of manufactured parts, to enable the manufacturer producing under Part 21 Subpart F to make the final determination and identification for conformity or airworthiness release and eligibility status.</td><td></td></tr>
<tr><td colspan="2">The scope of production covered by this arrangement is detailed in ... [DOCUMENT REFERENCE/ ATTACHED LIST]</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the manufacturer producing under Part 21 Subpart F]

Transfer of approved design data
The TC/STC/ETSO authorisation holder [NAME] acknowledges that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the manufacturer producing under Part 21 Subpart F]

Direct Delivery Authorisation
This acknowledgment includes also [OR does not include] the general agreement for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.</td></tr>
<tr><td>for the [NAME of the design organisation/DOA holder]

date signature

xx.xx.xxxx
([NAME in block letters])</td><td>for the [NAME of the person producing under Part 21 Subpart F]

date signature

xx.xx.xxxx
([NAME in block letters])</td></tr>
</table>

Instructions for completion:

Title: The title of the relevant document must clearly indicate that it serves the purpose of a design/production interface arrangement in accordance with 21A.122.

Commitment: The document must include the basic commitments between the design organisation and the manufacturer producing under Part 21 Subpart F as addressed in AMC 21A.4 and AMC No. 1 to 21A.122.

Relevant Procedures: Identify an entry point into the documentary system of the organisations with respect to the implementation of the arrangement (for example a contract, quality plan, handbooks, common applicable procedures, working plans etc.).

Scope of arrangement: The scope of arrangement must state by means of a list or reference to relevant documents those products, parts or appliances that are covered by the arrangement.

Transfer of approved design data: Identify the relevant procedures for the transfer of the applicable design data required by 21A.122 and AMC No. 1 to 21A.122 from the design organisation to the person producing under Part 21 Subpart F. The means by which the design organisation advises the person producing under Part 21 Subpart F whether such data is approved or not approved must also be identified (ref. 21A.4 / AMC 21A.4).

Direct Delivery Authorisation: Where the design organisation and the person producing under Part 21 Subpart F are separate legal entities the arrangement must clearly identify whether authorisation for direct delivery to end users is permitted or not.

Where any intermediate production/design organisation is involved in the chain between the original design organisation and the person producing under Part 21 Subpart F, evidence must be available that this intermediate organisation has received authority from the design organisation to grant Direct Delivery Authorisation.

Signature: AMC No. 1 to 21A.122 requests the identification of the responsible persons/offices who control the commitments laid down in the arrangement. Therefore the basic document must be signed mutually by the authorised representatives of the design organisation and the manufacturer producing under Part 21 Subpart F in this regard.

GM 21A.124(a)
Application – Application form

EASA Form 60 (see AMC 21B.120(c)(1)) should be obtained from the Competent Authority and completed by the applicant.

An application may be accepted from:

- An individual applying on his or her own behalf, or
- In the case of an organisation, an individual with the authority to make agreements on behalf of the organisation.

The completed form should be forwarded to the Competent Authority.

GM 21A.124(b)(1)(i)
Applicability - Inappropriate approval under Subpart G

The issue of a letter of agreement of production under Part 21 Subpart F may be agreed by the Competent Authority when:

1 The applicant produces or intends to produce aeronautical products, parts, appliances and/or materials intended for airborne use as part of a type-certificated product (this excludes simulators, ground equipment and tools), and

2 The Competent Authority determines that Part 21 Section A Subpart G would be inappropriate, and consequently Part 21 Section A Subpart F applies. The main difference between Part 21 Section A Subparts G and F is that Subpart G requires the existence of a Quality System which provides the Competent Authority with the necessary confidence to grant to the manufacturer the privileges of certifying its own production. There are situations where a Quality System, including independent monitoring and continuous internal evaluation functions, is not justified and /or feasible. In making the determination that Subpart F may apply, the Competent Authority may take into account one or a combination of parameters such as the following:

- no flow production (infrequent or low volume of production).
- simple technology (enabling effective inspection phases during the manufacturing process).
- very small organisation.

GM 21A.124(b)(1)(ii)
Certification or approval needed in advance of the issue of a POA

In cases where Part 21 Section A Subpart G is applicable, but when some time is needed for the organisation to achieve compliance with Subpart G, i.e., to establish the necessary documented quality system, the Competent Authority may agree to use Part 21 Section A Subpart F for a limited period (transient phase).

In cases where Part 21 Section A Subpart G is applicable, such as to produce ETSO articles or material, a letter of agreement to produce under Part 21 Subpart F should not be given unless an application has been made for organisation approval under Subpart G, and reasonable progress is being made towards compliance with Subpart G. Long-term production under Part 21 Subpart F will not be permitted.

GM 21A.124(b)(2)
Application - Minimum information to include with the application

At this early stage, provision of the complete manual is not necessary, but at least the following items should be covered:

1 Table of Contents of the Manual (including list of existing inspection system documents or procedures)

2 Description of items to be manufactured (including intended quantities /deliveries)

3 List of possible suppliers

4 General description of facilities

5 General description of production means

6 Human resources

GM No. 1 to 21A.125
Letter of agreement - Meaning of individual

"Individual" means that each part number or type of item (i.e., product, part, appliance, or material) to be produced should be specifically referenced, either directly or through a referenced capability list, in the letter of agreement from the Competent Authority. The letter may also specify any limitation in the production rate.

GM No. 1 to 21A.125(b)
Letter of agreement - Contents of the Manual

The manual referred in 21A.125(b) should include, at least the following information:

1 Declaration by the applicant of undertaking in respect of

1.1 the requirements defined in Part 21 Section A Subpart F

1.2 the procedures contained in the manual and in the documentation mentioned herein

1.3 every legal provision laid down for the carrying on of the business activities (statutory declaration).

2 Declaration by the applicant certifying the conformity of the manual to the requirements defined in Part 21 Section A Subpart F

3 Jobs, power and responsibilities of the accountable personnel

4 Organisation chart, if required by the Competent Authority

5 Description of the resources, including human resources, with an indication of the personnel qualification criteria

6 Description of location and equipment

7 Description of the scope of work, the production processes and techniques, and reference to the "capability list"

8 Communications with the Competent Authority, and specifically those required by 21A.125(c)

9 Assistance and communication with the design approval holder, and the means of compliance with 21A.125 (c)

10 Amendments to the Manual

11 Description of the Inspection System (including test, see GM No. 2 to 21A.125(b), and 21A.127 and 21A.128), and the procedures to meet 21A.126 and associated GM

12 List of suppliers

13 Issuing of the Statement of Conformity and Competent Authority inspection for validation

If the information is listed in the Manual in a different order a cross reference to the above list should be made available in the Manual.

GM No. 2 to 21A.125(b)
Letter of agreement - Production Inspection System: Functional Tests

All items produced should be subject to inspection to be carried out at suitable phases which permit an effective verification of conformity with the design data.

These inspections may provide for the execution of tests to measure performances as set out in the applicable design data.

Considerations of complexity of the item and/or its integration in the next level of production will largely determine the nature and time for these tests, for example:

- appliances - will require full functional testing to the specifications
- parts - will at least require basic testing to establish conformity, but due allowance may be made for further testing carried out at the next level of production
- material - will require verification of its stated properties.

GM 21A.125(c)
Letter of agreement - Assistance

The Competent Authority should be provided with material which defines the means of providing assistance as required by 21A.125(c). Suitable descriptive material should be included in the Manual, as described in GM No. 1 to 21A.125(b).

GM No. 1 to 21A.125B(a)
Uncontrolled non-compliance with applicable design data

An uncontrolled non-compliance with applicable design data is a non-compliance:

- that cannot be discovered through systematic analysis or
- that prevents identification of affected products, parts, appliances, or material

GM No. 2 to 21A.125B(a)
Examples for level one findings

Examples for level 1 findings are non-compliances with any of the following paragraphs, that could affect the safety of the aircraft:

21A.126, 21A.127, 21A.128, 21A.129.
It should be anticipated that a non-compliance with these paragraphs is only considered a level one finding when objective evidence has been found that this finding is an uncontrolled non-compliance that could affect the safety of the aircraft.

GM 21A.126
Production Inspection System

GM 21A.126 (a) and (b) has been developed for persons producing under Part 21 Section A Subpart F on the long term basis as defined in 21A.124(b)(1)(i).

SECTION A/Subpart F AMC & GM for PART 21

For those persons producing under Part 21 Section A Subpart F as a transient phase under 21A.124(b)(1)(ii), compliance with 21A.126 may also be demonstrated to the satisfaction of the Competent Authority by using the equivalent Part 21 Section A Subpart G AMC/GM.

GM 21A.126(a)(1)
Production Inspection System – Conformity of supplied parts, appliances and material

1. The person producing under Subpart F is responsible for determining and applying acceptance standards for physical condition, configuration status and conformity, as appropriate, of raw materials, subcontracted works, and supplied products, parts, appliances or material, whether to be used in production or delivered to customers as spare parts. This responsibility also includes BFE (Buyer Furnished Equipment) items.

2. Control may be based upon use of the following techniques, as appropriate:

   2.1 first article inspection, including destruction if necessary, to verify that the article conforms to the applicable data for new production line or new supplier,

   2.2 incoming inspections and tests of supplied parts or appliances that can be satisfactorily inspected on receipt,

   2.3 identification of incoming documentation and data relevant to the showing of conformity to be included in the certification documents,

   2.4 any additional work, tests or inspection which may be needed for parts or appliances which are to be delivered as spare parts and which are not subject to the checks normally provided by subsequent production or inspection stages.

3. The person producing under Part 21 Subpart F may rely upon an EASA Form 1 issued in accordance with Part 21 if provided as evidence of conformity with applicable design data

4. For suppliers not holding a POA the inspection system of the person producing under Part 21 Subpart F should establish a system for control of incoming materials and bought or subcontracted items which provides for inspections and tests of such items by the person producing under Part 21 Subpart F at the supplier’s facility, if the item cannot or will not be completely inspected upon receipt.

GM 21A.126(a)(2)
Production Inspection System - Identification of incoming materials and parts

All parts and materials coming from external parties should be identified and inspected to ascertain that they have not been damaged during transport or unpacking, that the incoming parts and materials have the appropriate and correct accompanying documentation and that the configuration and condition of the parts or materials is as laid down in that documentation'.

Only on completion of these checks and of any incoming further verifications laid down in the procurement specification, may the part or material be accepted for warehousing and used in production.

This acceptance should be certified by an inspection statement.

A suitable recording system should allow reconstruction at any time of the history of every material or part.

The areas where the incoming checks are carried out and the materials or parts are stored pending completion of the checks should be physically segregated from other departments.

GM No. 1 to 21A.126(a)(3)
Production Inspection System - List of specifications

It is the responsibility of:

1 The designer, to define all necessary processes, techniques and methods to be followed during manufacture (21A.31) and this information will be provided as part of the applicable design data.

2 The manufacturer, to ensure that all processes are carried out strictly in accordance with the specifications provided as part of the applicable design data.

GM No. 2 to 21A.126(a)(3)
Production Inspection System - Means of checking of the production processes

The Production Inspection System should be provided with appropriate means of checking that production processes, whether performed by the person producing under Part 21 Subpart F or by subcontractors under its control, are carried out in accordance with applicable data, including:

1 A system for the control and authorised amendment of data provided for the production, inspection and test to ensure that it is complete and up-to-date at the point of use

2 Availability of personnel with suitable qualification, experience, and training for each required production, inspection, and test task. Special attention should be paid to tasks requiring specialised knowledge and skill, e.g., NDT/NDI, welding...

3 A working area where the working conditions and environment are controlled as appropriate in respect of: cleanliness, temperature, humidity, ventilation, lighting, space/access, protection against noise and pollution

4 Equipment and tools sufficient to enable all specified tasks to be accomplished in a safe and effective manner without detrimental effect on the items under production. Calibration control of equipment and tools which affect critical dimensions and values must show compliance with, and be traceable to, recognised national or international standards.

GM 21A.126(a)(4)
Production Inspection System – Applicable design/production data procedures

1 When a person producing under Part 21 Subpart F is developing its own manufacturing data from the design data package delivered by a Design holder, procedures should demonstrate the correct transcription of the original design data.

2 Procedures should define the manner in which applicable design data is used to issue and update the production/inspection data, which determines the conformity of products, parts, appliances and materials. The procedure should also define the traceability of such data to each individual product, part, appliance or material for the purpose of stating the condition for safe operation and for issuing a Statement of Conformity.

3 During execution, all works should be accompanied by documentation giving either directly or by means of appropriate references, the description of the works as well as the identification of the personnel in charge of inspection and execution tasks for each of the different work phases.

GM 21A.126(b)(1)
Production Inspection System - Inspection of parts in process

The purpose of the Production Inspection System is to check at suitable points during production and provide objective evidence that the correct specifications are used, and that processes are carried out strictly in accordance with the specification.

During the manufacturing process, each article should be inspected in accordance with a plan which identifies the nature of all inspections required and the production stages at which they occur. The plan should also identify any particular skills or qualification required of person(s) carrying out the inspections (e.g., NDT personnel). A copy of the plan should be included in, or referenced by, the manual required by 21A.125(b).

If the parts are such that, if damaged, they could compromise the safety of the aircraft, additional inspections for such damage should be performed at the completion of each production stage.

GM 21A.126(b)(2)
Production Inspection System – Suitable storage and protection

1. Storage areas should be protected from dust, dirt, or debris, and adequate blanking and packaging of stored items should be practised.

2. All parts should be protected from extremes of temperatures and humidity and, where needed, temperature-controlled or full air-conditioned facilities should be provided.

3. Racking and handling equipment should be provided such as to allow storage, handling and movement of parts without damage.

4. Lighting should be such as to allow safe and effective access and handling, but should also cater for items which are sensitive to light e.g., rubber items.

5. Care should be taken to segregate and shield items which can emit fumes (e.g., wet batteries), substances or radiation (e.g., magnetic items) which are potentially damaging to other stored items.

6. Procedures should be in place to maintain and record stored parts identities and batch information.

7. Access to storage areas should be restricted to authorised personnel who are fully trained to understand and maintain the storage control arrangements and procedures.

8. Provisions should be made for segregated storage of non conforming items pending their disposition (see GM 21A.126(b)(4)).

GM 21A.126(b)(3)
Production Inspection System – Use of derived data instead of original design data

Where derived data, e.g., worksheets, process sheets, fabrication/inspection instructions, etc., is used instead of original design drawings, documents identification and control procedures should be used to ensure that the documentation in use is always accurate and current.

GM 21A.126(b)(4)
Production Inspection System – Segregation of rejected material

All materials and parts which have been identified at any stage in the manufacturing process as not conforming to the specific working and inspection instructions must be suitably identified by clearly marking or labelling, to indicate their non-conforming status.

All such non-conforming material or parts should be removed from the production area and held in a restricted access segregated area until an appropriate disposition is determined in accordance with 21A.126(b)(5).

GM 21A.126(b)(5)
Production Inspection System – Engineering and manufacturing review procedure

1. The procedure should permit to record the deviation, to present it to the Design holder under the provisions of 21A.122, and to record the results of the review and actions taken consequently as regards the part/product.

2. Any unintentional deviation from the manufacturing/inspection data should be recorded and handled in accordance with Part 21 Section A Subpart D or E as changes to the approved design.

GM 21A.126(b)(6)
Production Inspection System – Recording and record keeping

1. Records within a production environment satisfy two purposes. Firstly, they should , during the production process to ensure that products, parts, or appliances are in conformity with the controlling data throughout the manufacturing cycle. Secondly, certain records of milestone events are needed to subsequently provide objective evidence that all prescribed stages of the production process have been satisfactorily completed and that compliance with the applicable design data has been achieved.

   Therefore, the person producing under Part 21 Subpart F should implement a system for the compilation and retention of records during all stages of manufacture, covering short-term and long-term records appropriate to the nature of the product and its production processes.

   The management of such information should be subject to appropriate documented procedures in the Manual required by 21A.125(b).

   All forms of recording media are acceptable (paper, film, magnetic ...) provided they can meet the required duration for archiving under the conditions provided.

2. The related procedures should:

   2.1 Identify records to be kept.

   2.2 Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information (e.g., by product, subject).

   2.3 Control access and provide effective protection from deterioration or accidental damage.

   2.4 Ensure continued readability of the records.

   2.5 Demonstrate to the Competent Authority proper functioning of the records system.

   2.6 Clearly identify the persons involved in conformity determination.

   2.7 Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:

      a Data which supports conformity of a product, part, or appliance should be kept for not less than three years from the issue date of the related Statement of Conformity or Authorised Release Certificate.

      b Data considered essential for continuing airworthiness should be kept throughout the operational life of the product, part or appliance.

2.8 Data related to supplied parts may be retained by the supplier if the supplier has a system agreed under Part 21 Section A Subpart F by the Competent Authority. The manufacturer should, in each case, define the archiving period and satisfy himself or herself and the Competent Authority that the recording media are acceptable.

GM 21A.127
Approved production ground and flight tests

The production ground and flight tests for new aircraft will be specified by the aircraft design organisation.

GM No. 1 to 21A.128
Acceptable functional test - Engines

The functional test required for a new engine will be specified by the engine design organisation and will normally include at least the following:

1 Break-in runs that include a determination of fuel and oil consumption and a determination of power characteristics at rated maximum continuous power or thrust and, if applicable, at rated takeoff power or thrust.

2 A period of operation at rated maximum continuous power or thrust. For engines having a rated takeoff power or - thrust, part of that period should be at rated takeoff power or - thrust.

The test equipment used for the test run should be capable of output determination of accuracy sufficient to assure that the engine output delivered complies with the specified rating and operation limitations.

GM No. 2 to 21A.128
Acceptable functional test –Variable pitch propellers

The functional tests required for a new propeller will be specified by the propeller design organisation and should normally include a number of complete cycles of control throughout the propeller pitch and rotational speed ranges. In addition, for feathering and/or reversing propellers, several cycles of feathering operation and reversing operation from the lowest normal pitch to the maximum reverse pitch, should normally be required.

GM No. 3 to 21A.128
Acceptable functional test - Engines and Propellers

After functional test, each engine or propeller should be inspected to determine that the engine or propeller is in condition for safe operation. Such inspection will be specified by the design organisation and should normally include internal inspection and examination. The degree of internal inspections will normally be determined on the basis of the positive results of previous inspections conducted on the first production engines, and on the basis of service experience.

GM 21A.129(a)
Availability for inspection by the Competent Authority

Each product, part, appliance or material should be made available for inspection at any time at the request of the Competent Authority.

It is recommended that a pre-defined plan of inspection points be established and agreed with the Competent Authority to be used as a basis for such inspections.

The manufacturer should provide such documentation, tools, personnel, access equipment etc. as necessary to enable the Competent Authority to perform the inspections.

AMC No. 1 to 21A.129(c)
Obligations of the manufacturer – Conformity of prototype models and test specimens

21A.33 requires determination of conformity of prototype models and test specimens to the applicable design data. For a complete aircraft a 'conformity document', that has to be validated by the Competent Authority, should be provided as part of the assistance to the design approval applicant. For products other than a complete aircraft, and for parts and appliances, an EASA Form 1 validated by the Competent Authority may be used as a conformity document as part of the assistance to the design approval applicant.

AMC No. 2 to 21A.129(c)
Obligations of the manufacturer – Conformity with Applicable Design Data

Individual configurations are often based on the needs of the customer and improvements or changes which may be introduced by the type-certificate holder. There are also likely to be unintentional divergences (concessions or non-conformances) during the manufacturing process. All these changes are required to have been approved by the design approval applicant/holder, or when necessary by the Agency.

AMC No. 3 to 21A.129(c)
Obligations of the manufacturer – Condition for safe operation

Before issue of the Statement of Conformity to the Competent Authority the manufacturer under this Subpart should make an investigation so as to be satisfied in respect to each of the items listed below. The documented results of this investigation should be kept on file by the manufacturer. Certain of these items may be required to be provided (or made available) to the operator or owner of the aircraft, and, for validation of the statement of conformity, to the Competent Authority.

1 Equipment or modifications which do not meet the requirements of the state of manufacture but have been accepted by the competent authority of the importing country.

2 Identification of products, parts or appliances which:

2.1 Are not new

2.2 Are furnished by the buyer or future operator (including those identified in 21A.801 and 805).

3 Technical records which identify the location and serial numbers of significant components including those identified in 21A.801 and 21A.805.

4 Log book and a modification record book for the aircraft as required by the Agency.

5 Log books for products identified in 21A.801 installed as part of the type design as required by the Agency.

6 A weight and balance report for the completed aircraft.

7 A record of missing items or defects which do not affect airworthiness these for example could be furnishing or BFE (Items may be recorded in a technical log or other suitable arrangement such that the operator and Agency are formally aware).

8 Product support information required by other associated implementing rules and CS or GM, such as a Maintenance Manual, a Parts Catalogue, or MMEL all of which are to reflect the actual build standard of the particular aircraft. Also an Electrical load analysis and a wiring diagram.

9 Records which demonstrate completion of maintenance tasks appropriate to the test flight flying hours recorded by the aircraft. These records should show the relationship of the maintenance status of the particular aircraft to the manufacturers recommended maintenance task list and the Maintenance Review Board (MRB) document/report.

10 Details of the serviceability state of the aircraft in respect of, a) the fuel and oil contents, b) provision of operationally required emergency equipment such as life rafts, etc.

11 Details of the approved interior configuration if different from that approved as part of the type design.

12 An approved Flight Manual which conforms to the build standard and modification state of the particular aircraft should be available.

13 Show that inspections for foreign objects at all appropriate stages of manufacture have been satisfactorily performed.

14 The registration has been marked on the exterior of the aircraft as required by national legislation. Where required by national legislation fix a fireproof owners nameplate.

15 Where applicable, there should be a certificate for noise and, for the aircraft radio station.

17 The installed compass and or compass systems have been adjusted and compensated and a deviation card displayed in the aircraft.

18 Software criticality list.

19 A record of rigging and control surface movement measurements.

20 Details of installations which will be removed before starting commercial air transport operations (e.g., ferry kits for fuel, radio or navigation).

21 List of all applicable Service Bulletins and airworthiness directives that have been implemented.

AMC No. 1 to 21A.130(b)
Statement of Conformity for Complete Aircraft

1 PURPOSE AND SCOPE

The description under this AMC refers only to the use of the aircraft Statement of Conformity issued under Part 21 Section A Subpart F. Statement of Conformity under Part 21 Subpart F for products other than complete aircraft, and for parts and appliances is described in AMC No. 2 to 21A.130(b).

Use of the aircraft Statement of Conformity issued by an approved production organisation is described in 21A.163(b) under Part 21 Section A Subpart G and the completion instructions are to be found in the Appendices to Part 21.

The purpose of the aircraft Statement of Conformity (EASA Form 52) issued under Part 21 Section A Subpart F is to present to the Competent Authority a complete aircraft. The Competent Authority only validates the Statement of Conformity if it finds, as described in 21A.130 and its associated GM, that the aircraft conforms with the type design and is in condition for safe operation.

2 GENERAL

The Statement of Conformity must comply with the format attached including block numbers and the location of each Block. The size of each Block may however be varied to suit the individual application, but not to the extent that would make the Statement of Conformity unrecognisable. If in doubt consult the Competent Authority.

The Statement of Conformity must either be pre-printed or computer generated but in either case the printing of lines and characters must be clear and legible. Pre-printed wording is permitted in accordance with the attached model but no other certification statements are permitted.

Statements of Conformity must be issued in one or more of the official language(s) of the issuing Competent Authority with translations in English shown below, if required. Completion may be either machine/computer printed or hand-written using block letters to permit easy reading.

A copy of the Statement of Conformity and all referenced attachments are to be retained by the manufacturer. A copy of the validated Statement of Conformity is to be retained by the Competent Authority.

3 COMPLETION OF THE AIRCRAFT STATEMENT OF CONFORMITY BY THE ORIGINATOR

There must be an entry in all Blocks to make the document a valid Statement.

A Statement of Conformity must not be issued for validation by the Competent Authority, unless the design of the aircraft and its installed products are approved.

The information required in Blocks 9, 10, 11, 12, 13 and 14 may be by reference to separate identified documents held on file by the manufacturer, unless the Competent Authority agrees otherwise.

This Statement of Conformity is not intended to provide for the complete equipment fit required by the applicable operational rules. However, some of these individual items may be included in Block 10 or in the approved type design. Operators are therefore reminded of their responsibility to ensure compliance with the applicable operational rules for their own particular operation.

Block 1 Enter name of the State of manufacture.

Block 2 The Competent Authority under which authority the Statement of Conformity is issued.

Block 3 A unique serial number should be pre-printed in this Block for Statement control and traceability purposes. Except that in the case of a computer generated document the number need not be pre-printed where the computer is programmed to produce and print a unique number.

Block 4 The full name and location address of the manufacturer issuing the statement. This Block may be pre-printed. Logos, etc., are permitted if the logo can be contained within the Block.

Block 5 The aircraft type in full as defined in the type-certificate and its associated data sheet.

Block 6 The type-certificate reference numbers and issue for the subject aircraft.

Block 7 If the aircraft is registered then this mark will be the registration mark. If the aircraft is not registered then this will be such a mark that is accepted by the competent authority of the Member State and, if applicable, by the competent authority of a third country.

Block 8 The identification number assigned by the manufacturer for control and traceability and product support. This is sometimes referred to as a Manufacturers Serial No or Constructors No.

Block 9 The engine and propeller type(s) in full as defined in the relevant type-certificate and its associated data sheet. Their manufacturer identification No and associated location should also be shown.

Block 10 Approved design changes to the Aircraft Definition.

Block 11 A listing of all applicable airworthiness directives (or equivalent) and a declaration of compliance, together with a description of the method of compliance on the subject individual

aircraft including products and installed parts, appliances and equipment. Any future compliance requirement time should be shown.

Block 12 Approved unintentional deviation to the approved type design sometimes referred to as concessions, divergences, or non-conformances.

Block 13 Only agreed exemptions, waivers or derogations may be included here..

Block 14 Remarks: Any statement, information, particular data or limitation which may affect the airworthiness of the aircraft. If there is no such information or data, state; 'NONE'.

Block 15 Enter 'Certificate of Airworthiness' or 'Restricted Certificate of Airworthiness' for the Certificate of Airworthiness requested.

Block 16 Additional Requirements such as those notified by an importing country should be noted in this Block.

Block 17 Validity of the Statement of Conformity is dependent on full completion of all Blocks on the form. A copy of the flight test report together with any recorded defects and rectification details should be kept on file by the manufacturer. The report should be signed as satisfactory by the appropriate certifying staff and a flight crew member, e.g., test pilot or flight test engineer. The flight tests performed are those required by 21A.127 and GM 21A.127, to ensure that the aircraft conforms to the applicable design data and is in condition for safe operation.

The listing of items provided (or made available) to satisfy the safe operation aspects of this statement should be kept on file by the manufacturer.

Block 18 The Statement of Conformity may be signed by the person authorised to do so by the manufacturer in accordance with 21A.130(a). A rubber stamp signature should not be used.

Block 19 The name of the person signing the certificate should be typed or printed in a legible form.

Block 20 The date the Statement of Conformity is signed must be given.

Block 21 For production under Part 21 Subpart F, state "N/A"
Additionally, for production under Part 21 Section A Subpart F, this Block must include validation by the Competent Authority. For this purpose, the validation statement below should be included in the Block 21 itself, and not referred in a separate document. The statement can be pre-printed, computer generated or stamped, and should be followed by the signature of the representative of the Competent Authority validating the certificate, the name and the position/identification of such representative of the Competent Authority, and the date of such validation by the Competent Authority.

VALIDATION STATEMENT:

"After due inspection the <*identify the issuing Competent Authority* > is satisfied that this document constitutes an accurate and valid Statement of Conformity in accordance with Part 21 Section A Subpart F."

AMC No. 2 to 21A.130(b)
Statement of Conformity for Products (other than complete aircraft), parts, appliances and materials - The Authorised Release Certificate (EASA Form 1)

A INTRODUCTION

This GM relates only to the use of the EASA Form 1 for manufacturing purposes. Attention is drawn to Part 21, and Appendix I to Part 145 which covers the use of the EASA Form 1 for maintenance purposes.

1 PURPOSE AND SCOPE

Under Part 21 Subpart F, the primary purpose of the certificate is to release products (other than complete aircraft), parts, appliances (hereafter referred to as 'item(s)') and/or material as identified in Blocks 7 through 11 as applicable after manufacture, or to release maintenance work carried out on items under the approval of the Competent Authority.

The EASA Form 1 is prepared and signed by the manufacturer. For production under Part 21 Subpart F it is presented for validation by the Competent Authority.

The Certificate referenced EASA Form 1 is called the Authorised Release Certificate.

The Certificate is to be used for import purposes, as well as for domestic and intra-Community purposes, and serves as an official certificate for the delivery of items from the manufacturer to users. The Certificate is not a delivery or shipping note.

Under Subpart F the Certificate may only be issued by the Competent Authority.

Aircraft are not to be released using the Certificate.

A mixture of 'New' and 'Used' items is not permitted on the same Certificate.

A mixture of items certified in conformity with 'approved data' and to 'non-approved data' is not permitted on the same Certificate, and consequently only one box in Block 14 can be ticked.

A mixture of items released under Subpart G and under Subpart F of Part 21 is not permitted on the same Certificate.

2 GENERAL

By reference to Part 21, the Certificate must comply with the format attached including block numbers and the location of each Block. The size of each Block may however be varied to suit the individual application, but not to the extent that would make the Certificate unrecognisable. The overall size of the Certificate may be significantly increased or decreased so long as the Certificate remains recognisable and legible. If in doubt consult the Competent Authority.

Please note that the User responsibility statements are normally placed on the reverse of this Certificate, but they may be added to the front of the Certificate by reducing the depth of the Form.

All printing must be clear and legible to permit easy reading.

The Certificate may either be pre-printed or computer generated but in either case the printing of lines and characters must be clear and legible. Pre-printed wording is permitted in accordance with the attached model but no other certification statements are permitted.

English and, where required, one or more of the official languages of the issuing Member State are acceptable.
The details to be entered on the Certificate may be either machine/computer printed or hand-written using block letters, and must permit easy reading. Abbreviations must be restricted to a minimum. The space remaining on the reverse side of the Certificate may be used by the originator for any additional information but must not include any certification statement.

The original Certificate must accompany the items and correlation must be established between the Certificate and the item(s). A copy of the Certificate must be retained by the manufacturer of the item and the Competent Authority. Where the Certificate format and the data is entirely computer generated, subject to acceptance by the Competent Authority, it is permissible to retain the Certificate format and data on a secure database.

There is no restriction in the number of copies of the Certificate sent to the customer or retained by the originator.

The Certificate that accompanies the item may be attached to the item by being placed in an envelope for durability.

3 COMPLETION OF THE RELEASE CERTIFICATE BY THE ORIGINATOR

By reference to Part 21, except as otherwise stated, there must be an entry in all Blocks to make the document a valid certificate.

Block 1 The Member State of the Competent Authority issuing the letter of agreement under which the certificate is issued as referenced in Block 16. When the Competent Authority is the Agency, “EASA” should be stated. These names may be pre-printed.

Block 2 Pre-printed “Authorised Release Certificate/EASA Form 1”.

Block 3 A unique number must be pre-printed in this Block for Certificate control and traceability purposes except that in the case of a computer generated document, the unique number need not be pre-printed where the computer is programmed to produce the number.

Block 4 The information in this Block needs to satisfy two objectives:

1) To relate the Certificate to the manufacturer, for the purposes of verifying authenticity and authority of the Certificate;

2) To provide a ready means of rapidly identifying the place of manufacture and release, to facilitate traceability and communication in the event of problems or queries.

Therefore, the name entered in the box is that of the manufacturer, who is responsible for making the final determination of conformity or airworthiness. The name must be entered in exactly the same form as appears in the letter of agreement.

The address(es) entered in Block 4 will assist in the identification of the manufacturer AND in identifying the place of release.

If the place of manufacture and release is one of the organisation addresses listed on the letter of agreement, then that is the only address needed in this Block.

If the place of manufacture and release is a location which is NOT listed in the letter of agreement then two addresses are required. The first address will be the address of the manufacturer (as listed in the letter of agreement) and a second address entered to identify the place of manufacture and release.

This Block may be pre-printed. Logo of the manufacturer, etc., is permitted if it can be contained within the Block.

Block 5 The purpose of this Block is to reference work order/contract/invoice or any other internal organisational process such that a fast traceability system can be established. The use of the Block for such traceability is strongly recommended in the absence of item Serial Numbers or batch numbers. When not used, state “N/A”.

Block 6 The Block is provided for the convenience of the manufacturer issuing the Certificate to permit easy cross-reference to the ‘Remarks’ Block 13 by the use of line item numbers. Block 6 must be completed where there is more than one line item.

Where a number of items are to be released on the Certificate, it is permissible to use a separate listing cross-referring Certificate and list to each other.

Block 7 The name or description of the item must be given. Preference must be given to use of the Illustrated Parts Catalogue (IPC) designation. The description is to include reference to any applicable ETSO authorisation or EPA marking.

Block 8 State the Part Number. Preference must be given to use of the IPC number designation.

Block 9 Used to indicate the type-approved applications for which the released items are eligible for installation, based on the information provided by the design approval holder by virtue of the arrangement described in 21A.4 and 21A.122.

The following entries are permitted;

a At least one specific or series aircraft, propeller, or engine model as identified by the design approval holder. In case of engine or propeller release, state the aircraft approved applications, or, if application is not specific, state “type-certificated engine/propeller”. In case of ETSO article state either the type-approved applications or “ETSO article N/A”. In case of items to be installed in an ETSO article, state either “ETSO article N/A” or the ETSO article part number.

b ‘None’, to be used only when it is known that the items do not yet have a type-approved application, for example: pending type-certificate, for test only, pending approved data. If this category is used, then appropriate explanatory information must be provided in Block 13 and new items may only be released for Conformity purposes.

c ‘Various’ if known by virtue of the arrangements under 21A.122 to be eligible for installation on multiple type approved products, according to a procedure approved by the Competent Authority in charge of the manufacturer under Part 21 Subpart F surveillance.

In the case of multiple type-approved application it is acceptable for this Block to contain cross reference to an attached document which lists such applications.

Any information in Block 9 does not constitute authority to fit the item to a particular aircraft, engine or propeller. The User/Installer must confirm via documents such as the Parts Catalogue, Service Bulletins, etc., that the item is eligible for the particular installation.

Any information in Block 9 does not necessarily mean that the items are only eligible for installation on the listed model(s). Nor does it guarantee that the items are eligible for installation on all entries in Block 9. Eligibility may be affected by modification or configuration changes.

Where a part is identified by the design holder in accordance with officially recognised Standards, then the part is considered a Standard Part and release with an EASA Form 1 is not necessary. However where a manufacturer under Part 21 Subpart F releases a Standard Part with an EASA Form 1 then he or she should be able to demonstrate that it is in control of the manufacture of that part.

Block 10 State the quantity of items being released.

Block 11 State the item Serial Number or Batch Number if applicable, if neither applicable, state ‘N/A’.

Block 12 Enter one or a combination of appropriate standard words from the following table. The table lists, in quotes, the standard words permitted for use when releasing new items prior to entry into service, i.e., the items have not been previously used in operational service. It also details the circumstances and conditions under which they may be used. In all cases the certification rules relating to Block 14 apply, the appropriate box is to be marked, and Block 15 is to be signed.

TABLE OF STANDARD WORDS FOR NEW ITEMS

1 ‘MANUFACTURED’

a. The production of a new item in conformity with the applicable design data.

b Re-certification by the original manufacturer after rectification work on a item, previously released under 1(a) above, which has been found to be unserviceable prior to entry into service, e.g., defective, in need of inspection or test, or shelf life expired. Details of the original release and the rectification work are to be entered in Block 13; or Re-certification of new items from Conformity purpose to airworthiness purpose at the time of approval of the applicable design data, provided that the items conform to the approved design data. An explanation of the basis of release and details of the original release are to be entered in Block 13.

2 ‘INSPECTED’/’TESTED’

The examination of a previously released new item;

a to establish conformity with the applicable design data, or

b in accordance with a customer-specified standard or specification, details of which are to be entered in Block 13, or

c to establish serviceability and condition for safe operation prior to re-release as a spare, where the item has been obtained with an EASA Form 1. An explanation of the basis of release and details of the original release are to be entered in Block 13.

3 'MODIFIED'

The alteration, by the original manufacturer, of a previously released item prior to entry into service. Details of the alteration and the original release are to be entered in Block 13.

The above statements must be supported by reference to the approved data/ manual/specification. Such information shall be identified in either Block 12 or 13.

Block 13 It is necessary to state any information in this Block, either directly or by reference to supporting documentation, that identifies particular data or limitations relating to the item being released that are necessary for the User/Installer to make the final airworthiness determination of the item. The information must be clear, complete, and provided in a form and manner which is adequate for the purpose of making such a determination.

Each statement must be clearly identified as to which item it relates.

If there is no statement, state 'None'.

Examples of conditions which would necessitate statements in Block 13 are;

- When the certificate is used for Conformity purposes the following statement must be entered at the beginning of Block 13:

  'ONLY FOR CONFORMITY, NOT ELIGIBLE FOR INSTALLATION ON IN-SERVICE TYPE-CERTIFICATED AIRCRAFT/ENGINE/PROPELLER'.

- When the design data is not approved by the Agency , then the competent authority of a third country responsible for the approval of the design data must be identified and the following statement must be entered together with a reference identifying the approval:

  "Design data approved by <identify the responsible competent authority of a third country and the approval reference>".

- Re-certification of new items from Conformity purpose to airworthiness purpose at the time of approval of the applicable design data, provided that the items conform to the approved design data.

  Provided that no change in design has occurred during the design data approval process, the manufacturer may state that the design data has been approved and that provided the specific component is still in the condition it was when it was shipped to the user/installer, the component is now eligible to be installed. The manufacturer must make this statement on a second EASA Form 1 where in addition to any other necessary remarks, appropriate explanatory information must be provided. The following wording must be used: 'RE-CERTIFICATION OF NEW PARTS FROM CONFORMITY TO AIRWORTHINESS: THIS DOCUMENT ONLY CERTIFIES THE APPROVAL OF THE DESIGN DATA TO WHICH THIS ITEM (THESE ITEMS) WERE MANUFACTURED, BUT DOES NOT COVER CONFORMITY/CONDITION AFTER RELEASE OF THE INITIAL EASA FORM 1 REF .....'.
  EASA Form 1 (both for 'Conformity purposes' and for 'Airworthiness purposes')

must be generated by the same organisation, i.e., the original manufacturer or prime manufacturer, whichever raised the original EASA Form 1 for Conformity purposes.

- For complete engines and propellers the applicable type-certificate must be referenced.
- For complete engines and propellers, any additional export statement required by the importing country, as normally defined in the type-certificate data sheet.
- For complete engines, a statement of compliance with the applicable emissions requirements current at the date of manufacture of the engine
- For ETSO articles state the applicable ETSO authorisation number
- Usage restriction for repaired items
- Modification standard
- Alternative approved items supplied
- Concessions applicable
- Non-compliance with CS
- Details of repair work carried out or reference to a document where this is stated
- Compliance with or non-compliance with airworthiness directive's or Service Bulletins
- Information on life limited items
- Condition of items or reference to a document detailing this information
- Manufacturing date or cure date
- Shelf life data
- Shortages
- Time Since New (TSN), Time Since Overhaul (TSO), etc.
- Exceptions to the notified special requirements of the importing country
- Specially configured to meet the notified special requirements of the importing country
- Re-certification of previously released 'new' items

Additionally, for production under Subpart F, this Block must include the Statement of Conformity by the manufacturer under 21A.130. For this purpose, the appropriate Block 14 statement must be included in the Block 13 and not referred in a separated document. The Statement may be pre-printed, computer generated or stamped, and must be followed by the signature of the manufacturer authorised person under 21A.130(a), the name and the position/identification of such person and the date of the signature.

Block 14 This Block must only be used to indicate the status of new items.

The main purpose of the Certificate is to release items for airworthiness purposes, which means conformity with approved design data and in condition for safe operation.

This airworthiness certification is considered by the EU to be valid world-wide unless there are specific notified import conditions.

When using the EASA Form 1 issued for airworthiness purposes to satisfy such notified import conditions, compliance with these import conditions is certified according to bilateral agreement or other working arrangement. As the Part number is stated in Block 8 and compliance with any specific import conditions is entered in Block 13, 'approved' then means approved by the competent authority of the importing country.

The certificate may also be used as a Conformity Certificate when items conform to applicable design data which are not approved for a reason which is stated in Block 13 (e.g., pending type-certificate, for test only, pending approved data).

In this case the following additional statement must be entered at the beginning of Block 13 itself and not in a separate document:

'ONLY FOR CONFORMITY, NOT ELIGIBLE FOR INSTALLATION ON IN-SERVICE TYPE-CERTIFICATED AIRCRAFT/ENGINE/PROPELLER'.

Mixtures of items released for Airworthiness and for Conformity purposes are not permitted in the same certificate. Also refer to the notes for completion of Block 9.

Block 15 The hand-written normal signature of the Competent Authority representative validating the Block 13 manufacturer Statement of Conformity, under 21A.130(d).

Use of a stamp instead of a signature is not permitted, but the authorised person may add a stamp impression to his or her signature to aid recognition.

Block 16 State the full reference of the letter of agreement given by the Competent Authority to the manufacturer working under Part 21 Subpart F.

Block 17 The name of the person signing Block 15, printed, typed, or written in a legible form.

Block 18 The date on which Block 15 is signed, in the format day/month/year. The month must be stated in letters (sufficient letters must be used so there can be no ambiguity as to the month intended).

Block 19 Not used and strike out for release of new items.

Block 20 Not used and strike out for release of new items.

Block 21 Not used and strike out for release of new items.

Block 22 Not used and strike out for release of new items.

Block 23 Not used and strike out for release of new items.

AMC 21A.130(c)
Validation of the Statement of Conformity

It is the responsibility of the applicant to ensure that each and every product, part and appliance conforms to the applicable design data and is in condition for safe operation before issuing and signing the relevant Statement of Conformity. During manufacture, the applicant is expected to use such facilities, systems, processes and procedures as are described in the Manual and have been previously agreed with the Competent Authority.

The Competent Authority must then make such inspection and investigation of records and product, part or appliance as are necessary to determine that the agreed facilities, systems, processes and procedures have been used, and that the Statement of Conformity may be regarded as a valid document.

To enable timely inspection and investigation by the Competent Authority, the Statement of Conformity must be prepared and submitted to the Competent Authority immediately upon satisfactory completion of final production inspection and test.

AMC 21A.130(c)(1)
Initial transfer of ownership

Upon transfer of ownership:

a) For a complete aircraft, whether or not an application for a Certificate of Airworthiness is to be made, an EASA Form 52 must be completed and submitted to the Competent Authority for validation.
b) For anything other than a complete aircraft an EASA Form 52 is inappropriate, and an EASAForm 1 must be completed and submitted to the Competent Authority for validation.

NOTE: If there is any significant delay between the last production task and presentation of the EASA Form 52 or EASA Form 1 to the Competent Authority, then additional evidence relating to the storage, preservation and maintenance of the item since its production must be presented to the Competent Authority.

Subpart G – Production organisation approval for products, parts and appliances

GM 21A.131
Scope – Applicable design data

Applicable design data is defined as all necessary drawings, specifications and other technical information provided by the applicant for, or holder of a design organisation approval, TC, STC, approval of repair or minor change design, or ETSO authorisation (or equivalent when Part 21 Section A Subpart G is used for production of products, parts or appliances, the design of which has been approved other than according to Part 21) and released in a controlled manner to a production organisation approval holder. This should be sufficient for the development of production data to enable repeatable manufacture to take place in conformity with the design data.

Prior to issue of the TC, STC, approval of repair or minor change design or ETSO authorisation, or equivalent, design data is defined as 'not approved' but parts and appliances may be released with an EASA Form 1 as a certificate of conformity.

After issue of the TC, STC, approval of repair or minor change or ETSO authorisation, or equivalent, this design data is defined as 'approved' and items manufactured in conformity are eligible for release on an EASA Form 1 for airworthiness purposes.

GM 21A.133(a)
Eligibility – Approval appropriate for showing conformity

'Appropriate' should be understood as follows:

- The applicant produces or intends to produce aeronautical products, parts, appliances and/or materials intended for airborne use as part of a type-certificated product (this excludes simulators, ground equipment and tools).

- The applicant will be required to show a need for an approval, normally based on one or more of the following criteria:

    1 Production of aircraft, engines or propellers (except if the Competent Authority considers a POA inappropriate)

    2 Production of ETSO articles and parts marked EPA

    3 Direct delivery to users such as owners or operators maintenance organisations with the need for exercising the privileges of issuing Authorised Release Certificates – EASA Form 1

    4 Participation in an international co-operation program where working under an approval is considered necessary by the Competent Authority

    5 Criticality and technology involved in the part, appliance, or material being manufactured. Approval in this case may be found by the Competent Authority as the best tool to exercise its duty in relation to airworthiness control

    6 Where an approval is otherwise determined by the Competent Authority as being required to satisfy the essential requirements of Annex I to the Basic Regulation.

- It is not the intent of the Competent Authority to issue approvals to manufacturing firms that perform only sub-contract work for main manufacturers of products and are consequently placed under their direct surveillance.

• Where standard parts, materials, processes or services are included in the applicable design data (see guidance on applicable design data in GM 21A.131) their standards should be controlled by the POA holder in a manner which is satisfactory for the final use of the item on the product, part or appliance. Accordingly, the manufacturer or provider of the following will not at present be considered for production organisation approval:

- consumable materials
- standard parts
- parts identified in the product support documentation as 'industry supply' or 'no hazard'
- non-destructive testing or inspection
- processes (heat treatment, surface finishing, shot peening, etc.

AMC No. 1 to 21A.133(b) and (c)
Eligibility – Link between design and production organisations

An arrangement is considered appropriate if it is documented and satisfies the Competent Authority that co-ordination is satisfactory.

To achieve satisfactory coordination the documented arrangements must at least define the following aspects irrespective of whether the two organisations are separate legal entities or not:

• The responsibilities of a design organisation which assure correct and timely transfer of up-to-date airworthiness data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.);

• The responsibilities and procedures of a POA holder/applicant for developing, where applicable, its own manufacturing data in compliance with the airworthiness data package;

• The responsibilities of a POA holder/applicant to assist the design organisation in dealing with continuing airworthiness matters and for required actions (e.g., traceability of parts in case of direct delivery to users, retrofitting of modifications, traceability of processes' outputs and approved deviations for individual parts as applicable, technical information and assistance, etc.);

• The scope of the arrangements must cover Part 21 Subpart G requirements and associated AMC and GM, in particular: 21A.145(b), 21A.165(c), (f) and (g);

• The responsibilities of a POA holder/applicant, in case of products prior to type certification to assist a design organisation in showing compliance with CS (access and suitability of production and test facilities for manufacturing and testing of prototype models and test specimen);

• The procedures to deal adequately with production deviations and non conforming parts;

• The procedures and associated responsibilities to achieve adequate configuration control of manufactured parts, to enable the production organisation to make the final determination and identification for conformity or airworthiness release and eligibility status;

• The identification of the responsible persons/offices who control the above;

• The acknowledgment by the holder of the TC/STC/repair or change approval/ETSO authorisation that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.

;

In many cases the production organisation may receive the approved design data through an intermediate production organisation. This is acceptable provided an effective link between the design approval holder and the production organisation can be maintained to satisfy the intent of 21A.133.

When the design and production organisations are two separate legal entities a Direct Delivery Authorisation must be available for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.

Where there is no general agreement for Direct Delivery Authorisation, specific permissions may be granted (refer to AMC 21A.4).

AMC No. 2 to 21A.133(b) and (c)
Eligibility – Link between design and production organisations

In accordance with AMC No.1 to 21A.133(b) and (c) the POA holder must demonstrate to the Competent Authority that it has entered into an arrangement with the design organisation. The arrangement must be documented irrespective of whether the two organisations are separate legal entities or not.

The documented arrangement must facilitate the POA holder to demonstrate compliance with the requirement of 21A.133(b) and (c) by means of written documents agreed.

In the case where the design organisation and POA holder are part of the same legal entity these interfaces may be demonstrated by company procedures accepted by the Competent Authority.

In all other cases to define such a design/production interface the following sample format is offered:

Arrangement Sample Form

<table>
<tr><td colspan="2">ARRANGEMENT
i.a.w. 21A.133(b) and (c)</td></tr>
<tr><td>The undersigned agree on the following commitments:</td><td>relevant interface procedures</td></tr>
<tr><td>The design organisation [NAME] takes responsibility to
• assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.) to the production organisation approval holder [NAME]
• provide visible statement(s) of approved design data</td><td></td></tr>
<tr><td>The production organisation approval holder [NAME] takes responsibility to
• assist the design organisation [Name] in dealing with continuing airworthiness matter and for required actions
• assist the design organisation [Name] in case of products prior to type certification in showing compliance with airworthiness requirements
• develop, where applicable, its own manufacturing data in compliance with the airworthiness data package</td><td></td></tr>
<tr><td>The design organisation [Name] and the POA holder [Name] take joint responsibility to
• deal adequately with production deviations and non conforming parts in accordance with the applicable procedures of the design organisation and the production organisation approval holder
• achieve adequate configuration control of manufactured parts, to enable the POA holder to make the final determination and identification for conformity or airworthiness release and eligibility status.</td><td></td></tr>
<tr><td colspan="2">The scope of production covered by this arrangement is detailed in ... [DOCUMENT REFERENCE/ ATTACHED LIST]</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the production organisation approval holder]

Transfer of approved design data
The TC/STC/ETSO holder [NAME] acknowledges that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.</td></tr>
<tr><td colspan="2">[When the design organisation is not the same legal entity as the production organisation approval holder]

Direct Delivery Authorisation
This acknowledgment includes also [OR does not include] the general agreement for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.</td></tr>
<tr><td>for the [NAME of the design organisation/DOA holder]

date signature

xx.xx.xxxx
([NAME in block letters])</td><td>for the [NAME of the POA holder]

date signature

xx.xx.xxxx
([NAME in block letters])</td></tr>
</table>

Instructions for completion:

Title: The title of the relevant document must clearly indicate that it serves the purpose of a design/production interface arrangement in accordance with 21A.133(b) and (c).

Commitment: The document must include the basic commitments between the design organisation and the POA holder as addressed in AMC 21A.4 and AMC No. 1 to 21A.133(b) and (c).

Relevant Procedures: Identify an entry point into the documentary system of the organisations with respect to the implementation of the arrangement (for example a contract, quality plan, handbooks, common applicable procedures, working plans etc.).

Scope of arrangement: The scope of arrangement must state by means of a list or reference to relevant documents those products, parts or appliances that are covered by the arrangement.

Transfer of applicable design data: Identify the relevant procedures for the transfer of the applicable design data required by 21A.131 and AMC 21A.131 from the design organisation to the POA holder. The means by which the design organisation advises the POA holder whether such data is approved or not approved must also be identified (ref. 21A.4/AMC 21A.4).

Direct Delivery Authorisation: Where the design organisation and the POA holder are separate legal entities the arrangement must clearly identify whether authorisation for direct delivery to end users is permitted or not.

Where any intermediate production/design organisations are involved in the chain between the original design organisation and the POA holder evidence must be available that this intermediate organisation has received authority from the design organisation to grant Direct Delivery Authorisation.

Signature: AMC No. 1 to 21A.133(b) and (c) requests the identification of the responsible persons/offices who control the commitments laid down in the arrangement. Therefore the basic document must be signed mutually by the authorised representatives of the design organisation and the POA holder in this regard.

GM 21A.134
Application – Application form and manner

EASA Form 50 (see AMC 21B.220(c)) should be obtained from the Competent Authority, and completed by the accountable manager of the organisation.

The completed form, an outline of the production organisation exposition, and details of the proposed terms of approval are to be forwarded to the Competent Authority.

GM No. 1 to 21A.139(a)
Quality System

The quality system is an organisational structure with responsibilities, procedures, processes, and resources which implement a management function to determine and enforce quality principles.

The quality system should be documented in such a way that the documentation can be made easily available to personnel who need to use the material for performing their normal duties, in particular:

- procedures, instructions, data to cover the issues of 21A.139(b)(1) are available in a written form,
- distribution of relevant procedures to offices/persons is made in a controlled manner,

- procedures which identify persons responsible for the prescribed actions are established,
- the updating process is clearly described.

The manager responsible for ensuring that the quality system is implemented and maintained should be identified.

The Competent Authority will verify on the basis of the exposition and by appropriate investigations that the production organisation has established and can maintain their documented quality system.

GM No. 2 to 21A.139(a)
Quality System – Conformity of supplied parts or appliances

The POA holder is responsible for determining and applying acceptance standards for physical condition, configuration status and conformity of supplied products, parts or appliances, whether to be used in production or delivered to customers as spare parts. This responsibility also includes BFE (Buyer Furnished Equipment) item.

To discharge this responsibility the quality system needs an organisational structure and procedures to adequately control external suppliers.

Control can be based upon use of the following techniques (as appropriate to the system or product orientation necessary to ensure conformity).

- qualification and auditing of supplier's quality system,
- evaluation of supplier capability in performing all manufacturing activities, inspections and tests necessary to establish conformity of parts or appliances to type design,
- first article inspection, including destruction if necessary, to verify that the article conforms to the applicable data for new production line or new supplier,
- incoming inspections and tests of supplied parts or appliances that can be satisfactorily inspected on receipt,
- identification of incoming documentation and data relevant to the showing of conformity to be included in the certification documents,
- a vendor rating system which gives confidence in the performance and reliability of this supplier,
- any additional work, tests or inspection which may be needed for parts or appliances which are to be delivered as spare parts and which are not subjected to the checks normally provided by subsequent production or inspection stages.

The POA holder may rely on inspection/tests performed by supplier if it can establish that:

- personnel responsible in charge of these tasks satisfy the competency standards of the POA quality system,
- quality measurements are clearly identified,
- the records or reports showing evidence of conformity are available for review and audit.

The control of suppliers holding a POA for the parts or appliances to be supplied can be reduced, to a level at which a satisfactory interface between the two quality systems can be demonstrated. Thus, for the purpose of showing conformity, a POA holder can rely upon documentation for parts or appliances released under a suppliers 21A.163 privileges.

A supplier who does not hold a POA is considered as a sub-contractor under the direct control of the POA quality system.

The POA holder retains direct responsibility for inspections/tests carried out either at its own facilities or at supplier's facilities.

GM 21A.139(b)(1)
Quality System – Elements of the quality system

1. The control procedures covering the elements of 21A.139(b)(1) should document the standards to which the production organisation intends to work.

2. An organisation having a Quality system designed to meet a recognised Standard such as ISO 9002 (relevant to the scope of approval being requested) should expand it to include at least the following additional topics, as appropriate, in order to show compliance with the requirements of Part 21 Subpart G:

- Mandatory Occurrence Reporting and continued airworthiness as required by 21A.165(e)
- Control of work occasionally performed (outside the POA facility by POA personnel)
- Co-ordination with the applicant for, or holder of, an approved design as required by 21A.133(b) and (c) and 21A.165(g)
- Issue of certifications within the scope of approval for the privileges of 21A.163
- Incorporation of airworthiness data in production and inspection data as required in 21A.133(b) and (c) and 21A.145(b)
- When applicable, ground test and/or production flight test of products in accordance with procedures defined by the applicant for, or holder of, the design approval
- Procedures for traceability including a definition of clear criteria of which items need such traceability. Traceability is defined as a means of establishing the origin of an article by reference to historical records for the purpose of providing evidence of conformity
- Personnel training and qualification procedures especially for certifying staff as required in 21A.145(d).

3. An organisation having a quality system designed to meet a recognised aerospace quality standard will still need to ensure compliance with all the requirements of Subpart G of Part 21. In all cases, the Competent Authority will still need to be satisfied that compliance with Part 21 Subpart G is established.

GM No. 1 to 21A.139(b)(2)
Quality System – Independent quality assurance function

The quality assurance function which is part of the organisation is required to be independent from the functions being monitored. This required independence relates to the lines of reporting, authority and access within the organisation and assumes an ability to work without technical reliance on the monitored functions.

GM No. 2 to 21A.139(b)(2)
Quality System – Adequacy of procedures and monitoring function

Adequacy of procedures means that the quality system, through the use of the procedures as set forth, is capable of meeting the conformity objectives identified in 21A.139(a).

The quality assurance function to ensure the above should perform planned continuing and systematic evaluations or audits of factors that affect the conformity (and, where required, safe operation) of the products, parts, appliances and/or materials to the applicable design. This evaluation should include all elements of the quality system in order to show compliance with Part 21 Subpart G.

GM 21A.143
Exposition – Production organisation exposition

The purpose of the POE is to set forth in a concise document format the organisational relationships, responsibilities, terms of reference, and associated authority, procedures, means and methods of the organisation.

The information to be provided is specified in 21A.143(a). Where this information is documented and integrated in manuals, procedures and instruction, the POE should provide a summary of the information and an appropriate cross reference.

The Competent Authority requires the POE to be an accurate definition and description of the production organisation. The document does not require approval in itself, but it will be considered as such by virtue of the approval of the organisation.

When changes to the organisation occur, the POE is required to be kept up to date per a procedure, laid down in the POE. Significant changes to the organisation (as defined in GM 21A.147(a)) should be approved by the Competent Authority prior to update of the POE.

When an organisation is approved against any other implementing rule containing a requirement for an exposition, a supplement covering the differences may suffice to meet the requirements of Part 21 Subpart G except that the supplement should have an index identifying where those parts missing from the supplement are covered. Those items then formally become part of the POE. In any combined documents the POE should be easily identifiable.

GM 21A.145(a)
Approval Requirements

A facility is a working area where the working conditions and the environment are controlled as appropriate in respect of: cleanliness, temperature, humidity, ventilation, lighting, space/access, noise, air pollution.

Equipment and tools should be such as to enable all specified tasks to be accomplished in a repeatable manner without detrimental effect. Calibration control of equipment and tools which affect critical dimensions and values should show compliance with, and be traceable to, national or international standards.

Sufficient personnel means that the organisation has for each function according to the nature of the work and the production rate, a sufficient quantity of qualified personnel to accomplish all specified manufacturing tasks and to attest the conformity. Their number should be such that airworthiness consideration may be applied in all areas without undue pressure.

An evaluation of the competence of personnel is performed as part of the quality system. This should include, where appropriate, verification that specific qualification standards have been implemented, for example NDT, welding, etc.Training should be organised to establish and maintain the personal competence levels determined by the organisation to be necessary.

GM 21A.145(b)(2)
Approval Requirements – Airworthiness, noise, fuel venting and exhaust emissions /production data procedures

1 When a POA holder/applicant is developing its own manufacturing data, such as computer based data, from the design data package delivered by a design organisation, procedures are required to demonstrate the right transcription of the original design data.

2 Procedures are required to define the manner in which airworthiness, noise, fuel venting and exhaust emissions data is used to issue and update the production/quality data, which determines the conformity of products, parts and appliances. The procedure must also define the traceability of such data to each individual product, part or appliance for the purpose of certifying condition for safe operation and issuing a Statement of Conformity or EASA Form 1.

GM 21A.145(c)(1)
Approval Requirements – Accountable manager

Accountable manager means the manager who is responsible, and has corporate authority for ensuring that all production work is carried out to the required standard. This function may be carried out by the Chief Executive or by another person in the organisation, nominated by him or her to fulfil the function provided his or her position and authority in the organisation permits to discharge the attached responsibilities.

The manager is responsible for ensuring that all necessary resources are available and properly used in order to produce under the production approval in accordance with Part 21 Section A Subpart G.

The manager needs to have sufficient knowledge and authority to enable him or her to respond to the Competent Authority regarding major issues of the production approval and implement necessary improvements.

The manager needs to be able to demonstrate that he or she is fully aware of and supports the quality policy and maintains adequate links with the quality manager.

GM 21A.145(c)(2)
Approval Requirements – Responsible managers

The person or persons nominated should represent the management structure of the organisation and be responsible for all functions as specified in Part 21 Section A Subpart G. It therefore follows that, depending on the size of the Part 21 Section A Subpart G organisation, the functions may be subdivided under individual managers (and in fact may be further subdivided) or combined in a variety of ways.

The Competent Authority requires the nominated managers to be identified and their credentials submitted on an EASA Form Four (see format in EASA administrative procedures) to the Competent Authority in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the production activities as performed by the Part 21 Section A Subpart G organisation.

The responsibilities and the tasks of each individual manager are required to be clearly defined, in order to prevent uncertainties about the relations, within the organisation. In the case of organisation structures where staff-members are responsible to more than one person, as for instance in matrix and project organisations, responsibilities of the managers should be defined in such a way that all responsibilities are covered.

Where a Part 21 Section A Subpart G organisation chooses to appoint managers for all or any combination of the identified Part 21 functions because of the size of the undertaking, it is

necessary that these managers report ultimately to the accountable manager. In cases where a manager does not directly report to the accountable manager, he or she should have a formally established direct access to the accountable manager.

One such manager, normally known as the quality manager is responsible for monitoring the organisation's compliance with Part 21 Section A Subpart G and requesting remedial action as necessary by the other managers or the accountable manager as appropriate. He or she should have a direct access to the accountable manager.

AMC 21A.145(d)(1)
Approval Requirements – Certifying staff

1 Certifying Staff are nominated by the production organisation to ensure that products, parts, appliances and/or materials qualify for Statements of Conformity or Release Certificates. Certifying Staff positions and numbers are to be appropriate to the complexity of the product and the production rate.

2 The qualification of certifying staff is based on their knowledge, background and experience and a specific training (or testing) established by the organisation to ensure that it is appropriate to the product, part, or appliance to be released.

3 Training must be given to develop a satisfactory level of knowledge of organisation procedures, aviation legislation, and associated implementing rules, CS and GM, relevant to the particular role.

4 For that purpose, in addition to general training policy, the organisation must define its own standards for training, including pre-qualification standards, for personnel to be identified as certifying staff.

5 Training policy is part of the Quality System and its appropriateness forms part of investigation by the Competent Authority within the organisation approval process and subsequent surveillance of persons proposed by managers.

6 The training must be updated in response to experience gained and changes in technology.

7 A feedback system to ascertain that the required standards are being maintained must be put in place to ensure the continuing compliance of personnel to authorisation requirements.

8 For release of products, parts or appliances, the responsibilities to issue statements of conformity/release certificates (EASA Form 1) are allocated to the certifying staff identified in 21A.145 (d)(2).

9 The Competent Authority holds the right to reject those personnel, appointed by the organisation, if found to have inappropriate experience or not to otherwise comply with its requirements.

AMC 21A.145(d)(2)
Approval Requirements – Record of certifying staff

1 The following is the minimum information to be recorded in respect of each certifying person:

a Name

b Date of Birth

c Basic Training and standard attained

d Specific Training and standard attained

e If appropriate – Continuation Training

f Experience

g Scope of the authorisation

h Date of first issue of the authorisation

i If appropriate – expiry date of the authorisation

j Identification Number of the authorisation

2 The record may be kept in any format and must be controlled by an internal procedure of the organisation. This procedure forms part of the quality system.

3 Persons authorised to access the system must be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner and that confidential records cannot become accessible to unauthorised persons.

4 The certifying person must be given reasonable access on request to his or her own records.

5 Under the provision of 21A.157 the Competent Authority has a right of access to the data held in such a system.

6 The organisation must keep the record for at least two years after the certifying person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

AMC 21A.145(d)(3)
Approval requirements – Evidence of authorisation

1 The authorisation document must be in a style that makes its scope clear to the certifying staff and any authorised person who may require to examine the authorisation. Where codes are used to define scope, an interpretation document should be readily available.

2 Certifying staff are not required to carry the authorisation document at all times but should be able to make it available within a reasonable time of a request from an authorised person. Authorised persons include the Competent Authority.

GM 21A.147(a)
Changes to the approved production organisation – Significant changes

1 Changes to be approved by the Competent Authority include:

- Significant changes to production capacity or methods.

• Changes in the organisation structure especially those parts of the organisation in charge of quality.

• A change of the accountable manager or of any other person nominated under 21A.145 (c)(2).

• Changes in the production or quality systems that may have an important impact on the conformity/airworthiness of each product, part or appliance.

• Changes in the placement or control of significant sub-contracted work or supplied parts.

2 To ensure that changes do not result in non-compliance with Part 21 Section A Subpart G it is in the interest of both the Competent Authority and the approval holder to establish a relationship and exchange information that will permit the necessary evaluation work to be conducted before the implementation of a change. This relationship should also permit agreement on the need for variation of the terms of approval (ref 21A.143(a)(9)).

3 Where a change of name or ownership results in the issue of a new approval the investigation will normally take account of the Competent Authority's knowledge and information from the preceding approval.

4 Changes of location are addressed in 21A.148 and changes of ownership in 21A.149, change of scope of approval in 21A.153.

AMC 21A.148
Changes of location – Management during change of location

1 The relocation of any work, to an unapproved location, or a location with inappropriate scope of approval, constitutes a change of significance to the organisation and requires approval by the Competent Authority as prescribed in 21A.147. An unapproved relocation will invalidate the production organisation approval, and may necessitate re-application for any similar approval required at the new location. However, suitable transitional arrangements may be agreed with the Competent Authority, in advance of the relocation, which can allow continuation of the approval.

2 When an organisation expands its facility to include a new production location or moves parts of its production to a new location the production organisation approval may continue in force, but the approval does not include the new location until the Competent Authority has indicated its satisfaction with the arrangements.

3 For a change in location, taking an extended period of time, suitable transitional arrangements would require preparation of a co-ordination plan for the removal. The plan must, at least, identify the following:

a A clearly identified person, or group of persons, responsible for co-ordinating the removal and acting as focal point for communication with all parties, including the Competent Authority.

b The basis of the co-ordination plan, e.g., whether by product or area.

c Planned timing of each phase of relocation.

d Arrangements for maintaining the standards of the approval up to the point where the production area is closed down.

e Arrangements for verifying continued production quality upon resumption of work at the new location.

f Arrangements for check and/or re-calibration of inspection aids or production tools and jigs before resuming production.

g Procedures which ensure that goods are not released from the new location until their associated production and quality systems have been verified.

h Arrangements for keeping the Competent Authority informed of progress with the relocation.

4 From the co-ordination plan, the Competent Authority can determine the points at which it wishes to conduct investigation.

5 If an agreed co-ordination plan is in operation, the Competent Authority will normally allow the existing approval to remain in force and will, where appropriate, grant an additional approval to cover the new address for the duration of the move.

GM 21A.149
Transferability

Transfer of approval would normally only be agreed in cases where the ownership changes but the organisation itself remains effectively unchanged. For example:

An acceptable transfer situation could be a change of company name (supported by the appropriate certificate from the National Companies Registration Office or equivalent) but with no changes to site address, facilities, type of work, staff, accountable manager or person nominated under 21A.145.

Alternatively, in the event of receivership (bankruptcy, insolvency or other equivalent legal process) there may be good technical justification for continuation of the approval provided that the company continues to function in a satisfactory manner in accordance with their POE. It is likely that at a later stage the approval might be voluntarily surrendered or the organisation transferred to new owners in which case the former paragraphs apply. If it does not continue to operate satisfactorily then the Competent Authority could suspend or revoke the approval under 21B.245.

In order for the Competent Authority to agree to a transfer of approval, it will normally prescribe it as a condition in accordance with 21A.147(b) that the obligations and responsibilities of the former organisation should be transferred to the new organisation, otherwise transfer is not possible and application for a new approval will be required.

GM 21A.151
Terms of approval – Scope and categories

Terms of approval document(s) will be issued by the Competent Authority under 21A.135 to identify the scope of work, the products, and/or categories for which the holder is entitled to exercise the privileges defined in 21A.163.

The codes shown against each scope of work item are intended for use by the Competent Authority for purposes such as managing, administering and filing details of approvals. It may also assist in the production and publication of a list of approval holders.

The scope of work, the Products, Parts, or Appliances for which the POA holder is entitled to exercise the privileges defined in 21A.163 will be described by the Competent Authority as follows:

FOR PRODUCTS:

1 General area, similar to the titles of the corresponding certification codes.

2 Type of Product, in accordance with the type-certificate.

FOR PARTS AND APPLIANCES:

1 General area, showing the expertise, e.g., mechanical, metallic structure.

2 Generic type, e.g., wing, landing gear, tyres.

SCOPE OF WORK		PRODUCTS/CATEGORIES
A1	Large Aeroplanes	State types
A2	Small Aeroplanes	"
A3	Large Helicopters	"
A4	Small Helicopters	"
A5	Gyroplanes	"
A6	Sailplanes	"
A7	Motor Gliders	"
A8	Manned Balloons	"
A9	Airships	"
A10	Microlight Aircraft	"
A11	Very Light Aeroplanes	"
A12	Other	"
B1	Turbine Engines	"
B2	Piston Engies	"
B3	APU's	"
B4	Propellers	"
C1	Appliances:	State appliance generic types (e.g., Tyres, Altimeter, etc.) Examples include: Avionic, Com/Nav/Pulse Computer System, Aircraft/Engine/Avionic Instruments, Mechanical/Electrical/ Gyroscopic/Electronic Mechanical/Hydraulic/Pneumatic
C2	Parts:	State part generic types (e.g., Wing, Landing Gear, etc.) Examples include: Structural, Metallic/non-metallic Mechanical/Hydraulic/Pneumatic Electrical Electronic
C3	Materials	
D1	Maintenance	State aircraft types

AMC 21A.153
Changes to the terms of approval – Application for a change to the terms of approval

EASA Form 51 (see AMC No 1 to 21B.240) must be obtained from the Competent Authority and completed in accordance with the procedures of the POE.

The information entered on the form is the minimum required by the Competent Authority to assess the need for change of the production organisation approval.

The completed form and an outline of the changed production organisation exposition, and details of the proposed change to POA terms of approval must be forwarded to the Competent Authority.

GM 21A.157
Investigations – Arrangements

The arrangements made by the applicant for, or holder of an approval under Part 21 Section A Subpart G should allow the Competent Authority to make investigations that include the complete production organisation including partners, sub-contractors and suppliers, whether they are in the State of the applicant or not.

The investigation may include; audits, enquiries, questions, discussions and explanations, monitoring, witnessing, inspections, checks, flight and ground tests and inspection of completed products, parts or appliances produced under the POA.

In order to maintain its confidence in the standards achieved by a POA holder or applicant the Competent Authority may make an investigation of a sample product part or appliance and its associated records, reports and certifications.

The arrangements should enable the organisation to give positive assistance to the Competent Authority and co-operate in performing the investigation during both initial assessment and for the subsequent surveillance to maintain the POA.

Co-operation in performing investigation means that the Competent Authority has been given full and free access to the facilities and to any information relevant to show compliance to Part 21 Section A Subpart G requirements, and assistance (personnel support, records, reports, computer data, etc, as necessary).

Assistance to the Competent Authority includes all appropriate means associated with the facilities of the production organisation to allow the Competent Authority to perform these investigations, such as the availability of a meeting room, office and personnel support, documentation and data, and communication facilities, all properly and promptly available as necessary.

The Competent Authority seeks to have an open relationship with the organisation and suitable liaison personnel should be nominated to facilitate this, including suitable representative(s) to accompany Competent Authority staff during visits not only at the organisations own facilities but also at sub-contractors, partners or suppliers.

GM No. 1 to 21A.158(a)
Uncontrolled non-compliance with applicable design data

An uncontrolled non-compliance with applicable design data is a non-compliance:

- that can not be discovered through systematic analysis; or
- that prevents identification of affected products, parts, appliances, or material.

GM No. 2 to 21A.158(a)
Examples of level one findings

Examples of level one findings are non-compliances with any of the following paragraphs, that could affect the safety of the aircraft:

21A.139, 21A.145, 21A.147, 21A.148, 21A.151, 21A.163, 21A.165(b), (c), (d), (e), (f) and (g).

It should be anticipated that a non-compliance with these paragraphs is only considered a level one finding when objective evidence has been found that this finding is an uncontrolled non-compliance that could affect the safety of the aircraft.

In addition, the failure to arrange for investigations under 21A.157, in particular to obtain access to facilities, after denial of one written request should be classified as a level one finding.

GM 21A.159(a)(3)
Evidence of a lack of satisfactory control

A positive finding by the Competent Authority of:

1 an uncontrolled non-compliance with type design data affecting the airworthiness of product part or appliance

2 an incident/accident identified as caused by POA holder

3 non-compliance with the POE and its associated procedures which could affect conformity of manufactured items to design data

4 insufficient competence of certifying staff

5 insufficient resources in respect of facilities, tools and equipment

6 insufficient means to ensure good production work standards

7 a lack of effective and timely response to prevent a recurrence of any of paragraph 1 to 6.

AMC 21A.163(c)
Computer generated signature

1 Submission to the Competent Authority

Any POA holder intending to implement a computer generated signature procedure to issue EASA Form 1 must document it and submit it to the Competent Authority as part of the documents attached with its exposition and dealing with the issue of airworthiness certifications.

2 Characteristics of the computer generated signature system

The electronic system must :

- guarantee secure access for each certifying staff;
- provide for a "personal" signature;
- insure integrity and validity of the data that may be used coming from the computer system to issue the Form;
- be active only at the location where the part is being released with a EASA Form 1;

- not permit to sign a blank form;
- not permit modification after signature (if modification is necessary after issuance, i.e., re-certification of a part), a new form with a new number and reference to the initial certification should be made;
- insure integrity of the data certified by the signature of the Form and be able to show evidence of the authenticity of the EASA Form 1 (recording and record keeping).

POA holders/applicants are reminded that additional national and/or European requirements may need to be satisfied when operating computer generated signature systems.

3 Characteristics of the computer generated signature

The computer generated signature must take the form of a representation of the hand-written signature of the person signing (i.e. scanned signature). In addition to facilitate understanding and acceptance of the EASA Form 1 released with a computer generated signature the following statement should be printed in Block 13 of the Form: "This document has been issued according to an approved computer generated signature procedure".

AMC 21A.163(d)
Privileges – Maintenance

The applicant may apply for terms of approval, which cover maintenance of a new aircraft that it has manufactured, as necessary to keep it in an airworthy condition, but not beyond the point at which the applicable operational rules require maintenance to be performed by an approved maintenance organisation. If the production organisation intends to maintain the aircraft beyond that point, it would have to apply for and obtain an appropriate maintenance approval.

When the Competent Authority is satisfied that the procedures required by 21A.139 are satisfactory to control maintenance activities so as to ensure that the aircraft is airworthy, this capability will be stated in the terms of approval.

MAINTENANCE OF AIRCRAFT

Examples of such maintenance activities are:

- Preservation, periodic inspection visits, etc.
- Embodiment of a Service Bulletin.
- Application of airworthiness directives.
- Repairs.
- Maintenance tasks resulting from special flights.
- Maintenance tasks to maintain airworthiness during flight training, demo flights and other non-revenue flights.

Any maintenance activities must be recorded in the Aircraft Log Book. It must be signed by certifying staff for attesting the conformity of the work to the applicable airworthiness data.

In some cases the Aircraft Log Book is not available, or the production organisation prefers to use a separate form (for instance for a large work package or for delivery of the aircraft to the customer). In these cases, production organisations must use EASA Form 53 which must subsequently become part of the aircraft maintenance records.

Maintenance of components outside the POA capability

Such maintenance activity outside the capability of the Aircraft POA holder may still be accomplished under the production approval of the original release organisation. In such circumstances the engine(s), propeller(s), parts and appliances will require re-release in accordance with GM 21A.163(c) (EASA Form 1).

Records relevant to continued airworthiness or retirement lives, such as engine runs, flight hours, landings, etc., which affect part retirement of maintenance schedules must be specified on any re-release.

As an alternative the engine, propeller, part or appliance may be maintained by the holder of an approval in accordance with Part 145, classified and released as 'used'.

GM 21A.165(a)
Obligations of the holder – Basic working document

Compliance with the production organisation exposition (POE) is a prerequisite for obtaining and retaining a production organisation approval.

The organisation should make the POE available to its personnel where necessary for the performance of their duties. A distribution list should therefore be established. Where the POE mainly refers to separate manuals or procedures, the distribution of the POE could be limited.

The organisation should ensure that personnel have access to and are familiar with that part of the content of the POE or the referenced documents, which covers their activities.

Monitoring of compliance with the POE is normally the responsibility of the quality assurance function.

GM No. 1 to 21A.165(c)
Obligations of the holder – Conformity of prototype models and test specimens

21A.33 requires determination of conformity of prototype models and test specimens to the applicable design data. The EASA Form 1 may be used as a conformity certificate as part of the assistance a POA holder/applicant provides to a design approval holder/applicant.

GM No. 2 to 21A.165(c)
Obligations of holder – Conformity with type design

Individual configurations are often based on the needs of the customer and improvements or changes which may be introduced by the type-certificate holder. There are also likely to be unintentional divergences (concessions or non-conformances) during the manufacturing process. All these changes should have been approved by the design approval holder, or when necessary by the Agency.

GM No. 3 to 21A.165(c)
Obligations of the holder – Condition for safe operation

Before issue of the Statement of Conformity to the competent authority of the Member State of registry, the holder of a production organisation approval should make an investigation so as to

be satisfied in respect of each of the items listed below. The documented results of this investigation should be kept on file by the POA holder. Certain of these items may be required to be provided (or made available) to the operator or owner of the aircraft (and in some cases the competent authority of the Member State of registry):

1 Equipment or modifications which do not meet the requirements of the State of manufacture but have been accepted by the competent authority of the importing country.

2 Identification of products, parts or appliances which:

a Are not new.

b Are furnished by the buyer or future operator (including those identified in 21A.801 and 21A.805).

3 Technical records which identify the location and serial numbers of significant components including those identified in 21A.801 and 21A.805.

4 Log book and a modification record book for the aircraft as required by the Agency.

5 Log books for products identified in 21A.801 installed as part of the type design as required by the Agency.

6 A weight and balance report for the completed aircraft.

7 A record of missing items or defects which do not affect airworthiness these for example could be furnishing or BFE (Items may be recorded in a technical log or other suitable arrangement such that the operator and Agency are formally aware).

8 Product support information required by other implementing rules and associated CS or GM, such as a Maintenance Manual, a Parts Catalogue, or MMEL all of which are to reflect the actual build standard of the particular aircraft. Also an Electrical load analysis and a wiring diagram.

9 Records which demonstrate completion of maintenance tasks appropriate to the test flight flying hours recorded by the aircraft. These records should show the relationship of the maintenance status of the particular aircraft to the manufacturers recommended maintenance task list and the MRB document/report.

10 Details of the serviceability state of the aircraft in respect of a) the fuel and oil contents, b) provision of operationally required emergency equipment such as life rafts, etc.

11 Details of the approved interior configuration if different from that approved as part of the type design.

12 An approved Flight Manual which conforms to the build standard and modification state of the particular aircraft shall be available.

13 Show that inspections for foreign objects at all appropriate stages of manufacture have been satisfactorily performed.

14 The registration has been marked on the exterior of the aircraft as required by national legislation. Where required by national legislation fix a fireproof owners nameplate.

15 Where applicable there should be a certificate for noise and for the aircraft radio station.

17 The installed compass and or compass systems have been adjusted and compensated and a deviation card displayed in the aircraft.

18 Software criticality list.

19 A record of rigging and control surface movement measurements.

20 Details of installations which will be removed before starting commercial air transport operations (e.g., ferry kits for fuel, radio or navigation).

21 Where maintenance work has been performed under the privilege of 21A.163(d) issue a release to service that includes a statement that the aircraft is in a condition for safe operation.

22 List of all applicable Service Bulletins and airworthiness directives that have been implemented.

GM No. 4 to 21.165(c)
Airworthiness Release or Conformity Certificate

The EASA Form 1, when used as a release certificate as addressed in 21A.165(c)(2) and (3), may be issued in two ways:

- As an airworthiness release, only when by virtue of the arrangement described in 21A.133(b) and (c), it can be determined that the part conforms to the approved design data and is in condition for safe operation.

- As a conformity Certificate, only when by virtue of the arrangement described in 21A.133(b) and (c), it can be determined that the part conforms to applicable design data which is not (yet) approved, for a reason that is indicated in Block 13. Parts released with an EASA Form 1 as a conformity Certificate are not eligible for installation in a type-certificated aircraft.

The EASA Form 1 should only be used for Conformity release purposes when it is possible to indicate the reason that prevents its issue as for airworthiness release purposes.

GM 21A.165(d) and(h)
Obligations of the holder – Recording and archiving system

Records within a production environment satisfy two purposes. Firstly, they are required, during the production process to ensure that products, parts, or appliances are in conformity with the controlling data throughout the manufacturing cycle. Secondly, certain records of milestone events are needed to subsequently provide objective evidence that all prescribed stages of the production process have been satisfactorily completed and that compliance with the applicable design data has been achieved.

Therefore, the approved production organisation should implement a system for the compilation and retention of records during all stages of manufacture, covering short-term and long-term records appropriate to the nature of the product and its production processes.

The management of such information should be subject to appropriate procedures in the Quality System required by 21A.139.

All forms of recording media are acceptable (paper, film, magnetic, ...) provided they can meet the required duration for archiving under the conditions provided.

The related organisation procedures should:

- Identify records to be kept.

- Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information (e.g., by product, subject).

- Control access and provide effective protection from deterioration or accidental damage.

- Ensure continued readability of the records.

- Demonstrate to the Competent Authority proper functioning of the records system.

- Clearly identify the persons involved in conformity determination.

- Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:

  a Data which supports conformity of a product, part, or appliance should be kept for not less than three years from the issue date of the related Statement of Conformity or Authorised Release Certificate.

  b Data considered essential for continuing airworthiness should be kept throughout the operational life of the product, part or appliance.

- Ensure that the recording and record-keeping system used by the partners, supplier and sub-contractors meet the objective of conformity of the product, part or appliance with the same level of confidence as for their own manufacture. They should define in each case who is to retain the record data (organisation or partner, supplier or sub-contractor). They should also define method for surveillance of the recording/record keeping system of the partners, suppliers or sub-contractors.

Subpart H – Airworthiness certificates

There are no AMC or GM items associated with this Subpart.

Subpart I – Noise certificates

There are no AMC or GM items associated with this Subpart.

Subpart J – Design organisation approval

GM No. 1 to 21A.239(a)
Design assurance system

1 *Purpose*
This GM outlines some basic principles and objectives of 21A.239(a).

2 *Definitions*

2.1 The design assurance system is the organisational structure, responsibilities, procedures and resources to ensure the proper functioning of the design organisation.

2.2 The design assurance means all those planned and systematic actions necessary to provide adequate confidence that the organisation has the capability

- to design products or parts in accordance with the applicable CS and environmental protection requirements,

- to show and verify the compliance with these CS and environmental protection requirements, and

- to demonstrate to the Agency this compliance.

2.3 The “Type Investigation” means the tasks of the organisation in support of the type-certificate, supplemental type-certificate or other design approval processes necessary to show and verify and to maintain compliance with the applicable CS and environmental protection requirements.

3 *Design Assurance*
The complete process, starting with the CS and environmental protection requirements and product specifications and culminating with the issuing of a type-certificate, is shown in the diagram on Figure 1. This identifies the relationship between the design, the Type Investigation and design assurance processes.

Effective Design Assurance demands a continuing evaluation of factors that affect the adequacy of the design for intended applications, in particular that the product, or part, complies with applicable CS and environmental protection requirements and will continue to comply after any change.

Two main aspects should therefore be considered:

1 How the planned and systematic actions are defined and implemented, from the very beginning of design activities up to continued airworthiness activities;

2 How these actions are regularly evaluated and corrective actions implemented as necessary.

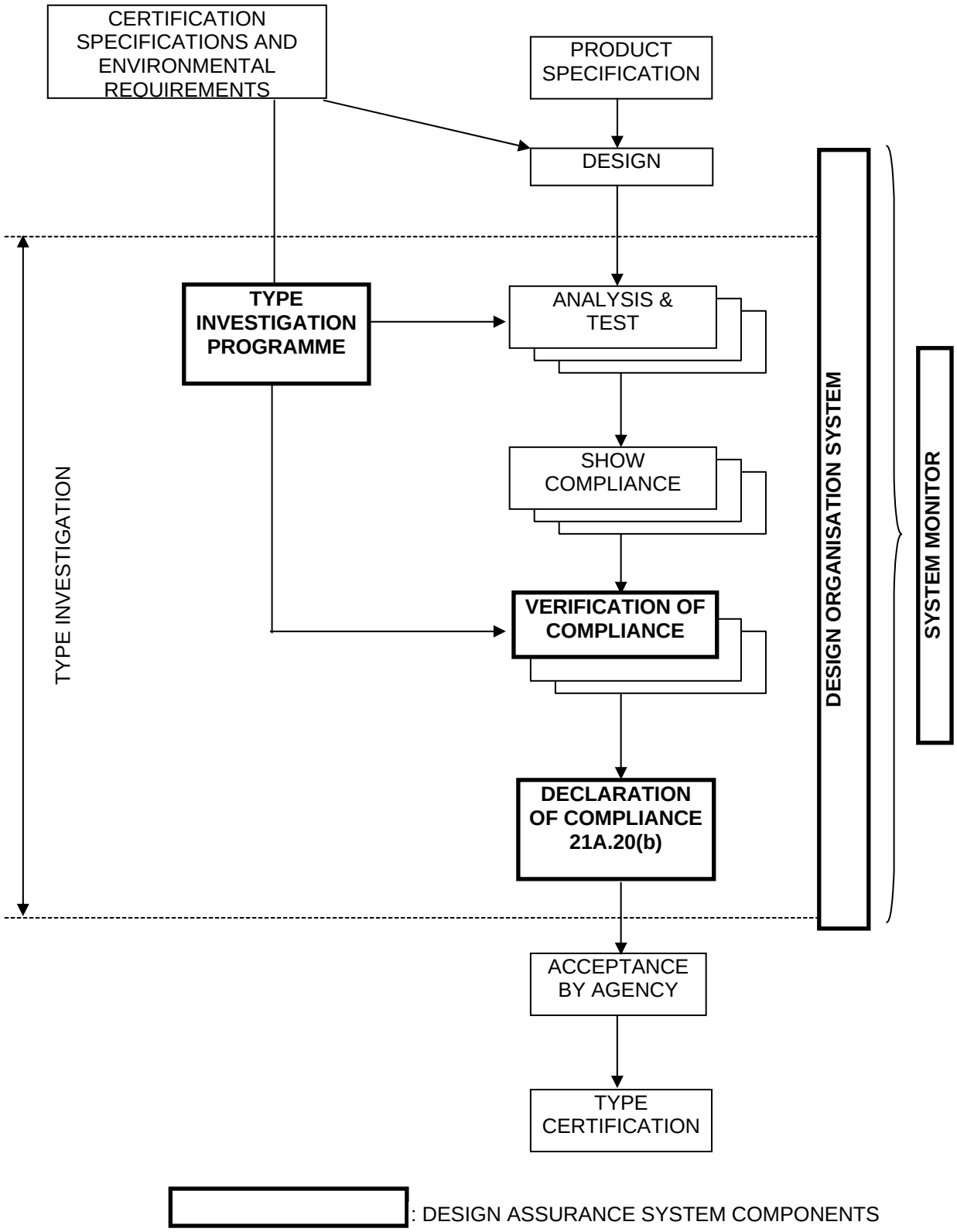


Figure 1 - RELATIONSHIPS BETWEEN DESIGN, DESIGN ASSURANCE AND TYPE INVESTIGATION

3.1 *Planned and Systematic Actions*
For design organisations carrying out Type Investigation of products, the planned and systematic actions should cover the following tasks and procedures should be defined accordingly:

3.1.1 *General*

a. To issue or, where applicable, supplement or amend the handbook in accordance with 21A.243, in particular to indicate the initiation of design activities on a product.

b. To assure that all instructions of the Handbook are adhered to.

c. To conduct Type Investigation.

d. To nominate staff as “compliance verification engineers” responsible to approve compliance documents as defined in paragraph 3.1.3.

e. To nominate personnel belonging to the Office of Airworthiness responsible as defined in paragraph 3.1.4.

f. In the case of an applicant for a supplemental type-certificate, to obtain the agreement of the type-certificate holder for the proposed supplemental type-certificate to the extent defined in 21A.115.

g. To ensure full and complete liaison between the type design organisation and related organisations having responsibility for products manufactured to the type-certificate.

h. To provide the assurance to the Agency that prototype models and test specimens adequately conform to the type design (see 21A.33(b)(1)).

3.1.2 *Chief Executive and Head of design organisation (or his or her Deputy)*

a. The Chief Executive should provide the necessary resources for the proper functioning of the design organisation.

b. The Head of the design organisation, or an authorised representative, should sign a declaration of compliance (see 21A.20(b) and 21A.97(a)(3)) with the applicable CS and environmental protection requirements after verification of satisfactory completion of the Type Investigation. In accordance with 21A.20(c) and 21A.97(a)(4), his or her signature on the declaration of compliance confirms that the procedures as specified in the handbook have been followed (see also GM 21A.A265(b)).

c. The functions of Chief Executive and Head of the design organisation may be performed by the same person.

3.1.3 *Compliance Verification*

a. Approval by signing of all compliance documents, including test programmes and data, necessary for the verification of compliance with the applicable CS and environmental protection requirements as defined in Type Investigation programme.

b. Approval of the technical content (completeness, technical accuracy...), including any subsequent revisions, of the manuals approved by the Agency (Aircraft Flight Manual, the Airworthiness Limitations section of the Instructions for Continued Airworthiness and the Certification Maintenance Requirements (CMR) document, where applicable).

3.1.4 *Office of Airworthiness*

a. Liaison between the design organisation and the Agency with respect to all aspects of Type Investigation.

b. Ensuring that a handbook is prepared and updated as required in 21A.243.

c. Co-operation with the Agency in developing procedures to be used for the type certification process.

d. Issuing of guidelines for documenting compliance.

e. Co-operation in issuing guidelines for the preparation of the manuals required by the applicable implementing rules, Service Bulletins, drawings, specifications, and standards.

f. Ensuring procurement and distribution of applicable CS and environmental protection requirements and other specifications.

g. Co-operating with the Agency in proposing the type-certification basis

h. Interpretation of CS and environmental protection requirements and requesting decisions of the Agency in case of doubt.

i. Advising of all departments of the design organisation in all questions regarding airworthiness, environmental protection approvals and certification.

j. Preparation of the Type Investigation programme and co-ordination of all tasks related to Type Investigation in concurrence with the Agency.

k. Regular reporting to the Agency about Type Investigation progress and announcement of scheduled tests in due time.

l. Ensuring co-operation in preparing test programmes needed for demonstration of compliance.

m. Establishing the compliance checklist and updating for changes.

n. Checking that all compliance documents are prepared as necessary to show compliance with all CS and environmental protection requirements, as well as for completeness, and signing for release of the documents.

o. Checking the required type design definition documents described in 21A.31 and ensuring that they are provided to the Agency for approval when required.

p. Preparation, if necessary, of a draft for a type-certificate data sheet and/or type-certificate data sheet modification.

q. Providing verification to the head of the design organisation that all activities required for Type Investigation have been properly completed.

r. Approving the classification of changes in accordance with 21A.91 and granting the approval for minor changes in accordance with 21A.95(b).

s. Monitoring of significant events on other aeronautical products as far as relevant to determine their effect on airworthiness of products being designed by the design organisation.

t. Ensuring co-operation in preparing Service Bulletins and the Structural Repair Manual, and subsequent revisions, with special attention being given to the manner in which the contents affect airworthiness and environmental protection and granting the approval on behalf of the Agency.

u. Ensuring the initiation of activities as a response to failure (accident/incident/in-service experience) evaluation and complaints from the operation and providing of information to the Agency in case of airworthiness impairment (continuing airworthiness).

v. Advising the Agency with regard to the issue of airworthiness directives in general based on Service Bulletins.

w. Ensuring that the manuals approved by the Agency, including any subsequent revisions (the Aircraft Flight Manual, MMEL, the Airworthiness Limitations section of the Instructions for Continued Airworthiness and the Certification Maintenance Requirements (CMR) document, where applicable) are checked to determine that they meet the respective requirements, and that they are provided to the Agency for approval.

3.1.5 *Maintenance and Operating Instructions*

a. Ensuring the preparation and updating of all maintenance and operating instructions (including Services Bulletins) needed to maintain airworthiness (continuing airworthiness) in accordance with relevant CS. For that purpose, the applicant should:

- establish the list of all documents it is producing to comply with the Appendix referred to in CS 23.1529, CS 25.1529, CS 27.1529, CS 29.1529, CS-E 25 or CS-P 40 (NPA P-3);

- define procedures and organisation to produce and issue these documents, using where applicable and so elected 21A.263(c)(3) privilege.

b. In accordance with 21A.57, 21A.61, 21A.107, 21A.119, 21A.120 and 21A.449, ensuring that these documents are provided to all affected operators and all involved authorities.

3.2 Continued Effectiveness of the design assurance system. The organisation should establish the means by which the continuing evaluation (system monitoring) of the design assurance system will be performed in order to ensure that it remains effective.

GM No. 2 to 21A.239(a)
Design assurance system for minor changes to type design or minor repairs to products

1. Purpose
This GM outlines some basic principles and objectives in order to comply with 21A.239(a) for organisations designing only minor changes to type design or minor repairs to products.

2. Design assurance system
The design assurance system should include the following:

◆ an organisational structure to:

- control the design

- show compliance with applicable CS and environmental protection requirements

- independently check showings of compliance

- liaise with the Agency

- continuously evaluate the design organisation

- control sub-contractors

◆ procedures and responsibilities associated with the functions listed above, taking due account of Part 21 requirements applicable to design and approval of minor changes to type design or minor repairs to products.

AMC 21A.239(a)(3)
Design assurance system - Independent system monitoring

The system monitoring function required by 21A.239(a)(3) may be undertaken by the existing quality assurance organisation when the design organisation is part of a larger organisation.

AMC 21A.239(b)
Design assurance system - Independent checking function of the showing of compliance

1 The independent checking function of the showing of compliance should consist of the verification by a person not creating the compliance data. Such person may work in conjunction with the individuals who prepare compliance data.

2 The verification should be shown by signing compliance documents, including test programmes and data.

3 For a product, there is normally only one compliance verification engineer nominated for each relevant subject.

A procedure should cover the non-availability of nominated persons and their replacement when necessary.

4 For STC cases, when compliance statement and associated documentation are produced by the TC holder, and when these data are approved under the system of the authority of TC holder, then the STC applicant does not need to provide, within its own DOA, the independent checking function required in 21A.239(b) for these data.

GM 21A.239(c)
Design assurance system

In meeting the requirements of 21A.239(c) the applicant for a design organisation approval under Subpart J may adopt the following policy:

1 The satisfactory integration of the Partner/Sub-contractor and applicant's design assurance systems should be demonstrated for the activities covered under the applicant's terms of approval.

2 In the event that a Partner/Sub-contractor holds a design organisation approval (DOA.), then in accordance with 21A.239(c), the applicant may take this into account in demonstrating the effectiveness of this integrated system.

3 When any Partner/Sub-contractor does not hold a DOA then the applicant will need to establish to its own satisfaction and the satisfaction of the Agency, the adequacy of that partner's/sub-contractor's design assurance system in accordance with 21A.243(b).

AMC No. 1 to 21A.243(a)
Data requirements

The handbook should provide the following information for each product covered by the design organisation approval.

1 A description of the tasks which can be performed under the approval, according to the following classification:

a. General areas, like subsonic turbojet aeroplanes, turbopropeller aeroplanes, small aeroplanes, rotorcraft.

b. Technologies handled by the organisation (composite, wood or metallic construction, electronic systems, etc.)

c. A list of types and models for which the design approval has been granted and for which privileges may be exercised, supported by a brief description for each product.

d. For repair design, classification and (if appropriate) approval activities it is necessary to specify the scope of activity in terms of structures, systems, engines, etc.

2 A general description of the organisation, its main departments, their functions and the names of those in charge; a description of the line management and of functional relationships between the various departments.

3 A description of assigned responsibilities and delegated authority of all parts of the organisation which, taken together, constitute the organisation's design assurance system together with a chart indicating the functional and hierarchical relationship of the design assurance system to Management and to other parts of the organisation; also the chains of responsibilities within the design assurance system, and the control of the work of all partners and sub-contractors.

4 A general description of the way in which the organisation performs all the design functions in relation to airworthiness and environmental protection approvals including:

a. The procedures followed and forms used in the Type Investigation process to ensure that the design of, or the change to the design of, the product as applicable is identified and documented, and complies with the applicable CS and environmental protection requirements, including specific requirements for import by importing authorities

b. The procedures for classifying design changes as "major" or "minor" and for the approval of minor changes.

c. The procedures for classifying and approving unintentional deviations from the approved design data occurring in production (concessions or non-conformance's).

d. The procedure for classifying and obtaining approval for repairs.

5 A general description of the way in which the organisation performs its functions in relation to the continuing airworthiness of the product it designs, including co-operation with the production organisation when dealing with any continuing airworthiness actions that are related to production of the product, part or appliance, as applicable.

6 A description of the human resources, facilities and equipment, which constitutes the means for design, and where appropriate, for ground and flight testing.

7 An outline of a system for controlling and informing the Staff of the organisation of current changes in engineering drawings, specifications and design assurance procedures.

8 A description of the recording system for:

a. The type design, including relevant design information, drawings and test reports, including inspection records of test specimens.

b. The means of compliance.

c. The compliance documentation (compliance check list, reports...).

9 A description of the record keeping system to comply with 21A.55 and 21A.105.

10 A description of the means by which the organisation monitors and responds to problems affecting the airworthiness of its product during design, production and in service in particular to comply with 21A.3 (see also GM No. 1 to 21A.239, paragraphs 3.1.4(s) and (u)).

11 The names of the design organisation authorised signatories. Nominated persons with specific responsibilities such as mentioned in 21A.33 and 21A.35 should be listed.

12 (Reserved).

13 A clear definition of the tasks, competence and areas of responsibility of the Office of Airworthiness.

14 A description of the procedures for the establishment and the control of the maintenance and operating instructions (see 21A.57, 21A.61, 21A.107, 21A.119, 21A.120 and 21A.449).

15 A description of the means by which the continuing evaluation (system monitoring) of the design assurance system will be performed in order to ensure that it remains effective.

AMC No. 2 to 21A.243(a)
Data requirements - Model content of handbook for organisations designing minor changes to type design or minor repairs to products

Part 1. Organisation

1.1 Objective of handbook and binding statement
1.2 Responsible person for administration of handbook
1.3 Amendment procedure
1.4 List of effective pages
1.5 Distribution list
1.6 Presentation of design organisation (including locations)
1.7 Scope of work (with identification of type and models of products)
1.8 Organisation charts
1.9 Human resources
1.10 Management staff
1.11 Certifying personnel (see GM No. 2 to 21A.243(d), paragraph 2)
1.12 Independent system monitoring

Part 2. Procedures
2.1 Management of changes to type design and design of repairs
- configuration control
- classification
- approval of minor changes to type design and minor repairs
2.2 Control of design subcontractors
2.3 Collecting/Investigating of failures, malfunctions and defects
2.4 Co-ordination with production
2.5 Documentation control
- in relations with the changes and repairs
- in relation with failures/malfunctions and defects (i.e. Services - Bulletins)
2.6 Record keeping

GM No. 1 to 21A.243(d)
Statement of qualifications and experience

1 Purpose

This GM provides guidelines on the following points:

- Who are the persons covered by 21A.243(d)?
- What is requested from the applicant for these persons?

2 Who are the persons?

Three different types of functions are named or implicitly identified in the requirements of Part 21 Subpart J or in associated AMC and GM, using qualified and experienced personnel:

- the Chief Executive [see GM No. 1 to 21A.239(a), para. 3.1.2, GM 21A.249, GM 21A.265(b)]

- the other management staff:

  * the Head of the design organisation [see GM No. 1 to 21A.239(a), para.3.1.2, GM No. 1 21A.245, para.4.1, GM 21A.265(b)]

  * the Chief of the Office of Airworthiness, or [see GM No. 1 to 21A.245, para. 4.2]

  * the Chief of the independent monitoring function of the design assurance system [see 21A.239(a)(3) and AMC No. 1 to 21A.243(a), para.2]

- the personnel making decisions affecting airworthiness and environmental protection:

  * compliance verification engineers [see GM No. 1 to 21A.239(a), para.3.1.3; AMC 21A.239(b)]

  * personnel of the Office of Airworthiness making decisions affecting airworthiness and environmental protection, especially those linked with the 21A.263 privileges (signing documents for release, approving classification of changes and repairs, and granting the approval of minor changes and minor repairs, granting the approval of SBs, and documentary changes to the aircraft flight manual) [see GM No. 1 to 21A.239(a), para. 3.1.4]

3 Kind of statement

3.1 Chief Executive

The Chief Executive should provide the necessary resources for the proper functioning of the design organisation.

A statement of the qualification and experience of the Chief Executive is normally not required.

3.2 Other management staff

The person or persons nominated should represent the management structure of the organisation and be responsible through the Head of design organisation to the Chief Executive for the execution of all functions as specified in Part 21, Subpart J. Depending on the size of the organisation, the functions may be subdivided under individual managers.

The nominated managers should be identified and their credentials furnished to the Agency.

Agency on EASA Form Four [EASA form expected] (see format in EASA administrative procedures) in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the design activities as performed by the organisation.

The responsibilities and the tasks of each individual manager should be clearly defined, in order to prevent uncertainties about the relations, within the organisation. Responsibilities of the managers should be defined in a way that all responsibilities are covered.

3.3 Personnel making decisions affecting airworthiness and environmental protection

For these personnel, no individual statement is required. The applicant should show to the Agency that there is a system to select, train, maintain and identify them for all tasks where they are necessary.

The following guidelines for such a system are proposed:

***** These personnel should be identified in the handbook, or in a document linked to the handbook. This, and the corresponding procedures, should enable them to carry out the assigned tasks and to properly discharge associated responsibilities.

* The needs, in terms of quantity of these personnel to sustain the design activities, should be identified by the organisation.

***** These personnel should be chosen on the basis of their knowledge, background and experience.

***** When necessary, complementary training should be established, to ensure sufficient background and knowledge in the scope of their authorization. The minimum standards for new personnel to qualify in the functions should be established. The training should lead to a satisfactory level of knowledge of the procedures relevant for the particular role.

***** Training policy forms part of the design assurance system and its appropriateness forms part of investigation by the Agency within the organisation approval process and subsequent surveillance of persons proposed by the organisation.

***** This training should be adapted in response to experience gained within the organisation

***** The organisation should maintain a record of these personnel which includes details of the scope of their authorisation. The personnel concerned should be provided with evidence of the scope of their authorisation.

***** The following minimum information should be kept on record:

a) Name
b) Date of birth
c) Experience and training
d) Position in organisation
e) Scope of the authorisation
f) Date of first issue of the authorisation
g) If appropriate, date of expiry of the authorisation
h) Identification number of the authorisation.

The record may be kept in any format and should be controlled.

* Persons authorised to access the system should be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner or that such confidential records do not become accessible to unauthorised persons.

* Personnel should be given access to their own record.

* Under the provision of 21A.257 the Agency has a right of access to the data held in such a system.

* The organisation should keep the record for at least two years after a person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

GM No. 2 to 21A.243(d)
Data requirements - Statement of the qualification and experience- Organisations designing minor changes to type design or minor repairs to products

For organisations designing minor changes to type design or minor repairs to products, the statement of the qualifications and experience required by 21A.243(d) should be addressed as follows :

1. The nominated managers should be identified and their credentials submitted to the Agency on EASA Form Four [EASA form expected] (see format in EASA administrative procedures) in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the design activities as performed by the organisation.

2. The persons responsible to:

- classify changes to type design or repairs

- verify compliance [21A.239(b)]

- approve minor changes to type design and minor repairs [21A.263(c)(2)]

- issue information or instructions [21A.263(c)(3)]

should be selected by the organisation in accordance with a procedure and criteria agreed with the Agency.

GM No. 1 to 21A.245
Requirements for approval
See 21A.245

1 *General.* The data submitted in accordance with 21A.243 should show that sufficient skilled personnel are available and suitable technical and organisational provisions have been made for carrying out the Type Investigation defined by GM No. 1 to 21A.239(a), paragraph 2.3.

2 *Personnel.* The applicant should show that the personnel available to comply with 21A.245(a) are, due to their special qualifications and number, able to provide assurance of the design or modification of a product, as well as the compilation and verification of all data needed to meet the applicable CS and environmental protection requirements while taking into account the present state of the art and new experience.

3 *Technical.* The applicant should have access to:

a. Workshops and production facilities which are suitable for manufacturing prototype models and test specimens.
b. Accommodation and test facilities which are suitable for carrying out tests and measurements needed to demonstrate compliance with the CS and environmental protection requirements. The test facilities may be subjected to additional technical conditions related to the nature of tests performed.

4 *Organisation.* The data submitted in accordance with 21A.243 should show that:

4.1 The Head of the design organisation for which an application for approval has been made, has the direct or functional responsibility for all departments of the organisation which are responsible for the design of the product. If the departments responsible for design are functionally linked, the Head of the design organisation still carries the ultimate responsibility for compliance of the organisation with Part 21Subpart J.

4.2 An Office of Airworthiness, or equivalent function, has been established and staffed on a permanent basis to act as the focal point for co-ordinating airworthiness and environmental protection matters (see GM No. 1 to 21A.239 (a) paragraph 3.1.4); it reports directly to the Head of the design organisation or is integrated into an independent quality assurance organisation reporting to the Head of the design organisation.

4.3 [Reserved]

4.4 Responsibilities for all tasks related to Type Investigations are assigned in such a way that gaps in authority are excluded.

4.5 The responsibility for a number of tasks as in paragraph 4.4 may be assigned to one person especially in the case of simple projects.

4.6 Co-ordination between technical departments and the persons in charge of the system monitoring required by 21A.239(a)(3) has been established :

- to ensure quick and efficient reporting and resolution of difficulties encountered using the handbook and associated procedures
- to maintain the design assurance system
- to optimise auditing activities.

GM No. 2 to 21A.245
Requirements for approval - Organisations designing minor changes to type design or minor repairs to products

The data submitted in accordance with 21A.243 should show that:

1 The manager responsible for design has the direct or functional responsibility for all departments of the organisation which are involved in the design of minor changes to type design or minor repairs to products.

2 Person(s) have been nominated to liaise with the Agency and to co-ordinate airworthiness and environmental protection matters. Their position in the organisation should allow direct report to the manager responsible for design.

3 Responsibilities for all tasks related to the design and approval of minor changes to type design or minor repairs to products are assigned to ensure that all areas are covered

4 The responsibility for a number of tasks as in paragraph 3 may be assigned to one person especially in the case of simple projects.

GM 21A.247
Significant changes in the design assurance system

In addition to a change in ownership (see 21A.249), the following changes to the design assurance system should be considered as “significant” to the showing of compliance or to the airworthiness or environmental protection of the products:

1 Organisation

* Relocation to new premises (see also GM 21A.249)

* Change in the industrial organisation (partnership, suppliers, design worksharing) unless it can be shown that the independent checking function of the showing of compliance is not affected

* Change in the parts of the organisation that contribute directly to the airworthiness or environmental protection (independent checking function, office of airworthiness [or equivalent])

* Change to the independent monitoring principles (see 21A.239(a)(3))

2 Responsibilities

* Change of the management staff

  - the Head of the design organisation [GM No. 1 to 21A.239(a), para.3.1.2, GM No. 1 to 21A.245, para.4.1, GM 21A.265(b)]

  - the Chief of the Office of Airworthiness [GM No. 1 to 21A.245, para. 4.2]

  - the Chief of the independent monitoring function of the design assurance system [21A.239(a)(3) and AMC No. 1 to 21A.243(a), para.2]

* New distribution of responsibilities affecting airworthiness or environmental protection.

* For organisations designing minor changes to type design or minor repairs to products, change of the persons identified in GM No. 2 to 21A.243(d).

3 Procedures

Change to the principles of procedures related to :

- the type certification

- the classification of changes and repairs as " major " or " minor " [21A.263(c)(1)]

- the treatment of major changes and major repairs

- the approval of the design of minor changes and minor repairs [21A.263(c)(2)]

- the issue of information and instructions under the privilege of 21A.263(c)(3)

- the approval of documentary changes to the Aircraft Flight Manual [21A.263(c)(4)]

- the approval of the design of major repairs [21A.437 or 21A.263(c)(5)]

- continued airworthiness (see 21A.3)

- the configuration control, when airworthiness or environmental protection is affected

- the acceptability of design tasks undertaken by partners or subcontractors [21A.239(c)]

4 Resources

* Substantial reduction in number and/or experience of staff (see 21A.245(a)).

GM 21A.249
Transferability

1. Transfer of the approval would normally only be agreed in cases where the organisation itself remains substantially unchanged.

2. An acceptable transfer situation could be for example a change of company name (supported by the appropriate certificate from the National Companies Registration Office or equivalent) but with no changes to site address or Chief Executive. However, if the same legal entity were to relocate to new premises with a new Chief Executive and/or new departmental heads, then a substantial investigation by the Agency would be necessary such that the change would be classified as a reapproval.

3. In the event of receivership there may be good technical justification for continuation of the approval provided that the company continues to function in a satisfactory manner. It is likely that at a later stage the approval might be surrendered by the receiver or transferred to another legal entity in which case the former paragraphs apply.

GM No. 1 to 21A.251
Terms of approval

1 The terms of approval are stated on the certificate of approval issued by the Agency. The certificate states the scope of work and the products , changes or repairs thereof, with the appropriate limitations for which the approval has been granted. For design organisation approval covering type certification or ETSO authorisation for APU, the list of product types covered by the design assurance system should be included.

2 Approval of a change in the terms of approval in accordance with 21A.253 will be confirmed by an appropriate amendment of the certificate of approval.

3 The certificate references the handbook of the approved design organisation, provided in accordance with 21A.243. This handbook defines the tasks which may be performed under the approval.

4 Scopes of work are, for example, “subsonic turbojet aeroplanes”, “turbopropeller aeroplanes”, “small aeroplanes”, “rotorcraft”... Technologies are quoted in the scope of work when it is considered by the Agency as a limitation for the design organisation approval.

5 For repair design activities, the certificate states the scope of work with the appropriate limitations for which the approval has been granted.

GM No. 2 to 21A.251
Terms of approval - Organisations designing minor changes to type design or minor repairs to products

Terms of approval issued for organisations designing minor changes to type design or minor repairs to products should contain:

1. Scope of work
This design organisation approval has been granted for:

- designing minor changes to type design or minor repairs to [aircraft, engine, propeller] in accordance with the applicable CS and environmental protection requirements,

- showing and verifying the compliance with these CS and environmental protection requirements.

2. Category of products

Any other indication if the Agency has found a limitation related to aircraft systems or technologies and reducing the scope as defined in paragraph 1.

3. Privileges

The holder of this approval is entitled to:
List of the privileges granted with the approval, pursuant to 21A.263(c)(1), (2) and (3).

GM 21A.257(a)
Investigations

Arrangements that allow the Agency to make investigations include the complete design organisation including partners, sub-contractors and suppliers, whether they are in the State of the applicant or not, assisting and co-operating with the Agency in performing inspections and audits conducted during initial assessment and subsequent surveillance.

Assistance to the Agency includes all appropriate means associated with the facilities of the design organisation to allow the Agency to perform these inspections and audits, such as a meeting room and office support.

GM 21A.263(b)
DOA privilege related to compliance documents

A compliance document is the end result of a certification process, where the showing of compliance is recorded. For each specific certification process, the Agency is involved in the process itself at an early stage, especially through the establishment of the certification programme. The inspections or tests under 21A.257(b) may be performed at various stages of the whole certification process, not necessarily when the compliance document is presented.

Therefore, according to the scheduled level of involvement, the Agency should agree with the DOA holder documents to be accepted without further Agency verification under the DOA privilege of 21A.263(b).

AMC No. 1 to 21A.263(c)(1)
Procedure for the classification of changes to type design and repairs as minor and major

1 INTENT

This acceptable means of compliance provides means to develop a procedure for the classification of changes to type design and repairs.

Each DOA applicant must develop its own internal classification procedure following this AMC, in order to obtain the associated 21A.263(c)(1) privilege.

2 PROCEDURE FOR THE CLASSIFICATION OF CHANGES TO TYPE DESIGN AND REPAIRS

2.1 Content

The procedure must address the following points:

- the identification of changes to type design or repairs
- classification

- justification of the classification
- authorised signatories
- supervision of changes to type design or repairs initiated by subcontractors

For changes to type design, criteria used for classification must be in compliance with 21A.91 and GM 21A.91.

For repairs, criteria used for classification must be in compliance with 21A.435 and GM 21A.435.

2.2 Identification of changes to type design or repairs

The procedure must indicate how the following are identified:

- major changes to type design or major repairs
- those minor changes to type design or minor repairs where additional work is necessary to show compliance with the CS and environmental protection requirements
- other minor changes to type design or minor repairs requiring no further showing of compliance.

2.3 Classification

The procedure must show how the effects on airworthiness and environmental protection are analysed, from the very beginning, by reference to the applicable requirements.

If no specific CS or environmental protection requirements are applicable to the change or repairs, the above review must be carried out at the level of the part or system where the change or repair is integrated and where specific CS or environmental protection requirements are applicable.

2.4 Justification of the classification

All decisions of classification of changes to type design or repairs as “major” or “minor” must be recorded and, for those which are not straightforward, also documented. These records must be easily accessible to the Agency for sample check.

2.5 Authorised signatories

All classifications of changes to type design or repairs must be accepted by an appropriate authorised signatory.

The procedure must indicate the authorised signatories for the various products listed in the terms of approval.

For those changes or repairs that are handled by subcontractors, as described under paragraph 2.6, it must be described how the DOA holder manages its classification responsibility.

2.6 Supervision of changes to type design or repairs initiated by subcontractors

The procedure must indicate, directly or by cross-reference to written procedures, how changes to type design or repairs may be initiated and classified by subcontractors and are controlled and supervised by the DOA holder.

AMC No. 2 to 21A.263(c)(1)
Privileges - Organisations designing minor changes to type design or minor repairs to products : classification procedure

1. Content

The procedure must address the following points:

- configuration control rules, especially the identification of changes to type design or repairs
- classification, in compliance with 21A.91 and GM 21A.91 for changes and GM 21A.435 for repairs
- justification of the classification
- authorised signatories

2. Identification of changes to type design or repairs

The procedure must indicate how the following minor changes to type design or minor repairs are identified:

- those minor design changes to type design or minor repairs where additional substantiation data is necessary to show compliance with the CS or environmental protection requirements
- other minor design changes to type design or minor repairs requiring no further showing of compliance.

3. Classification

The procedure must show how the effects on airworthiness and environmental protection are analysed, from the very beginning, by reference to the applicable requirements.

If no specific requirements are applicable to the change or the repair, the above review must be done at the level of the part or system where the change or repair is integrated and where specific CS or environmental protection requirements are applicable.

For repair, see also GM 21A.435.

4. Justification of the classification

All decisions of classification of changes to type design or repairs as "minor " must be recorded and, for those which are not straightforward, also documented. These records must be easily accessible to the Agency for sample check.

It may be in the format of meeting notes or register.

5. Authorised signatories

All classifications of changes to type design or repairs must be accepted by an appropriate authorised signatory.

The procedure must indicate the authorised signatories for the various products listed in the terms of approval.

AMC No. 1 to 21A.263(c)(2)
Procedure for the approval of minor changes to type design or minor repairs

1 INTENT

This acceptable means of compliance provides means to develop a procedure for the approval of minor changes to type design or minor repairs.

Each DOA applicant must develop its own internal procedures following this AMC, in order to obtain the associated privilege under 21A.263(c)(2).

2 PROCEDURE FOR THE APPROVAL OF MINOR CHANGES TO TYPE DESIGN OR MINOR REPAIRS

2.1 Content

The procedure must address the following points:

- compliance documentation
- approval under the DOA privilege
- authorised signatories
- supervision of minor changes to type design or minor repairs handled by subcontractors.

2.2 Compliance documentation

For those minor changes to type design or minor repairs where additional work to show compliance with the applicable CS and environmental protection requirements is necessary, compliance documentation must be established and independently checked as required by 21A.239(b).

The procedure must describe how the compliance documentation is produced and checked.

2.3 Approval under the DOA privilege

2.3.1 For those minor changes to type design or minor repairs where additional work to show compliance with the applicable CS and environmental protection requirements is necessary, the procedure must define a document to formalise the approval under the DOA privilege.

This document must include at least :

- identification and brief description of the change or repair and reasons for change or repair
- applicable CS or environmental protection requirements and methods of compliance
- reference to the compliance documents
- effects, if any, on limitations and on the approved documentation

- evidence of the independent checking function of the showing of compliance
- evidence of the approval under the privilege of 21A.263(c)(2) by an authorised signatory
- date of the approval

For repairs, see AMC 21A.433(a).

2.3.2 For the other minor changes to type design or minor repairs, the procedure must define a means to identify the change or repair and reasons for the change or repair, and to formalise its approval by the appropriate engineering authority under an authorised signatory. This function may be delegated by the Office of Airworthiness but must be controlled by the Office of Airworthiness, either directly or through appropriate procedures of the DOA holder's design assurance system.

2.4 Authorised signatories

The persons authorised to sign for the approval under the privilege of 21A.263(c)(2) must be identified (name, signature and scope of authority) in appropriate documents that maybe linked to the handbook.

2.5 Supervision of minor changes to type design or minor repairs handled by subcontractors

For the minor changes to type design or minor repairs described in 2.3.2, that are handled by subcontractors, the procedure must indicate, directly or by cross-reference to written procedures how these minor changes to type design or minor repairs are approved at the subcontractor level and the arrangements made for supervision by the DOA holder.

AMC No. 2 to 21A.263(c)(2)
Privileges - Organisations designing minor changes to type design or minor repairs to products : procedure for the approval of minor changes to type design or minor repairs

1. Content
The procedure must address the following points :

- compliance documentation
- approval under the DOA privilege
- authorised signatories

2. Compliance documentation
For those minor changes to type design or minor repairs where additional work to show compliance with the applicable CS and environmental protection requirements is necessary, compliance documentation must be established and independently checked as required by 21A.239(b).

The procedure must describe how the compliance documentation is produced and checked.

3. Approval under the DOA privilege

3.1. For those minor changes to type design or minor repairs where additional work to show compliance with the applicable CS or environmental protection requirements is necessary, the procedure must define a document to formalise the approval under the DOA privilege.

This document must include at least :

- identification and brief description of the change or the repair and reason for change or repair
- applicable CS or environmental protection requirements and methods of compliance
- reference to the compliance documents
- effects, if any, on limitations and on the approved documentation
- evidence of the independent checking function of the showing of compliance
- evidence of the approval under the privilege of 21A.263(c)(2) by an authorised signatory
- date of the approval

For repairs, see also AMC 21A.433(a).

3.2. For the other minor changes to type design or minor repairs, the procedure must define a means to identify the change or repair and reasons for the change or repair, and to formalise its approval by the appropriate engineering authority under an authorised signatory. This function must be controlled through appropriate procedures of the DOA holder's design assurance system.

4. Authorised signatories
The persons authorised to sign for the approval under the privilege of 21A.263(c)(2) must be identified (name, signature and scope of authority) in appropriate documents that may be linked to the handbook.

GM 21A.263(c)(3)
Issue of information or instructions

1 INTENT
This GM provides guidelines to address the various aspects the DOA should cover in order to have a comprehensive procedure for the issue of information or instructions.

2 SCOPE
The information or instructions referred to in 21A.263(c)(3) are issued by a DOA holder to make available to the owners or operators of a product with all necessary data to implement a change on the product or a repair, or to inspect it. Some are also issued to provide maintenance organisations and other interested persons with all necessary maintenance data for the performance of maintenance, including implementation of a change on the product or a repair, or inspection, in accordance with 21A.61, 21A.107, 21A.120 or 21A.449 (Instructions for Continued Airworthiness).

This information or instructions may be issued in a format of a Service Bulletin as defined in ATA 100 system , or in Structural Repair Manuals, Maintenance Manuals, Engine and Propeller Manuals etc.
The preparation of this data involves design, production and inspection. As the overall responsibility, through the privilege, is allocated to the DOA holder, the three aspects should be properly handled under the DOA to obtain the privilege "to issue information or instructions containing a statement that the technical content is approved", and a procedure should exist.

3 PROCEDURE
For the information and instructions issued under 21A.263(c)(3), the DOA holder should establish a procedure addressing the following points :

- preparation

- verification of technical consistency with corresponding approved change(s) , repair(s) or approved data, including effectivity, description, effects on airworthiness and environmental protection, especially when limitations are changed

- verification of the feasibility in practical applications

- authorised signatories.

The procedure should include the information or instructions prepared by subcontractors or vendors, and declared applicable to its products by the DOA holder.

4 STATEMENT

The statement provided in the information or instructions should also cover the information or instructions prepared by subcontractors or vendors and declared applicable to its products by the DOA holder.

The technical content is related to the design data and accomplishment instructions, and its approval means that:

- the design data has been appropriately approved ; and

- the instructions provide for practical and well defined installation/inspection methods, and, when accomplished, the product is in conformity with the approved design data.

Note : Information and instructions related to required actions under 21A.3B(b) (airworthiness directives) are submitted to the Agency to ensure compatibility with Airworthiness directive content (see 21A.265(e)), and contain a statement that they are, or will be, subject to an airworthiness directive issued by the Agency.

GM 21A.263(c)(4)
Procedure for the approval of documentary changes to the Aircraft Flight Manual

1 INTENT

This GM provides guidelines to develop a procedure for the approval of documentary changes to the Aircraft Flight Manual (AFM).

Each DOA applicant should develop its own internal procedure, based on these guidelines, in order to obtain the associated privilege under 21A.263(c)(4).

2 DEFINITION OF DOCUMENTARY CHANGES TO THE AFM

Examples of documentary changes to the AFM that may be approved under the DOA privilege:

A - FOR AFM ISSUED BY THE TYPE-CERTIFICATE HOLDER

Editorial changes or corrections to the AFM.

Changes to weight limitations that are within all previously EASA approved limitations (e.g., structural, noise, etc.)

The addition of compatible and previously EASA approved AFM Temporary changes, appendices or Supplements.
Conversions of previously FAA or EASA approved combinations of units of measurement added to the AFM in a previously approved manner.

The addition of aircraft serial numbers to an existing AFM where the aircraft configuration, as related to the AFM, is identical to aircraft already in that AFM.

The removal of reference to aircraft serial numbers no longer applicable to that AFM.

B - FOR AFM SUPPLEMENTS ISSUED BY STC HOLDERS

Editorial changes or corrections to the AFM Supplement.

Changes to weight limitations that are within all previously EASA approved limitations (e.g., structural, noise, etc.)

Conversions of previously FAA or EASA approved combinations of units of measurement added to the AFM Supplement in a previously approved manner.

The addition of aircraft serial numbers to an existing AFM Supplement where the aircraft configuration, as related to the AFM Supplement, is identical to aircraft already in that AFM Supplement.

The removal of reference to aircraft serial numbers no longer applicable to that AFM Supplement.

3 PROCEDURE FOR THE APPROVAL OF DOCUMENTARY CHANGES

3.1 Content

The procedure should address the following points:

- preparation of all AFM changes,
- classification as documentary AFM change,
- verification by the airworthiness function, especially regarding the classification of the AFM change,
- approval of AFM changes,
- approval statement and authorised signatories,
- distribution.

3.2 Preparation

The procedure should indicate how AFM changes are prepared and how the co-ordination with people in charge of design changes is performed.

3.3 Classification

The procedure should indicate how AFM changes are classified as documentary changes, in accordance with the criteria of paragraph 2.

Changes to the AFM of an editorial nature should be non-technical and should normally only affect existing approved data.

3.4 Verification by Office of airworthiness function

The procedure should indicate how people in charge of Office of airworthiness function will :

- verify the classification as documentary changes
- review the content of the AFM changes.

3.5 Approval

Any change to the AFM should be approved, either by the Agency, or under the privilege of 21A.263(c)(4) for documentary AFM changes.

For documentary AFM changes, the procedure should indicate how the approval under the privilege will be formalised.

3.6 Approval statement and authorised signatories

Revisions of the AFM containing only documentary changes should be issued with the approval statement defined in 21A.263(c)(4).

When approval status is shown on each page, a simplified statement such as "Approved under the authority of DOA nr.[EASA].J.[xyz] " may be used.

The authorised signatories should be identified (name, signature), together with the scope of authorisation, in a document that can be linked to the DOA handbook.

3.7 Maintaining, updating and distribution

The procedure should indicate how the master copy of the AFM is maintained and updated, and how approved revisions are distributed, taking account of 21A.57 or 21A.119.

AMC 21A. 265(a)
Administration of the Handbook

1 The handbook of the applicant must be in the language which will permit the best use of it by all personnel charged with the tasks performed for the purpose of the design organisation. The applicant may be requested to provide an English translation of the handbook and other supporting documents as necessary for the investigation.

2 The handbook must be produced in a concise form with sufficient information to meet 21A.243 relevant to the scope of approval sought by the applicant. The handbook must include the following:

a. Organisation name, address, telephone, telex and facsimile numbers.

b. Document title, and company document reference No (if any).

c. Amendment or revision standard identification for the document.

d. Amendment or revision record sheet.

e. List of effective pages with revision/date/amendment identification for each page.

f. Contents list or index.

g. A distribution list for the Handbook.

h. An introduction, or foreword, explaining the purpose of the document for the guidance of the organisation’s own personnel. Brief general information concerning the history and development of the organisation and, if appropriate, relationships with other organisations which may form part of a group or consortium, must be included to provide background information for the Agency.

i. The certificate of approval must be reproduced in the document.

j. Identification of the department responsible for administration of the Handbook.

NOTE: In the case of an initial or revised approval it is recognised that certificate will be issued after Agency agreement to the handbook content in draft form. Arrangements for formal publication in a timely manner must be agreed before the certificate of approval is issued.

3 An updating system must be clearly laid down for carrying out required amendments and modifications to the handbook.

4 The handbook may be completely or partially integrated into the company organisation manual. In this case, identification of the information required by 21A.243 must be provided by giving appropriate cross references, and these documents must be made available, on request, to the Agency.

GM 21A.265(b)
Use of the Handbook

1 The handbook should be signed by the Chief Executive and the Head of the design organisation and declared as a binding instruction for all personnel charged with the development and type investigation of products.

2 All procedures referenced in the handbook are considered as parts of the handbook and therefore as basic working documents.

Subpart K – Parts and appliances

GM No. 1 to 21A.303(c)
Standard Parts

In this context a part is considered as a “standard part” where it is designated as such by the design approval holder responsible for the product, part or appliance, in which the part is intended to be used. In order to be considered a “standard part”, all design, manufacturing, inspection data and marking requirements necessary to demonstrate conformity of that part should be in the public domain and published or established as part of officially recognised Standards.

GM No. 2 to 21A.303(c)
Officially recognised Standards

In this context “officially recognised Standards” means those standards established or published by an official body whether having legal personality or not, which are widely recognised by the air transport sector as constituting good practice.

GM 21A.307
Release of Parts and Appliances for Installation

“Authorised release certificate certifying airworthiness for a new part or appliance” means certifying that the part or appliance conforms with the approved design data and is in condition for safe operation.

(Subpart L – Not applicable)

Subpart M - Repairs

GM 21A.431(a)
Scope

Manuals and other instructions for continued airworthiness (such as the Manufacturers Structural Repair Manual, Maintenance Manuals and Engine Manuals provided by the holder of the type-certificate, supplemental type-certificate, design approval or ETSO authorisation as applicable) for operators, contain useful information for the development and approval of repairs.

When these data are explicitly identified as approved, they may be used by operators without further approval to cope with anticipated in-service problems arising from normal usage provided that they are used strictly for the purpose for which they have been developed.

Approved data is data which is approved either by the Agency, or by an appropriately approved design organisation.

NB: Flow Chart 1 addresses the procedures that should be followed for products where the State of design is a Member State

Flow Chart 2 addresses procedures that should be followed for products where the State of design is not a Member State.

When specific repair data is approved outside of the Community, conditions for acceptance may be defined in the bilateral arrangements between the Community and the competent authority of a third country. In the absence of such arrangement, the repair data shall follow the approval route as if it was designed and approved within the Community.

GM 21A.431(d)
Repairs to articles

A repair to an article under 21A.611 has to be seen in the context of an ETSO authorisation, i.e., when an article as such is specifically approved under Subpart O, with dedicated rules that give specific rights and obligations to the designer of the article, irrespective of any product type design or change to the type design. For a repair to such an article, irrespective of installation on any aircraft, Subpart O, and 21A.611 in particular, should be followed.

When an airline or a maintenance organisation is designing a new repair (based on data not published in the TC holder or Original Equipment Manufacturer documentation) on an article installed on an aircraft, such a repair can be considered as a repair to the product in which the article is installed, not to the article taken in isolation. Therefore Subpart M can be used for the approval of this repair, that will be identified as " repair to product x affecting article y", but not "repair to article y".

AMC 21A.433 (a) and 21A.447
Repair design and Record Keeping

1. Relevant substantiation data associated with a new major repair design and record keeping should include:

a. damage identification and reporting source,

b. major repair design approval sheet identifying applicable requirements and references of justifications,

c. repair drawing and/or instructions and scheme identifier,

d. correspondence with the TC, STC, design approval or ETSOA holder, if its advice on the design has been sought,

e. structural justification (static strength, fatigue, damage tolerance, flutter etc) or references to this data,

f. effect on the aircraft, engines and/or systems, (performance, flight handling, etc as appropriate)

g. effect on maintenance programme,

h. effect on Airworthiness limitations, the Flight Manual and the Operating Manual,

i. weight and moment change,

j. special test requirements.

2. Relevant minor repair documentation includes paragraphs 1(a) and (c). Other points of paragraph 1 may be included where necessary. If the repair is outside the approved data, justification for classification is required.

3. Special consideration should be given to repairs that impose subsequent limitations on the part, product or appliance, (e.g., engine turbine segments that may only be repaired a finite number of times, number of repaired turbine blades per set, oversizing of fastener holes, etc.).

4. Special consideration should also be given to Life Limited parts and Critical Parts, notably with the involvement of the type-certificate or STC holder, when deemed necessary under 21A.433 (b).

5. Repairs to engine critical parts would normally only be accepted with the involvement of the TC holder.

GM 21A.435(a)
Classification of repairs

1. Clarification of the terms Major/Minor

In line with the definitions given in 21A.91, a new repair is classified as 'major' if the result on the approved type design has an appreciable effect on structural performance, weight, balance, systems, operational characteristics or other characteristics affecting the airworthiness of the product, part or appliance. In particular, a repair is classified as major if it needs extensive static, fatigue and damage tolerance strength justification and/or testing in its own right, or if it needs methods, techniques or practices that are unusual (i.e., unusual material selection, heat treatment, material processes, jigging diagrams, etc.)

Repairs that require a re-assessment and re-evaluation of the original certification substantiation data to ensure that the aircraft still complies with all the relevant requirements, are to be considered as major repairs.

Repairs whose effects are considered minor and require minimal or no assessment of the original certification substantiation data to ensure that the aircraft still complies with all the relevant requirements, are to be considered “minor”.

It is understood that not all the certification substantiation data will be available to those persons/organisations classifying repairs. A qualitative judgement of the effects of the repair will therefore be acceptable for the initial classification. The subsequent review of the design of the repair may lead to it being re-classified, owing to early judgements being no longer valid.

2. Airworthiness concerns for Major/Minor classification

The following should be considered for the significance of their effect when classifying repairs. Should the effect be considered to be significant then the repair should be classified 'Major'. The repair may be classified as 'Minor' where the effect is known to be without appreciable consequence.

i) Structural performance

Structural performance of the product includes static strength, fatigue, damage tolerance, flutter and stiffness characteristics. Repairs to any element of the structure should be assessed for their effect upon the structural performance.

ii) Weight and balance

The weight of the repair may have a greater effect upon smaller aircraft as opposed to larger aircraft. The effects to be considered are related to overall aircraft centre of gravity and aircraft load distribution. Control surfaces are particularly sensitive to the changes due to the effect upon the stiffness, mass distribution and surface profile which may have an affect upon flutter characteristics and controllability.

iii) Systems

Repairs to any elements of a system should be assessed for the effect intended on the operation of the complete system and for the effect on system redundancy. The consequence of a structural repair on an adjacent or remote system should also be considered as above, (for example: airframe repair in area of a static port).

iv) Operational characteristics

Changes may include:

- stall characteristics
- handling
- performance and drag
- vibration

v) Other characteristics

- changes to load path and load sharing
- change to noise and emissions
- fire protection / resistance

Note: Considerations for classifying repairs 'Major/Minor' should not be limited to those listed above.

3. Examples of 'Major' repairs

i) A repair that requires a permanent additional inspection to the approved maintenance programme, necessary to ensure the continued airworthiness of the product. Temporary repairs for which specific inspections are required prior to installation of a permanent repair do not

necessarily need to be classified as 'Major'. Also, inspections and changes to inspection frequencies not required as part of the approval to ensure continued airworthiness do not cause classification as 'Major' of the associated repair.

ii) A repair to life limited or critical parts.

iii) A repair that introduces a change to the Aircraft Flight Manual.

GM 21A.437
Issue of repair design approval

1) Approval by DOA holder

Approval of repairs through the use of procedures agreed with the Agency, means an approval issued by the DOA holder without requiring Agency involvement. The Agency will monitor application of this procedure within the surveillance plan for the relevant organisation. When the organisation exercises this privilege, the repair release documentation should clearly show that the approval is under their DOA privilege.

2) Previously approved data for other applications

When it is intended to use previously approved data for other applications, it is expected that applicability and effectiveness would be checked with an appropriately approved design organisation. After damage identification, if a repair solution exists in the available approved data, and if the application of this solution to the identified damage remains justified by the previous approved repair design, (structural justifications still valid, possible airworthiness limitations unchanged), the solution can be considered approved and can be used again.

3) Temporary repairs.

These are repairs that are life limited, to be removed and replaced by a permanent repair after a limited service period. These repairs should be classified under 21A.435 and the service period defined at the approval of the repair.

4) Fatigue and damage tolerance.

When the repaired product is released into service before the fatigue and damage tolerance evaluation has been completed, the release should be for a limited service period, defined at the issue of the repair.

GM 21A.437(a)
Issue of repair design approval

1) Products first type-certificated by the Agency or first type-certificated by a Member State (covering products type-certificated through JAA procedures or under national regulations and products certificated nationally without a type-certificate).

i) Agency approval is required in cases of major repairs proposed by design organisation approval holders, not being the TC or STC holder, and in cases of minor repairs proposed by persons not holding a design organisation approval.

ii) Agency approval may be required in cases of major repairs proposed by design organisation approval holders, being the TC or STC holder, if the major repair is:

- related to new interpretation of the airworthiness requirement as used for type certification.

- related to different means of compliance from that used for type certification.

- related to the application of airworthiness requirements different from that used for type certification.

NOTE: This should be established at the time of DOA approval.

2) Products first type-certificated by the competent authority of a third country.

Agency approval is always required for major repairs on products first type-certificated by the competent authority of a third country. Approval privileges extended to TC holders (noted in 21A.437(b) are not extended to TC holders of products first type-certificated by the competent authority of a third country. Type-certificate holders of those types may need to be involved when an arrangement with the TC holder has been determined necessary under 21A.433(b).

For repairs approved outside of the Community conditions for acceptance may be defined in the bilateral arrangement between the Community and the competent authority of a third country. In the absence of such arrangement, the repair data shall follow the approval route as if it was designed and approved within the EU.

AMC 21A.437(b)
Issue of repair design approval

In order for the approved design organisation that is also the type-certificate holder to approve 'Major' repair design the following should be considered applicable:

i) The type-certificate holder being approved under Part 21 Subpart J.

ii) Procedures having been established that comply with Part 21 Subpart M as agreed with the Agency.

iii) The type-certification basis for the product, part or appliance to be repaired having been identified together with all other relevant requirements.

iv) All records and substantiation data including documents showing compliance with all relevant airworthiness requirements being held for reviews by the Agency.

v) A summary list of all major repair approvals being provided to the Agency on a regular basis as agreed with the Agency.

vi) Whether the repair design is affected by the presence of any supplemental type-certificate.

GM 21A.439
Production of repair parts

A maintenance body, (organisation or person), may manufacture parts for repair purposes when in accordance with Subpart F or when approved under Subpart G of Part 21. In addition, a maintenance organisation may manufacture parts for its own repair purposes when expressly authorised by the competent authority of the Member State in accordance with the applicable implementing rules.

GM 21A.441
Repair Embodiment

Repairs should be accomplished by an organisation or person in accordance with the relevant implementing rules.

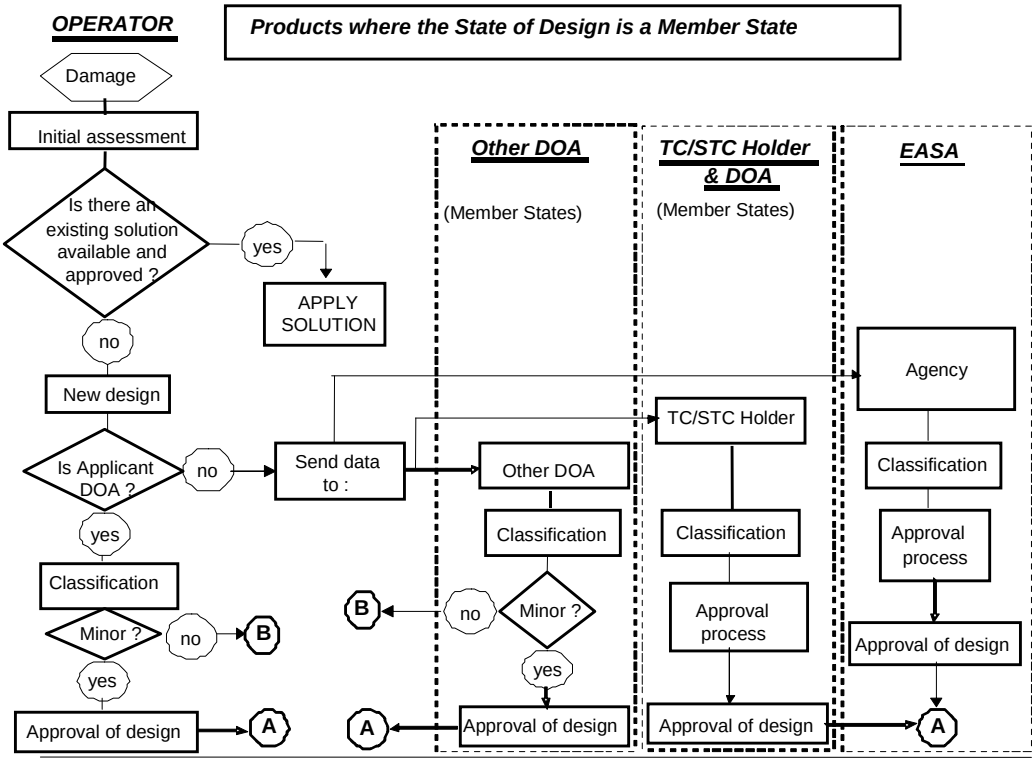
The holder of a production organisation approval under Subpart G of Part 21 may accomplish repairs to new aircraft, within its terms of approval, under the privilege of 21A.163(d).

GM 21A.443
Limitations

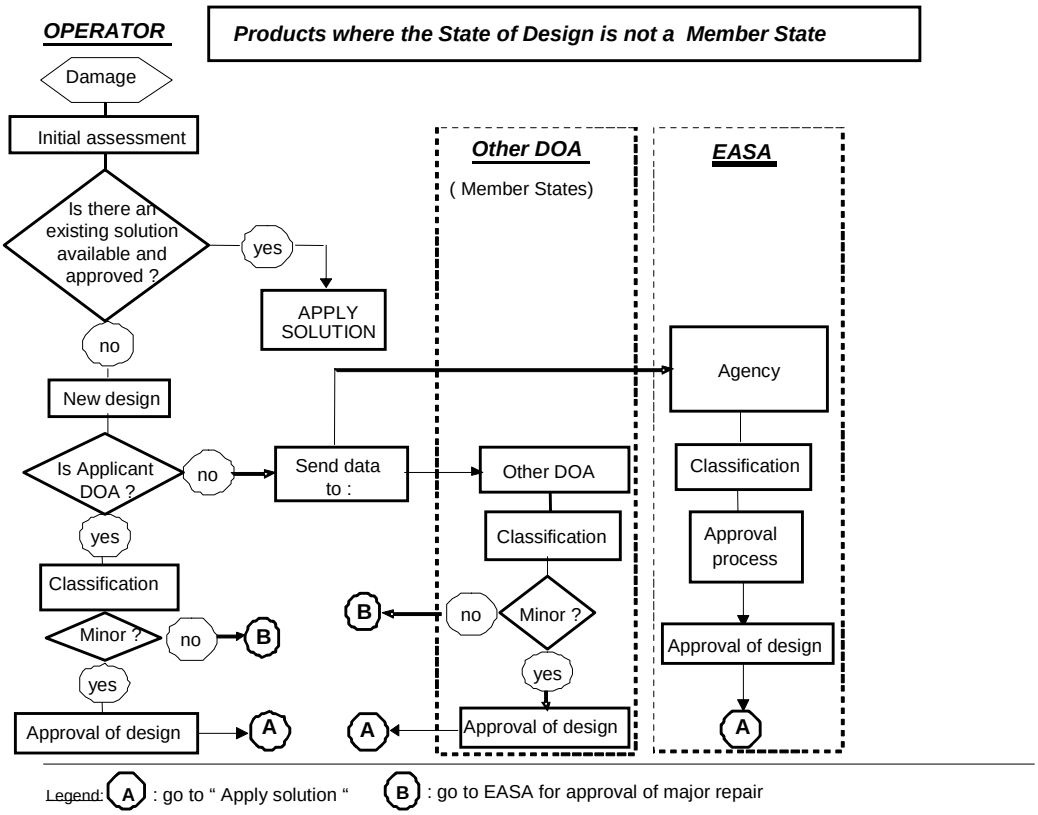
Instructions and limitations associated with repairs should be specified and controlled by those procedures required by the applicable operations rules.

GM 21A.445
Unrepaired damage

This is not intended to supersede the normal maintenance practices defined by the type-certificate holder, (e.g., blending out corrosion and re-protection, stop drilling cracks, etc.), but addresses specific cases not covered in the manufacturer's documentation.



Legend: (A) : go to " Apply solution " (B) : go to EASA or TC/STCH for approval of major repair (only if T C/STC holder has DOA privilege for major repair)



Legend: (A) : go to " Apply solution " (B) : go to EASA for approval of major repair

(Subpart N – Not applicable)

Subpart O – European Technical Standard Order Authorisations

AMC 21A.602B(b)(2)
Procedures for ETSO authorisations

1 Scope

1.1 A manual of procedures must set out specific design practices, resources and sequence of activities relevant for the specific projects, taking account of Part 21 requirements.

1.2 These procedures must be concise and limited to the information needed for quality and proper control of activities by the applicant/holder, and by the Agency.

2 Management of the ETSO authorisation process

2.1 For ETSO authorisation, a procedure following the principles of AMC 21A.14(b), paragraph 2.1, 2.2 and 2.3, with the necessary adaptation related to Part 21 Section A Subpart O context, must be established.

3 Management of design changes

3.1 A procedure following the principles of AMC 21A.14(b), paragraphs 3.2 and 3.3, with the necessary adaptation to take into account 21A.611, must be established for the classification and approval of design changes on articles under ETSO authorisation

3.2 Repairs and production deviations from the approved design data

A procedure following the principles of paragraph 3.1 must be established for the classification and approval of repairs and unintentional deviations from the approved design data occurring in production (concessions or non-conformance's). For repairs, the procedure must be established in accordance with Part 21 Section A Subpart M and associated AMC or GM. For deviations, the procedure must be established in accordance with 21A.610.

4 Obligations addressed in 21A.609

The applicant should establish the necessary procedures to show to the Agency how it will fulfil the obligations under 21A.609.

For issue of information and instructions, a procedure following the principles of AMC 21A.14(b), paragraph 4 must be established.

5 Control of design subcontractors

The applicant must establish the necessary procedures to show to the Agency how it will control design subcontractors.

AMC 21A.608
Declaration of Design and Performance

STANDARD FORM

DDP No. .....

ISSUE No. .....

1 Name and address of manufacturer.

2 Description and identification of article including:

Type No .....

Modification Standard

Master drawing record

Weight and overall dimensions

3 Specification reference, i.e., ETSO No. and Manufacturer's design specification.

4 The rated performance of the article directly or by reference to other documents.

5 Particulars of approvals held for the equipment.

6 Reference to qualification test report.

7 Service and Instruction Manual reference number.

8 Statement of compliance with appropriate ETSO and any deviations therefrom.

9 A statement of the level of compliance with the ETSO in respect of the ability of the article to withstand various ambient conditions or to exhibit various properties.

The following are examples of information to be given under this heading depending on the nature of the article and the requirements of the ETSO.

a. Working and ultimate pressure or loads.
b. Limitations of voltage and frequency.
c. Time rating (e.g., continuous, intermittent) or duty cycle.
d. Limits of accuracy of measuring instruments.
e. Whether the equipment is "flameproof" (explosion-proof).
f. Whether the equipment is "fire-resistant".
g. The compass safe distance.
h. Level of radio interference.
j. Radio and audio frequency susceptibility.
k. Degree of vibration which the equipment will withstand.
l. Degree of acceleration and shock which the equipment will withstand.
m. Degree of waterproofness or sealing of equipment.
n. Ability to withstand sand and dust.
o. Ability to resist salt spray and aircraft fluids.

p. Fungus resistance.

q. Temperature and altitude category.

r. Humidity category.

s. Any other known limitations which may limit the application in the aircraft e.g., restrictions in mounting attitude.

(NOTE: The “categories” referred to are those listed in the current issue of EUROCAE ED–14/RTCA document DO–160).

10 A statement of criticality of software.

(NOTE: Software levels are those defined in the current issue of EUROCAE ED–12B/RTCA document DO–178B.)

11 The declaration in this document is made under the authority of

……(name of manufacturer)

(Manufacturer’s name) cannot accept responsibility for equipment used outside the limiting conditions stated above without their agreement.

Date: ……Signed……(Manufacturer’s authorised representative)

(Subpart P – Not applicable)

Subpart Q – Identification of products, parts and appliances

There are no AMC or GM items associated with this Subpart.

SECTION B
Subpart A – General

GM 21B.20
Responsibility for implementation

Each certificate or approval in accordance with Part 21 Section A Subparts F, G, H and I will normally be issued and controlled by the competent authority of the Member State in whose country the applicant or holder is located. Therefore, to ensure consistency between the competent authorities of the Member States in issuing certificates and approvals, implementation of Part 21 should be based on the following three principles:

- The establishment and maintenance of an effective organisation and corresponding processes by all competent authorities.
- The operation of all competent authorities in accordance with Part 21 and its certification specifications (CS).
- A standardisation process established and operated by the Agency to access the standard achieved, and to provide timely advice and guidance to the competent authorities of the Member States.

As a result the responsibility for implementation comprises of the two main objectives:

- to ensure that certificates and approvals are only granted to applicants that comply with the requirements of Part 21; and
- to ensure sufficient visibility of the processes to give the Agency and the other Member States the necessary confidence in the certificates or approvals granted.

GM 21B.25(a)
Organisation

The competent authority designated by each Member State should have an organisation in such a way that

- there is specific and effective management authority in the conduct of all relevant activities
- the functions and processes described in Part 21 and its CS and GM may be properly implemented
- the competent authority of the Member State policy, organisation and operating procedures for the implementation of Part 21 are properly documented and applied
- all competent authority of the Member State personnel involved in the related activities are provided with training where necessary
- specific and effective provision is made for the communication and interface as necessary with the Agency and the competent authorities of the Member States
- all functions related to the implementation of Part 21 are adequately described and shown (Standardisation)

A general policy in respect of Part 21 activities should be developed, sponsored and implemented by the manager at the highest appropriate level, for example the top of the functional area of the competent authority of the Member State that is responsible for the related matters.
Appropriate steps should be taken to ensure that the policy is known and understood by all staff involved, and all necessary steps should be taken to implement and maintain the policy.

Whilst satisfying also additional national regulatory responsibilities, the general policy should in particular take into account:

- the provisions of the Basic Regulation
- the provisions of Part 21 and its CS and GM
- the needs of industry
- the needs of the Agency and of the competent authorities of the Member States.

The policy should define specific objectives for key elements of the organisation and processes for implementation of related Part 21 activities, including the corresponding control procedures and the measurement of the achieved standard.

GM 21B.25(b)
Resources

The organisation for related Part 21 activities should be clearly defined within the general organisation of the competent authority of the Member State, with the hierarchical and functional links, and the names of the senior staff. Although final responsibility should be placed at the top of the functional area that is responsible for the related Part 21 activities as a whole, all subordinate levels of management should be suitably resourced and empowered to fulfil their delegated tasks.

The definition of an organisation for the implementation of related Part 21 activities should include the specification of

- a manager responsible for the specific Part 21 activity acting as internal and external focal point. The responsibility is best placed with the manager who is in control of the day-to-day functions concerning the specific Part 21 activity, although he may delegate specific tasks to other individuals;
- individual or group responsibilities, duties and associated reporting lines;
- the resources, human and material;
- the documented procedures to be operated in respect of the relevant Part 21 activities.

The various tasks and responsibilities of the personnel involved in the related Part 21 activities should be clearly identified. The authority attached to the responsibilities should be enough to ensure that the activities will be performed correctly.

These responsibilities include among others:

- the management of the organisation
- the management of investigation teams
- the team leadership/membership
- the investigation and surveillance activities
- the administrative management of certificates and approvals including record keeping
- the external and internal interface activities including feedback to the Agency

- the control and distribution of documentation

The definition of the organisation should include means to ensure continued effectivity of the organisation. The means should provide for a regular assessment of the organisation and its related activities as well as a feedback system for the follow up of necessary corrective actions (e.g., through the implementation of a quality system, internal audit system, etc.).

GM 21B.25(c)
Qualification and training

The competent authority of the Member State should ensure appropriate and adequate training of its personnel to meet the standard that is considered by the Agency necessary to perform the work. Arrangements should be made for initial and continuation training as required.

It is understood that the basic competence of the competent authority of the Member State staff is a matter of recruitment and normal management functions in selection of staff for particular duties. Moreover, it is understood that the competent authority of the Member State provides training in the basic skills as required for those duties.

However, to avoid differences in understanding and interpretation, it is considered important that all personnel involved in Part 21 activities should be provided with further training specifically related to the relevant Part 21 activity up to the common Agency standard.

The competent authority of the Member State should provide training through its own training organisation with qualified trainers or through another qualified training source (e.g., training provided by other competent authorities, the Agency or qualified entities).

AMC 21B.30(a)
Documented procedures

The various elements of the organisation for the related Part 21 activities must be documented in order to establish a reference source for the establishment and maintenance of this organisation. The documented procedures must be established in a way that it will facilitate its use. They must be clearly identified, kept up-to-date and made readily available to all the personnel involved in the relevant activities.

The documented procedures must cover, as a minimum, the following aspects:

- policy and objectives,
- organisation structure,
- responsibilities and attached authority,
- procedures and processes,
- internal and external interfaces,
- internal control procedures,
- training of personnel,
- cross references to associated documents,
- assistance from other competent authorities or the Agency (where required).

Except for smaller competent authorities, it is likely that the information is held in more than one document or series of documents, and suitable cross-reference information must be provided. For example, organisational structure and job descriptions are not usually in the same documentation as the detailed working procedures. In such cases it is recommended that the documented procedures include an index of cross-references to all such other related information, and the related documentation must be readily available when required.

AMC 21B.35(a)
Changes

Standardisation is based on the assessment of the organisation and procedures of the competent authorities of the Member States and their implementation and suitability by the Agency. Consequently, a significant change in the competent authority of the Member State organisation and documented procedures validated by the Agency needs a reassessment to maintain the confidence in the standardisation process.

Examples of significant changes include changes in the organisation hierarchy, decision making levels, number and qualification of personnel, etc.

The competent authority of the Member State must notify any of these changes to the Agency and must be prepared to provide any further explanation/information requested by the Agency. The Agency may decide to review the documented organisation and procedures of the competent authority of the Member State and request any clarification or changes. This might also apply when a change in the regulations takes place and the Agency decides that a specific assessment/monitoring of the competent authorities related to that change is necessary.

GM 21B.40
Principles for the resolution of disputes

It is essential for the efficient accomplishment of the competent authority of the Member State activities related to Part 21 that all decisions regarding the resolution of disputes are taken at as low a level as possible. In addition the documented procedures for the resolution of disputes should clearly identify the chain of escalation.

GM No. 1 to 21B.45
Co-ordination with other related activities

The purpose of co-ordination with other related activities is to

- harmonize the effects of various approval and certification teams especially when dealing with one organisation / applicant to prevent conflicts of conclusions
- ensure efficient flow of information between the various approval and certification teams to facilitate the execution of their duties
- optimise the use of the Agency and the competent authorities resources to minimise disruption and cost.

Therefore, for a given organisation / applicant the responsible person(s) of the Agency or competent authorites of the Member State should arrange for exchange of information with, and provide necessary assistance, as appropriate, to the relevant competent authority of the Member State or Agency teams or staff - e.g.:

- the appropriate certification teams;

- the design organisation approval team;
- the production organisation approval team;
- the maintenance organisation approval team; or
- other approval or certification teams as appropriate.

GM No. 2 to 21B.45
Co-ordination

An exchange of information should especially take place in accordance with Article 10 of the Basic Regulation:

- an immediate reaction of a competent authority of the Member State to a safety problem
- granting of exemptions by the competent authority of the Member State from the substantive requirements of the Basic Regulation and its implementing rules (for a period of more than two months or when the exemptions become repetitive)
- granting of approvals on an equivalent level of protection by the competent authority of the Member State by derogation from the Part 21 requirements

GM No. 3 to 21B.45
Reporting - Information relevant to registers established by the Agency

When so requested by the Agency, the competent authority of the Member State should notify any certificate or approval issued, changed or revoked including details of the scope of that certificate or approval to the Agency for inclusion in a central register managed by the Agency.

GM No. 1 to 21B.50
Standardisation findings by the Agency

The competent authority of the Member State should respond in a positive manner to any findings identified during the standardisation activities by the Agency and should make any recommended changes in its interpretation of Part 21, its procedures or its organisation.

For standardisation purposes, the competent authority of the Member State should be prepared to accept participation of representatives of the Agency during activities related to Part 21.

GM No. 2 to 21B.50
Standardisation - Means established by the Agency

The Agency may implement administrative and procedural means to ensure a uniform approach for the implementation of Part 21 throughout the Member States. This may require the individual Member States to adjust their procedures and processes (e.g. a standardised numbering system for approvals) accordingly.

GM 21B.55
Record keeping for design approvals transferred to the Agency

Record keeping related to design approvals, for which the responsibility is transferred to the Agency, will remain initially with the competent authority of the Member State that has granted the approvals, at the disposal of the Agency. This GM specifies the administrative documents to be kept for the

various kinds of design approvals. It does not repeat the requirements put on holders of design approvals to keep records (ref. 21A.55, 21A.105, 21A.118A(a)(1), 21A.447, 21A.605)

1 Type-certificate

a) Copy of the type-certificate
b) Copy of the type-certificate data sheet
c) Environmental protection approval data
d) Documents defining the type-certification basis including information to justify special conditions, equivalent safety findings and exemptions (Certification Review Items or equivalent)
e) List of approved modifications,
f) List of competent authorities approved publications (Flight Manual, Repair Manual, Airworthiness Limitations, Certification Maintenance Requirements)
g) Airworthiness directives
h) Master Minimum Equipment List
i) Maintenance Review Board Report

2 Supplemental type certificate

a) Copy of supplemental type certificate
b) Environmental protection approval data
c) Documents defining the certification basis including information to justify special conditions, equivalent safety findings and exemptions (Certification Review Items or equivalent)
d) List of competent authorities approved documents
e) Airworthiness directives

3 JTSO Authorisation

a) Copy of JTSO authorisation letter,
b) Copy of Declaration of Design and Performance
c) Statement of compliance with applicable standards
d) Airworthiness directives

4 Other part or appliance approvals

a) Copy of approval letter,
b) Copy of Declaration of Design and Performance or equivalent
c) Statement of compliance with applicable standards
d) Airworthiness Directives

5 Changes from non TC or STC holders

a) Modification approval sheet, or equivalent document
b) Documents required by 21A.105, or equivalent national requirement

Note: not applicable to minor design changes approved under a DOA privilege, for which record keeping is under the DOA holder responsibility.

6 Repair design approvals

a) Repair approval sheet
b) Documents listed in 21A.447, or equivalent national requirement

Note: not applicable to repair design approved under a DOA privilege, for which record keeping is under the DOA holder responsibility.

Subpart B – Type-certificates and restricted type-certificates

Administrative procedures established by the Agency apply.

(Subpart C – Not applicable)

Subpart D – Changes to type-certificates and restricted type-certificates

Administrative procedures established by the Agency apply.

Subpart E – Supplemental type-certificates

Administrative procedures established by the Agency apply.

Subpart F - Production without production organisation approval

AMC 21B.120(a)
Investigation team - Qualification criteria for the investigation team members

The Competent Authority must ensure that the team leader and team members have received appropriate training in the relevant Subpart of Part 21 and in the related Competent Authority documentation before performing investigations. They must also have knowledge and experience at the appropriate level in aviation production and inspection activities relative to the particular application for a letter of agreement.

AMC 21B.120(c)(1)
Evaluation of applications

1. General

When applying Part 21 Section A Subpart F and Section B Subpart F the Competent Authority must consider that these Subparts are only an alternative way for production to Part 21 Section A Subpart G and Section B Subpart G. To meet the ICAO airworthiness obligations and to issue a Certificate of Airworthiness for an individual aircraft in a practical and efficient way, the Competent Authority must use a system of approval of production organisations (POA) under Part-21 Section A Subpart G and Section B Subpart G, providing to the Competent Authority the necessary confidence in technical standards. The consistent standards of these approvals will also support the standardisation efforts by the Agency. Nevertheless it is recognised that it is not always practical, economical and/or advisable to use the POA.

Considering ICAO airworthiness obligations as well, Part 21 Section A Subpart F and Section B Subpart F is provided for such a case on the basis of the following principles:

- Subpart F must be considered as an alternative option for particular cases
- Its adoption must be done on an individual basis, as consequence of an assessment by the Competent Authority (see 21A.121, 21A.133(a) and their associated CS and GM).

2. Application

The Competent Authority must receive an application for a letter of agreement on an EASA Form 60 (see below) completed by the applicant. The eligibility of the application should be verified in relation to the Competent Authority procedures, based on 21A.121 and its associated CS and GM. The applicant should be advised accordingly about the acceptance or rejection of the application.

3. Location of the applicant

The location of the applicant seeking acceptance for production under Part 21 Section A Subpart F determines which Competent Authority is responsible for issuing the letter of agreement.

EASA Form 60 **Application for agreement of production under Part 21 Subpart F**	
Competent authority of a Member State of the European Union or EASA	
1. Registered name and address of the applicant:	
2. Trade name (if different):	
3. Location(s) of manufacturing activities:	
4. Description of the manufacturing activities under application	
a) Identification (TC, P/N , … as appropriate):	
b) Termination (No. of units, Termination date, …):	
5. Evidence supporting the application, as per 21A.124(b):	
6. Links/arrangements with design approval holder(s)/design organisation(s) where different from Block 1. :	
7. Human resources:	
8. Name of the person signing the application:	
Date	Signature

EASA Form 60

Block 1: The name of the applicant must be entered. For legal entities the name must be as stated in the register of the National Companies Registration Office. In this case a copy of the entry in the register of the National Companies Registration Office must be provided to the Competent Authority.

Block 2: State the trade name by which the applicant is known to the public if different from the information given in Block 1. The use of a logo may be indicated in this Block.

Block 3: State all locations of manufacturing activities that are covered by the application. Only those locations must be stated that are directly under the control of the applicant stated in Block 1.

Block 4: This Block must include further details of the manufacturing activities under the approval for the addresses indicated in Block 3. The Block “Identification” must indicate the products, parts, appliances or material intended to be produced, while the Block “Termination” must address any information on the limitation of the activity, e.g., by stating the intended number of units to be manufactured or the expected date of completion of the manufacturing activities.

Block 5: This Block must state evidence supporting the determination of applicability as stated in 21A.121. In addition an outline of the manual required by 21A.125(b) must be provided with the application.

Block 6: The information entered here is essential for the evaluation of eligibility of the application. Therefore special attention must be given concerning the completion of this Block either directly or by reference to supporting documentation in relation to the requirements of 21A.122 and AMC 21A.122.

Block 7: The information to be entered here must reflect the number of staff, or in case of an initial approval the intended number of staff, for the manufacturing activities under this application and therefore must include also any associated administrative staff.

Block 8: State the name of the person authorised to sign the application.

GM 21B.120(c)(3)
Investigation preparation and planning

Following acceptance of an application and before commencing an investigation the Competent Authority should:

- identify the site locations needing investigation

- liaise with the competent authority of another Member State where there is seen to be a need to visit a production facility in that State for one of the following reasons:

    - where a manufacturer has contracted part of the production to another organisation holding a production organisation approval and a need arises to ensure the contract has the same meaning for all parties to the contract, and the local competent authority of the Member State agrees

    - to inspect a product (or part or appliance) under production where the subcontractor is not holding a POA

- co-ordinate with the competent authority of a third country and/or the Agency where there is seen to be a need to visit a production facility in that country for one of the following reasons:

    - where a manufacturer has contracted part of the production to another organisation holding a production organisation approval issued by the Agency or accepted through an recognition agreement in accordance with Article 9 of the Basic Regulation and a need arises to ensure the contract has the same meaning for all parties to the contract, and the Agency and/or the competent authority agrees

    - to inspect a product (or part or appliance) under production where the subcontractor is not holding a POA

GM 21B.120(c)(5) and (6)
Auditing and investigation findings

During its investigation process, the Competent Authority may make findings which should then be recorded. These may be non-conformities to the requirements, the manual as supplied by the manufacturer describing its inspection procedures or non-conformities related to the items under inspection. The manner in which the findings will be handled by the Competent Authority before and during the validity of the letter of agreement, should be detailed in its procedures.

AMC 21B.130
Issue of the letter of agreement

Unless otherwise agreed by the Competent Authority no production before the issue of the letter of agreement may be accepted under Part 21 Section A Subpart F.

GM 21B.130(b)
Issue of the letter of agreement

The agreement should include or reference a pre-defined plan of inspection points established as part of the production inspection system and agreed with the Competent Authority to be used as a basis for the inspections described in 21A.129 and 21B.120(c)(5) and its associated CS and GM. The plan should clearly identify inspection point, places, inspection subjects (materials, process, tooling documentation, human resources, etc.), as well as the focal points and the method of communication between the manufacturer and the Competent Authority.

The Competent Authority should detail a method how it will assure itself that the manufacturer is working in accordance with the manual and the agreed inspection procedures during the validity period of the agreement. For renewal of this validity period the procedure as defined in 21B.140 should be used.

Any conditions under which the agreement will expire (such as termination date and/or number of units to produce), should be clearly stated in the letter of agreement.

AMC 21B.140
Amendment of a letter of agreement

The Competent Authority must be satisfied that any change affecting a letter of agreement comply with the requirements of Section A Subpart F before implementation can start. A plan for the change should be agreed with the applicant in accordance with AMC 21B.130. If the change affects the content of the letter of agreement, a new application should be filed and an amended/revised letter of agreement should be obtained subsequently.

GM 21B.143(a)
Objective evidence

Objective evidence is a fact which is, or can be documented, based on observations, measurements or tests that can be verified. Objective evidence generally comes from the following:

- documents or manuals
- examination of equipment/products
- information from interview questions and observations of production activities

GM 21B.150(d)
Record keeping - Traceability of release certificates

The recordkeeping for those EASA Forms 52 and One that have been validated by the Competent Authority should allow verification of such validation by concerned parties including the recipients of the release certificates.

Subpart G- Production organisation approval

GM 21B.220(a)
Investigation team

1. Type of Team

Where the applicant is located in an Member State, the Competent Authority should appoint a production organisation approval team (POAT) leader and members appropriate to the nature and scope of the applicant's organisation.

Where the facilities of the applicant are located in more than one Member State, the Competent Authority of the country of manufacture should liaise with the other involved competent authorities to agree and appoint a POAT leader and members appropriate to the nature and scope of the applicant's organisation.

2. Team leader selection

The team leader should satisfy all of the criteria for a team member and will be selected by considering the following additional criteria:

- the capability to lead and manage a team
- the capability to prepare reports and be diplomatic
- experience in approval team investigations (not necessarily only Part 21A Subpart G)
- a knowledge of production and quality systems for aircraft and related products and parts

3. Team member selection

The team leader should agree with the Competent Authority on the size of the POA team and the specialisations to be covered taking into account the scope of work and the characteristics of the applicant. Team members should be selected by considering the following criteria:

- training, which is mandatory, for Part 21 Section A, Subpart G and Section B, Subpart G
- education and experience, to cover appropriate aviation knowledge, audit practices and approval procedures
- the ability to verify that an applicant's organisation conforms to its own POA procedures, and that its key personnel are competent.

AMC 21B. 220(c)
Procedures for investigation - Evaluation of applications

The Competent Authority must receive an application for POA on an EASA Form 50 (see below) completed by the applicant. The eligibility and appropriateness of the application must be evaluated in accordance with 21A.133 at that time and the applicant must be advised about acceptance or rejection of its application in writing accordingly.

EASA Form 50 **Application for Part 21 production organisation approval**	
Competent authority of a Member State of the European Union or EASA	
1. Registered name and address of the organisation:	
2. Trade name (if different):	
3. Locations for which the approval is applied for:	
4. Brief summary of proposed activities at the item 3 addresses	
a) General:	
b) Scope of approval:	
c) Nature of privileges:	
5. Description of organisation:	
6. Links/arrangements with design approval holder(s)/design organisation(s) where different from 1. :	
7. Approximate number of staff engaged or intended to be engaged in the activities:	
8. Position and name of the accountable manager:	
Date	Signature of the accountable manager

EASA Form 50

Block 1: The name of the organisation must be entered as stated in the register of the National Companies Registration Office. For the initial application a copy of the entry in the register of the National Companies Registration Office must be provided to the Competent Authority.

Block 2: State the trade name by which the organisation is known to the public if different from the information given in Block 1. The use of a logo may be indicated in this Block.

Block 3: State all locations for which the approval is applied for. Only those locations must be stated that are directly under the control of the legal entity stated in Block 1.

Block 4: This Block must include further details of the activities under the approval for the addresses indicated in Block 4. The Block “General” must include overall information, while the Block “Scope of approval” must address the scope of work and products/categories following the principles laid down in the GM 21A.151. The Block “nature of privileges” must indicate the requested privileges as defined in 21A.163(b)-(d). For an application for renewal state “N/A”.

Block 5: This Block must state a summary of the organisation with reference to the outline of the production organisation exposition, including the organisational structure, functions and responsibilities. The nomination of the responsible managers in accordance with 21A.145(c)(2) must be included as far as possible, accompanied by the corresponding EASA Forms 4.
For an application for renewal state “N/A”.

Block 6: The information entered here is essential for the evaluation of eligibility of the application. Therefore special attention must be given concerning the completion of this Block either directly or by reference to supporting documentation in relation to the requirements of 21A.133(b) and (c) and the AMC to 21A.133(b) and (c).

Block 7: The information to be entered here must reflect the number of staff, or in case of an initial approval the intended number of staff, for the complete activities to be covered by the approval and therefore must include also any associated administrative staff.

Block 8: State the position and name of the accountable manager.

GM No. 1 to 21B.220(c)
Procedures for investigation - Investigation preparation and planning

Following the acceptance of the application and before commencing an investigation, the Competent Authority should, for the preparation and planning of the investigation:

- identify the site locations needing investigation taking into account the scope of any other POA issued by a Member State, which are valid in the circumstances
- liaise with the Agency for the appointment of any necessary observer(s) for standardisation purposes
- establish any necessary liaison arrangement with other competent authorities
- agree the size and composition of the POAT and any specialist tasks likely to be covered and to select suitable team members from all involved competent authorities
- seek any necessary advice and guidance from the Agency
- liaise with the competent authority of the other Member State where there is seen to be a need to visit a production approval holder facility in that Member State for one of the following reasons:
    - where a manufacturer has subcontracted production to another organisation and therefore a need arises to ensure that contract has the same meaning for all parties to the contract, and the competent authority of the Member State agrees
    - to inspect a product, part, appliance, or material under production for its own, Member States or non-EU register.

GM No. 2 to 21B.220(c)
Procedures for investigation – General

1. Purpose of the Procedures

The purpose is to investigate the applicant production organisation for compliance with Part 21 Subpart G in relation to the requested terms of approval. When appropriate, this procedure should also be used to investigate significant changes or applications for variation of scope of approval.

The following procedure assumes that the application has been accepted and that an investigation team has been selected.

2. Initiation

The POA Team Leader initiates the procedure by:

2.1 arranging a meeting with the POAT members to review the information provided in accordance with 21A.134 and to take account of any knowledge that the POAT members have regarding the production standards of the applicant

2.2. obtaining information from other teams of a competent authority of the Member State or the Agency on the functioning applicant organisation. (see GM No. 1 to 21B.45)

2.3 arranging a meeting with the applicant in order to:

- enable the applicant to make a general presentation of its organisation and products, parts or appliances
- enable the POAT to describe the proposed investigation process
- enable the POAT to confirm to the applicant the identity of those managers nominated in accordance with Part 21 Subpart G who need to complete an EASA Form 4 (see format in EASA administrative procedures). The applicant should provide a completed copy of EASA Form 4 for each of the key management staff identified by Part 21 Subpart G. The EASA Form 4 is a confidential document and will be treated as such.

3. Preparation

The POAT:

3.1 studies the information gathered in the initiation phase

3.2 establishes an investigation plan which:

- takes account of the location of the POA applicants facility as identified per GM 21B.220(c)(3)
- defines areas of coverage and worksharing between POAT members taking account of their individual expertise
- defines areas where more detailed investigation is considered necessary
- establishes the need for external advice to POAT members where expertise may be lacking within the team
- includes completion of a comprehensive plan for the investigation in order to present it to the applicant
- recognises the need to:

  - review the documentation and procedures
  - verify compliance and implementation
  - audit a sample of products, parts, and appliances

3.3 co-ordinates with the appropriate Part 21 Section A Subpart J design organisation approval Teams sufficiently for both parties to have confidence in the applicants co-ordination links with the holder of the approval of the design (as required by 21A.133)

3.4 establishes liaison with the applicant to plan mutually suitable dates and times for visits at each location needing investigation, and also to agree the investigation plan and approximate time scales with the applicant

4. Investigation

The POAT:

4.1 makes a check of the POE for compliance with Part 21 Subpart G

4.2 audits the organisation, its organisational structure, and its procedures for compliance with Part 21 Subpart G, using EASA Form 56 as a guide during the investigation, and as a checklist at the end of it

4.3. generates compliance checklists for investigations of working processes and procedures on site as required

4.4 accepts or rejects each EASA Form 4 completed by the key nominated personnel in accordance with 21A.145(c)(2)

4.5 checks that the production organisation exposition (POE) standard reflects the organisation, its procedures, practices and 21A.143. Having checked and agreed a POE issue or subsequent amendment, the Competent Authority should have a clear procedure to indicate its acceptance or rejection

4.6 makes sample audits at working level to verify that:-

- work is performed in accordance with the system described in the POE
- products, parts, appliances or material produced by the organisation are in conformity with the applicable design data (see GM 21B.235(b)(4)).
- facilities, working conditions, equipment and tools are in accordance with the POE and appropriate for the work being performed
- competence and numbers of personnel is appropriate for the work being performed
- co-ordination between production and design is satisfactory

4.7 at an advanced stage of the investigation, conducts an interim team review of audit results and matters arising, in order to determine any additional areas requiring investigation

Each investigation team should be accompanied during the process by company representatives who are knowledgeable of the applicants organisation and procedures. This will ensure that the organisation is aware of audit progress and problems as they arise. Access to information will also be facilitated.

The POATL should co-ordinate the work of POAT members for an efficient investigation process, which will provide a consistent and effective investigation and reporting standards.

5. Conclusions

5.1 The POATL holds a team meeting to review findings and observations so as to produce a final agreed report of findings.

5.2 The POATL, on completion of the investigation, holds a meeting to verbally presents the report to the applicant.

The POATL should be the chairman of this meeting, but individual team members may present their own findings and observations.

5.3 The meeting should agree the findings, corrective action time scales, and preliminary arrangements for any follow up that may be necessary.

5.4 Some items may as a result of this meeting be withdrawn by the POATL but if the investigation has been correctly performed, at this stage there should be no disagreement over the facts presented.

5.5 Inevitably there will be occasions when the POAT member carrying out the audit may find situations in the applicant or POA holder where it is unsure about compliance. In this case, the organisation is informed about possible non-compliance at the time and advised that the situation will be reviewed within the Competent Authority before a decision is made. The organisation should be informed of the decision without undue delay. Only if the decision results in a confirmation of non-compliance this is recorded in Part 4 of EASA Form 56.

5.6 The POATL will transmit the final signed report on EASA Form 56 together with notes of the final meeting with the applicant to the Competent Authority where the applicant is located. The report will include recommendations and significant findings, together with appropriate conclusions and corrective actions. In particular, it should indicate if the POE is acceptable, or changes are required.

5.7 Completion of EASA Form 56 includes the need to record in Part 4 comments, criticisms, etc., and this must reflect any problems found during the visit and must be the same as the comments, criticisms made to the organisation during the debrief. Under no circumstances should additional comments, criticisms, etc., be included in Part 4 of the report unless the applicant or POA holder has previously been made aware of such comments.

Many applicants may need to take corrective action and amend the proposed exposition before the Competent Authority is able to conclude its investigation. Such corrective actions should be summarised in Part 4 of the EASA Form 56 and a copy always given to the applicant, so that there is a common understanding of the actions necessary before approval can be granted.

The intention of the EASA Form 56 Part 4 is to provide a summary report of findings and outstanding items during initial investigation and major changes. The competent authority will need to operate a supporting audit system to manage corrective action monitoring, closure etc. While the EASA Form 56 Part 4 format may be used for monitoring purposes, it is not adequate on its own to manage such system.

5.8 If the findings made during the investigation mean that approval recommendation will not or cannot be issued, then it is essential that such findings are confirmed in writing to the organisations within two weeks of the visit. The reason for confirmation in writing is that many organisations take a considerable time to establish compliance. As a result, it is too easy to establish a position of confusion where the organisation claims it was not aware of the findings that prevented issue of an approval.

6. Management Involvement

The accountable manager will be seen at least once during the investigation process and preferably twice, because he or she is ultimately responsible for ensuring compliance with the requirements for initial grant and subsequent maintenance of the production organisation approval. Twice is the

preferred number of visits to the accountable manager, with one being conducted at the beginning of the audit to explain the investigation process and the second, at the end, to debrief on the results of the investigation.

Competent authority of

a Member State of the

EUROPEAN UNION or EASA

RECOMMENDATION REPORT IN SUPPORT OF Part 21 SUBPART G APPROVAL ISSUE / CONTINUATION / VARIATION

PART ONE OF FIVE PARTS: BASIC DETAILS OF THE ASSESSMENT

Name of the organisation:

Approval reference: _____

Address(es) of the facilities surveyed:

Main Part 21 Subpart G activities at facilities surveyed:

Date(s) of survey:

Names and positions of the organisation's senior management attended during survey:

Names of the Competent Authority staff:

Office: **EASA Form 56 completion date:**

Note: If it is determined that recommendation for issue/continuation/variation of approval cannot be made because of non-compliance with Part 21 Subpart G, the reasons for non-compliance need to be identified in PART 4 of the report. A copy of PART 1 and PART 4, or at least the information included in these parts, must be given to the organisation to ensure that the organisation, in failing to obtain Part 21 Subpart G approval, even if only temporarily, has the same information as is on the files of the Competent Authority.

Competent authority of

a Member State of the

EUROPEAN UNION or EASA

RECOMMENDATION REPORT IN SUPPORT OF Part 21 SUBPART G ISSUE / CONTINUATION / VARIATION

PART TWO OF FIVE PARTS: Part 21 SUBPART G COMPLIANCE

Name of organisation:

Approval of organisation:

Approval reference: _____ **Survey reference:**

Note A: This form has been compiled according those paragraphs of Part 21 Subpart G which are relevant to an organisation trying to demonstrate compliance.

Note B: The right hand part of each box must be completed with one of three indicators:
1. a tick (✓) which means compliance;
2. NR which means the requirement is Not Relevant to the activity at the address surveyed; (the reason for NR should be stated in Part 4 of the report, unless the reason is obvious)
3. a number relating to a comment which must be recorded in Part 4 of the report.

The left hand part of each box is optional for use by the Competent Authority.

21A.133 Eligibility

Any natural or legal person ("organisation") shall be eligible as an applicant for an approval under this Subpart. The applicant shall:

(a) justify that, for a defined scope of work, an approval under this Subpart is appropriate for the purpose of showing conformity with a specific design; and

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(b) hold or have applied for an approval of that specific design; or

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(c) have ensured, through an appropriate arrangement with the applicant for, or holder of, an approval of that specific design, satisfactory co-ordination between production and design.

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21A.134 Application

Each application for a production organisation approval shall be made to the Competent Authority in a form and manner established by that authority, and shall include an outline of the information required by 21A.143 and the terms of approval requested to be issued under 21A.151.

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PART TWO OF FIVE (CONTINUED): SURVEY REFERENCE:

21A.139 Quality System

(a) The production organisation shall demonstrate that it has established and is able to maintain a quality system. The quality system shall be documented. This quality system shall be such as to enable the organisation to ensure that each product, part or appliance produced by the organisation or by its partners, or supplied from or subcontracted to outside parties, conforms to the applicable design data and is in condition for safe operation, and thus exercise the privileges set forth in 21A.163.

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(b) The quality system shall contain:
(1) As applicable within the scope of approval, control procedures for:

(i) +-------+
+-------+ Document issue, approval, or change.

(ii) +-------+
+-------+ Vendor and subcontractor assessment audit and control.

(iii) +-------+
+-------+ Verification that incoming products, parts, materials, and equipment, including items supplied new or used by buyers of products, are as specified in the applicable design data.

(iv) +-------+
+-------+ Identification and traceability.

(v) +-------+
+-------+ Manufacturing processes.

(vi) +-------+
+-------+ Inspection and testing, including production flight tests.

(vii) +-------+
+-------+ Calibration of tools, jigs, and test equipment.

(viii) +-------+
+-------+ Non conforming item control.

(ix) +-------+
+-------+ Airworthiness co-ordination with the applicant or holder of a design approval.

(x) +-------+
+-------+ Records completion and retention.

(xi) +-------+
+-------+ Personnel competence and qualification.

(xii) +-------+
+-------+ Issue of airworthiness release documents.

(xiii) +-------+
+-------+ Handling, storage and packing.

(xiv) +-------+
+-------+ Internal quality audits and resulting corrective actions.

(xv) +-------+
+-------+ Work within the terms of approval performed at any location other than the approved facilities.

(xvi) +-------+
+-------+ Work carried out after completion of production but prior to delivery, to maintain the aircraft in a condition for safe operation.
+-------+
+-------+ The control procedures need to include specific provisions for any critical parts.

(b) The quality system shall contain (cont'd) –
(2) An independent quality assurance function to monitor compliance with, and adequacy of, the documented procedures of the quality system. This monitoring shall include a feedback system to the person or group of persons specified in 21A.145(c)(2) and ultimately to the manager specified in 21A.145 (c)(1) to ensure, as necessary, corrective action.
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PART TWO OF FIVE (CONTINUED): SURVEY REFERENCE:

21A.143 Exposition

(a) The organisation shall submit to the Competent Authority a production organisation exposition providing the following information:
(see Part 3 of this Form)

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(b) The production organisation exposition shall be amended as necessary to remain an up-to-date description of the organisation, and copies of any amendments shall be supplied to the Competent Authority.

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21A.145 Approval requirements

The production organisation shall demonstrate, on the basis of the information submitted in accordance with 21A.143 that:

(a) with regard to general approval requirements, facilities, working conditions, equipment and tools, processes and associated materials, number and competence of staff, and general organisation are adequate to discharge obligations under 21A.165.

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(b) with regard to all necessary airworthiness, noise, fuel venting and exhaust emissions data:
(1) The production organisation is in receipt of such data from the Agency, and from the holder of, or applicant for, the type-certificate, restricted type-certificate or design approval to determine conformity with the applicable design data.

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(2) The production organisation has established a procedure to ensure that airworthiness, noise, fuel venting and exhaust emissions data are correctly incorporated in its production data.

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(3) Such data are kept up to date and made available to all personnel who need access to such data to perform their duties.

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(c) with regard to management and staff:
(1) A manager has been nominated by the production organisation, and is accountable to the Competent Authority. His or her responsibility within the organisation shall consist of ensuring that all production is performed to the required standards and that the production organisation is continuously in compliance with the data and procedures identified in the exposition referred to in 21A.143.

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(2) A person or a group of persons have been nominated by the production organisation to ensure that the organisation is in compliance with the requirements of this Part, and are identified, together with the extent of their authority. Such person(s) shall act under the direct authority of the senior manager referred to in subparagraph (1). The persons nominated shall be able to show the appropriate knowledge, background and experience to discharge their responsibilities.

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(3) Staff at all levels have been given appropriate authority to be able to discharge their allocated responsibilities and that there is full and effective co-ordination within the production organisation in respect of airworthiness, noise, fuel venting and exhaust emission data matters.

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PART TWO OF FIVE (CONTINUED): SURVEY REFERENCE:

21A.145 Approval requirements (cont'd)

(d) with regard to certifying staff, authorised by the production organisation to sign the documents issued under 21A.163 under the scope or terms of approval:
(1) The knowledge, background (including other functions in the organisation), and experience of the certifying staff are appropriate to discharge their allocated responsibilities.

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(2) The production organisation maintains a record of all certifying staff which shall include details of the scope of their authorisation.

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(3) Certifying staff are provided with evidence of the scope of their authorisation.

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21A.147 Changes to the approved production organisation

(a) After the issue of a production organisation approval, each change to the approved production organisation that is significant to the showing of conformity or to the airworthiness and characteristics of noise, fuel venting and exhaust emissions of the product, part or appliance, particularly changes to the quality system, shall be approved by the Competent Authority. An application for approval shall be submitted in writing to the Competent Authority and the organisation shall demonstrate to the Competent Authority before implementation of the change, that it will continue to comply with this Subpart.

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(b) The Competent Authority shall establish the conditions under which a Subpart G approved production organisation may operate during such changes unless the Competent Authority determines that the approval should be suspended.

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21A.148 Changes of location

A change of the location of the manufacturing facilities of the approved production organisation shall be deemed of significance and therefore shall comply with 21A.147.

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21A.149 Transferability

Except as a result of a change in ownership, which is deemed significant for the purposes of 21A.147, a production organisation approval is not transferable.

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21A.151 Terms of approval

The terms of approval shall identify the scope of work, the products or the categories of parts and appliances, or both, for which the holder is entitled to exercise the privileges under 21A.163.
Those terms shall be issued as part of a production organisation approval.

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21A.153 Changes to the terms of approval

Each change to the terms of approval shall be approved by the Competent Authority. An application for a change to the terms of approval shall be made in a form and manner established by the Competent Authority. The applicant shall comply with the applicable requirements of this Subpart.

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PART TWO OF FIVE (CONTINUED): SURVEY REFERENCE:

21A.157 Investigations

A production organisation shall make arrangements that allow the Competent Authority to make any investigations, including investigations of partners and subcontractors, necessary to determine compliance and continued compliance with the applicable requirements of this Subpart.

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21A.163 Privileges

Pursuant to the terms of approval issued under 21A.135, the holder of a production organisation approval may:

(a) Perform production activities under this Part.

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(b) In the case of complete aircraft and upon presentation of a Statement of Conformity (EASA Form 52) under 21A.174, obtain an aircraft certificate of airworthiness and a noise certificate without further showing.

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(c) In the case of other products, parts or appliances issue authorised release certificates (EASA Form 1) under 21A.307 without further showing.

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(d) Maintain a new aircraft that it has produced and issue a certificate of release to service (EASA Form 53) in respect of that maintenance.

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21A.165 Obligations of the holder

The holder of a production organisation approval shall:

(a) Ensure that the production organisation exposition furnished in accordance with 21A.143 and the documents to which it refers, are used as basic working documents within the organisation.

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(b) Maintain the production organisation in conformity with the data and procedures approved for the production organisation approval.

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(c) (1) Determine that each completed aircraft conforms to the type design and is in condition for safe operation prior to submitting Statements of Conformity to the Competent Authority, or

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(2) Determine that other products, parts or appliances are complete and conform to the approved design data and are in condition for safe operation before issuing EASA Form 1 to certify airworthiness, and additionally in case of engines, determine according to data provided by the engine type-certificate holder that each completed engine is in compliance with the applicable emissions requirements as defined in 21A.18(b), current at the date of manufacture of the engine, to certify emissions compliance, or

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(3) Determine that other products, parts or appliances conform to the applicable data before issuing EASA Form 1 as a conformity certificate;

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(d) Record all details of work carried out.

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PART TWO OF FIVE (CONTINUED): SURVEY REFERENCE:

21A.165 Obligations of holder (cont'd)

(e) Establish and maintain an internal occurrence reporting system in the interest of safety, to enable the collection and assessment of occurrence reports in order to identify adverse trends or to address deficiencies, and to extract reportable occurrences. This system shall include evaluation of relevant information relating to occurrences and the promulgation of related information.

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(f) (1) Report to the holder of the type-certificate or design approval, all cases where products, parts or appliances have been released by the production organisation and subsequently identified to have possible deviations from the applicable design data, and investigate with the holder of the type-certificate or design approval in order to identify those deviations which could lead to an unsafe condition.

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(2) Report to the Agency and the competent authority of the Member State, or both, the deviations which could lead to an unsafe condition identified according to subparagraph (1). Such reports shall be made in a form and manner established by the Agency under 21A.3(b)(2) or accepted by the competent authority of the Member State.

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(3) Where the holder of the production organisation approval is acting as a supplier to another production organisation, report also to that other organisation all cases where it has released products, parts or appliances to that organisation and subsequently identified them to have possible deviations from the applicable design data.

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(g) Provide assistance to the holder of the type-certificate or design approval in dealing with any continuing airworthiness actions that are related to the products parts or appliances that have been produced.

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(h) Establish an archiving system incorporating requirements imposed on its partners, suppliers and subcontractors, ensuring conservation of the data used to justify conformity of the products, parts or appliances. Such data shall be held at the disposal of the Competent Authority and be retained in order to provide the information necessary to ensure the continuing airworthiness of the products, parts or appliances.

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(i) Where, under its terms of approval, the holder issues a certificate of release to service, determine that each completed aircraft has been subjected to necessary maintenance and is in condition for safe operation, prior to issuing the certificate.

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Competent authority of

a Member State of the

EUROPEAN UNION or EASA

RECOMMENDATION REPORT IN SUPPORT OF Part 21 SUBPART G ISSUE / CONTINUATION / VARIATION

PART THREE OF FIVE PARTS: Part 21 SUBPART G EXPOSITION COMPLIANCE

Name of organisation:

Approval of organisation:

Approval reference: _____ **Survey reference:**

Note A: Each box must be completed with one of three indicators:
1. a tick (✓) which means compliance;
2. NR which means the requirement is NOT RELEVANT to the activity at the address surveyed; (The reason for NR should be stated in Part 4 of the report unless the reason is obvious.);
3. a number relating to a comment which must be recorded in Part 4 of the report.

Note B: The exposition may be compiled in any subject order as long as all applicable subjects are covered.

Note C: If the organisation holds another Part approval requiring an exposition or handbook it is acceptable to use this index as a supplement to the existing exposition or handbook and to cross-refer each subject to the position in the existing exposition or handbook.

Production organisation exposition

Revision Status:

(Content as required by 21A.143(a))

(1) ☐ A statement signed by the accountable manager confirming that the production organisation exposition and any associated manuals which define the approved organisation's compliance with this Subpart will be complied with at all times.

(2) ☐ The title(s) and names of the persons nominated in accordance with 21A.145(c)(2).

(3) ☐ The duties and responsibilities of the person(s) as required by 21A.145(c)(2) including matters on which they may deal directly with the Competent Authority on behalf of the organisation.

(4) ☐ An organisational chart showing associated chains of responsibility of the managers/persons as required by 21A.145(c)(1) and (c)(2).

(5) ☐ A list of certifying staff as referred to in 21A.145(d)
[Note : a separate document may be referenced**]**

(6) ☐ A general description of man-power resources.

PART THREE OF FIVE (CONTINUED): **SURVEY REFERENCE:**

(7) ☐ A general description of the facilities located at each address specified in the production organisation's certificate of approval.

(8) ☐ A general description of the production organisation's scope of work relevant to the terms of approval.

(9) ☐ The procedure for the notification of organisational changes to the Authority.

(10) ☐ The amendment procedure for the production organisation exposition.

(11) ☐ A description of the quality system and the procedures as required by 21A.139(b)(1).

(12) ☐ A list of those outside parties referred to in 21A.139 (a).
[Note : a separate document may be referenced**]**

Competent authority of Sheet 1 of ___

a Member State of the

EUROPEAN UNION or EASA

RECOMMENDATION REPORT IN SUPPORT OF Part 21 SUBPART G APPROVAL ISSUE / CONTINUATION / VARIATION

PART FOUR OF FIVE PARTS: FINDINGS ON Part 21 SUBPART G COMPLIANCE STATUS

Name of organisation:

Approval reference: _____ Survey reference:

Note A: Each finding must be identified by number and the number must cross-refer to the same number in a box in Part 2 or 3 of the Part 21 Subpart G survey report.
Note B: As stated in Part 1 any comments recorded in this Part 4 should be copied to the organisation surveyed together with Part 1.
Note C: In case of a partial clearance of a finding with some outstanding action remaining, this action has to be identified.

NO:	FINDING	LEVEL	OUTSTANDING ACTION	CLEARANCE	
				DATE	REP.REF.

NAME & SIGNATURE OF SURVEYOR: **Date:**

PART FOUR OF FIVE (CONTINUED): **Sheet ___ of ___**

SURVEY REFERENCE:

NO:	FINDING	LEVEL	OUTSTANDING ACTION	CLEARANCE	
				DATE	REP.REF.

NAME & SIGNATURE OF SURVEYOR: **Date:**

Competent authority of

a Member State of the

EUROPEAN UNION or EASA

RECOMMENDATION REPORT IN SUPPORT OF Part 21 SUBPART G APPROVAL ISSUE / CONTINUATION / VARIATION

PART FIVE OF FIVE PARTS: Part 21 SUBPART G APPROVAL RECOMMENDATION

Name of organisation:

Approval reference: _____ Survey reference:

Recommendation for issue / variation of approval:

The following Part 21 Subpart G Terms of approval are recommended for the above organisation at the address(es) specified in Part 1 of this report:

Or

Recommendation for continuation of existing approval:

It is recommended that the Part 21 Subpart G Terms of approval identified in EASA Form 55 referenced

_____ be continued.

☐ **Reporting performed according to procedure for authority surveillance of suppliers of a POA holder located in other Member States, if applicable (Strict confidentiality to be observed)**

Name of Competent Authority surveyor making recommendation:

Signature of the Competent Authority surveyor:

Competent Authority office: Date:

GM No. 3 to 21B.220(c)
Procedures for investigation - POA applications received from organisations with facilities/partners/suppliers/subcontractors located in a third country

The obligations of the applicant are totally independent from the surveillance exercised by the Competent Authority. It is not acceptable that the applicant relies on surveillance activities of the Competent Authority to simplify its tasks.

Facilities located in a third country

When any part of the production facilities of an applicant for POA is located outside the Member States, then the location will be treated in all aspects as part of the applicant's POA organisation.

Therefore the investigating Competent Authority will:

- include the facilities outside the Member States fully in their investigation and surveillance activities for the applicant for, or holder of, the POA

- include the facilities outside the Member States in the terms of approval of the EASA Form 55 (see Part 21 Appendix) when issuing the POA

Partners/suppliers/subcontractors located in a third country

The Competent Authority should define on the basis of Part 21, its associated CS and GM, a clear procedure on supplier control. This procedure should include the control of partners/suppliers/subcontractors of the applicant for, or holder of, a POA that are located outside the Member States.

In respect of the applicant for, or holder, of the POA, the Competent Authority should:

a) investigate, for the initial approval and consequent continued surveillance, the production organisation, and its partners/suppliers/subcontractors at the necessary level to ensure the organisation can comply with the requirements of Part 21.

b) in accordance with the Competent Authority procedure, assess and accept the documented procedure for supplier control as part of the POA holder's quality system, and changes to that procedure prior to implementation.

c) in accordance with Competent Authority procedure, assess the necessary level of surveillance to be exercised by the production organisation on partners / suppliers / subcontractors and check the audit plan of the production organisation against this level.

The level of co-operation between the Competent Authority and the competent authority of the third country where a partner/supplier/subcontractor of the production organisation is located may influence the authorities' activities concerning this partner/supplier/subcontractor. Co-operation with the competent authority of the third country should be based on the capability and goodwill of that authority, and a complete interchange of necessary information.

a) The involvement of this competent authority of the third country in the surveillance of the partner/supplier/subcontractor will be based on the following principles:

1) When a recognition agreement under Article 9 of the Basic Regulation covering production subjects has been concluded:

- The competent authority in accordance with GM No. 2 to 21A.139(a) may decide that direct surveillance of the POA holder activities at the foreign location may not be necessary.

- In any other case, provisions of the recognition agreement on the subject apply (technical assistance, ...).

2) If a recognition agreement has not been concluded, or it does not cover production subjects, it may be necessary that the competent authority of the Member State, the Agency, and the competent authority of a third country enter into a specific working arrangement addressing the following matters:

- acceptance by the competent authority of the third country of conducting manufacturing surveillance of the relevant production activities on behalf of the Competent Authority, under the respective quality standards defined by the Competent Authority.
- tasks to be performed
- practical methods

These arrangements are between authorities and do not relieve the applicant of its obligations.

b) In all cases, even though surveillance tasks are delegated to the competent authority of the third country, the Competent Authority remains the responsible authority and may consequently exercise direct surveillance if necessary.

c) In case that it is not possible to delegate surveillance tasks to the competent authority of the third country, the Competent Authority will have to establish a direct surveillance program in accordance with its procedure concerning supplier control as part of the overall surveillance of the POA holder.

GM No. 4 to 21B.220(c)
Procedures for investigation – Competent Authority surveillance of suppliers of a POA holder located in other Member States

1. The aviation legislation identifies specific State obligations in relation to complete products:

State of manufacture, as used in ICAO Annex 8, normally identifies the country where the final assembly and the final determination of airworthiness is made. However, sub assemblies and parts may be produced by POA holders in other countries and the EASA Form 1 - Authorised Release Certificate will identify those countries as the location for production.

Among Member States the obligations of the State of manufacture may be discharged through the use of the Part 21 POA system.

According to Part 21 Subpart G, each POA holder must have established and documented in its POE a system for its own control of suppliers/supplies. Surveillance of this system is part of the responsibility of the Competent Authority of the POA holder wherever the suppliers are located.

This surveillance may be exercised through the POA holder and/or at supplier level especially in the cases where the supplier would be eligible for its own POA.

The purpose of this procedure is to ensure the completeness of the responsibilities chain so that no separate technical agreement between these national authorities is necessary and when necessary to establish a means of communication between the involved competent authorities of the Member States.

2. Principle to organise Competent Authority supplier surveillance between Member States:

In order to avoid duplication and to take the best advantage of the Basic Regulation that establishes under Article 8 mutual recognition of certificates issued by production organisations approved in accordance with IR-21 Section A Subpart G by an Member State, the principle for the Competent Authority surveillance of the suppliers of a POA holder located in other Member States is for the responsible Competent Authority to delegate

surveillance activity to the other competent authority of the supplier.

This applies between Member States and for suppliers holding a Part 21 POA.

Delegation of surveillance tasks does not imply a delegation of the overall responsibility, therefore the competent authority of the contractor always retains the right of direct supervision at the supplier location especially when serious quality problems are encountered. In such a case, co-ordination will be organised between both competent authorities.

This delegation of surveillance is to be considered automatic as soon as the supplier holds a Part 21 POA provided that the intended supply is included in the approved scope of work. Evidence of that approval will normally be found through the release of the supplied parts with an EASA Form 1. In addition, the competent authority of the supplier should immediately inform the competent authority of the contractor in case of a serious quality problem.

In the cases where the competent authority of the contractor considers that it is necessary to establish closer ties with the competent authority of the supplier (i.e., critical or significant parts) exchange of information between the competent authorities should be organised as follows:

2.1 Tasks of the competent authority of the POA contractor.

The competent authority of the contractor should inform in writing the competent authority of the subcontractor with the following:

- Identification (and location) of the contractor
- Identification (and location) of the subcontractor
- Identification of the subcontracting (parts, contract N°, etc.)
- Reference to the quality requirements attached to the contract
- Name and address of the competent authority office/person in charge of the POA
- Whether Direct Delivery Authorisation (DDA) applies
- Any specific action item/requirement from the competent authority
- Request for a bi-annual reporting (both ways).

EASA Form 58 is provided for convenience of the competent authority for this purpose.

The competent authority of the contractor should require that the contract/order from the contractor to the subcontractor should indicate that it is placed under the surveillance of its competent authority on behalf of the competent authority of the contractor and should address the subject to the payment of the possible surveillance fees.

2.2 Tasks of the competent authority of the supplier (subcontractor).

On receipt of the information from the competent authority of the contractor, the competent authority of the subcontractor should:

- Verify that the scope of work of the POA of the supplier covers the intended supply (or envisage to extend it in liaison with the supplier).
- Verify that the specific quality requirements for the parts have been introduced in the quality system of the supplier.

- Confirm to the competent authority of the contractor that the procurement is included in the POA of the supplier and that their surveillance will cover this activity.

- Indicate the name and address of the competent authorities office/person in charge of the POA.

If the supplier has no POA under Part 21, or does not want to extend it, and/or if its competent authority cannot conduct surveillance on behalf of the other competent authority, the competent authority of the supplier will inform the competent authority of the contractor in order for it to decide on appropriate actions.

2.3 Exchange of information between the competent authorities.

This information should normally take two forms:

1. Immediate exchange of information between both competent authorities in case of serious quality problems.

2. a bi-annual exchange of information at a given date in order to guarantee proper on going control of the subcontract by both competent authorities.

   This information should cover in a concise form:

- for the competent authority of the contractor:

  - a resume of the quality problems encountered by the contractor, on receipt inspection, on installation on aircraft or on in service aircraft.

  - a status of the reference documents

- for the competent authority of the subcontractor:

  a resume of at least the following subjects;

  - changes in organisation and qualification of the subcontractor.(in case of impact on the procurement),

  - quality problems encountered during manufacture,

  - corrective actions following problems encountered earlier on the procurement,

  - findings from national authorities surveillance that may have an impact on the procurement,

  - quality problems related to the contractor procurement (materials, documentation, procedures, processes).

Exchange of information between national authorities according to this procedure is strictly confidential and should not be disclosed to other parties.

It is recommended to plan at least every 5 years a meeting between Industry and the two national authorities to review each major subcontract to verify proper management by the various parties involved.

3. Miscellaneous.

a) Release documentation.

Release of parts by the POA subcontractor to the contractor will be accompanied by an «Authorised Release Certificate EASA Form 1» issued for «Airworthiness» or for «Conformity» as appropriate.

b) Sub-subcontracting.
If the sub-contractor wants itself to subcontract, it is up to the competent authority of the subcontractor to verify that this is done in accordance with the conditions of the contract, to organise as necessary the related authority surveillance and to inform the competent authority of the contractor.

c) Language.
Except if agreed otherwise it is recommended to use the English language for exchange of information between the competent authorities.

Competent authority of **a Member State of the European Union** **REQUEST FOR REPORTING ON SUB-CONTRACTOR SURVEILLANCE**	
Document reference number:	*<REQUEST REF. NO.>*
As competent authority which issued a POA to -	*<CONTRACTOR COMPANY>*
with approval reference -	*<CONTRACTOR POA REF. NO..>*
the <competent authority> has determined that there is a need for direct authority supplier surveillance of -	*<SUB-CONTRACTOR COMPANY>*
with approval reference -	*<SUB-CONTRACTOR POA REF.NO.>*
which is situated in -	*<COUNTRY OF SUB-CONTRACTOR COMPANY>*
As part of the surveillance as required for the Part 21 Section A Subpart G approved production organisation, according to GM No. 4 to 21.220(c) the competent authority of the subcontractor is requested to perform authority surveillance on the specific sub assemblies and parts as details and requirements are defined below:	
Identification of subcontracting (parts, contract No., …)	
Reference to the quality requirements attached to the contract between contractor and subcontractor:	
Name and address of the requesting competent authority office/person in charge of the POA:	
Direct Delivery Authorisation (DDA) applies:	**∀ Yes ∀ No**
Specific action item/requirement from the competent authority of the contractor.	
Request and details required for a bi-annual reporting (both ways) according to GM No. 4 to 21B.220(c) (Strict confidentiality to be observed):	
Name and signature of competent authority person making the request:	
competent authority office:	**Date:**
EASA Form 58A – *Request for reporting on subcontractor surveillance, Page x of x*	

Competent authority of **a Member State of the European Union** **REPORT ON SUB-CONTRACTOR SURVEILLANCE**	
Document reference number:	*<REPORT REF. NO.>*
Reporting request reference number:	*< REQUEST REF. NO >*
As responsible competent authority the <*competent authority*> issued a POA to and is performing direct authority surveillance of -	*<SUB-CONTRACTOR COMPANY>*
with approval reference -	*<SUB-CONTRACTOR POA REF. NO..>*
which is a subcontracted supplier of -	<CONTRACTOR COMPANY>
with approval reference -	*<CONTRACTOR POA REF.NO.>*
which is situated in -	*<COUNTRY OF CONTRACTOR COMPANY>*

According to GM No. 4 to 21.220(c) and on request of the competent authority of the contractor company the <*competent authority*> reports on the results of its authority surveillance on the specific parts and appliances defined below:	
Identification of subcontracting (parts, contract No., …)	
Identification of attachments to this report (if needed):	
Date and identification of previous report :	
Resume of surveillance results:	
Changes in organisation and qualification of the subcontractor. (in case of impact on the procurement).	
Quality problems encountered during manufacture.	
Corrective actions following problems encountered earlier on the procurement.	
Findings from competent authority surveillance that may have an impact on the procurement.	
Quality problems related with the contractor procurement (materials, documentation, procedures, processes).	
Note: Exchange of information between national authorities according to this procedure is strictly confidential and should not be disclosed to other parties.	
Name and signature of competent authority person reporting:	
competent authority office:	**Date:**
EASA Form 58B – Report on subcontractor surveillance, Page x of x	

GM 21B.225(a)
Objective evidence

Objective evidence is a fact which is, or can be documented, based on observations, measurements or tests that can be verified. Objective evidence generally comes from the following:

- documents or manuals
- examination of equipment/products
- information from interview questions and observations of POA activities

AMC 21B.225(a)
Notification of findings

In case of a level one finding confirmation must be obtained in a timely manner that the accountable manager received the letter containing details of the level one finding and the approval suspension details.

A level two finding requires timely and effective handling by the Competent Authority to ensure completion of the corrective action. This includes intermediate communication, including reminding letters as necessary, with the POA holder to verify that the corrective action plan is followed.

AMC No. 1 to 21B.230
Issue of the certificate

The Competent Authority must base its decision to issue or amend a POA on the recommendation report (EASA Form 56, see GM No.2 to 21B.220(c)) of the POAT submitted by the POA team leader. The EASA Form 56 includes a proposal by the POAT for the scope and terms of approval defining the products, parts and appliances for which the approval is to be granted, with appropriate limitations.

When the Competent Authority issues the approval a final controlled copy of an acceptable exposition for the organisation must have been supplied to the Competent Authority.

In some cases it may be accepted that some findings are not fully closed because corrective actions are still in progress. The Competent Authority may decide according to the following principles:

1) Findings must be equivalent to level two, which do not need to be rectified as a matter of urgency within less than three months, and must normally not exceed three in number.

2) Corrective action plan, including timescales, musthave been accepted and must not require an additional and specific follow-up audit by the Competent Authority.

A record must be kept by the Competent Authority and must be brought to the attention of the Agency on request for standardisation purposes.

AMC No. 2 to 21B.230
Approval reference number

The approval reference number must be a unique number allowing to trace any release issued by a POA holder to the respective authority approval. It also must be issued in a standardised manner between the EU Members States to easily allow identification of a production organisation approval in accordance with Part 21. Therefore the format of the approval reference number must comply with the Agency administrative procedures.

GM 21B.235(a)(4)

Guide to the conduct of monitoring production standards.

1. 21B.235(a)(4) identifies a need for a sample investigation of products, parts or appliances, their associated conformity determinations and certifications made by a POA holder. For this to be performed effectively and efficiently, the Competent Authority should integrate a sampling plan as part of the planning of the investigation and continued surveillance activities appropriate to the scope and size of the relevant applicant.

2. The sampling plan could, for example, investigate:

- a modification (or change)
- the installation, testing, or operation of a major part or system
- the accuracy and generation of the Flight Test report data
- the accuracy and generation of the Weighing report data
- an engine test bed run
- records traceability
- the accuracy and generation of the Statement of Conformity data and the associated safe operation determination
- the accuracy and generation of EASA Form 1 data.

The sampling plan should be flexible so as to:

- accommodate changes in production rate
- make use of results from other samples
- make use of results from other POA Investigations
- provide the maximum national authorities confidence

To be effective this product sample requires that the individual investigator(s):

- have a good practical knowledge of the product, part or appliance
- have a good practical knowledge of the manufacturing processes
- have an up to date knowledge of the manufacturers production programme
- use an appropriate and up to date sample plan and compliance check lists
- have a suitable recording system for the results
- have a properly operating feedback system to their national authorities organisation for POA and the manufacturer
- maintain an effective working relationship with the manufacturer and his staff
- be able to communicate effectively.

GM 21B.235(b)
Maintenance of the POA - Work allocation within the Competent Authority

After issue of the approval the Competent Authority should appoint a suitable member of its technical staff as the POATL to be in charge of the approval for the purpose of continued surveillance.

Where the POA holder facilities are located in more than one Member State the Competent Authority of the State of manufacture will liaise with the competent authorities of the various partners/members to ensure appropriate continued surveillance.

GM 21B.235(b) and (c)
Continued surveillance

Continued surveillance consists of:

- planned continued surveillance, in which the total surveillance actions are split into several audits, which are carried out at planned intervals during the validity period of the production organisation approval. Within the continued surveillance one aspect may be audited once or several times depending upon its importance.

- unplanned POA reviews, which are specific additional investigation of a POA holder related to surveillance findings or external needs. The Competent Authority is responsible for deciding when a review is necessary taking into account changes in the scope of work, changes in personnel, reports on the organisation performance submitted by other EASA or national authorities teams, reports on the in service product.

AMC 21B.235(c)
Continuation of POA

At the end of the 24 months continued surveillance cycle the POATL responsible for the POA must complete an EASA Form 56 (see GM No.2 to 21B.220(c)) as a summary report for the continued surveillance including the recommendation for continuation of the POA as applicable. At this stage there is no limitation to the number of level two findings that may be open, provided they are within the time limits of the respective corrective action plans.

AMC No. 1 to 21B.240
Application for significant changes or variation of scope and terms of the POA

The Competent Authority must receive an application for significant changes or variation of scope and terms of the POA on an EASA Form 51 (see below) completed by the applicant.

EASA Form 51 **Application for significant changes or variation of scope and terms of Part 21 POA**	
Competent authority of a Member State of the European Union	
1. Name and address of the POA holder:	
2. Approval reference number:	
3. Locations for which changes in the terms of approval are requested:	
4. Brief summary of proposed changes to the activities at the item 3 addresses	
a) General:	
b) Scope of approval:	
c) Nature of privileges:	
5. Description of organisational changes:	
6. Position and name of the accountable manager or nominee:	
Date	Signature of the accountable manager (or nominee)

EASA Form 51

Block 1: The name must be entered as written on the current approval certificate. Where a change in the name is to be announced state the old name and address here, while using Block 5 for the information about the new name and address. The change of name and/or address must be supported by evidence, e.g. by a copy of the entry in the register of commerce.

Block 2: State the current approval reference number.

Block 3: State the locations for which changes in the terms of approval are requested or state “N/A” if no change is to be anticipated here.

Block 4: This Block must include further details for the variation of the scope of approval for the addresses indicated in Block 3. The Block “General” must include overall information for the change (including changes e.g. in workforce, facilities etc.), while the Block “Scope of approval” must address the change in the scope of work and products/categories following the principles laid down in the GM 21A.151. The Block “nature of privileges” must indicate a change in the privileges as defined in 21A.163(b)-(d). State “N/A” if no change is anticipated here.

Block 5: This Block must state the changes to the organisation as defined in the current production organisation exposition, including changes the organisational structure, functions and responsibilities. This Block must therefore also be used to indicate a change in the accountable manager in accordance with 21A.145(c)(1) or a change in the nomination of the responsible managers in accordance with 21A.145(c)(2). A change in the nomination of responsible managers must be accompanied by the corresponding EASA Forms 4. State “N/A” if no change is anticipated here.

Block 6: State the position and name of the accountable manager here. Where there is a change in the nomination of the accountable manager, the information must refer to the nominee for this position. State “N/A” if no change is anticipated here.

In case of an application for a change of the accountable manager the EASA Form 51 must be signed by the new nominee for this position. In all other cases the EASA Form 51 must be signed by the accountable manager.

GM 21B.245
Continued validity

1 GENERAL

Decisions on restriction, surrender, suspension or revocation of POA will always be actioned in such a way as to comply with any applicable national laws or regulations relating to appeal rights and the conduct of appeals, unless the decision has been taken by the Agency. In such case, the Agency appeal procedures will apply.

2 RESTRICTION is temporary withdrawal of some of the privileges of a POA under 21A.163.

3 SURRENDER is a permanent cancellation of a production organisation approval by the Competent Authority upon formal written request by the accountable manager of the organisation concerned. The organisation effectively relinquishes its rights and privileges granted under the approval and, after cancellation, may not make certifications invoking the approval and must remove all references to the approval from its company documentation.

4 SUSPENSION is temporary withdrawal of all the privileges of a production organisation approval under 21A.163. The approval remains valid but no certifications invoking the approval may be made while the suspension is in force. Approval privileges may be re-instated when the circumstances causing the suspension are corrected and the organisation once again can demonstrate full compliance with the Requirements.

5 REVOCATION is a permanent and enforced cancellation of the whole of an approval by the Competent Authority. All rights and privileges of the organisation under the approval are withdrawn and, after revocation, the organisation may not make any certifications or other statements invoking the approval and must remove all references to the approval from its company documentation.

AMC 21B.245
Corrective action plan

It is expected that any established POA holder will move quickly to re-establish compliance with Part 21 and not risk the possibility of approval suspension. Therefore, the corrective action period granted by the Competent Authority must be appropriate to the nature of the finding but in any case initially must not be more than 6 months. In certain circumstances and subject to the nature of the finding the Competent Authority can vary the 6 months period subject to a satisfactory corrective action plan agreed by the Competent Authority.

Failure to comply within time scale agreed by the Competent Authority means that provisional suspension of the POA in whole or in part must proceed.

Subpart H - Airworthiness Certificates

GM 21B.320(b)(6)
Investigation

1 Determination of necessary conditions, restrictions and/or limitations on the airworthiness certificate issued by a Member State

The competent authority of the Member State of registry may issue under its own legislation a document to list and identify all necessary conditions, restrictions and limitations that result from the investigation by the Agency and/or from the legislation of the competent authority of the Member State of registry. This document could take the form of an addendum to the approved Flight Manual or Operating instruction or comparable document and should be referenced in Block 5 (limitations/remarks) of the appropriate Certificate of Airworthiness.

GM 21B.325(a)
Airworthiness Certificates

1 Completion of the certificate of airworthiness by a Member State

Block 5: Insert restrictions developed in accordance with Part 21, including any reference to limitations as indicated in GM 21B.320(b)(6).

2 Completion of the restricted certificate of airworthiness by a Member State

Block 5: Insert restrictions developed in accordance with Part 21, including any reference to limitations as indicated in GM 21B.320(b)(6).

3 Completion of the permit to fly by a Member State

Block 4: Insert purpose of flight in accordance with Article 5(4)(e)(ii) first indent of the Basic Regulation.

Block 5: Insert restrictions in accordance with Article 5(4)(e)(ii) second and third indent of the Basic Regulation.

GM 21B.325(b)
Completion of the Airworthiness Review Certificate by a Member State

In accordance with the applicable continuing airworthiness requirements a certificate of airworthiness is valid only if a valid airworthiness review certificate is attached to it. For new aircraft, the Competent Authority will issue the airworthiness review certificate when issuing the certificate of airworthiness.

Subpart I - Noise certificates

GM 21B.425(a)
Noise Certificates

1 Completion of the noise certificate by a Member State

1.1 Form (see Appendix to Part 21)

It is intended that the Form of the EASA noise certificate should be consistent with the ICAO, CAEP agreed format. It follows that the EASA Form of noise certificate suggested in the Appendix to Part 21 may be changed subject to ICAO, CAEP recommendations. Completion instructions are accordingly subject to change as appropriate.

1.2 Completion instructions

Block 4: Engine designation should contain type and model including any de-rate that may be appropriate.

Block 5: Propeller information should be entered if applicable in which case it shall contain type and model designation.

Blocks 6: State maximum take-off mass and unit, (e.g., 170,500 kg) at which compliance with the applicable noise certification standards has been demonstrated.

Block 8: State maximum landing mass and unit at which compliance with the applicable noise certification standards has been demonstrated, if applicable.

Block 7: Should contain height above the runway at which thrust/power is reduced, following full thrust/power take-off, and unit e.g. 950 ft., or “N/A”.

Block 9: Should contain details of noise relevant equipment or modifications that may be necessary to identify the acoustical configuration of the aircraft, such as silencers, STCs incorporated for the purposes of compliance, tailrotor, acoustic liner etc. (as appropriate).

Block 10: Should contain the Chapter of ICAO Annex 16, Volume I and section specifying maximum noise levels (e.g., Chapter 10, Section 10.4b)

Blocks 11, 12, 13 & 14 Should state noise level and unit, e.g., 98,5 EPNdB, or “N/A”.

Subpart J – Design organisation approval

Administrative procedures established by the Agency apply.

Subpart K – Parts and appliances

Administrative procedures established by the Agency apply.

(Subpart L – Not applicable)

Subpart M – Repairs

Administrative procedures established by the Agency apply.

(Subpart N – Not applicable)

Subpart O – European Technical Standard Order authorisations

Administrative procedures established by the Agency apply.

(Subpart P – Not applicable)

Subpart Q – Identification of products, parts and appliances

Administrative procedures established by the Agency apply.