

STATE OF LIBYA  
GOVERNMENT OF LIBYA  
MINISTRY OF TRANSPORT  
CIVIL AVIATION AUTHORITY



دولة ليبيا  
الحكومة الليبية  
وزارة المواصلات  
مصلحة الطيران المدني

# LIBYA CIVIL AVIATION REGULATIONS – INITIAL AIRWORTHINESS

## Part 21

**AMC (Acceptable Means of Compliance)**

**&**

**GM (Guidance Material)**

*Initial Issue – December 2016*

## INTRODUCTION

1. The LyCAA has adopted associated compliance or interpretative and guidance materials to Part 21 regulations which establishes technical requirements 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. The documents are based on EASA Acceptable Means of Compliance (AMCs) and Guidance Materials (GMs)
2. Unless specifically stated otherwise, clarification will be based on this material or other EASA documentation, therefore, reference to EASA in this document may still be used for clarification and guidance.
3. The information contained herein is subject to constant review in the light of changing regulations and requirements. No subscriber or other reader should act on the basis of any such information without also referring to the applicable laws and regulations and/or without taking appropriate professional advice when/as indicated/required. Although, every effort has been made to ensure accuracy, the Libyan Civil Aviation Authority, shall not be held responsible for loss or damage caused by errors, omissions, misprints or misinterpretation of the contents hereof.
4. Copies of this publication can be obtained from the following address:  
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Signed on 1 December 2016, by:



**Capt. Nasereddin Shaebelain**  
Director General

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1.	Initial Issue	December 2016			
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Initial Issue	December 2016	

## Section. A – Technical Requirements

### AMC 21.A.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:
  - (1) A large reduction in safety margins or functional capabilities, or
  - (2) Physical distress or excessive workload such that the flight crew cannot be relied upon to perform their tasks accurately or completely, or
  - (3) 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 certification specifications, 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 certification specifications 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 LYCAA considers there is an unsafe condition. There may be other cases where overriding safety considerations may lead the LYCAA 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 21.A.11 Scope

The type acceptance certificate has no holder as such. The type acceptance certificate is issued to recognize a foreign type certificate in Libya. Once issued, any subsequent aircraft of that type may enter Libya without going through the type acceptance process.

All aircraft must go through the entry process for the issue of an airworthiness certificate.

Acceptance of the aircraft's type certificate will imply acceptance of the associated engine and/or propeller type certificate.

### AMC 21.A.15(a) Application

An application should be made on (LYCAA Form.21-735).

The application form should state exactly which models are to be included on the TAC. These models shall be included on the foreign type certificate.

The data requirements specified in LYCAR-21.A.15 (c) shall be met for each model included on the application form.

## GM 21.A.91 Classification of changes in 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 LYCAR-21 Subpart D, i.e., either LYCAR-21.A.95 or LYCAR-21.A.97, or alternatively whether application and approval has to be made in accordance with LYCAR-21 Subpart E.

### 2. INTRODUCTION

2.1 LYCAR-21.A.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 LYCAR-21.A.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 LYCAR-21.A.91 where classification is the first step of a procedure.

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

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

### 3. ASSESSMENT OF DESIGN CHANGE FOR CLASSIFICATION

#### 3.1. Changes to the type design

##### 3.1.1. The type design consists of:

1. The drawings and specifications, and a listing of those drawings and specifications, necessary to define the configuration and the design features of the product shown to comply with the applicable type-certification basis and environmental protection requirements;
2. Information on materials and processes and on methods of manufacture and assembly of the product necessary to ensure the conformity of the product;
3. An approved airworthiness limitations section of the instructions for continued airworthiness as defined by the applicable airworthiness code; and
4. Any other data necessary to allow by comparison, the determination of the airworthiness, the characteristics of noise, fuel venting, and exhaust emissions (where applicable) of later products of the same type.

Alteration to any of the data included within the scope of 3.1.1 is considered a change to the type design.

#### 3.2. Classification Process (see Flowchart 1)

LYCAR-21.A.91 requires all changes to be classified as either major or minor, using the criteria of LYCAR-21.A.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 CAA should be consulted for clarification.

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, earlier certification specification (reversion), later certification specification).
- ii. Where the applicant proposes a new interpretation of the certification specifications used for the type type-certification basis, that has not been published as AMC material or otherwise agreed with LYCAA.
- 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 certification specifications 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. LYCAR-21.A.3B).

See note 1.

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

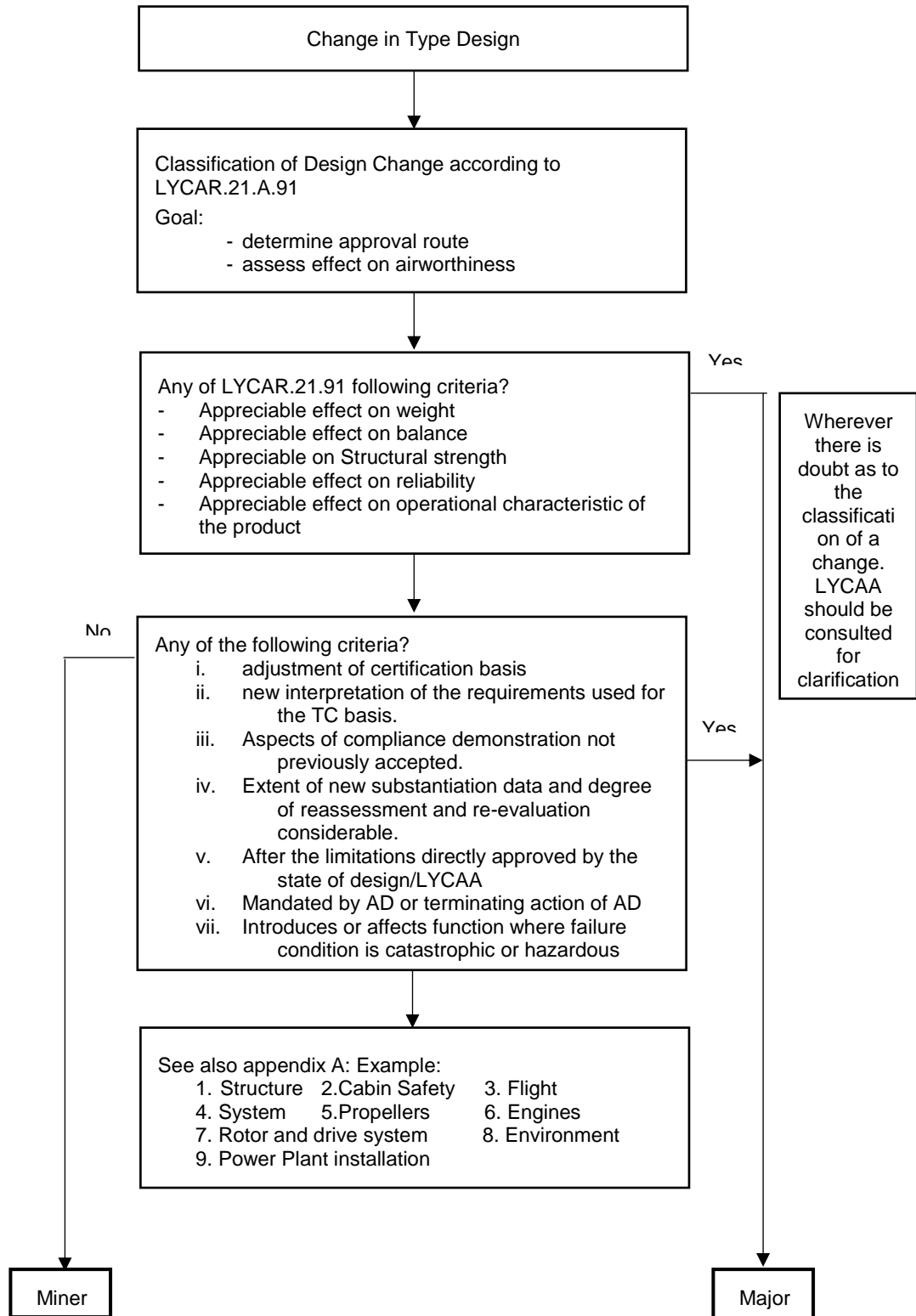
**Note 1:** *The design change previously classified minor and approved prior to the airworthiness directive issuance decision needs no re-classification. However, LYCAA retains the right to review the change and re-classify/re-approve if found necessary.*

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

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



**Flowchart 1 to GM 21.A.91 – Classification process**

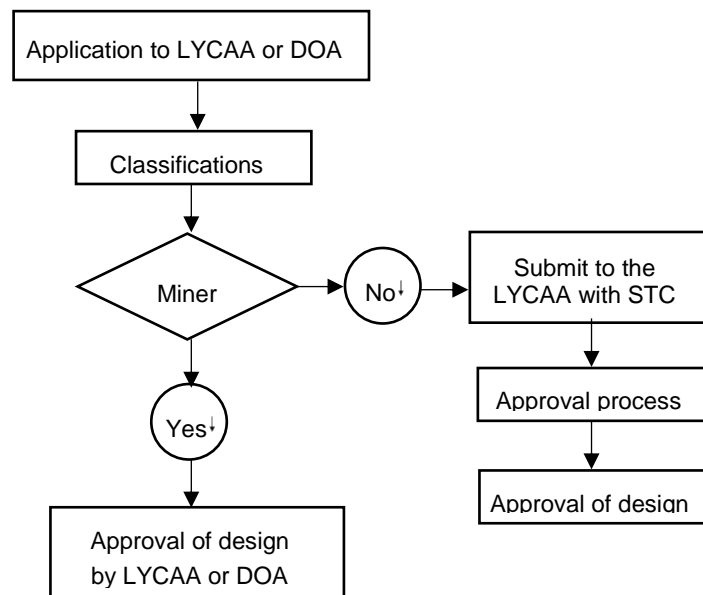


**AMC 21.A.95 (b)1 Minor changes**

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 (i.e. the persons responsible to):
    - i. classify changes to type design or repairs
    - ii. verify compliance
    - iii. approve minor changes to type design and minor repairs
    - iv. issue information or instructions
  - 1.12. Independent system monitoring
- Part 2. Procedures
- 2.1. Management of changes to type design and design of repairs
    - i. configuration control
    - ii. classification
    - iii. 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
    - i. in relations with the changes and repairs
    - ii. in relation with failures/malfunctions and defects (i.e. Services - Bulletins)
  - 2.6. Record keeping

**GM 21.A.95 Type design change (modification) approval flowchart****GM 21.A.95(b) Minor changes**

An owner/operator may get their minor change classified and approved by the TC/STC holder even though the TC/STC holder has not submitted the handbook to LYCAA.

The requirement to submit a handbook to LYCAA is for design organisations other than TC/STC holder.

**GM 21.A.97 Type design change (modification) approval flowchart**

(Refer to GM 21.A.95)

**AMC 21.A.101 Designation of applicable certification specifications and environmental protection requirements – Explanation of terminology**

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

**AMC 21.A.174(b)2(i) Application**

A statement of conformity confirms that that the product, part or appliance conforms to the approved design data and is in condition for safe operation. Typical statements of conformity is:

- i) EASA Form 52 issued for complete aircraft by EASA approved production organisations

**AMC 21.A.174(b)3(i) Application**

A statement reflecting the airworthiness state can be:

- i) An Airworthiness Review Certificate (ARC) issued under national authority accepted by LYCAA
- ii) An Export Certificate of Airworthiness issued within 60 days preceding the date of receipt of the application by LYCAA
- iii) A current domestic Certificate of Airworthiness issued or renewed less than twelve months prior to the date of receipt of the application by the CAA

- iv) A current domestic Certificate of Airworthiness issued or renewed more than twelve months prior to the date of receipt of the application by LYCAA and a statement from the exporting authority

### **AMC 21.A.303(c) Standard Parts**

1. 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 recognized Standards, or
2. For sailplanes and powered sailplanes, where it is a non-required instrument and/or equipment certified under the provision of CS 22.1301(b) or equivalent, if that instrument or equipment, when installed, functioning, functioning improperly or not functioning at all, does not in itself, or by its effect upon the sailplane and its operation, constitute a safety hazard.

'Required' in the term 'non-required' as used above means required by the applicable certification specifications (CS 22.1303, 22.1305 and 22.1307 or equivalent) or required by the relevant operating regulations and the applicable Rules of the Air or as required by Air Traffic Management (e.g. a transponder in certain controlled airspace).

Examples of equipment which can be considered standard parts are electrical VA-riometers, bank/slip indicators ball type, total energy probes, capacity bottles (for VA-riometers), final glide calculators, navigation computers, data logger / barograph / turn-point camera, bug-wipers and anti-collision systems.

Equipment which must be approved in accordance to the certification specifications shall comply with the applicable TSO or equivalent and is not considered a standard part (e.g. oxygen equipment).

### **GM 21.A.303(c) Officially recognized Standards**

In this context "officially recognized Standards" means:

1. Those standards established or published by an official body whether having legal personality or not, which are widely recognized by the air transport sector as constituting good practice; or
2. The standard used by the manufacturer of the equipment as mentioned in paragraph 2 of AMC 21.A.303(c).

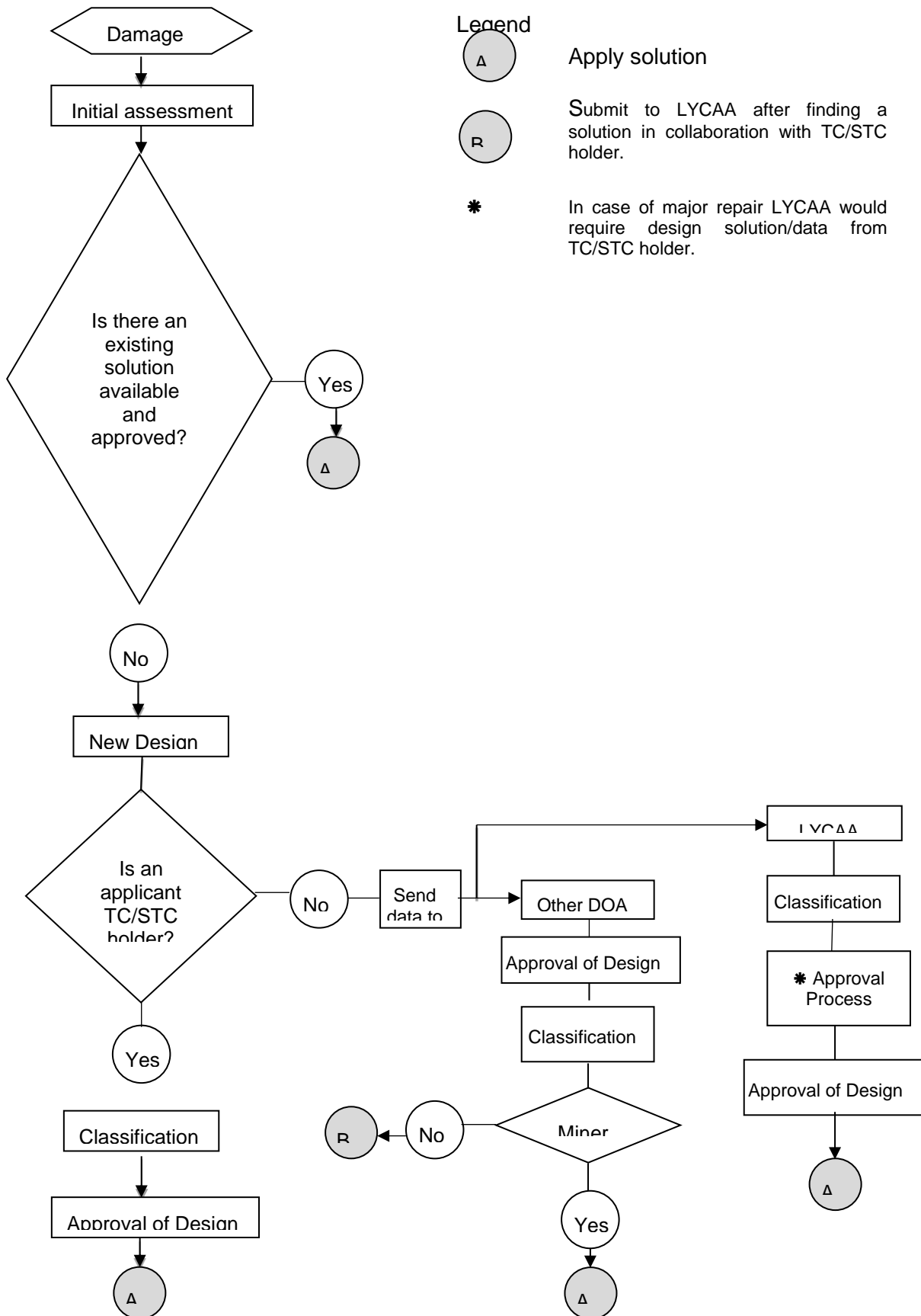
### **GM 21.A.431A(a) Scope**

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, or APU TSO authorization 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 state of design/CAA, or by an appropriately approved design organisation.

**Flowchart 1 to GM 21.A.431(a) addresses the procedures that should be followed for approval of a repair.**



**AMC 21.A.433 (a) 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 specifications and references of justifications,
  - c. repair drawing and/or instructions and scheme identifier,
  - d. correspondence with the TC, STC, or APU TSO authorisation 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 LYCAR-21.A.433 (b).
5. Repairs to engine or APU critical parts would normally only be accepted with the involvement of the TC holder.

**GM 21.A.435(a) Classification of repairs**

1. Clarification of the terms Major/Minor

In line with the definitions given in LYCAR-21.A.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, jiggling 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 center 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 effect 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 21.A.435(b) Classification of repairs**

An owner/operator may get their repair classified and approved by the TC/STC holder even though the TC/STC holder has not submitted the handbook to LYCAA.

The requirement to submit a handbook to LYCAA is for design organisations other than TC/STC holder.

### **GM 21.A.437 Issue of repair design approval**

1. Approval by Design Organization Approval (DOA) holder

The DOA may approve repairs through the use of procedures in handbook without requiring LYCAA involvement. However, the owner or operator shall provide LYCAA

- (i) Notification before incorporation of modification by sending all the documents relevant to the modification
- (ii) Any instructions for continued airworthiness issued by the design organization

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 LYCAR-21.A.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 21.A.439 Production of Repair Parts**

A maintenance organisation may manufacture parts for its own repair purposes when expressly authorised by LYCAA.

### **GM 21.A.443 Limitations**

Instructions and limitations associated with repairs should be specified and controlled by those procedures required by the applicable operations rules.

### **GM 21.A.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.



**GM 21.A.445(a) Unrepaired damage**

An owner/operator may get their unrepaired damage evaluated for its airworthiness consequences by the TC/STC holder even though the TC/STC holder has not submitted the handbook to LYCAA. The requirement to submit a handbook to LYCAA is for design organisations other than TC/STC holder.

**AMC 21.A.447 Record Keeping**

(Refer to AMC 21.A.433(a))

**GM Subpart P Permit to Fly**

The process allowing a flight under a permit to fly can be described as follows:

Flowchart 1 – Overview

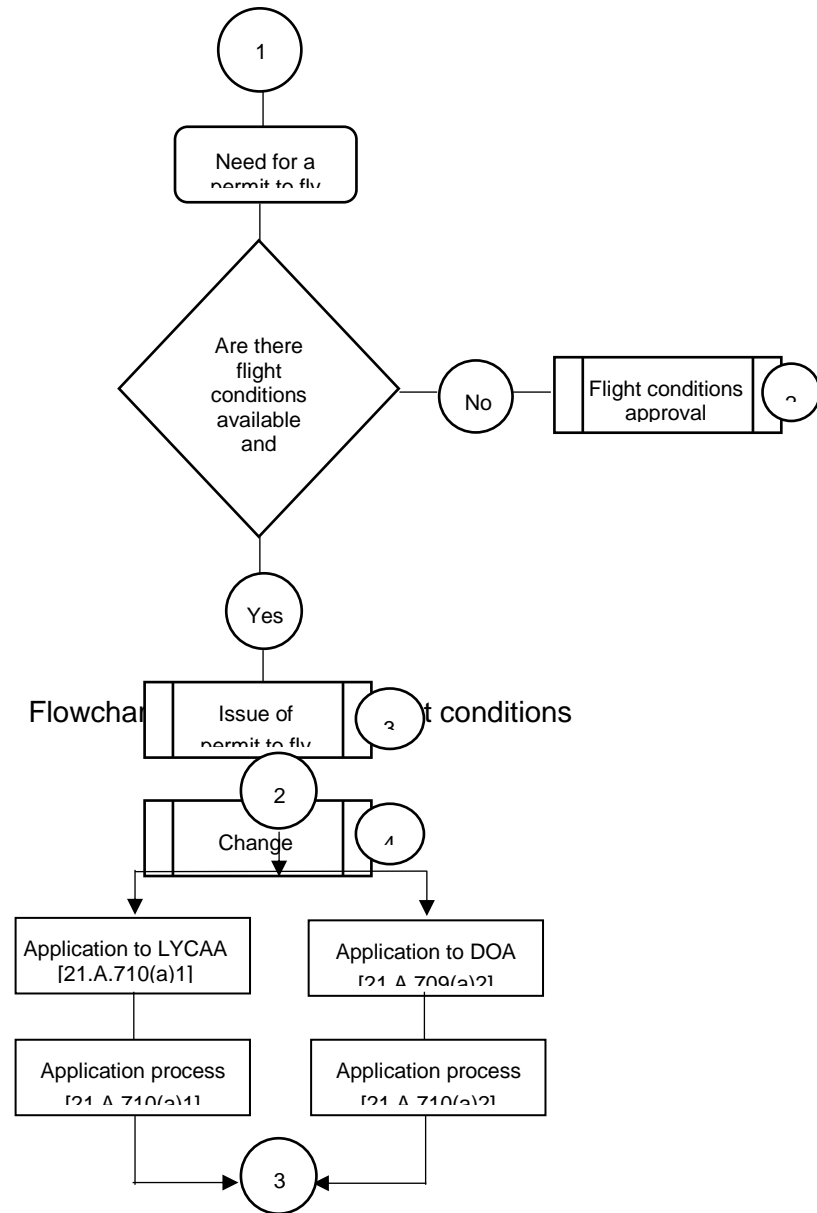
Flowchart 2 – Approval of flight conditions

Flowchart 3 – Issue of permit to fly

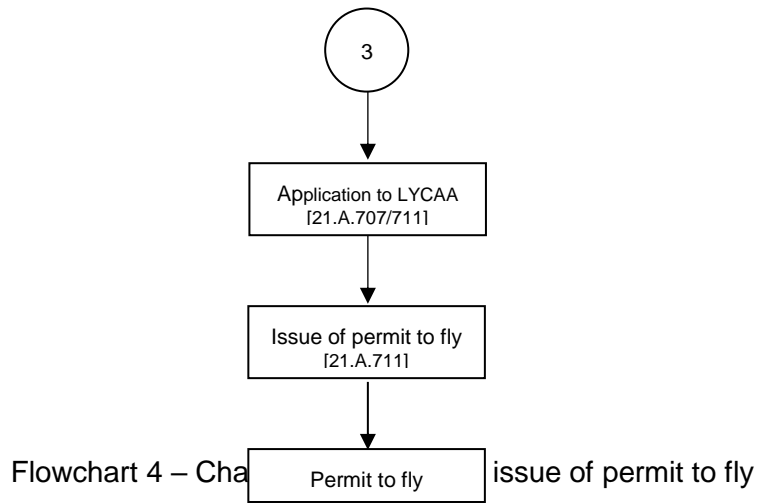
Flowchart 4 – Changes after the first issue of permit to fly

Flowchart I to GM Subpart P-Overview

Operator/Owner

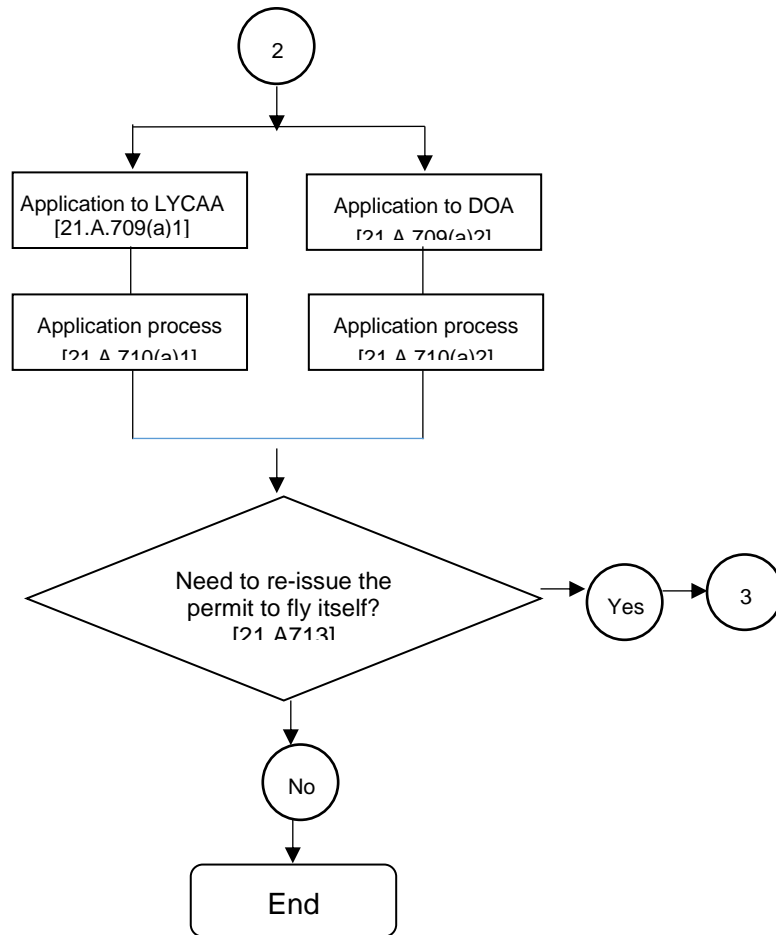


Flowchart 3 – Issue of permit to fly



Flowchart 4 – Cha

issue of permit to fly



**GM 21.A.701(a) Permit to fly when certificate of airworthiness is not appropriate**

A certificate of airworthiness may not be appropriate for an individual aircraft or aircraft type when it is not practicable to comply with the normal continued airworthiness requirements and the aircraft is to a design standard that is demonstrated to be capable of safe flight under defined conditions.

LYCAR-21.A.701 identifies cases where the issuance of a Certificate of Airworthiness may not be possible or appropriate and this GM provides further information and typical examples for clarification where appropriate:-

**Note:** *This list of examples is not exhaustive*

1. Development:
  - testing of new aircraft or modifications
  - testing of new concepts of airframe, engine propeller and equipment;
  - testing of new operating techniques;
2. Demonstration of compliance with regulations or certification specifications:
  - certification flight testing for type certification, supplemental type certificates, changes to type certificates or Technical Standard Order authorisation;
3. Design organisations or production organisations crew training:
  - Flights for training of crew that will perform design or production flight testing before the design approval or Certificate of Airworthiness can be issued.
4. Production flight testing of new production aircraft:
  - For establishing conformity with the approved design, typically this would be the same program for a number of similar aircraft;
5. Flying aircraft under production between production facilities:
  - green aircraft ferry for follow on final production.
6. Flying the aircraft for customer acceptance:
  - Before the aircraft is sold and/or registered.
7. Delivering or exporting the aircraft:
  - Before the aircraft is registered in the State where the Certificate of Airworthiness will be issued.
8. Flying the aircraft for Authority acceptance:
  - In the case of inspection flight test by the authority before the Certificate of Airworthiness is issued.
9. Market survey, including customer's crew training:
  - Flights for the purpose of conducting market survey, sales demonstrations and customer crew training with non type certificated aircraft or aircraft for which conformity has not yet been established or for non-registered a/c and before the Certificate of Airworthiness is issued
10. Exhibition and air show:

- Flying the aircraft to an exhibition or show and participating to the exhibition or show before the design approval is issued or before conformity with the approved design has been shown.
11. Flying the aircraft to a location where maintenance or airworthiness review are to be performed, or to a place of storage:
    - Ferry flights in cases where maintenance is not performed in accordance with approved programs, where an AD has not been complied with where certain equipment outside the Minimum Equipment List (MEL) is unserviceable or when the aircraft has sustained damage beyond the applicable limits.
  12. Flying an aircraft at a weight in excess of its maximum certificated takeoff weight for flight beyond the normal range over water, or over land areas where adequate landing facilities or appropriate fuel is not available:
    - Oversees ferry flights with additional fuel capacity.
  13. Record breaking, air racing or similar competition:
    - Training flight and positioning flight for this purpose are included
  14. Flying aircraft meeting the applicable certification specifications before conformity to the environmental requirements has been found:
    - Flying an aircraft which has been demonstrated to comply with all applicable certification specifications but not with environmental requirements.
  15. For non-commercial flying activity on individual non-complex aircraft or types for which a certificate of airworthiness is not appropriate.
    - For aircraft which cannot practically meet all applicable certification specifications, such as certain aircraft without TC-holder ("generically termed orphan aircraft") or aircraft which have been under national systems of Permit to Fly and have not been demonstrated to meet all applicable requirements. The option of a permit to fly for such an aircraft should only be used if a certificate of airworthiness cannot be issued due to conditions which are outside the direct control of the aircraft owner, such as the absence of properly certified spare parts.

**Note:** *The above listing is of cases when a permit to fly MAY be issued; it does not mean that in the described cases a permit to fly MUST be issued. If other legal means are available to allow the intended flight(s) they can also be used.*

### **GM 21.A.707(b) Application**

An application should be made on (LYCAA Form.21-21).

### **GM 21.A.708(b)6 Continuing airworthiness**

In most cases a simple reference to existing maintenance requirements will suffice for aircraft that have a temporarily invalid Certificate of Airworthiness.

For other aircraft it will have to be proposed by the applicant as part of the flight conditions. For approved organisations they can be included in their procedures.

**GM No. 1 21.A.708(c) Safe flight**

Safe flight normally means continued safe flight and landing but in some limited cases (e.g. higher risk flight testing) it can mean that the aircraft is able to fly in a manner that will primarily ensure the safety of overflowed third parties, the flight crew and, if applicable other occupants.

This definition of 'safe flight' should not be interpreted as allowing a test pilot, equipped with a parachute and operating over a sparsely populated area, to set out on a test flight in the full knowledge that there is a high probability of losing the aircraft. The applicant should take reasonable care to minimize safety risks and to be satisfied that there is a reasonable probability that the aircraft will carry out the flight without damage or injury to the aircraft and its occupants or to other property or persons whether in the air or on the ground.

**GM No. 2 21.A.708(c) Substantiations**

The substantiations should include analysis, calculations, tests or other means used to determine under which conditions or restrictions the aircraft can perform safely a flight. GM No. 3 21.A.708(c) Operation of Overweight Aircraft

This GM provides information and guidance with respect to permit to fly for operating an aircraft in excess of its maximum certificated takeoff weight, for flight beyond the normal range over water, or over land areas where adequate landing facilities or appropriate fuel is not available.

**1. GENERAL.**

The excess weight that may be authorized for overweight operations should be limited to additional fuel, fuel carrying facilities, and navigational equipment necessary for the flight.

It is recommended that the applicant discuss the proposed flight with the TC holder of the aircraft to determine the availability of technical data on the installation of additional fuel carrying facilities and/or navigational equipment.

**2. CRITERIA USED TO DETERMINE THE SAFETY OF ADDITIONAL FACILITIES.**

In evaluating the installation of additional facilities, the LYCAA or the design organisation must find that the changed aircraft is safe for operation. To assist in arriving at such a determination, the following questions are normally considered:

- a. Does the technical data include installation drawings, structural substantiating reports, weight, balance, new center of gravity limits computations, and aircraft performance limitations in sufficient detail to allow a conformity inspection of the aircraft to be made?
- b. In what ways does the aircraft not comply with the applicable certification specifications?
- c. Are the fuel tanks vented to the outside? Are all areas in which tanks are located ventilated to reduce fire, explosion, and toxicity hazards?
- d. Are the tanks even when empty strong enough to withstand the differential pressure at maximum operating altitude for a pressurized aircraft?
- e. Have means been provided for determining the fuel quantity in each tank prior to flight?
- f. Are shutoff valves, accessible to the pilot, provided for each additional tank to disconnect these tanks from the main fuel system?
- g. Are the additional fuel tank filler connections designed to prevent spillage within the aircraft during servicing?
- h. Is the engine oil supply and cooling adequate for the extended weight and range?

### 3. LIMITATIONS.

The following types of limitations may be necessary for safe operation of the aircraft:

- a. Revised operational airspeeds for use in the overweight condition.
- b. Increased pilot skill requirements.
- c. A prescribed sequence for using fuel from various tanks as necessary to keep the aircraft within its center of gravity range.
- d. Notification to the control tower of the overweight takeoff condition to permit use of a runway to minimize flight over congested areas.
- e. Avoidance of severe turbulence. If encountered, the aircraft should be inspected for damage as soon as possible.

### 4. EXAMPLE OF OPERATING LIMITATIONS WHICH MAY BE PRESCRIBED AS PART OF THE PERMIT TO FLY.

Aircraft type: XXXX          Model: YYYY

Limitations:

- a. Maximum weight must not exceed 8,150 pounds.
- b. Maximum quantity of fuel carried in auxiliary tanks must not exceed 106 gallons in fwd tank, 164 gallons in center tank, and 45 gallons in aft tank.
- c. Centre of gravity limits must not exceed (fwd.) +116.8 and (aft) +124.6.
- d. Aerobatics are prohibited.
- e. Use of autopilot while in overweight condition is prohibited.
- f. Weather conditions with moderate to severe turbulence should be avoided.
- g. When an overweight landing is made or the aircraft has been flown through moderate or severe turbulence while in an overweight condition, the aircraft must be inspected for damage after landing. The inspections performed and the findings must be entered in the aircraft log. The pilot must determine, before the next takeoff, that the aircraft is airworthy.
- h. When operated in the overweight condition, the cruising speed ( $V_c$ ) shall not exceed 185 m.p.h. and the maximum speed ( $V_{ne}$ ) shall not exceed 205 mph
- i. Operation in the overweight condition must be conducted to avoid areas having heavy air traffic, to avoid cities, towns, villages, and congested areas, or any other areas where such flights might create hazardous exposure to person or property on the ground.

#### **GM 21.A.708(d) Control of aircraft configuration**

The applicant should establish a method for the control of any change or repair made to the aircraft, for changes and repairs that do not invalidate the conditions established for the permit to fly.

All other changes should be approved in accordance with LYCAR 21.A.713 and when necessary a new permit to fly should be issued in accordance with LYCAR 21.A.711.

#### **AMC 21.A.709(b) Submission of documentation supporting the establishment of flight conditions**

Together with the application, the documentation required by LYCAR 21.A.709(b) must be submitted with the approval form (LYCAA Form 18b), completed with all relevant information. If the complete

set of data is not available at the time of application, the missing elements can be provided later. In such cases, the approval form must be provided only when all data are available, to allow the applicant to make the statement required in box 9 of the form.

When the flight conditions are approved under a privilege, this form should be used by the approved organisation to document the approval.

### **GM 21.A.711(e) Additional conditions and restrictions**

The conditions and restrictions prescribed by the CAA may include airspace restrictions to make the conditions approved under LYCAR 21.A.710 more concrete, or conditions outside the scope of the ones mentioned in LYCAR 21.A.708(b) such as a radio station license.

### **GM 21.A.713 Changes**

Changes to the conditions or associated substantiations that are approved but do not affect the text on the permit to fly do not require issuance of a new permit to fly.

In case a new application is necessary, the substantiation for approval of the flight conditions only needs to address the change.