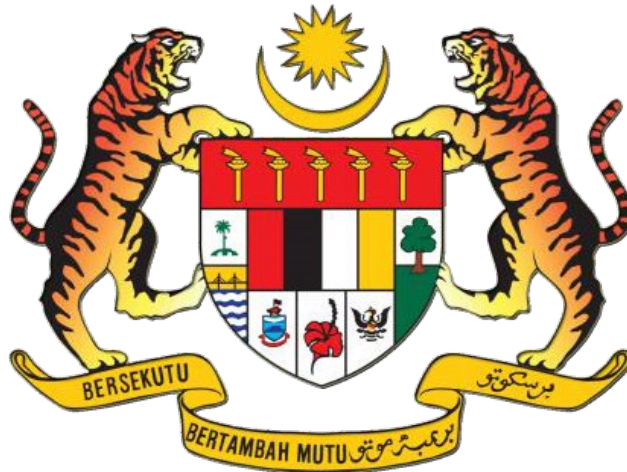


# MALAYSIAN STATE AIRWORTHINESS AUTHORITY



## MALAYSIAN STATE TECHNICAL AIRWORTHINESS MANUAL

### MSTAR 21 - AIRCRAFT DESIGN, PRODUCTION, AND CERTIFICATION INTERIM VOLUME 2

The Malaysian State Airworthiness Authority (MSAA) issued the Malaysian State Technical Airworthiness Manual (MSTAM) as a Technical Airworthiness Management System. Authority given by the Minister of Defence under Council of Ministers of Defence Meeting Series 02/06 (*Mesyuarat Lembaga Menteri Pertahanan Siri 02/06*) dated 05 September 2006, the State Airworthiness Authority (SAA) makes this MSTAM.

MSTAM contains Airworthiness Management System (AMS) information related to policies, regulatory frameworks, State Technical Airworthiness Regulations (STAR), Airworthiness Requirements, and Implementing Rules specific to the State Technical Airworthiness Program. The Implementing Rules describe the Technical Requirements, Acceptable Means of Compliance, and Guidance Material to give effect to the MSTAR provision applicable to state aircraft set out in the Malaysian State Technical Airworthiness Regulation (MSTAR) produced by the technical airworthiness regulator (TAR) MSTAM and its supplementary documents apply to every person, aircraft, aeronautical product, and maintenance training related to State aircraft.

#### **Non-compliance with these Orders**

Any organisation or person subject to and upon the terms and conditions of the agreement who contravenes any provision in this MSTAM shall be liable to the implication imposed under appropriate airworthiness instruments.

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**MSTAR 21 – AIRCRAFT DESIGN, PRODUCTION, AND CERTIFICATION**

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**MALAYSIAN STATE TECHNICAL AIRWORTHINESS MANUAL****LIST OF ABBREVIATIONS**

## Notes:

1. Definitions with no superscript have been sourced directly from the European Military Airworthiness Document (EMAD 1). Those definitions and terminologies with a superscript\* are either DGTA specific or derived from other sources.

AA*	Airworthiness Authority
AAC*	Airworthiness Advisory Circular
ABDR*	Aircraft Battle Damage Repair
AD	Airworthiness Directive
AO*	Airworthiness Order
AMS*	Airworthiness Management System
AM*	Accountable Manager
AMC	Acceptable Means Compliance
AMO*	Approved Maintenance Organisation
AMTO*	Approved Maintenance Training Organisation
AB*	Airworthiness Board
ASR*	Airworthiness Standards Representative
ARC	Airworthiness Review Certificate
BoSTA*	Board of State Technical Airworthiness
CAA*	Civil Aviation Authority
CAAM*	Civil Aviation Authority of Malaysia
CAD*	Civil Airworthiness Directive
CAESE*	Centre for Aerospace and Engineering Services Establishment
CAP*	Competent Authority Procedures
CAME	Continuing Airworthiness Management Exposition
CAMO	Continuing Airworthiness Management Organisation
CAR*	Corrective Action Request
CARs*	Canadian Aviation Regulations
CDCCL	Critical Design Configuration Control Limitations
CDL	Configuration Deviation List
CI	Configuration Item
Cmaint*	Contingency Maintenance
CMM	Component Maintenance Manual
CRS	Certificate of Release to Service
CoA*	Certificate of Airworthiness
CS	Certification Specification
DAR*	Delegated Airworthiness Representative
DCA*	Department Civil Aviation
DGTA*	Directorate General Technical Airworthiness
DOE	Design Organisation Exposition
DoD*	U.S. Department of Defence
DOA	Design Organisation Approval
EAC*	Engineering Authority Certificate
EASA	European Aviation Safety Agency
EDA	European Defence Agency
EDP	Electronic Data Processing
EMACC	European Military Airworthiness Certification Criteria



EMAD	European Military Airworthiness Document
EMAD R	European Military Airworthiness Document Recognition
EMAR	European Military Airworthiness Requirement
EMPA	European Military Part Approval
EMTSO	European Military Technical Standard Order
ESF	Equivalent level of Safety Finding
EWIS	Electrical Wiring Interconnect System
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FTS	Fuel Tank Safety or Flight Test Schedule
GFE	Government Furnished Equipment
GM	Guidance Materials
GoM*	Government of Malaysia
HF	Human Factor
ICA*	Instructions for Continuing Airworthiness
ICAO	International Civil Aviation Organisation
IQA*	Internal Quality Audit
LEA*	Letter of Engineering Authority
LEP*	List of Effective Pages
LMA*	Letter of Maintenance Authority
LMS	Learning Management System
LMTA*	Letter of Maintenance Training Authority
MA*	Maintenance Authority
MAA*	Military Airworthiness Authority
MAC*	Maintenance Authority Certificate
MAF*	Malaysian Armed Forces
MAO*	Maintenance Authorising Office
MCAI*	Mandatory Continuing Airworthiness Information
MCAR*	Malaysian Civil Aviation Regulations
MCOQ*	Multiple Choice Objective Question
MM	Maintenance Manager
MEL	Minimum Equipment List
MSTC*	Malaysian State Type Certificate
MTAC	Maintenance Training Authority Certificate
MTC	Military Type Certificate
MTCH	Military Type Certificate Holder
MoD*	Ministry of Defence
MoT*	Ministry of Transport
MI/S*	Maintenance Inspector/Supervisor
MMI*	Maintenance Managed Item
MMP*	Maintenance Management Plan
MMS*	Maintenance Management System
MRM*	Management Review Meeting
MSTA*	Malaysian State Technical Airworthiness
MSTAR*	Malaysian State Technical Airworthiness Regulation
MSTC*	Malaysian State Type Certification
MTF*	Maintenance Test Flight
MTMP*	Maintenance Training Management Plan
NAA*	National Airworthiness Authority
NDT	Non-Destructive Test
OAA*	Operational Airworthiness Authority
OAR	Operational Airworthiness Regulator
OEM	Original Equipment Manufacturer

OJT*	On-Job Training
OM*	Operational Maintenance
OPPDMEF*	Organisation, People, Procedure, Data, Material, Equipment and Facilities
OSH*	Occupational Safety and Health
POA*	Production Organisation Approval
POE	Product Organisation Exposition
PTF	Permit To Fly
QM*	Quality Manager
QMS*	Quality Management System
RMAF*	Royal Malaysian Air Force
RMSTC*	Restricted Malaysian State Type Certificate
SAA*	State Airworthiness Authority
SARPs*	Standards and Recommended Practices
SAO*	State Aircraft Operator
SB	Service Bulletin
SMM*	Senior Maintenance Manager
SMS*	Safety Management Systems
SOI*	Statement of Operating Intent
SOR*	Statement of Operating Requirements
SRAO*	State Registered Aircraft Operator
SSP*	State Safety Programme
STANAG	Standardisation Agreement (in NATO)
STAP*	State Technical Airworthiness Policies
STAR*	State Technical Airworthiness Regulations
STC*	Supplemental Type Certificate
STI*	Special Technical Instruction
TAA*	Technical Airworthiness Authority
TAAC*	Technical Airworthiness Advisory Circular
TAC*	Technical Airworthiness Clearance
TAD*	Technical Airworthiness Directive
TAMM*	Technical Airworthiness Management Manual
TC	Type Certificate
TCCA*	Transport Canada Civil Aviation
TIR*	Technical Information Review
TM*	Training Manager
TSN*	Training Support Network
UAS	Unmanned Aircraft System

**MALAYSIAN STATE TECHNICAL AIRWORTHINESS MANUAL****GLOSSARY****Notes:**

2. Definitions with no superscript have been sourced directly from the European Military Airworthiness Document (EMAD 1). Those definitions and terminologies with a superscript\* are either DGTA-specific or derived from other sources.

**Academic and Curriculum Manager\***

A person who oversees the curriculum design, training media, lesson plan, and instructor guides to evaluate the effectiveness of basic and type training courses.

**Acceptable Means of Compliance**

This illustrates a means, but not the only means, by which regulation can be met, and a regulated entity may decide to show compliance by other means. Hence, only an Authority can agree on alternatives to the published Acceptable Means of Compliance. Acceptable Means of Compliance are strongly recommended practices, and justification will be required of the Authority if they are followed. The burden of proof that regulation is satisfied rests entirely with a regulated entity when alternatives are proposed to the Authority.

**Accountable Manager\***

A person designated by the Approved Organisation and named in the Exposition, who is accountable to the DGTA for maintaining safety standards required by relevant MSTAR and any additional standards specified in the respective Exposition. Also, a key figure who has influence within the organisation and the ability to make appropriate resource decisions to ensure compliance with airworthiness regulations.

**Addition**

The inclusion of further basic categories or sub-categories to a State Aircraft Maintenance Licence that is already held by an individual.

**Adopt**

To transcribe, with no deviation, the requirements (European Military Airworthiness Requirements) into national regulations using English or the National Language(s).

**Advisory Material**

Advisory Material provides interpretation of technical airworthiness requirements and standards to assist in understanding and implementation. It also provides guidance on methods and procedures that are in compliance with technical airworthiness requirements and standards. Advisory material, including the described methods and procedures, is not mandatory, and organisations may choose to follow other means of demonstrating compliance.

**Aeronautical Product\***

Any airframe, aircraft system (airframe, avionics, engine, armament, and egress and survival),

aircraft power train (including engines, auxiliary power units, and transmissions), propeller, rotor and or components/parts/materials, equipment parts including computer systems software/firmware which when connected has a direct effect on the structural and technical integrity of the aircraft.

**Aircraft**

Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

**Aircraft Airborne Equipment\***

Equipment that interfaces with and is borne by the aircraft or aircrew during flight. This includes role equipment but not items of cargo.

**Aircraft Battle Damage Repair\***

Aircraft Battle Damage Repair is the subset of Battle Damage Repair that uniquely applies to aircraft and is used to restore sufficient strength and serviceability to permit damaged aircraft to fly additional operational sorties or to enable those aircraft that are damaged beyond unit repair capability to make a one-time ferry flight to a major repair facility.

**Aircraft Flight Manual**

An Aircraft Flight Manual is a manual, associated with the Malaysian State Type Certificate (MSTC), containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

**Aircraft Maintenance Documentation\***

The aircraft's maintenance and operational certificate, maintenance forecast, and technical particulars record.

**Aircraft Maintenance Program**

A document that describes or incorporates by reference the specific schedule maintenance tasks and their frequency of completion, the associated maintenance procedures, and related standard maintenance practices necessary to preserve the airworthiness of those aircraft to which it applies.

**Aircraft Non-Airborne Equipment\***

Equipment that interfaces with the aircraft, aircrew, or aircraft equipment but which is not usually airborne itself. Such equipment may include but is not limited to aircraft ground servicing equipment, ground test equipment, and some mission planning systems that interface with the aircraft or aircraft equipment.

**Aircraft-Related Equipment\***

Aircraft-related equipment can be aircraft airborne equipment or aircraft non-airborne equipment whose performance could directly affect airworthiness.

**Aircraft Technical Log\***

The primary source for technical and operational data on each flight that occurs on an aircraft. A system for recording data that includes defects and malfunctions, block times, and fuel consumption during the aircraft operation and for recording details of all maintenance carried out on an aircraft between scheduled base maintenance visits. Also known as the journey logbook, it is used for recording flight safety and maintenance information the operating crew needs to know.

**Airworthiness**

The ability of an aircraft or other airborne equipment or system to operate in flight and on the ground without significant hazard to aircrew, ground crew, passengers (where relevant), or to other third parties.

**Airworthiness Codes**

Product airworthiness requirements, applicable to the design of a product that is approved by a competent airworthiness authority for the use with standardized aircraft categories (e.g. EASA CS, FAA FAR, STANAG, Def-STAN, etc).

**Airworthiness Directive**

A document issued or adopted by the Authority that mandates actions to be performed on an aircraft to restore an acceptable level of safety when evidence shows that the safety level of this aircraft may otherwise be compromised.

**Airworthiness Limitation Item**

This is an item arising from a system safety analysis that has been shown to have failure mode(s) associated with an unsafe condition.

**Airworthiness Standards Representative\***

A Head of Design Organisation with delegated authority from the Technical Airworthiness Regulator (TAR) to set and review airworthiness standards for the State Aircraft Operator (SAO).

**Airworthy\***

The status of an aircraft, engine, propeller, or part when it conforms to its approved design and is in condition for safe operation.

**Approved Basic Training Course\***

The Approved basic training course shall consist of knowledge training, knowledge examination, practical training, and a practical assessment.

**Approved Maintenance Organisation\***

An organisation that has been sponsored by Maintenance Authorising Office and certified (awarded a Maintenance Authority Certificate) by the TAR and authorized to conduct maintenance on state aircraft and aeronautical products.

**Approved Maintenance Training Organisation\***

An organisation that has been certified (awarded a Maintenance Training Authority Certificate (MTAC)) by the TAR and authorized by the relevant MAO to conduct training and/or examinations and issue certificates to students upon successful completion of the courses.

**Approved Training Course\***

This means a defined course of maintenance training designed to give a level of knowledge and some experience to a student.

**Approved Type Training Course\***

Aircraft type training can be divided into aircraft or helicopter type ratings for state aircraft maintenance licensing Category B1 aeromechanical and Category B2 avionics.

**Artefact**

An airworthiness-related document, either hard copy or electronic, can be used as evidence in making an airworthiness judgment.

**Authorised Aircrew\***

Nominated aircrew who have been formally authorized by the Senior Maintenance Manager (SMM) or delegate to perform a particular maintenance task.

**Authorised Technical Data\***

Data that has been reviewed, approved, and released by the TAR or a DOA responsible for the technical equipment to which the technical data applies.

**Authorised Tradesperson\***

An individual operating as part of an AMO, authorized by the SMM or delegate as competent to carry out a specific scope of maintenance activities.

**Authority**

Authority means a National Military Airworthiness Authority responsible for the airworthiness of military aircraft.

**Aviation Ground Support Equipment\***

AGSE is the equipment used to support maintenance and aeronautical equipment directly.

**Aviation Software\***

Aviation Software is inclusive of:

- a. On-aircraft software, off-aircraft software with aircraft interface, and off-aircraft software with no interface but with airworthiness or safety implications.
- b. Technologies that resemble software development.

**Base Maintenance**

Maintenance tasks falling outside the criteria for line Maintenance.

**Board of State Technical Airworthiness\***

BoSTA is convened at least four times a year or as and when required. It is a platform for recommending technical airworthiness management to the TAR and issuing Aircraft Certificates, Organisation Approval (DOA, AMO, AMTO, CAMO), and Personnel Licensing. BoSTA ensures that each aircraft type remains airworthy to fly by verifying the technical airworthiness requirements are met. Any issues related to technical airworthiness requirements and procedures shall be reviewed and approved by the BoSTA committee.

**Continuing Airworthiness Management Organisation\***

The State Aircraft Operator / State Registered Aircraft Operator (SAO/SRAO) responsible for Configuration Item (CI) management of the whole aircraft is required to have CAMO approval from TAA-DGTA.

**Centre of Expertise\***

SAO DOA in which the Senior Design Engineer (SDE) position is a designated Airworthiness Standard Representative appointment.

**Certification**

Recognition that a product, part or appliance, organisation or person complies with the applicable airworthiness requirement followed by the declaration of compliance.

**Certification Basis\***

The set of standards that define the criteria against which the design of aircraft or aircraft-related equipment, or changes to that design, are assessed to determine their airworthiness.

**Certificate of Release to Service**

This statement, signed by an appropriately authorised person, on behalf of an approved organisation, asserts that maintenance has been properly carried out. The Certificate of Release to Service contains the basic details of the maintenance carried out, the date it was completed, and the identification details (may include an authorisation stamp) of the person issuing the certificate.

**Certification Review Item**

A document recording Deviations, Special Conditions, new Means of Compliance, or any other certification issue that requires clarification and interpretation or represents major technical or administrative issues.

**Certifying Staff**

Personnel responsible for the release of an aircraft or a component after production and/or maintenance.

**Chief Invigilator\***

This means a person who is appointed to lead the Invigilators.

**Chief Executive Officer**

A person who is responsible for a civil company within which the Approved Organisation operates. The Chief Executive Officer may report to a board of directors and may appoint other managers, or he/she may be one of very few people in a small company. In relation to MSTAR M, the Chief Executive Officer is mentioned as he/she may be senior to the Accountable Manager.

**Compliance Demonstration**

Activities to demonstrate that the product, part, or appliance complies with the requirements in the Certification Basis.

**Component**

Any engine, propeller, part, or appliance.

**Component Maintenance Manual**

A formal document that details how off-aircraft maintenance instructions on the specified component shall be accomplished.

**Configuration\***

The functional and physical characteristics of existing or planned hardware, firmware, software or a combination thereof, as outlined in technical documentation (which includes specifications, standards, and drawings) and ultimately achieved in a product.

**Configuration Control**

A systematic process that ensures that changes to released configuration documentation are properly identified, documented, evaluated for impact, approved by an appropriate level of authority, incorporated, and verified.

**Configuration Deviation List**

A list, established by the Type Certificate Holder and approved by the National Military Airworthiness Authority, which identifies any external parts of an aircraft type that may be missing at the commencement of a flight and which contains, where necessary, any information on associated operating limitations and performance correction. Examples of Configuration Deviation List items will vary from aircraft type but typically may include external light covers, retractable landing lights, etc.

**Configuration Item**

Any component, module, subcomponent, equipment, technical manuals, software, or ground support equipment, that can be submitted to the configuration control process.

**Configuration Management**

A management process for establishing and maintaining consistency of a product's



performance, functional, and physical attributes with its requirements, design, and operational information throughout its life.

### **Contingency Maintenance\***

Those maintenance activities are performed during a declared contingency operation. CMaint involves revised servicing schedules, component lifting strategies (plans), and repair philosophies, including Battle Damage Repair, which will maximize operational availability while constraining and managing risk.

### **Continuing Airworthiness**

All of the processes ensure that, at any time in its operating life, the aircraft complies with the airworthiness requirements in force and is in a condition for safe operation.

### **Continued (design) airworthiness**

All tasks to be carried out to verify that the conditions under which a Type-Certificate or a Supplemental Type Certificate has been granted continue to be fulfilled at any time during its period of validity.

### **Crew/Aircrew**

Include Pilot(s) and other personnel on board the aircraft and/or the Unmanned Aerial Vehicle control station with responsibilities to ensure the safe conduct of the flight.

### **Critical Design Configuration Control Limitations**

Critical Design Configuration Control Limitations identify the critical design features such as proper wire separation, proper installation of a panel gasket, minimum bonding jumper resistance level, etc., that must be maintained in the same manner throughout the life of the aircraft to comply with the (Military) Type Certificate and maintain airworthiness. The purpose of the Critical Design Configuration Control Limitations is to provide instruction to ensure these critical features are present throughout the life of the airplane and are inspected and verified when changes, repairs, or maintenance actions occur in the area.

### **Declaration of Compliance**

A statement, signed by the Head of Design or by an authorized representative, to show compliance with all applicable type certification basis and, where applicable, environmental protection requirements. It declares that the aircraft is airworthy within the specific design limitations.

### **Deeper Maintenance\***

This level of maintenance includes tasks that are more complex than operational maintenance and normally require specialized equipment and technical skills and which rely on access to extensive support equipment and workshop facilities for successful conduct.

### **Delegated Airworthiness Representative\***

An individual within the CAMO whom the TAR has authorized to perform design acceptance functions to make compliance findings and/or provide airworthiness approval in the configuration item management system.

**Design\***

The process or act of creating or changing a product and related technical process descriptions through the application of scientific and engineering effort (verb), or the outcome of that process (noun). The design, therefore, encompasses not only the configuration of the product, but also the:

- a. Testing and evaluation are needed to validate that the design meets performance and safety requirements.
- b. Manufacturing processes (including production test requirements) that require special control to ensure the product meets requirements.
- c. In-service monitoring requirements, maintenance processes, and authorized repairs.
- d. Maintenance lives and intervals and fatigue life.
- e. Operating procedures and limits.

**Design Acceptance\***

The process whereby a design or design change (i.e. an output of the design process) involving aircraft or aircraft-related equipment is determined to be technically acceptable for SAO use based on a determination that the specified requirements and design standards are sufficient and applicable (to the SAO authorised configuration, maintenance policy and procedures, and operations) and that the quality of the design has been proven to the satisfaction of the responsible CAMO – Continuing Airworthiness Manager. Generally, design quality is assured through approval of the design by a DOA against the approved design requirements and standards plus an acceptable basis of design verification.

**Design Acceptance Certification\***

The final act of the Design Acceptance process whereby a CAMO – Continuing Airworthiness Manager provides a certified record of the technical acceptability of a change to aircraft or aircraft-related equipment Type Design.

**Design Approval Certification\***

The act of approval of design output resulting from a process that formally examines and documents compliance of a design (or design change) with specified requirements and design standards.

**Design Change\***

A design change is a change in Type Design as defined in MSTAR 21.A.91.

**Design Engineer\***

A professional engineer within a DOA with assigned authority from the SDE to perform certain engineering activities, including judging the significance of design changes and undertaking a design review of significant design changes.

**Design Organisation Approval\***

An organisation that has been sponsored by the Maintenance Authorising Office and certified (awarded an Engineering Authority Certificate (EAC)) by the TAR to provide design or engineering management services to the SAO.

**Design Organisation Exposition\***

A controlled quality document containing the details of an organisation's Engineering Management System (EMS). The DOE describes all of the requirements that are satisfied by an organisation to become and remain a DOA.

**Design Review\***

The act whereby a design (or design change) is independently checked by an authorized person (other than the person who developed the design) to verify the validity of the assumptions, conditions, data, and methods used in design development and to verify that the design output meets the specified design input requirements.

**Design Support Network\***

A collective term describes a group of agencies that provide design support to a DOA.

**Deviation\***

A specific written authorisation to depart from an item's current approved configuration documentation. A deviation differs from an engineering change in that an approved engineering change requires revision of documentation defining the affected item. In contrast, a deviation does not revise the applicable document or drawing.

**Engineering Authority\***

The authority is assigned expressly to an organisation (DOA) or an individual within an organisation to undertake specific engineering activities.

**Engineering Authority Certificate\***

The certificate awarded by the TAR to an organisation to operate as a DOA.

**Engineering Change\***

A change to the currently approved configuration documentation of a Configuration Item (CI) at any point in the life cycle of the CI.

**Engineering Change Proposal\***

An Engineering Change Proposal is defined as a proposed change to the current approved configuration of a CI and the supporting design documentation via which the change is described, justified, and submitted to the Configuration Control Board (CCB).

**Examination\***

A written or practical examination or combination of both is conducted at the end of every subject.

**Examination Department\***

Means a department in the training organisation for the management of all examinations conducted.

**Examination Manager\***

A person who oversees the design of question papers, standards of examinations, and invigilation. Such person(s) may also be an Instructor and/or Assessor.

**Examiner\***

This means a person approved by DGTA or an approved training organisation to conduct and administer the examination.

**Exemption\***

The TAR grants written authorisation to either a DOA, AMO, CAMO, AMTO, or licensing to depart from a particular technical airworthiness regulation for a specified period of time.

**Exposition**

The document or documents that contain the material specifying the scope of work deemed to constitute approval and showing how the organisation complies with an MSTAR.

**Extension**

Inclusion of additional topics to Categories A, B1, and B2 Military Aircraft Maintenance Licences as detailed in MSTAR 66 Appendix I (which includes Modules 50-55) that are not part of the applicable modules for that category of Military Aircraft Maintenance Licence.

**Flight Safety Critical Item\***

Any part, assembly, or installation containing a critical characteristic whose failure, malfunction, or absence could cause a catastrophic failure or an uncommon engine shutdown, resulting in loss or serious damage to the aircraft or an unsafe condition.

**Fit for Flight**

Condition of a type design being certified as compliant with applicable airworthiness requirements as well as of an aircraft having been serviced and inspected as meeting the certified design and prepared for the intended flight.

**Guidance Material**

This is typically developed to provide additional explanation to assist the application of the requirement and/or explain the Acceptable Means of Compliance.

**Human Factors**

Principles apply to design, certification, production, training, operation, and maintenance and seek a safe interface between the human and other system components by properly considering human performance.

**Human Performance**

Human capabilities and limitations have an impact on the safety and efficiency of operations.

**Implement\***

To introduce MSTAR requirements into regulations by either adoption or compliance.

**Instructions for Continuing Airworthiness**

Instructions for Continuing Airworthiness detail the methods, inspections, processes, and procedures necessary to keep aircraft and/or products airworthy.

**Instructor\***

This means a person appointed to carry out instructional duties, compile questions for examinations, and undertake duties as invigilator and examiner.

**Invigilator\***

This means a person who is responsible for overseeing the conduct of the examinations.

**Letter of Engineering Authority\***

An attachment to an EAC that defines the scope of activity and any caveats and limitations under which the EAC is issued.

**Letter of Maintenance Authority\***

An attachment to the MAC defines the scope of activity and any caveats and limitations under which the MAC is issued.

**Letter of Maintenance Training Authority\***

An attachment to the MTAC defines the scope of activity and any caveats and limitations under which the MTAC is issued.

**Life Limited Parts**

Parts that, as a condition of their type certificate, may not exceed specified operating time, calendar time, number of operating cycles, or any other approved service life consumption units.

**Limited Certification Authorisation**

This is issued by the Approved Maintenance Organisation, in accordance with a procedure approved by the DGTA, for flight crew, flight engineer, or crew chief to carry out specific tasks (usually away from their home base or station). The authorisation permits the holder to issue certificates of release to service following specific tasks within the limits of the tasks specifically endorsed on the authorisation.

**Line Maintenance**

Carried out before flight to ensure that the aircraft is fit for the intended flight.

**Maintenance**

Any one or combination of overhaul, repair, inspection, replacement, modification, or defect/fault rectification of an aircraft or component, with the exception of pre-flight inspection.

**Maintenance Authority\***

The authority to undertake specific maintenance activities.

**Maintenance Authority Certificate\***

The certificate awarded by the TAR to an organisation to operate as an AMO.

**Maintenance Authorising Office\***

The MAO is the Head of the SAO Aviation Engineering Organisation and is responsible for controlling the resources that enable the maintenance organisation to conduct maintenance.

**Maintenance Document\***

The orders, instructions, publications, and forms utilised by technical personnel when conducting maintenance include Defence Instructions, Standing Instructions, maintenance forms, Special Technical Instructions, specifications, and worksheets. Maintenance documents may be provided in paper-based and/or electronic formats.

**Maintenance Inspector/Supervisor\***

A person authorised to conduct compulsory maintenance inspections and/or supervise maintenance activities on nominated aircraft type and aeronautical product. The term applies to all personnel with direct maintenance task supervision or inspection responsibilities and, as such, may include, but is not limited to, trade supervisors, independent/final inspectors, and progressive/mandatory inspectors.

**Maintenance Manager\***

An authorised person responsible for managing maintenance activities on nominated aircraft type or aeronautical product within an AMO.

**Maintenance Manual\***

That part of the Instruction for Continuing Airworthiness. Those instructions are required to keep aircraft and aircraft-related equipment in an airworthy condition.

**Maintenance Organisation Exposition\***

A controlled quality document containing the details of an organisation's maintenance management system. The MOE describes all of the requirements that are satisfied by an organisation to become and remain an AMO.

**Maintenance Records\***

This is an important document that demonstrates compliance with the airworthiness requirements has been met. It is completed and signed by an authorized person to certify that the maintenance work performed has been completed satisfactorily under approved data. Maintenance records information includes:

- a. The total time in service (hours, calendar time, and cycles, as appropriate) of the aeroplane and all life-limited components.
- b. The status of compliance with all mandatory continuing airworthiness information.
- c. Appropriate details of modifications and repairs.
- d. The time in service (hours, calendar time, and cycles, as appropriate) since the last overhaul of the aeroplane or its components subject to a mandatory overhaul life.
- e. The status of the aeroplane's compliance with the maintenance program.
- f. The detailed maintenance records show that all requirements for signing a maintenance release have been met.

**Maintenance Training Authority Certificate\***

The certificate awarded by the TAR to an organisation to operate as an AMTO.

**Maintenance Training Management Plan\***

A controlled quality document containing the details of an organisation's training management system. The MTMP describes all of the requirements that are satisfied by an organisation to become and remain an AMTO.

**Maintenance Personnel\***

Maintenance personnel, including aircrew and Non-Trade Personnel (NTP), are authorised to perform maintenance tasks.

**Maintenance Support Network\***

A collective term describes a group of agencies that provide maintenance support to an AMO.

**Maintenance Test Flight\***

It is a flight to ensure that an aircraft meets specifications concerning performance and handling characteristics and to establish, on prescribed occasions, that no deterioration of that standard has occurred in service.

**Malaysia State Airworthiness Authority\***

The Competent Authority consists of the State Airworthiness Authority and includes any officer empowered by him to perform all or any of the functions.

**Malaysian State Type Certificate\***

A certificate issued by the State Airworthiness Authority (SAA), for an aircraft type entered on the register of state aircraft. The MSTC signifies that the SAO has assessed the particular aircraft type (undergone type certification) as airworthy and supportable in its intended SAO role/s.

**Master Minimum Equipment List\***

The Master Minimum Equipment List is a list established for a particular aircraft type by the organisation responsible for the Type Design with the approval of the Malaysian State Airworthiness Authority that identifies items that individually may be unserviceable at the commencement of a flight. The Master Minimum Equipment List may be associated with special operating conditions, limitations, or procedures.

**Material\***

Products used in the manufacture of components and in the maintenance and operation of aircraft, including fuels, oils, and lubricants.

**Mean of Compliance**

The techniques will be used to demonstrate the compliance of the type design against each certification requirement identified on the Certification basis. Examples include tests, analyses, and inspections.

**Military Aircraft\***

Aircraft (including Unmanned Aircraft Systems) in the military service of the Armed Forces include any aircraft commanded by a member of the Armed Forces in the course of his duties as such a member.

**Minor Amendment\***

Those changes to the Organisation's Exposition(s) do not affect the Malaysian State Airworthiness Regulation-related approval.

**Minor Maintenance**

Includes repetitive tasks and simple defect/fault rectification.

**Mission Critical Item\***

An item whose failure will seriously degrade an aircraft's ability to complete an assigned mission or lead to a mission being aborted.

**Modification**

A modification is a change of the design to the authorized configuration of the approved type design of a product, part, or appliance. Typical examples are component changes, equipment additions, or software changes and often involve a revision to the drawings and support documentation.

**Non-Conformance\***

The failure of a product, process or system to meet its regulatory, specification, drawing, or quality requirements.

**Non-installed equipment**

This means any instrument, equipment, mechanism, apparatus, appurtenance, software, or accessory carried on board an aircraft by the aircraft operator, which is not a part, and which



is used or intended to be used in operating or controlling an aircraft, support the occupants' survivability, or which could impact the safe operation of the aircraft.

**Non-Technical Personnel\***

A collective term covering personnel that have not completed formal SAO-recognised technical trade training.

**Occurrence Reporting**

The reporting to the relevant Authorities, to the Malaysian State Type Certificate Holder, or Restricted Type Certificate Holder, and/or the Supplemental Type Certificate Holder as appropriate, of any failure, malfunction, defect, or other occurrence which has resulted in or may result in an unsafe condition. The Type Certificate Holder can also make an Occurrence Report to the Authority.

**Organisation\***

This means an organisation is registered as a legal entity. Such an organisation may conduct business from multiple addresses and hold more than one approval.

**Original Equipment Manufacturer\***

The OEM is the manufacturer listed as the approved source of manufacture for components in the type certificate data sheet. The OEM owns and controls the source drawings, i.e., the design of the component.

**Operational Maintenance\***

Tasks directly related to equipment preparation for immediate use, recovery, and minor repair of the equipment after use. OM tasks require a limited range of support equipment and may involve the limited use of workshop facilities.

**Parts and Appliances**

Parts and appliances are lower-level components for which a Technical Standard Order may exist.

**Period of Operation\***

It is the time from the captains' acceptance of an aircraft until it's released back to maintenance. For rotary wing aircraft, the period of operation includes when the aircraft is released to aircrew for ground running of engines with the rotor engaged.

**Permit to Fly\***

A permit issued under State Technical Airworthiness Regulations.

**Practical Assessor\***

This means a person approved by the training organisation to conduct the practical assessment

**Procedure\***

A documented course of action is to be followed to ensure a consistent outcome.

**Product**

An aircraft, an engine, or a propeller.

**Quality Management System\***

All activities of the overall management function determine the quality policy, objectives, and responsibilities and implement them by means such as quality planning, quality controls, quality assurance, and quality improvement within the quality system.

**Registration**

Registration is a formal recording by the National Military Airworthiness Authority ( or national equivalent) of individual aircraft on the military aircraft register and the assignment of a tail number.

**Repair**

A repair means the elimination of damage and/or restoration to an airworthy condition following initial release into service by the manufacturer of any product, part, or appliance.

**Shall**

Used to express mandatory requirements.

**Should**

Used to express a preferred, but not mandatory, method of accomplishment. An alternative method of accomplishment shall be agreed upon by the relevant authority.

**Sign-Off\***

A 'sign-off' is a statement issued by the 'authorised person' that indicates that the task or group of tasks has been correctly performed. A 'sign-off' relates to one step in the maintenance process and is, therefore, different from a certificate of release to service.

**Special Conditions**

Special conditions are included in the Certification Basis of the aircraft when the design features of a particular product or the experience in operation render any of the airworthiness code provisions inadequate or inappropriate to ensure conformity with essential requirements.

**Specification\***

A document defines a product's essential function and performance requirements and identifies the relevant standards for the acquisition process. In contrast to standards, specifications provide a more complete description of requirements and include the basis for establishing conformance (particularly during test and evaluation), and hence validation for the acceptance of material.

**Standard\***

A description of a material, product, doctrine, or process meant for repeated applications by many users.

**Standard Parts**

A standard part is a part designated as such by the design approval holder responsible for the product, part or appliance in which it is intended to be used and manufactured in complete compliance with an established specification, which includes design, manufacturing, testing, and acceptance criteria, an uniform identification requirements. Examples of standard parts are aircraft general spares as defined by the design approval holder, such as nuts, bolts, washers, split pins, etc. All design, manufacturing, inspection data, and marking requirements necessary to demonstrate the conformity of the part will be in the public domain or established as part of recognised specifications.

**State Airworthiness Authority\***

The Chief of Air Force appointed by the Minister of Defence under Section 7 to take accountable for the State Airworthiness.

**Statement of Operating Intent\***

A document that sufficiently details the intended roles, missions, tasks, and in-service usage of the proposed Aeronautical Product Type Design permits an engineering analysis and assessment to determine and apply the appropriate Airworthiness Standards.

**Statement of Operational Requirement\***

A document or document defining the complete set of DAR requirements on a design agency to allow DAR acceptance of an aircraft or aircraft-related equipment design or design change. The SOR includes or references a *Specification*, which is the document defining the specific essential function and performance requirements for the product design or design change.

**State Aircraft Maintenance Licence\***

A categorized license which, dependent upon completion of all relevant approved training and examinations and the requisite levels of practical experience, permits an authorized individual to issue certificates of release to service or act as support staff for scheduled and/or unscheduled maintenance performed on an aircraft or aircraft systems as defined by MSTAR 66.

**State Aircraft Operator\***

The SAO are the military organisations or Government of Malaysia enforcement agencies that operate and maintain state-registered aircraft. SAOs that are currently under the ambit of the SAA are as follows:

- a. Royal Malaysian Air Force (RMAF).
- b. Malaysian Army Air Wing.
- c. Royal Malaysian Navy (RMN) Air Wing.
- d. Malaysian Fire and Rescue Department (Air Wing).

- e. Malaysian Maritime Enforcement Agency (MMEA) Air Wing.
- f. Malaysian Armed Forces Headquarters.
- g. Malaysian Joint Forces Headquarters.

**State Registered Aircraft\***

State aircraft that are registered with MSA through DGTA shall be known as state-registered aircraft.

**Student\***

This means a person who has been enrolled in the training organisation.

**Supplemental Type Certificate\***

A certificate issued by the Chief of Air Force for an aircraft that undergoes a major design change or role change that is beyond the type design defined in the original MSTC but is not substantial enough to require a complete re-investigation of compliance of the aircraft with the applicable airworthiness standards (ie does not require a new MSTC).

**Support Staff\***

Those staff holding MSTAR 66 SAML in category B1 and/or B2 with the appropriate extension and Military Aircraft Type Ratings are working in a base maintenance environment while not necessarily holding certification privileges.

**Task Authorisation\***

The legal authority allows a person to perform a specified maintenance task, recognising that the person has completed the prerequisite training relevant to the task and has demonstrated competency in the performance of the task. Task authorisations are recorded in the person's logbook (RMAF License Without Type Rating- RMAF LWTR) or equivalent document.

**Technical Airworthiness\***

A concept that defines the condition of an aircraft and supplies the basis for the judgment of its sustainability for flight in that it has been designed, constructed, and maintained to approved standards by competent and approved individuals who are acting as members of an approved organisation and whose work is certified as correct and accepted on behalf of the SAO.

**Technical Airworthiness Regulator\***

The person with delegated responsibility from the State Airworthiness Authority for technical airworthiness management of state aircraft and aircraft-related equipment.

**Technical Data\***

All recorded scientific, technical, and engineering nature relating to a weapon system. Includes specifications, standards, engineering drawings, instructions, reports, manuals, tabular data, test results, and software documentation used in the development, production, in-service

operation, and logistics support (such as maintenance, provisioning, codification, testing, and modification), and disposal of a weapon system.

**Technical Integrity\***

Refers to the state of airworthiness of a platform, combat system, or ancillary item to fulfill its intended mission safely and effectively throughout its planned life. This requires evidence to demonstrate that the material has been designed, constructed, and maintained to approved standards by competent and formally approved personnel acting as members of an approved organisation and whose work is certified as correct and accepted on behalf of the SAO.

**Technical Record\***

A set of documents describing the airworthiness of a particular aeronautical product must be maintained throughout its life cycle. The documents in a technical record generally fall into one of the following sub-categories:

- a. In-service product certification documentation, including Maintenance Release records, aircraft release records, Flight Authority records, and Certificates of Conformance; and
- b. Product status documentation, including operating records, maintenance records, configuration status data, airworthiness directive records, and product-related deviations/waivers.

**Terms of Reference\***

This means the scope of work that a person is responsible for and authorised to carry out on behalf of the approved maintenance training organisation.

**Tool Control\***

A systematic means of controlling tool usage that intends to eliminate the risk of tools being inadvertently left in an aircraft or aircraft components/equipment.

**Training Manager\***

A person who leads and manages the training management team and is responsible for all training functions in the AMTO.

**Training Support Manager\***

A person shall be appointed to plan and administer training resources to fulfill the knowledge and practical training.

**Training Support Network\***

A collective term used to describe a group of agencies that provide training support to an AMTO.

**Type Certification\***

The process of:

- a. Prescribing and revising minimum standards governing the design of aircraft, engines, propellers, and other aircraft equipment as may be required in the interests of safety.
- b. Administering a program to determine compliance with those prescribed standards and maintain certification integrity with a higher level of oversight, specification, and compliance than the normal Design Acceptance process requires. Successful type certification activity leads to the issue of an MSTC.

**Type Certification Basis**

An agreed set of airworthiness requirements (including code, special condition, etc.) that a product must be compliant with in order to obtain a Type Certificate.

**Type Certificate Holder**

The organisation is responsible for the relevant Type Design and applying for, and then holding, the Type Certificate and accepting the rights and obligations for the product.

**Type Design**

The set of approved design information necessary to define the product type, as detailed in MSTAR 21.A.31.

**Type Record\***

A set of documents that describes the state of Airworthiness for a particular Aeronautical Product Approved Type Design and must be maintained throughout the life of the Type Design. It consists of a summary document that defines the (aircraft) type design at the time of acceptance by Malaysia by providing an index to the issue status of all type design data.

**Unapproved Aeronautical Product\***

Any part, component or material that has not been manufactured and certified as conforming with the technical data against which type certification is provided.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 1****TECHNICAL REQUIREMENT****SUBPART A - GENERAL PROVISIONS****21.A.1 Scope**

This Section establishes general provisions governing the rights and obligations of the applicant for and holder of any certificate issued or to be issued in accordance with this Section.

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**21.A.2 Undertaking by another organisation than the applicant for, or holder of, a certificate.**

The actions and obligations required to be undertaken by the holder of, or applicant for, a certificate for a product, part or appliance under this section may be undertaken on its behalf by any other organisation, provided the holder of, or applicant for, that certificate can show that it has made an agreement with the other organisation such as to ensure that the holder's obligations are and will be properly discharged.

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**21.A.3A Failures, malfunctions, and defects**

- (a) System for Collection, Investigation, and Analysis of Data.

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The holder of a type certificate, restricted type certificate, supplemental type certificate, Technical Standard Order (TSO) authorisation, major repair design approval or any other relevant approval deemed to have been issued under this MSTAR shall have a system for collecting, investigating and analysing reports of and information related to failures, malfunctions, defects or other occurrences which cause or might cause adverse effects on the airworthiness of the product, part or appliance covered by the type certificate, restricted type certificate, supplemental type certificate, TSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under this MSTAR. Information about this system shall be made available to all known operators of the product, part or appliance and, on request, to any person authorised under other associated MSTARs.

- (b) Reporting Occurrences to the Authority.

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1. The holder of a type certificate, restricted type certificate, supplemental type certificate, TSO authorisation, major repair design approval, or any other relevant approval deemed to have been issued under this MSTAR, shall report to the issuing/approving Authority any failure, malfunction, defect or other occurrences of which it is related to a product, part or appliance covered by the type certificate, restricted type certificate, supplemental type certificate, TSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under this MSTAR, and which has resulted in or may result in an unsafe condition.

2. These reports shall be made in a form and manner established by the Authority, as soon as practicable and in any case dispatched not later than 72 hours after the identification of the possible unsafe condition, unless exceptional circumstances prevent this.

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(c) Investigation of Reported Occurrences.

1. When an occurrence reported under paragraph (b), or under MSTAR 21.A.129(f)(2) or 21.A.165(f)(2) results from a deficiency in the design, or a manufacturing deficiency, the holder of the type certificate, restricted type certificate, supplemental type certificate, TSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under this MSTAR, or the manufacturer (Production Organisation) as appropriate, shall investigate the reason for the deficiency and report to the Authority the results of its investigation and any action it is taking or proposes to take to correct that deficiency.

2. If the Authority finds that an action is required to correct the deficiency, the holder of the type certificate, restricted type certificate, supplemental type certificate, TSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under this MSTAR, or the manufacturer as appropriate, shall submit the relevant data to the Authority.

### 21.A.3B Airworthiness Directives

(a) An Airworthiness Directive means a document issued or adopted by the Authority which mandates actions to be performed on an aircraft to restore an acceptable level of safety when evidence shows that the safety level of this aircraft may otherwise be compromised.

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(b) The Authority shall issue an airworthiness directive when:

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1. An unsafe condition has been determined by the Authority to exist in an aircraft, as a result of a deficiency in the aircraft, or an engine, propeller, part or appliance installed on this aircraft; and

2. That condition is likely to exist or develop in other aircraft, including engine, propeller, part, or appliance installed on those aircraft that may be affected by this unsafe condition.

(c) When an Airworthiness Directive has to be issued by the Authority to correct the unsafe condition referred to in paragraph (b), or to require the performance of an inspection, the holder of the type certificate, restricted type certificate, supplemental type certificate, major repair design approval, TSO authorisation or any other relevant approval deemed to have been issued under this MSTAR, shall:

1. Propose the appropriate corrective action and/or required inspections and submit details of these proposals to the Authority for approval.

2. Following the approval by the Authority of the corrective action and/or required inspections referred to under subparagraph (c)1, make available to all known operators or owners of the product, part or appliance and, on request, to



any person required to comply with the airworthiness directive, appropriate descriptive data and accomplishment instructions.

- (d) An Airworthiness Directive shall contain at least the following information:
1. An identification of the unsafe condition;
  2. An identification of the affected aircraft; operating and maintenance associated documentation;
  3. The action(s) required;
  4. The compliance time for the required action(s);
  5. The date of entry into force.

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#### 21.A.4 Coordination between design and production

Each holder of a type certificate, restricted type certificate, supplemental type certificate, TSO authorisation, approval of a change to type certificate, or approval of a repair design, shall ensure collaboration between the design organisation and the production organisation as necessary to achieve:

- (a) The satisfactory coordination of design and production required by MSTAR 21.A.122, MSTAR 21.A.130(b)(3) and (b)(4), MSTAR 21.A.133 or MSTAR 21.A.165(c)(2) and (c)(3), as appropriate; and
- (b) The proper support of the continued airworthiness of the product, part, or appliance.

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**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 2****SUBPART B - MALAYSIAN STATE TYPE CERTIFICATES (MSTC) AND RESTRICTED MALAYSIAN STATE TYPE CERTIFICATES (RMSTC)****21.A.11 Scope**

This Subpart establishes the procedure for issuing Malaysian State Type Certificates (MSTC) for products and Restricted Malaysian State Type Certificates (RMSTCs) for aircraft and establishes the rights and obligations of the applicants for, and holders of, those certificates.

Note: Within the DGTA context, the Type certificates And Restricted Type Certificates will be known as Malaysian State Type Certificates (MSTC) and Restricted Malaysian State Type Certificates (RMSTC), respectively. As such, the terms of MSTC and RMSTC will be used hereafter.

**21.A.13 Eligibility**

Any organisation that has demonstrated, or is in the process of demonstrating, its capability in accordance with MSTAR 21.A.14 shall be eligible as an applicant for a MSTC or a RMSTC under the conditions laid down in this Subpart.

**21.A.14 Demonstration of capability**

(a) Any organisation applying for a MSTC or a RMSTC shall demonstrate its capability by holding a Design Organisation Approval (DOA), issued by the Authority in accordance with MSTAR 21 Subpart J.

(b) By way of derogation from paragraph (a), as an alternative procedure to demonstrate its capability, an applicant may seek Authority agreement for the use of procedures setting out the specific design practices, resources, and sequence of activities necessary to comply with this MSTAR, under the following:

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1. Products with simple or limited scope of design.
2. Starting phase toward a military design organisation approval or limited duration of design activities.
3. Products for which a major part of the Type Design certification activities has already been accepted by the Authority concerned.
4. Reserved.

(c) By way of derogation from paragraph (a) and (b), any government organisation applying for a MSTC or a RMSTC may demonstrate its capability by having an agreement in place, accepted by the Authority, in accordance with MSTAR 21.A.2 with a design organisation which has access to the type design data. The agreement shall include detailed statements how the actions and obligations are delegated to enable the government organisation, in cooperation with the contracted organisation, to

comply with the requirements of MSTAR 21 Subpart J, including demonstration of compliance with MSTAR 21.A.44.

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### 21.A.15 Application

(a) An application for a MSTC or a RMSTC shall be made in a form and manner established by the Authority.

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(b) An application for a MSTC or a RMSTC shall include, as a minimum, preliminary descriptive data of the product, the intended use of the product and the kind of operation for which certification is requested. In addition, it shall include, or be supplemented after the initial application, a certification programme for the demonstration of compliance in accordance with MSTAR 21.A.20, consisting of:

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1. a detailed description of the type design, including all the configurations to be certified;
2. the proposed operating characteristics and limitations;
3. the intended use of the product and the kind of operations for which certification is requested;
4. a proposal for the initial type-certification basis, and environmental protection requirements, prepared in accordance with the requirements and options specified in MSTAR 21.A.17A, and 21.A.18;
5. a proposal for a breakdown of the certification programme into meaningful groups of compliance demonstration activities and data, including a proposal for the means of compliance and related compliance documents;
6. a proposal for the assessment of the meaningful groups of compliance demonstration activities and data, addressing the likelihood of an unidentified non-compliance with the type-certification basis or environmental protection requirements and the potential impact of that non-compliance on product safety or environmental protection; and
7. a project schedule including major milestones.

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(c) After its initial submission to the Authority, the certification programme shall be updated by the applicant when there are changes to the certification project affecting any of the points 1 to 7 of (b).

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(d) (Reserved).

(e) An application for a MSTC or a RMSTC shall be valid for five years, unless the Authority agrees at the time of application that its product requires a longer time period for the applicant to demonstrate and declare compliance.

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(f) In the case where a type-certificate or restricted type-certificate has not been issued, or it is evident that it will not be issued, within the time agreed in point (e), the applicant shall apply for an extension of the validity of the application and comply with any changes to the type-certification basis and environmental protection requirements, as established and notified by the Authority in accordance with MSTAR 21.A.17A, and 21.A.18 for a new date that is in compliance with the time period established under (e).

#### 21.A.16A Airworthiness Codes

The Authority shall approve the use of airworthiness codes and other detailed specifications, including codes and specifications for airworthiness and environmental protection, that may be used to demonstrate compliance of products, parts and appliances with the relevant essential requirements in the Basic Policy and Regulation in MSTAR. Such codes and specifications shall be sufficiently detailed and specific to indicate to applicants the conditions under which certificates are to be issued, amended or supplemented.

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#### 21.A.16B Special conditions

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(a) The Authority shall prescribe any special detailed technical specifications, named 'special conditions', for a product if the related airworthiness codes and specifications do not contain adequate or appropriate safety standards for the product because:

1. The product has novel or unusual design features relative to the design practices on which the applicable airworthiness codes are based;
2. The intended use of the product is unconventional;
3. Experience from other similar products in service or products having similar design features or newly identified hazards have shown that unsafe conditions may develop; or
4. Applicable airworthiness codes do not exist for the concerned product class or do not address the requested kind of operations.

(b) Special conditions contain such safety standards as the Authority finds necessary in order to establish a level of safety equivalent to that of the applicable airworthiness codes or a level of safety acceptable if airworthiness codes do not exist for the concerned product.

#### 21.A.17A Type-certification basis for a MSTC or RMSTC

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The type certification basis for a MSTC or a RMSTC shall consist of:

(a) The requirements of the airworthiness code established according to MSTAR 21.A.16A from those applicable to the product at the date of application for that certificate, unless:

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1. The applicant chooses to comply or is required to comply with MSTAR 21.A.15(f), with requirements of the airworthiness code which became applicable after the date of the application. In that case, the type-certification basis shall include any other requirements of the airworthiness code or other detailed specifications that the Authority finds are directly related; or

2. The Authority accepts any alternative to a designated airworthiness requirement that cannot be complied with, for which compensating factors have been found that provide an equivalent level of safety; or

3. The Authority accepts or prescribes other means that:

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i. In the case of a type-certificate, demonstrate compliance with the relevant essential requirements of MSTAR.

ii. In the case of a restricted type-certificate, provide a level of safety adequate with regard to the intended use; and

(b) Any special condition prescribed by the Authority in accordance with MSTAR 21.A.16B(a).

(c) Dedicated airworthiness requirements and means of compliance established to account for military operations that are not covered under (a).

**21.A.17B (Reserved)**

**21.A.18 Designation of applicable environmental protection requirements**

The applicable environmental protection requirements shall be established when certifying a product, taking account of the military operational need.

**21.A.19 Changes requiring a new type certificate**

Any applicant proposing to change a product, shall apply for a new type-certificate if the Authority finds that the change in design, configuration, power, thrust, or mass is so extensive that a substantially complete investigation of compliance with the applicable type-certification basis is required.

**21.A.20 Demonstration of compliance with the type certification basis and environmental protection requirements**

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(a) Following the acceptance of the certification programme by the Authority, the applicant shall demonstrate compliance with the type-certification basis and environmental protection requirements, as established in accordance with MSTAR 21.A.17A, and 21.A.18, and shall provide the Authority with the means by which such compliance has been demonstrated.

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(b) The applicant shall report to the Authority any difficulty or event encountered during the process of demonstration of compliance that may have an appreciable effect on the risk assessment under MSTAR 21.A.15(b)(6) or on the certification programme or may otherwise necessitate a change to the level of involvement of the Authority previously notified to the applicant.

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(c) The applicant shall record justification of compliance within compliance documents as referred to in the certification programme.

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(d) After completion of all demonstrations of compliance in accordance with the certification programme, including any inspections and tests in accordance with MSTAR 21.A.33, and after all flight tests in accordance with MSTAR 21.A.35, the applicant shall declare that:

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1. it has demonstrated compliance with the type-certification basis and environmental protection requirements, as established under MSTAR 21.A.17A, and 21.A.18, following the certification programme as accepted by the Authority; and

2. no feature or characteristic has been identified that may make the product unsafe for the uses for which certification is requested.

(e) The applicant shall submit to the Authority the declaration of compliance provided for in (d). Where the applicant holds an appropriate design organisation approval, the declaration of compliance shall be made in accordance with MSTAR 21 Subpart J and submitted to the Authority.

#### 21.A.21 Issue of a type certificate

(a) In order to be issued a product type-certificate or, when the aircraft does not meet the essential requirements of MSTAR Basic Requirement an aircraft restricted type-certificate, the applicant shall:

1. demonstrate its capability in accordance MSTAR 21.A.14;
2. comply with MSTAR 21.A.20
3. demonstrate that the engine and propeller, if installed in the aircraft:
  - i. have a type-certificate issued in accordance with this MSTAR;  
or
  - ii. (Reserved).
  - iii. have been demonstrated to be in compliance with the aircraft type-certification basis and the environmental protection requirements established by the Authority a necessary to ensure the safe flight of the aircraft.

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(c) (Reserved).

**21.A.31 Type design**

- (a) The type design shall consist 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 continuing airworthiness as defined by the applicable airworthiness codes; and
  4. Any other data allowing by comparison the determination of the airworthiness and, if relevant, the environmental characteristics of later products of the same type.
- (b) Each type design shall be adequately identified.

**21.A.33 Inspections and tests**

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- (a) (Reserved).
- (b) Before each test is undertaken during the demonstration of compliance required by MSTAR 21.A.20, the applicant shall have verified:
1. For the test specimen, that:
    - i. The materials and processes adequately conform to the specifications for the proposed type design;
    - ii. The parts of the products adequately conform to the drawings in the proposed type design;
    - iii. The manufacturing processes, construction and assembly adequately conform to those specified in the proposed type design; and
  2. For the test and measuring equipment to be used for the test, that those are adequate for the test and appropriately calibrated.
- (c) On the basis of the verifications carried out in accordance with (b), the applicant shall issue a statement of conformity listing any potential non-conformity, together with a justification that this will not affect the test results, and shall allow the Authority to make an inspection it considers necessary to check the validity of that statement.
- (d) The applicant shall allow the Authority to:
1. Review any data and information related to the demonstration of compliance; and

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2. Witness or carry out any test, including any flight and ground test, or inspection conducted for the purpose of the demonstration of compliance.

(e) For all the tests and inspections witnessed or carried out by the Authority in accordance with (d)(2):

1. The applicant shall submit to the Authority a statement of conformity provided for in (c); and

2. No change that affects the validity of the statement of conformity shall be made to the test specimen, or the test and measuring equipment, between the time the statement of conformity provided for in (c) was issued and the time the test specimen is presented to the Authority for test.

### 21.A.35 Flight Tests

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(a) Flight testing for the purpose of obtaining a type-certificate shall be conducted in accordance with conditions for such flight testing approved by the Authority.

(b) The applicant shall make all flight tests that the Authority finds necessary:

1. To determine compliance with the applicable type-certification basis, and environmental protection requirements; and

2. To determine whether there is reasonable assurance that the aircraft, its parts and appliances are reliable and function properly.

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(c) (Reserved).

(d) (Reserved).

(e) (Reserved).

(f) The flight tests prescribed in subparagraph (b)(2), shall include:

1. For aircraft incorporating turbine engines of a type not previously used in type-certificated aircraft, at least 300 hours of operation or as agreed by the Authority, with a full complement of engines that conform to a type-certificate; and

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2. For all other aircraft, at least 150 hours of operation or as agreed by the Authority.

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**21.A.41 Type certificate and restricted type certificate**

The MSTC or a RMSTC shall include the type design, the operating limitations, the type-certificate data sheet for airworthiness, the applicable type-certification basis and environmental protection requirements with which the Authority records compliance, and any other conditions or limitations prescribed for the product in the applicable airworthiness requirements and environmental protection requirements.

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**21.A.42 Integration**

The aircraft MSTC holder shall be responsible for the integration of Products, Weapons, and other Systems onto the aircraft, except for approvals under Subpart E.

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**21.A.44 Obligations of the holder**

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Each holder of a MSTC or a RMSTC shall:

(a) Undertake the obligations laid down in MSTAR 21.A.3A, MSTAR 21.A.3B, MSTAR 21.A.4, MSTAR 21.A.55, MSTAR 21.A.57 and MSTAR 21.A.61; and, for this purpose, shall continue to meet the requirements of MSTAR 21.A.14;

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(b) Specify the marking in accordance with MSTAR 21 Subpart Q; and

(c) Ensure the continued integrity of the aircraft structure and propulsion system through ongoing monitoring and periodic assessment.

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**21.A.47 Transferability**

Transfer of a type-certificate or restricted type-certificate may only be made to an organisation that is able to undertake the obligations under MSTAR 21.A.44, and, for this purpose, has demonstrated its ability to qualify under the criteria of MSTAR 21.A.14.

**21.A.51 Duration and continued validity**

(a) A MSTC or a RMSTC shall be issued for an unlimited duration. They shall remain valid subject to:

1. The holder remaining in compliance with this MSTAR; and
2. The certificate not being surrendered or revoked under the applicable administrative procedures established by the Authority.

(b) Upon surrender or revocation, the MSTC or a RMSTC shall be returned to the Authority.

(c) The MSTC or a RMSTC holder must inform the Authority, as soon as practicable, when it is no longer able to meet the type-certificate or the restricted

type-certificate holder responsibilities defined by this MSTAR, for one or several types of products.

#### 21.A.55 Record keeping

All relevant design information, drawings, and test reports, including inspection records for the product tested, shall be held by the MSTC or a RMSTC holder at the disposal of the Authority and shall be retained in order to provide the information necessary to ensure the continued airworthiness and compliance with applicable environmental protection requirements of the product.

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#### 21.A.57 Manuals

The holder of a MSTC or a RMSTC shall produce, maintain, and update master copies of all manuals required by the applicable type- certification basis and environmental protection requirements for the product, and provide copies, on request, to the Authority.

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#### 21.A.61 Instructions for continuing airworthiness

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(a) The holder of the MSTC or a RMSTC shall furnish at least one set of complete instructions for continuing airworthiness, comprising descriptive data and accomplishment instructions prepared in accordance with the applicable type-certification basis, to each known operator of one or more aircraft, engine or propeller upon its delivery or upon issue of the first certificate of airworthiness for the affected aircraft, whichever occurs later and thereafter make those instructions available on request to any other operator required to comply with any of the terms of those instructions. The availability of some manual or portion of the instructions for continuing airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered into service, but shall be available before any of the products reaches the relevant age or flight-hours/cycles.

(b) In addition, changes to the instructions for continuing airworthiness shall be made available to all known operators of the product and shall also be provided on request to any other operator required to comply with any of those instructions. A programme showing how changes to the instructions for continuing airworthiness are distributed shall be submitted to the Authority.

#### 21.A.62 (Reserved)

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 1**

**CHAPTER 3**

**SUBPART C – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 4****SUBPART D – CHANGES TO MALAYSIAN STATE TYPE CERTIFICATES (MSTC) AND RESTRICTED MALAYSIAN STATE TYPE CERTIFICATES (RMSTC)****21.A.90 Scope**

This Subpart establishes the procedure for the approval of changes to type certificates and establishes the rights and obligations of the applicants for and holders of those approvals. In this Subpart, references to type certificates include type certificates and restricted type certificates.

Note: Within the DGTA context, the Type Certificates and Restricted Type Certificates will be known as Malaysian State Type Certificates (MSTC) and Restricted Malaysian State Type Certificates (RMSTC) respectively. As such, the terms of MSTC and RMSTC will be used hereafter.

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**21.A.91 Classification of changes to a type certificate**

Changes to a type certificate are classified as minor and major. A 'minor change' has no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product or its environmental characteristics. Without prejudice to MSTAR 21.A.19, all other changes are "major changes" under this Subpart. Major and minor changes shall be approved in accordance with MSTAR 21.A.95 or MSTAR 21.A.97 as appropriate and shall be adequately identified.

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**21.A.92 Eligibility**

(a) Only the type certificate holder may apply for approval of a major change to a type certificate under this Subpart; all other applicants for a major change to a type certificate shall apply under MSTAR 21 Subpart E.

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(b) Any organisation may apply for approval of a minor change to a type certificate under this Subpart.

**21.A.93 Application**

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(a) An application for approval of a change to a type certificate shall be made in a form and manner established by the Authority.

(b) An application shall include, or be supplemented after the initial application with, a certification programme for the demonstration of compliance in accordance with MSTAR 21.A.20, consisting of:

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1. A description of the change identifying:
  - i. the configuration(s) of the product in the type certificate upon which the change is to be made;

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- ii. all areas of the product in the type certificate, including the approved manuals, that are changed or affected by the change;
- 2. An identification of any reinvestigations necessary to demonstrate compliance of the change and areas affected by the change with the type certification basis and environmental protection requirements;

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- 3. For a major change to a type certificate:

- i. a proposal for the initial type certification basis and environmental protection requirements, prepared in accordance with the requirements and options specified in MSTAR 21.A.101;

- ii. a proposal for a breakdown of the certification programme into meaningful groups of compliance demonstration activities and data, including a proposal for the means of compliance and related compliance documents;

- iii. a proposal for the assessment of the meaningful groups of compliance demonstration activities and data, addressing the likelihood of an unidentified non-compliance with the type certification basis, operational suitability data certification basis or environmental protection requirements and the potential impact of that non-compliance on product safety or environmental protection; and

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- iv. a project schedule including major milestones.

(c) An application for a change to a type certificate shall be valid for five years unless the Authority agrees at the time of application on a longer time period. In the case where the change has not been approved, or it is evident that it will not be approved, within the time limit provided for in this point, the applicant shall apply for an extension of the validity of the application and comply with the type certification basis and environmental protection requirements, established in accordance with MSTAR 21.A.101.

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#### 21.A.95 Requirements for approval of a minor changes

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- (a) Minor changes to a type certificate shall be classified and approved by:
  - 1. the Authority; or
  - 2. an approved design organisation within the scope of its privileges provided for in (1) and (2) of MSTAR 21.A.263(c), as recorded in the terms of approval.
- (b) A minor change to a type certificate shall only be approved:
  - 1. when it has been demonstrated that the change and areas affected by the change comply with the type certification basis and the environmental protection requirements incorporated by reference in the type certificate;

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2. (Reserved)
  3. when compliance with the type certification basis that applies in accordance with (1) has been declared and the justifications of compliance have been recorded in the compliance documents; and
  4. when no feature or characteristic has been identified that may make the product unsafe for the uses for which certification is requested
- (c) By way of exception from (b)(1), airworthiness requirements which became applicable after those incorporated by reference in the type certificate can be used for approval of a minor change, provided they do not affect the demonstration of compliance
- (d) (Reserved)
- (e) The applicant shall submit to the Authority the substantiation data for the change and a statement that compliance has been demonstrated in accordance with (b).
- (f) An approval of a minor change to a type certificate shall be limited to the specific configuration(s) in the type certificate to which the change relates.

#### 21.A.97 Requirements for approval of a major change

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- (a) Major changes to a type certificate shall be classified and approved by:
1. the Authority; or
  2. an approved design organisation or holder of a type certificate within the scope of its privileges provided for in (1) and (8) of MSTAR 21.A.263(c) or (2) of MSTAR 21.A.263(d), as recorded in the terms of approval.
- (b) A major change to a type certificate shall only be approved:
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1. When it has been demonstrated that the change and areas affected by the change comply with the type certification basis and environmental protection requirements, as established by the Authority in accordance with MSTAR 21.A.101;
  2. (Reserved);
  3. When compliance with (1) has been demonstrated in accordance with MSTAR 21.A.20, as applicable to the change.
- (c) (Reserved).
- (d) An approval of a major change to a type certificate shall be limited to the specific configuration(s) in the type certificate to which the change relates.

#### 21.A.101 Type certification basis and environmental protection requirements for a major change to a type certificate

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(a) A major change to a type certificate and areas affected by the change shall comply with either the airworthiness requirements applicable to the changed product on the date of the application for the change or airworthiness requirements which became applicable after that date in accordance with (f) below. The validity of the application shall be determined in accordance with MSTAR 21.A.93(c). In addition, the changed product shall comply with the environmental protection requirements established in accordance with MSTAR 21.A.18.

(b) By way of exception from (a), an earlier amendment to an airworthiness requirement referred to in (a), and to any other airworthiness requirement which is directly related may be used in any of the following situations, unless the earlier amendment became applicable before the date at which the corresponding airworthiness requirements incorporated by reference in the type certificate became applicable

1. A change that the Authority finds not to be significant. In determining whether a specific change is significant, the Authority considers the change in context with all previous relevant design changes and all related revisions to the applicable airworthiness requirements incorporated by reference in the type certificate for the product. Changes meeting one of the following criteria shall automatically be considered significant:

- i. The general configuration or the principles of construction are not retained;
- ii. The assumptions used for certification of the product to be changed do not remain valid.

2. Each area, system, part or appliance that the Authority finds not affected by the change.

3. Each area, system, part or appliance that is affected by the change, for which the Authority finds that compliance with the airworthiness requirements described in (a) would not contribute materially to the level of safety of the changed product or is impractical.

(c) (Reserved)

(d) If the Authority finds that the airworthiness requirements applicable on the date of the application for the change do not provide adequate standards with respect to the proposed change, the applicant shall also comply with any special conditions, and amendments to those special conditions, prescribed by the Authority in accordance with MSTAR 21.A.16B, to provide a level of safety equivalent to that established in the airworthiness requirements applicable on the date of the application for the change.

(e) By way of exception from (a) and (b), the change and areas affected by the change may comply with an alternative to an applicable airworthiness requirement if proposed by the applicant, provided that the Authority finds that the alternative provides a level of safety which is

1. In the case of a type certificate:

- i. equivalent to that of the airworthiness requirements designated under (a) or (b) above; or

ii. compliant with the essential requirements of MSTAR.

2. In the case of a restricted type certificate, adequate with regard to the intended use.

(f) If an applicant chooses to comply with airworthiness requirements set out in an amendment that becomes applicable after submitting the application for a change to a type certificate, the change and areas affected by the change shall also comply with any other airworthiness requirement that is directly related.

#### **21.A.105 Record keeping**

(a) For each change, all relevant design information, drawings, and test reports, including inspection records for the changed product tested, shall be held by the applicant at the disposal of the Authority and shall be retained in order to provide the information necessary to ensure the continued airworthiness and compliance with applicable environmental protection requirements of the changed product.

(b) Unless otherwise laid down by the Authority, the records must be retained for at least two years after the removal of service of the last aircraft of the type certified.

#### **21.A.107 Instructions for Continuing Airworthiness**

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(a) The holder of a minor change approval to a type certificate shall furnish at least one set of the associated variations, if any, to the instructions for the continuing airworthiness of the product on which the minor change is to be installed, prepared in accordance with the applicable type certification basis, to each known operator of one or more aircraft, engine, or propeller incorporating the minor change, upon its delivery, or upon issuance of the first certificate of airworthiness for the affected aircraft, whichever occurs later, and thereafter make those variations in instructions available, on request, to any other person or organisation required to comply with any of the terms of those instructions.

(b) In addition, changes to those variations of the instructions for continuing airworthiness shall be made available to all known operators of a product incorporating the minor change and shall be made available, on request, to any person or organisation required to comply with any of those instructions.

#### **21.A.108 (Reserved)**

#### **21.A.109 Obligations and Parts Approval marking**

The holder of a minor change approval to type certificate shall:

(a) Undertake the obligations laid down in MSTAR 21.A.4, MSTAR 21.A.105, MSTAR 21.A.107;

(b) Specify the marking, including PA (herein 'Part Approval') letters, in accordance with MSTAR 21.A.804.



**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 5****SUBPART E - SUPPLEMENTAL TYPE CERTIFICATES****21.A.111 Scope**

This Subpart establishes the procedure for the approval of major changes to the type certificate under supplemental type certificate procedures and establishes the rights and obligations of the applicants for, and holders of, those certificates. In this Subpart, the references to type certificates include type certificates and restricted type certificates.

**21.A.112A Eligibility**

Any Organisation that has demonstrated, or is in the process of demonstrating, its capability under MSTAR 21.A.112B shall be eligible as an applicant for a Supplemental Type Certificate (STC) under the conditions laid down in this Subpart.

**21.A.112B Demonstration of capability**

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(a) Any organisation applying for a supplemental type certificate shall demonstrate its capability by holding a design organisation approval (DOA), issued by the Authority in accordance with MSTAR 21 Subpart J.

(b) By way of derogation from paragraph a, as an alternative procedure to demonstrate its capability, an applicant may seek Authority agreement for the use of procedures setting out the specific design practices, resources and sequence of activities necessary to comply with this Subpart.

(c) By way of derogation from paragraph (a) and (b), any government organisation applying for a supplemental type certificate may demonstrate its capability by having an agreement in place, accepted by the Authority, in accordance with MSTAR 21.A.2 with a design organisation which has access to the type design data. The agreement shall include detailed statements how the actions and obligations are delegated to enable the government organisation, in cooperation with the contracted organisation, to comply with the requirements of MSTAR 21 Subpart J, including demonstration of compliance with MSTAR 21.A.118A.

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**21.A.113 Application for a Supplemental Type Certificate**

(a) An application for a supplemental type certificate shall be made in a form and manner established by the Authority.

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(b) When applying for a supplemental type certificate, the applicant shall:

1. include in the application the information required by MSTAR 21.A.93(b);

2. specify whether the certification data has been or will be prepared completely by the applicant or on the basis of an arrangement with the owner of the type certification data.

(c) MSTAR 21.A.93(c) applies to the requirements for the time limits of the application effectivity as well as the requirements related to the need to update the type certification basis and environmental protection requirements when the change has not been approved or it is evident that it will not be approved within the time limit established.

**21.A.115 Requirements for approval of major changes in the form of Supplemental Type Certificate**

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- (a) Supplemental type certificates shall be issued by:
1. the Authority; or
  2. an approved design organisation within the scope of its privileges provided for in (1) and (9) of MSTAR 21.A.263(c), as recorded in terms of approval.
- (b) A supplemental type certificate shall only be issued when;
1. The applicant has demonstrated its capability in accordance with MSTAR 21.A.112B;
  2. It has been demonstrated that the change to a type certificate and areas affected by the change comply with the type certification basis and the environmental protection requirements, as established in accordance with MSTAR 21.A.101;
  3. (Reserved);
  4. Compliance with (2) has been demonstrated in accordance with MSTAR 21.A.20, as applicable to the change; and
  5. In case the applicant has specified that it provided certification data on the basis of an arrangement with the owner of the type certification data in accordance with MSTAR 21.A.113(b):
    - i. The type certificate holder has indicated that it has no technical objection to the information submitted under MSTAR 21.A.93; and
    - ii. The type certificate holder has agreed to collaborate with the supplemental type certificate holder to ensure discharge of all obligations for continued airworthiness of the changed product through compliance with MSTAR 21.A.44 and MSTAR 21.A.118A.
- (c) (Reserved).
- (d) A supplemental type certificate shall be limited to the specific configuration(s) in the type certificate to which the related major change relates.

**21.A.116 Transferability**

A supplemental type certificate shall only be transferred to an organisation that is able to undertake the obligations of MSTAR 21.A.118A and for this purpose has demonstrated its ability to qualify under the criteria of MSTAR 21.A.112B.

**21.A.117 Changes to that part of a product covered by a supplemental type certificate**

(a) Minor changes to that part of a product covered by a supplemental type certificate shall be classified and approved in accordance with MSTAR 21 Subpart D

(b) Each major change to that part of a product covered by a supplemental type certificate shall be approved as a separate supplemental type certificate in accordance with this Subpart.

(c) By way of derogation from paragraph (b), a major change to that part of a product covered by a supplemental type certificate submitted by the supplemental type certificate holder itself may be approved as a change to the existing supplemental type certificate.

**21.A.118A Obligations and Parts Approval marking**

Each holder of a supplemental type certificate shall:

(a) Undertake the obligations:

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1. Laid down in MSTAR 21.A.3A, MSTAR 21.A.3B, MSTAR 21.A.4, MSTAR 21.A.105, MSTAR 21.A.119 and MSTAR21.A.120;

2. Implicit in collaboration with the type certificate holder under MSTAR 21.A.115(b)(5); and for this purpose, continue to meet the criteria of MSTAR 21.A.112B.

(b) Specify the marking, including PA letters, in accordance with MSTAR 21.A.804.

**21.A.118B Duration and continued validity**

(a) A supplemental-type certificate shall be issued for an unlimited duration. It shall remain valid subject to:

1. The holder remaining in compliance with this MSTAR; and

2. The certificate not being surrendered or revoked under the applicable administrative procedures established by the Authority.

(b) Upon surrender or revocation, the supplemental type certificate shall be returned to the Authority.

(c) The supplemental type certificate holder shall inform the Authority, as soon as practicable, when it is no longer able to meet the supplemental type certificate holder responsibilities defined by this MSTAR, for one or several types of products. In this case, it shall provide access to the Authority with all the information necessary for the

latter to ensure, or have ensured, the continued airworthiness of the type design of the concerned products.

#### 21.A.119 Manuals

The holder of a supplemental type certificate shall produce, maintain, and update master copies of variations in the manuals required by the applicable type certification basis and environmental protection requirements for the product, necessary to cover the changes introduced under the supplemental type certificate and furnish copies of these manuals to the Authority, on request.

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#### 21.A.120A Instructions for Continuing Airworthiness

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(a) The holder of the supplemental type certificate for an aircraft, engine, or propeller shall furnish at least one set of the associated variations to the instructions for continuing airworthiness, prepared in accordance with the applicable type-certification basis, to each known operator of one or more aircraft, engine, or propeller incorporating the features of the supplemental type certificate, upon its delivery, or upon issuance of the first certificate of airworthiness for the affected aircraft, whichever occurs later, and thereafter make those variations in instructions available, on request, to any other operator required to comply with any of the terms of those instructions. Availability of some manual or portion of the variations to the instructions for continuing airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered service, but shall be available before any of the products reaches the relevant age or flight-hours/cycles.

(b) In addition, changes to those variations of the instructions for continuing airworthiness shall be made available to all known operators of a product incorporating the supplemental type certificate and shall be made available, on request, to any operators required to comply with any of those instructions. A program showing how changes to the variations to the instructions for continuing airworthiness are distributed shall be submitted to the Authority.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 1**

**CHAPTER 6**

**SUBPART F – (RESERVED)**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 7****SUBPART G - PRODUCTION ORGANISATION APPROVAL****21.A.131 Scope**

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This Subpart establishes:

- (a) The procedure for the issuance of a production organisation approval for a production organisation showing conformity of products, parts and appliances with the applicable design data;
- (b) The rules governing rights and obligations of the applicant for, and holders of, such approvals.

Note: Within DGTA context, the Military Production Organisation Approval will be known as Production Organisation Approval (POA). As such the term of POA to be used hereafter.

**21.A.133 Eligibility (MY)**

Any organisation shall be eligible as an applicant for approval under this Subpart. The applicant shall:

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(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 approval of that specific design; or

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(c) have ensured, through an appropriate arrangement with the applicant for, or holder of, approval of that specific design, satisfactory coordination between production and design.

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(d) be mandated through the formal instrument by SAO/ MAO for those commercial organisations required to hold a DGTA approval for the provision of production services to the SAO.

**21.A.134 Application**

Each application for a production organisation approval shall be made to the Authority in a form and manner established by that Authority and shall include an outline of the information required by MSTAR 21.A.143 and the terms of approval requested to be issued under MSTAR 21.A.151.

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**21.A.135 Issue of production organisation approval**

An organisation shall be entitled to have a production organisation approval issued by the Authority when it has demonstrated compliance with the applicable requirements under this Subpart.

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**21.A.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 MSTAR 21.A.163.

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(b) The quality system shall contain:

1. as applicable within the scope of approval, control procedures for:

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- 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 coordination with the applicant for, or holder of, the design approval;
- x. records completion and retention;
- xi. personnel competence and qualification;
- xii. issue of airworthiness release documents;
- xiii. handling, storage, and packing;

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- 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;
- xvii. issue of permit to fly and approval of associated flight conditions.

The control procedures shall include specific provisions for any critical parts.

- 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 referred to in MSTAR 21.A.145(c)(2) and ultimately to the manager referred to in MSTAR 21.A.145(c)(1) to ensure, as necessary, corrective action.

#### **21.A.143 Production Organisation Exposition**

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- (a) The organisation shall submit to the Authority a production organisation exposition providing the following information:

- 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 managers accepted by the Authority in accordance with MSTAR 21.A.145(c)(2);
- 3. the duties and responsibilities of the manager(s) as required by MSTAR 21.A.145(c)(2) including matters on which they may deal directly with the Authority on behalf of the organisation;
- 4. an organisational chart showing associated chains of responsibility of the managers as required by MSTAR 21.A.145(c)(1) and (2);
- 5. a list of certifying staff as referred to in MSTAR 21.A.145(d);
- 6. a general description of man-power resources;
- 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 MSTAR 21.A.139(b)(1);
12. a list of those outside parties referred to in MSTAR 21.A.139(a).
13. if flight tests are to be conducted, a flight test operations manual defining the organisation's policies and procedures in relation to flight test.

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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 Authority.

#### 21.A.145 Approval requirements

The production organisation shall demonstrate, on the basis of the information submitted in accordance with MSTAR 21.A.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 MSTAR 21.A.165.

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(b) with regard to all necessary airworthiness and environmental data:

1. the production organisation is in receipt of such data from the Authority, and from the holder of, or applicant for, the type certificate, restricted type certificate or design approval, including any exemption granted against the CO<sub>2</sub> production cut-off requirements, to determine conformity with the applicable design data;

2. the production organisation has established a procedure to ensure that airworthiness and environmental data are correctly incorporated in its production data; and

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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.

(c) with regard to management and staff:

1. a manager has been nominated by the production organisation and is accountable to the Authority. His or her responsibilities 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 MSTAR 21.A.143;

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2. a person or group of persons have been nominated by the production organisation to ensure that the organisation is in compliance with the requirements of this MSTAR, and are identified, together with the extent of their authority. Such person(s) shall act under the direct authority of the accountable manager referred to in (1). The person(s) nominated shall be able to show the

appropriate knowledge, background and experience to discharge their responsibilities; and

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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 coordination within the production organisation in respect of airworthiness and environmental data matters.

(d) with regard to certifying staff, authorised by the production organisation to sign the documents issued under MSTAR 21.A.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;

AMC

2. The production organisation maintains a record of all certifying staff which shall include details of the scope of their authorisation;

AMC

3. Certifying staff are provided with evidence of the scope of their authorisation.

AMC

#### **21.A.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 environmental characteristics of the product, part or appliance, particularly changes to the quality system, shall be approved by the Authority. An application for approval shall be submitted in writing to the Authority and the organisation shall demonstrate to the Authority before implementation of the change, that it will continue to comply with this Subpart.

GM

(b) The Authority shall establish the conditions under which a production organisation approved under this Subpart may operate during such changes unless the Authority determines that the approval should be suspended.

#### **21.A.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 MSTAR 21.A.147.

AMC

#### **21.A.149 Transferability**

Except as a result of a change in ownership, which is deemed significant for the purposes of MSTAR 21.A.147, a production organisation approval is not transferable.

GM

**21.A.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 MSTAR 21.A.163. Those terms shall be issued as part of a production organisation approval.

GM

**21.A.153 Changes to the terms of approval**

Each change to the terms of approval shall be approved by the Authority. An application for a change to the terms of approval shall be made in a form and manner established by the Authority. The applicant shall comply with the applicable requirements of this Subpart.

AMC

**21.A.157 Investigations**

A production organisation shall make arrangements that allow the 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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**21.A.158 Findings (MY)**

(a) When objective evidence is found showing non-compliance of the holder of a production organisation approval with the applicable requirements of this MSTAR, the finding shall be classified as follows:

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1. a level one finding is any non-compliance with this MSTAR which could lead to uncontrolled non-compliances with applicable design data, and which could affect the safety of the aircraft;
2. a level two finding is any non-compliance with this MSTAR which is not classified as level one.

(b) An Opportunity For Improvement (OFI) finding is any item where it has been identified, by objective evidence, to contain potential problems that could lead to non-compliance under paragraph (a).

(c) After receipt of notification of findings issued by the Authority:

1. in case of a level one finding, the holder of the production organisation approval shall demonstrate corrective action to the satisfaction of the Authority within a period of no more than 1-month calendar date after written confirmation of the finding;
2. in case of level two findings, the corrective action period granted by the Authority shall be appropriate to the nature of the finding but in any case, initially shall not be more than three months. In certain circumstances and subject to the nature of the finding the Authority may extend the three months period subject to a satisfactory corrective action plan agreed by the Authority;

3. an OFI finding shall not require immediate action by the holder of the production organisation's approval.

(d) In case of level one or level two findings, the production organisation approval may be subject to a partial or full limitation, suspension or revocation of the production organisation approval. The holder of the production organisation approval shall provide confirmation of receipt of the notice of limitation, suspension or revocation of the production organisation approval in a timely manner.

#### 21.A.159 Duration and continued validity (MY)

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(a) A production organisation approval shall be issued with a validity of three (3) years, unless otherwise specified by the authority. It shall remain valid unless:

1. the production organisation fails to demonstrate compliance with the applicable requirements of this Subpart; or
2. the Authority is prevented by the holder or any of its partners or subcontractors to perform the investigations in accordance with MSTAR 21.A.157; or
3. there is evidence that the production organisation cannot maintain satisfactory control of the manufacture of products, parts, or appliances under the approval; or

GM

4. the production organisation no longer meets the requirements of MSTAR 21.A.133; or
5. the certificate has been surrendered or revoked;
6. The production organisation has not carried out production activities in the scope of the term of the approval for a period specified by the Authority.

(b) Upon surrender or revocation, the certificate shall be returned to the Authority.

#### 21.A.163 Privileges

Pursuant to the terms of approval issued under MSTAR 21.A.135, the holder of a production organisation approval may:

- (a) perform production activities under this MSTAR;
- (b) in the case of complete aircraft and upon presentation of a statement of conformity (MSTAR Form 52) under MSTAR 21.A.174, obtain an aircraft certificate of airworthiness and a noise certificate, where applicable, without further showing;
- (c) in the case of other products, parts, or appliances, issue authorised release certificates (MSTAR Form 1) without further showing;

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(d) maintain a new aircraft that it has produced and issue a certificate of release to service (MSTAR Form 53) in respect of that maintenance; or

AMC

(e) N/A

### 21.A.165 Obligations of the holder

The holder of a production organisation approval shall:

(a) ensure that the production organisation exposition furnished in accordance with MSTAR 21.A.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;

(c)

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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 Authority; or

2. determine those other products, parts, or appliances are complete and conform to the approved design data and are in condition for safe operation before issuing MSTAR Form 1 to certify conformity to approved design data and condition for safe operation;

3. additionally, in the case of environmental requirements, determine that:

i. the completed engine is in compliance with the applicable engine exhaust emissions requirements on the date of manufacture of the engine; and

ii. the completed aircraft is in compliance with the applicable CO2 emissions requirements on the date its first certificate of airworthiness is issued.

4. determine those other products, parts, or appliances conform to the applicable data before issuing an MSTAR Form 1 as a conformity certificate.

(d) record all details of work carried out;

GM

(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 the evaluation of relevant information relating to occurrences and the promulgation of related information;

(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;

2. report to the Authority the deviations which could lead to an unsafe condition identified according to (1). Such reports shall be made in a form and manner established by the Authority under MSTAR 21.A.3A(b)(2);

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.

(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;

(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 Authority and be retained in order to provide the information necessary to ensure the continued airworthiness of the products, parts or appliances;

GM

(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;

(j) N/A

(k) N/A

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 8****SUBPART H - CERTIFICATES OF AIRWORTHINESS AND RESTRICTED  
CERTIFICATES OF AIRWORTHINESS****21.A.171 Scope**

This Subpart establishes the procedure for issuing airworthiness certificates.

**21.A.172 Eligibility**

Any organisation or operator under whose name an aircraft is registered or will be registered in a participating State ('State of registry'), or its representative, shall be eligible as an applicant for an airworthiness certificate for that aircraft under this Subpart.

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**21.A.173 Classification**

Airworthiness certificates shall be classified as follows:

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(a) Certificates of airworthiness shall be issued to aircraft which conform to a Malaysian State Type Certificate that has been issued in accordance with this MSTAR 21;

(b) Restricted certificates of airworthiness shall be issued to aircraft:

1. Which conform to a Restricted Malaysian State Type Certificate that has been issued in accordance with this MSTAR; or
2. Which have been shown to the Authority to comply with specific airworthiness specifications ensuring adequate safety.

**21.A.174 Application**

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(a) Pursuant to MSTAR 21.A.172, an application for an airworthiness certificate shall be made in a form and manner established by the Authority of the State of Registry.

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(b) Each application for a certificate of airworthiness or restricted certificate of airworthiness shall include:

1. The class of airworthiness certificate applied for;
2. With regard to new aircraft:
  - i. A statement of conformity:
    - issued under MSTAR 21.A.163(b); or

RESTRICTED

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- issued under MSTAR 21.A.130 and validated by the Authority; or
  - For an imported aircraft, any acceptable evidence to support that the aircraft conforms to a design approved by the Authority of the State of registry.
  - ii. A weight and balance report with a loading schedule;
  - iii. The flight manual and any other manuals required by the Authority of the State of registry.
3. With regard to used aircraft:

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- i. originating from a MSTAR compliant environment, an CoA renewal issued in accordance with MSTAR M;
  - ii. originating from another State:
    - a statement by the Authority of the State where the aircraft is, or was, registered, reflecting the airworthiness status of the aircraft on its register at time of transfer;
    - a weight and balance report with a loading schedule;
    - the flight manual and any other manuals required by the Authority of the State of registry;
    - Historical records to establish the production, modification, and maintenance standard of the aircraft, including all limitations associated with a restricted certificate of airworthiness;
    - A recommendation for the issuance of a certificate of airworthiness or restricted certificate of airworthiness and a CoA Renewal following an airworthiness review in accordance with MSTAR M.
- (c) Unless otherwise agreed, the statements referred to in (b)(2)(i) and (b)(3)(ii) shall be issued no more than 60 days before presentation of the aircraft to the airworthiness Authority of the State of registry.

#### **21.A.175 Language**

The manuals, placards, listings, and instrument markings and other necessary information required by applicable airworthiness codes shall be presented in a language acceptable to the Authority of the State of Registry.

#### **21.A.177 Amendment or modification**

An airworthiness certificate may be amended or modified only by the Authority of the State of Registry.



**21.A.179 Transferability and re-issuance within States applying EMAR/ MSTAR**

Not applicable within DGTA perspective.

**21.A.180 Inspections**

The holder of the airworthiness certificate shall provide access to the aircraft for which that airworthiness certificate has been issued upon request by the Authority of the State of registry.

**21.A.181 Duration and continued validity (MY)**

(a) An airworthiness certificate shall be issued as an initial CoA and a CoA Renewal Certificate will be issued yearly under MSTAR M.A.710, Airworthiness Review. It shall remain valid subject to:

1. Compliance with the applicable type design and continuing airworthiness requirements; and
2. The aircraft remaining on the same register; and
3. The Malaysian State Type Certificate or Restricted Malaysian State Type Certificate under which it is issued not being previously invalidated under MSTAR 21.A.51 ; and
4. The certificate not being surrendered or revoked.

(b) Upon surrender or revocation, the certificate shall be returned to the Authority of the State of Registry.

**21.A.182 Aircraft identification**

Each applicant for an airworthiness certificate under this Subpart shall demonstrate that its aircraft is identified in accordance with MSTAR 21 Subpart Q.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 1**

**CHAPTER 9**

**SUBPART I – (RESERVED)**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 10****SUBPART J - DESIGN ORGANISATION APPROVAL****21.A.231 Scope**

This Subpart establishes the procedure for the approval of design organisations and rules governing the rights and obligations of applicants for, and holders of, such approvals. In this Subpart, the references to type certificates include type certificates and restricted type certificates.

**Note:** Within the DGTA context, the Military Design Organisation Approval will be known as Design Organisation Approval (DOA). As such, only the term of Design Organisation Approval (DOA) will be used hereafter.

**21.A.233 Eligibility**

At the discretion of the Authority, any organisation shall be eligible as an applicant for an approval under this Subpart:

- (a) In accordance with MSTAR 21.A.14, MSTAR 21.A.112B, MSTAR 21.A.432B or MSTAR 21.A.602B; or
- (b) For approval of minor changes or minor repair design, when requested for the purpose of obtaining privileges under MSTAR 21.A.263.

**21.A.234 Application**

Each application for a design organisation approval shall be made in a form and manner established by the Authority and shall include an outline of the information required by MSTAR 21.A.243, and the terms of approval requested to be issued under MSTAR 21.A.251.

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**21.A.235 Issue of design organisation approval**

An organisation shall be entitled to have a design organisation approval issued by the Authority when it has demonstrated compliance with the applicable requirements under this Subpart.

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**21.A.239 Design assurance system (MY)**

(a) The design organisation shall demonstrate that it has established and is able to maintain a design assurance system for the control and supervision of the design, and of design changes, of products, parts and appliances covered by the application. This design assurance system shall be such as to enable the organisation:

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GM2

1. To ensure that the design of the products, parts and appliances or the design change or repair solution thereof, comply with the applicable type-certification basis and environmental protection requirements (where applicable); and

2. To ensure that its responsibilities are properly discharged in accordance with:

- i. The appropriate provisions of this MSTAR; and
- ii. The terms of approval issued under MSTAR 21.A.251.

3. To independently monitor the compliance with, and adequacy of, the documented procedures of the system. This monitoring shall include a feedback system to a person or a group of persons having the responsibility to ensure corrective actions.

AMC

(b) The design assurance system shall include an independent checking function of the showings of compliance on the basis of which the organisation submits compliance statements and associated documentation to the Authority.

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(c) The design organisation shall specify the manner in which the design assurance system accounts for the acceptability of the parts or appliances designed or the tasks performed by partners or subcontractor according to methods which are the subject of written procedures.

GM

(d) (Reserved)

(e) The design assurance system shall include Design Acceptance which is the determination of the technical acceptability of a design to the SAO and by extension, by the CAMO - Continuing Airworthiness Manager (CAM).

#### 21.A.243 Design Organisation Exposition (DOE)

(a) The design organisation shall furnish a DOE to the Authority describing, directly or by cross-reference, the organisation, the relevant procedures and the products, or changes to products to be designed.

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1. If flight tests are to be conducted, the design organisation shall furnish a flight test plan defining the procedures in relation to flight tests.

AMC

(b) Where any parts or appliances, or any changes to the products are designed by partner organisations or subcontractors, the DOE shall include a statement of how the design organisation is able to give, for all parts and appliances, the assurance of compliance required by MSTAR 21.A.239(b), and shall contain, directly or by cross-reference, descriptions and information on the design activities and organisation of those partners or subcontractors, as necessary to establish this statement.

(c) The DOE shall be amended as necessary to remain an up-to-date description of the organisation, and copies of amendments shall be supplied to the Authority.

(d) The design organisation shall furnish a statement of the qualifications and experience of the management staff and other persons responsible for making decisions affecting airworthiness and environmental protection (where applicable) in the organisation.

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**21.A.245 Approval requirements**

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GM2

The design organisation shall demonstrate, on the basis of the information submitted in accordance with MSTAR 21.A.243 that, in addition to complying with MSTAR 21.A.239:

(a) The staff in all technical departments are of sufficient numbers and experience and have been given appropriate authority to be able to discharge their allocated responsibilities and that these, together with the accommodation, facilities and equipment are adequate to enable the staff to achieve the airworthiness and environmental protection (where applicable) objectives for the product.

(b) There is full and efficient coordination between departments and within departments in respect of airworthiness and environmental protection (where applicable) matters.

**21.A.247 Changes in design assurance system**

After the issue of a design organisation approval, each change to the design assurance system that is significant to the showing of compliance or to the airworthiness and environmental protection (where applicable) of the product, shall be approved by the Authority. An application for approval shall be submitted in writing to the Authority and the design organisation shall demonstrate to the Authority, on the basis of submission of proposed changes to the DOE, and before implementation of the change, that it will continue to comply with this Subpart after implementation.

GM

**21.A.249 Transferability**

Except as a result of a change in ownership, which is deemed significant for the purposes of MSTAR 21.A.247, a design organisation approval is not transferable

GM

**21.A.251 Terms of approval**

The terms of approval shall identify the types of design work, categories of products, parts and appliances for which the design organisation holds a design organisation approval, and the functions and duties that the organisation is approved to perform in regard to the airworthiness of products. For design organisation approval covering type-certification or TSO authorisation for Auxiliary Power Units (APUs), the terms of approval shall contain in addition the list of products or APUs. Those terms shall be issued as part of a design organisation approval.

GM1

GM2

**21.A.253 Changes to the terms of approval**

Each change to the terms of approval shall be approved by the Authority. An application for a change to the terms of approval shall be made in a form and manner established by the Authority. The design organisation shall comply with the applicable requirements of this Subpart.

AMC

**21.A.257 Investigations**

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(a) The design organisation shall make arrangements that allow the 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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(b) The design organisation shall allow the Authority to review any report and make any inspection and perform or witness any flight and ground test necessary to check the validity of the compliance statements submitted by the applicant under MSTAR 21.A.239(b).

**21.A.258 Findings (MY)**

(a) When, during the investigations referred to in MSTAR 21.A.257 and GM 21.A.15(b)(6), objective evidence is found demonstrating non-compliance of the holder of a design organisation approval with the applicable requirements of this MSTAR, the finding shall be classified as follows:

1. A level one finding is any non-compliance with this MSTAR which could lead to uncontrolled non-compliances with applicable requirements, and which could affect the safety of the aircraft;
2. A level two finding is any non-compliance with this MSTAR which is not classified as level one.

(b) An Opportunity for Improvement (OFI) finding is any item where it has been identified, by objective evidence, to contain potential problems that could lead to a non-compliance under paragraph (a).

(c) After receipt of notification of findings under the applicable administrative procedures established by the Authority,

1. In case of a level one finding, the holder of the production organisation approval shall demonstrate corrective action to the satisfaction of the Authority within a period of no more than 1 month calendar date after written confirmation of the finding;

2. In case of level two findings, the corrective action period granted by the Authority shall be appropriate to the nature of the finding but in any case, initially shall not be more than three months. In certain circumstances and subject to the nature of the finding the Authority may extend the three months period subject to a satisfactory corrective action plan agreed by the Authority;

3. An Opportunity for Improvement (OFI) finding shall not require immediate action by the holder of the production organisation approval.

(d) In case of level one or level two findings, the design organisation approval may be subject to a partial or full suspension or revocation under the applicable administrative procedures established by the Authority. The holder of the design organisation approval shall provide confirmation of receipt of the notice of suspension or revocation of the design organisation approval in a timely manner.

**21.A.259 Duration and continued validity (MY)**

(a) A design organization approval can be issued with a validity of three (3) years, unless otherwise specified by the authority. It shall remain valid for that duration unless:

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1. The design organisation fails to demonstrate compliance with the applicable requirements of this Subpart; or
2. The Authority is prevented by the holder or any of its partners or subcontractors to perform the investigations in accordance with MSTAR 21.A.257; or
3. There is evidence that the design assurance system cannot maintain satisfactory control and supervision of the design of products or changes thereof under the approval; or
4. The certificate has been surrendered or revoked under the applicable administrative procedures established by the Authority.

(b) Upon surrender or revocation, the certificate shall be returned to the Authority.

**21.A.263 Privileges**

(a) (Reserved)

(b) (Reserved)

(c) The holder of a design organization approval shall be entitled, within its terms of approval and under the relevant procedures of the design assurance system:

1. To classify changes to type design and repairs as 'major' or 'minor';

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2. To approve minor changes to type design and minor repairs;

AMC1

AMC2

AMC3

3. (Reserved)

4. (Reserved)

5. to approve certain major repair designs under Subpart M to products or Auxiliary Power Units (APUs);

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AMC2

6. (Reserved)

7. (Reserved)

8. (Reserved)

9. (Reserved)

(d) (Reserved)

**21.A.265 Obligations of the holder**

The holder of a design organization approval shall:

- (a) Maintain the DOE in conformity with the design assurance system. AMC
- (b) Ensure that this DOE is used as a basic working document within the organisation; GM
- (c) Determine that the design of products, or changes or repairs thereof, as applicable, comply with applicable airworthiness requirements and have no unsafe feature;
- (d) Except for minor changes or repairs approved under the privilege of MSTAR 21.A.263, provide to the Authority statements and associated documentation confirming compliance with paragraph (c);
- (e) Provide to the Authority information or instructions related to required actions under MSTAR 21.A.3B;
- (f) Reserved.
- (g) Reserved.
- (h) Designate data and information issued under the authority of the approved design organization within the scope of its terms of approval as established by the Authority with the following statement: "The technical content of this document is approved under the authority of the DOA ref. [MYS].[DGTA].21J.[XXXX]". GM



**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 11****SUBPART K - PARTS AND APPLIANCES****21.A.301 Scope**

This Subpart establishes the procedure relating to the approval of parts and appliances.

GM

**21.A.303 Compliance with applicable requirements.**

The showing of compliance of parts and appliances to be installed in a type certificated product shall be made:

- (a) In conjunction with the type-certification procedures of MSTAR 21 Subpart B, D, or E for the product in which it is to be installed; or
- (b) Where applicable, under the TSO authorisation procedures of MSTAR 21 Subpart O; or
- (c) In the case of standard parts, in accordance with officially recognised Standards; or

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GM

- (d) For specific equipment not subject to recognised airworthiness standards covered by the above and which has been demonstrated to the Authority not to adversely affect the airworthiness of the aircraft, in accordance with integration or installation requirements at aircraft level.

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GM

**21.A.305 Approval of parts and appliances**

In all cases where the approval of a part or appliance is explicitly required by this MSTAR or Authority procedures, the part or appliance shall comply with the applicable TSO or with the specifications recognised as equivalent by the Authority in the particular case.

**21.A.307 Release of parts and appliances for installation**

AMC

A part or appliance shall be eligible for installation in a type certificated product when it is in a condition for safe operation, and it is:

- (a) Accompanied by an authorised release certificate (**MSTAR Form 1—** Authorised Release Certificate), certifying that the item was manufactured in conformity to approved design data and is marked in accordance with MSTAR 21 Subpart Q,
- (b) A standard part, or
- (c) Specific equipment referred to in MSTAR 21.A.303(d).

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 1**

**CHAPTER 12**

**SUBPART L – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 13****SUBPART M - REPAIRS****21.A.431A Scope**

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(a) This Subpart establishes the procedure for the approval of a repair design of a product, part or appliance, and establishes the rights and obligations of the applicants for, and holders of, those approvals.

(b) This Subpart **defines standard repairs that are not subject to an approval process** under this Subpart.

(c) A 'repair' means elimination of damage and/or restoration to an airworthy condition following initial release into service by the manufacturer of any product, part or appliance.

(d) The elimination of damage by replacement of parts or appliances without the necessity for design activity shall be considered as a maintenance task and shall therefore require no approval under this MSTAR.

(e) A repair to a TSO article other than an Auxiliary Power Unit (APU) shall be treated as a change to the TSO design and shall be processed in accordance with MSTAR 21.A.611.

GM

(f) In this Subpart, the references to type certificates include type certificates and restricted type certificates.

**21.A.431B Standard repairs**

GM

(a) Standard repairs are repairs:

1. in relation to products, as accepted by the Authority; and
2. that follow design data included in airworthiness codes or equivalent standards issued or accepted by the Authority, containing acceptable methods, techniques, and practices for carrying out and identifying standard repairs, including the associated instructions for continuing airworthiness; and
3. that are not in conflict with type certificate holders' data.

(b) MSTAR 21.A.432A to 21.A.451 are not applicable to standard repairs.

**21.A.432A Eligibility**

(a) Any person or organisation that has demonstrated, or is in the process of demonstrating, its capability according to MSTAR 21.A.432B shall be eligible as an applicant for a major repair design approval under the conditions laid down in this Subpart.

(b) Any person or organisation shall be eligible to apply for approval of a minor repair design.

#### 21.A.432B Demonstration of capability

(a) An applicant for a major repair design approval shall demonstrate its capability by holding a design organisation approval issued by the Authority in accordance with MSTAR 21 Subpart J.

(b) By way of derogation from paragraph (a), as an alternative procedure to demonstrate its capability, an applicant may seek Authority agreement for the use of procedures setting out the specific design practices, resources, and sequence of activities necessary to comply with this Subpart.

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(c) By way of derogation from paragraph (a), any government organisation applying for a major repair design approval may demonstrate its capability in accordance with MSTAR 21.A.2 and MSTAR 21.A.14(d), including a demonstration of compliance with MSTAR 21.A.451.

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#### 21.A.432C Application for a repair design approval

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(a) An application for a repair design approval shall be made in a form and manner established by the Authority.

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(b) An application for a major repair design approval shall include, or be supplemented after the initial application, a certification programme containing:

1. a description of the damage and repair design identifying the configuration of the type design upon which the repair is made;

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2. an identification of all areas of the type design and the approved manuals that are changed or affected by the repair design;

3. an identification of any reinvestigations necessary to demonstrate compliance of the repair design and areas affected by the repair design with the type-certification basis incorporated by reference in, as applicable, either the type certificate, the supplemental type certificate or the APU TSO authorisation;

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4. any proposed amendments to the type-certification basis incorporated by reference in, as applicable, either the type certificate, the supplemental type certificate or the APU TSO authorisation;

5. a proposal for a breakdown of the certification program into meaningful groups of compliance demonstration activities and data, including the means and process proposed to be followed to demonstrate compliance with MSTAR 21.A.433(a)(1) and references to related compliance documents;

6. a proposal for the assessment of the meaningful groups of compliance demonstration activities and data, addressing the likelihood

of an unidentified non-compliance with the type-certification basis and the potential impact of that non-compliance on product safety; and

7. the specification of whether the certification data is prepared completely

AMC

by the applicant or on the basis of an arrangement with the owner of the type-certification data.

#### 21.A.433 Requirements for a repair design

- (a) A repair design shall only be approved:

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1. when it has been demonstrated, following the certification programme referred to in MSTAR 21.A.432C(b), that the repair design complies with the type-certification basis incorporated by reference in, as applicable, either the type certificate, the supplemental type certificate or the APU TSO authorisation, as well as with any amendments established and notified by the Authority.

GM

2. when compliance with the type-certification basis that applies in accordance with (a)(1) has been declared and the justifications of compliance have been recorded in the compliance documents;

3. when no feature or characteristic has been identified that may make the product unsafe for the uses for which certification is requested; and

4. where the applicant has specified that it provided certification data on the basis of an arrangement with the owner of the type-certification data in accordance with MSTAR 21.A.432C(b)(7):

i. when the holder has indicated that it has no technical objection to the information submitted under (a)(2); and

ii. when the holder has agreed to collaborate with the repair design approval holder to ensure discharge of all obligations for continued airworthiness of the changed product through compliance with MSTAR 21.A.451.

- (b) The applicant shall submit to the Authority the declaration referred to in (a)(2) and, on request by the Authority, all necessary substantiation data.

#### 21.A.435 Classification and approval of repair designs

- (a) A repair design shall be classified as either "major" or "minor" in accordance with the criteria set out in MSTAR 21.A.91 for a change to the type certificate.

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- (b) A repair shall be classified and approved by:

GM

1. the Authority; or

2. an approved design organisation within the scope of its privileges provided for in (1), (2) and (5) of MSTAR 21.A.263(c), as recorded in the terms

of approval.

#### 21.A.439 Production of repair parts

GM

Parts and appliances to be used for the repair shall be manufactured in accordance with production data based upon all the necessary design data as provided by the repair design approval holder:

- (a) under MSTAR 21 Subpart F; or
- (b) by an organisation appropriately approved in accordance with MSTAR 21 Subpart G; or
- (c) by an appropriately approved maintenance organisation.

#### 21.A.441 Repair embodiment

GM

- (a) The embodiment of a repair shall be made in accordance with MSTAR 145, or by a production organisation appropriately approved in accordance with MSTAR 21 Subpart G, in accordance with the privilege provided for in MSTAR 21.A.163(d).
- (b) The design organisation shall transmit to the organisation performing the repair all the necessary installation instructions.

#### 21.A.443 Limitations

GM

A repair design may be approved subject to limitations, in which case the repair design approval shall include all necessary instructions and limitations. These instructions and limitations shall be transmitted by the repair design approval holder to the operator in accordance with a procedure agreed with the Authority.

#### 21.A.445 Unrepaired damage

AMC

GM

(a) When a damaged product, part, or appliance, is left unrepaired, and is not covered by previously approved data, the evaluation of the damage for its airworthiness consequences may only be made:

1. by the Authority; or
2. by an appropriately approved design organisation under a procedure agreed with the Authority.

Any necessary limitations shall be processed in accordance with the procedures of MSTAR 21.A.443.

(b) Where the organisation evaluating the damage under paragraph (a) is neither the Authority nor the type certificate or supplemental type certificate or APU TSO authorisation holder, this organisation shall justify that the information on which the evaluation is based is adequate either from its organisation's own resources or through an arrangement with the type certificate, supplemental type certificate or APU TSO authorisation holder, or manufacturer, as applicable.

**21.A.447 Record keeping**

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For each repair, all relevant design information, drawings, test reports, instructions and limitations possibly issued in accordance with MSTAR 21.A.443, justification for classification and evidence of the repair design approval, shall:

- (a) be held by the repair design approval holder at the disposal of the Authority; and
- (b) be retained by the repair design approval holder in order to provide the information necessary to ensure the continued airworthiness of the repaired products, parts, or appliances.

**21.A.449 Instructions for continuing airworthiness**

AMC

GM

(a) The holder of the repair design approval shall furnish at least one complete set of those changes to the instructions for continuing airworthiness which result from the design of the repair, comprising descriptive data and accomplishment instructions prepared in accordance with the applicable requirements, to each operator of the aircraft incorporating the repair. The repaired product, part, or appliance may be released back into service before the changes to those instructions have been completed, but this shall be for a limited-service period and in agreement with the Authority. Those changes to the instructions shall be made available on request to any other person required to comply with any of the terms of those changes to the instructions. The availability of some manual or portion of the changes to the instructions for continuing airworthiness, dealing with overhaul, or other forms of heavy maintenance may be delayed until after the product has entered into service but shall be available before any of the products reaches the relevant age or flight — hours/cycles.

(b) If updates to those changes to the instructions for continuing airworthiness are issued by the holder of the repair design approval after the repair has been first approved, these updates shall be furnished to each operator and shall be made available on request to any other person required to comply with any of the terms of those changes to the instructions. A programme showing how updates to the changes to the instructions for continuing airworthiness are distributed shall be submitted to the Authority.

**21.A.451 Obligations and Part Approval (PA) marking**

- (a) Each holder of a major repair design approval shall:
  - 1. undertake the obligations:
    - i. laid down in MSTAR 21.A.3A, MSTAR 21.A.3B, MSTAR 21.A.4, MSTAR 21.A.439, MSTAR 21.A.441, MSTAR 21.A.443, MSTAR 21.A.447 and MSTAR 21.A.449;
    - ii. implicit in the collaboration with the type certificate or supplemental type certificate and APU TSO authorisation holder, under MSTAR 21.A.433(b), as appropriate.
  - 2. specify the marking, including MPA (Military Part Approval) letters, in accordance with MSTAR 21.A.804(a).

(b) Except for type certificate holders or APU TSO authorisation holders for which MSTAR 21.A.44 applies, the holder of a minor repair design approval shall:

1. undertake the obligations laid down in MSTAR 21.A.4, MSTAR 21.A.447, and MSTAR 21.A.449; and
2. specify the marking, including MPA letters, in accordance with MSTAR 21.A.804(a).



**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 1**

**CHAPTER 14**

**SUBPART N – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 15****SUBPART O - TECHNICAL STANDARD ORDER AUTHORISATIONS****21.A.601 Scope**

This Subpart establishes the procedure for issuing Technical Standard Order (TSO) authorisations and the rules governing the obligations and privileges of applicants for, or holders of, such authorisations.

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**21.A.602A Eligibility**

Any organisation that produces or is preparing to produce a TSO article, and that has demonstrated, or is in the process of demonstrating, its capability under MSTAR 21.A.602B shall be eligible as an applicant for a TSO authorisation.

**21.A.602B Demonstration and capability**

Any applicant for a TSO authorisation shall demonstrate its capability as follows:

- (a) For production, by holding a production organisation approval, issued in accordance with MSTAR 21 Subpart G, or through compliance with MSTAR 21 Subpart F procedures; and
- (b) For design:
  - 1. For an Auxiliary Power Unit, by holding a design organisation approval, issued by the Authority in accordance with MSTAR 21 Subpart J;
  - 2. For all other articles, by using procedures setting out the specific design practices, resources, and sequence of activities necessary to comply with this MSTAR.

AMC

**21.A.603 Application**

(a) An application for an TSO authorisation shall be made in a form and manner established by the Authority and shall include an outline of the information required by MSTAR 21.A.605.

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(b) When a series of MINOR changes in accordance with MSTAR 21.A.611 is anticipated, the applicant shall set forth in its application the basic model number of the article and the associated part numbers with open brackets after it to denote that suffix change letters or numbers (or combinations of them) will be added from time to time.

**21.A.604 TSO Authorisation for an Auxiliary Power Unit**

With regard to TSO authorisation for an Auxiliary Power Unit (APU):

(a) MSTAR 21.A.15, MSTAR 21.A.16B, MSTAR 21.A.17A, MSTAR 21.A.20, MSTAR 21.A.21, MSTAR 21.A.31, MSTAR 21.A.33, and MSTAR 21.A.44 shall apply by way of derogation from MSTAR 21.A.603, 21.A.606(c), MSTAR 21.A.610 and

MSTAR 21.A.615, except that an TSO authorisation shall be issued in accordance with MSTAR 21.A.606 instead of the type certificate;

(b) Subpart D or Subpart E of this MSTAR is applicable for the approval of design changes by way of derogation from MSTAR 21.A.611. When Subpart E is used, a separate TSO authorisation shall be issued instead of a supplemental type certificate.

(c) Subpart M is applicable to the approval of repair designs.

#### **21.A.605 Data requirements**

The applicant shall submit the following documents to the Authority:

(a) A statement of compliance certifying that the applicant has met the requirements of this Subpart;

(b) A MSTAR Form DDP - Declaration of Design and Performance (DDP);

(c) One copy of the technical data required in the applicable technical standards and airworthiness specifications;

(d) The exposition (or a reference to the exposition) referred to in MSTAR 21.A.143 for the purpose of obtaining an appropriate production organisation approval under MSTAR 21 Subpart G or the manual (or a reference to the manual) referred to in MSTAR 21.A.125A(b) for the purpose of manufacturing under MSTAR 21 Subpart F without production organisation approval;

(e) For an APU, the Design Organisation Exposition (DOE), or a reference to the DOE, referred to in MSTAR 21.A.243 for the purpose of obtaining an appropriate design organisation approval under 21 Subpart J;

(f) For all other articles, the procedures referred to in MSTAR 21.A.602B(b)(2).

#### **21.A.606 Issue of TSO authorisation**

The applicant shall be entitled to have a TSO authorisation issued by the Authority after:

(a) Demonstrating its capability in accordance with MSTAR 21.A.602B;

(b) Demonstrating that the article complies with the technical conditions of the technical standards and airworthiness specifications that are acceptable to the Authority, and submitting the corresponding statement of compliance; and

(c) Expressly stating that it is prepared to comply with MSTAR 21.A.609.

#### **21.A.607 TSO authorisation privileges**

The holder of a TSO authorisation is entitled to produce and to mark the article with the appropriate TSO marking.

**21.A.608 Declaration of Design and Performance**

(a) The MSTAR Form DDP - Declaration of Design and Performance (DDP) shall contain at least the following information:

AMC

1. Information corresponding to MSTAR 21.A.31(a) and MSTAR 21.A.31(b), identifying the article and its design and testing standard.
2. The rated performance of the article, where appropriate, either directly or by reference to other supplementary documents.
3. A statement of compliance certifying that the article has met the applicable technical standards and airworthiness specifications.
4. Reference to relevant test reports.
5. Reference to the appropriate Maintenance, Overhaul and Repair Manuals.
6. The levels of compliance, where various levels of compliance are allowed by the applicable technical standards and airworthiness specifications.
7. List of deviations accepted in accordance with MSTAR 21.A.610.

(b) The DDP shall be endorsed with the date and signature of the holder of the TSO authorisation, or its authorised representative.

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**21.A.609 Obligations of holders of TSO authorisations**

The holder of a TSO authorisation under this Subpart shall:

- (a) Manufacture each article in accordance with MSTAR 21 Subpart G or Subpart F that ensures that each completed article conforms to its design data and is safe for installation;
- (b) Prepare and maintain, for each model of each article for which a TSO authorisation has been issued, a current file of complete technical data and records in accordance with MSTAR 21.A.613;
- (c) Prepare, maintain, and update master copies of all manuals required by the applicable airworthiness specifications for the article;
- (d) Make available to users of the article and to the Authority on request those maintenance, overhaul, and repair manuals necessary for the usage and maintenance of the article, and changes to those manuals.
- (e) Mark each article in accordance with MSTAR 21.A.807;
- (f) Comply with MSTAR 21.A.3A, MSTAR 21.A.3B and MSTAR 21.A.4;
- (g) Continue to meet the certification requirements of MSTAR 21.A.602B.

**21.A.610 Approval for deviation**

(a) Each manufacturer who requests approval to deviate from any performance requirements of applicable technical standards and airworthiness specifications shall demonstrate that the standards from which a deviation is requested are compensated for by factors or design features providing an equivalent level of safety.

(a) The request for approval to deviate, together with all pertinent data, shall be submitted to the Authority.

**21.A.611 Design changes**

GM

(a) The holder of the TSO authorisation may make minor design changes (any change other than a major change) without further authorisation by the Authority. In this case, the changed article keeps the original model number (part number changes or amendments shall be used to identify minor changes) and the holder shall forward to the Authority any revised data that are necessary for compliance with MSTAR 21.A.603(b).

(b) Any design change by the holder of the TSO authorisation that is extensive enough to require a substantially complete investigation to determine compliance with the applicable technical standards and airworthiness specifications is a MAJOR change. Before making such a change, the holder shall assign a new type or model designation to the article and apply for a new authorisation under MSTAR 21.A.603.

(c) No design change by any organisation, other than the holder of the TSO authorisation who submitted the statement of compliance for the article, is eligible for approval under this MSTAR 21 Subpart O unless the organisation seeking the approval applies under MSTAR 21.A.603 for a separate TSO authorisation.

**21.A.613 Record keeping**

Further to the record keeping requirements appropriate to, or associated with, the quality system, all relevant design information, drawings and test reports, including inspection records for the article tested, shall be held at the disposal of the Authority and shall be retained in order to provide the information necessary to ensure the continued airworthiness of the article and of the type certificated product in which it is fitted.

AMC

**21.A.615 Inspection by the Authority**

Upon a request of the Authority, each applicant for, or holder of an TSO authorisation for an article shall allow the Authority to:

- (a) Witness any tests;
- (b) Inspect the technical data files on that article.

**21.A.619 Duration and continued validity**

(a) A TSO authorisation shall be issued for an unlimited duration. It shall remain valid unless:

1. The conditions required when TSO authorisation was granted are no longer being observed; or
  2. The obligations of the holder specified in MSTAR 21.A.609 are no longer being discharged; or
  3. The article has proved to give rise to unacceptable hazards in service; or
  4. The authorisation has been surrendered or revoked under the applicable administrative procedures established by the Authority.
- (b) Upon surrender or revocation, the certificate shall be returned to the Authority.

**21.A.621 Transferability**

Except for a change in ownership of the holder, which shall be regarded as a change of significance, and shall therefore comply with MSTAR 21.A.147 and MSTAR 21.A.247 as applicable, a TSO authorisation issued under this is not transferable.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 16****SUBPART P - PERMITS TO FLY**

GM

**21.A.701 Scope**

GM1

GM2

(a) Permits to Fly shall be issued in accordance with this Subpart to aircraft that do not meet, or have not been shown to meet, applicable airworthiness requirements but are capable of safe flight under defined conditions and for the following purposes:

Examples of where a Permits to Fly may be required are:

1. Development;
2. Demonstration of compliance with regulations or certification requirements;
3. Design organisations or production organisations crew training;
4. Production flight testing of new production aircraft;
5. Flying aircraft under production between production facilities;
6. Flying the aircraft for customer acceptance;
7. Delivering or exporting the aircraft;
8. Flying the aircraft for Authority acceptance;
9. Market survey, including customer's crew training;
10. Exhibition and air show;
11. Flying the aircraft to a location where maintenance or airworthiness review are to be performed, or to a place of storage;
12. Flying an aircraft at a weight in excess of its maximum certificated take-off weight for flight beyond the normal range over water, or over land areas where adequate landing facilities or appropriate fuel is not available;
13. (Reserved)
14. Flying aircraft meeting the applicable airworthiness requirements before conformity to the environmental requirements (where applicable) has been found;
15. For individual aircraft or types for which a certificate of airworthiness or restricted certificate of airworthiness is not appropriate;
16. Operation of new or modified capability, prior to certification, due to a capability imperative;

17. Operation of aircraft where a required maintenance activity has not been completed, due to a capability imperative.

18. Flying an aircraft for troubleshooting purposes or to check the functioning of one or more systems, parts or appliances after maintenance.

(b) This Subpart establishes the procedure for issuing Permits to Fly and approving associated flight conditions and establishes the rights and obligations of the applicants for, and holders of, those permits and approvals for flight conditions.

#### 21.A.703 Eligibility

GM

(a) At the discretion of the Authority, any organisation shall be eligible as an applicant for a Permit to Fly under the conditions laid down in this Subpart. The applicant for a Permit to Fly is also eligible for application for the approval of the flight conditions.

(b) Reserved

(c) Reserved

#### 21.A.705 Authority of the State

The Permits to Fly under MSTAR 21 shall be issued by the approving Authority of the State of registry including cases where the aircraft will fly in another State. The Permits to Fly contains all the conditions and restrictions to ensure safe flight but other airspace and operational rules remain the competence of the Authority of the State where the flight will take place. The applicant shall therefore also ensure compliance with the relevant regulations of that State.

#### 21.A.707 Application for Permits to Fly (MY)

(a) Pursuant to MSTAR 21.A.703 and when the applicant has not been granted the privilege to issue a Permits to Fly, an application for a Permits to Fly shall be made to the Authority in a form and manner established by that Authority through [Delegated Airworthiness Representative \(DAR\) from SAO \(Project Office\) and CAMO-Continuing Airworthiness Manager for in-service aircraft](#).

(b) Each application for a Permits to Fly shall include

GM

1. The purpose(s) of the flight(s), in accordance with MSTAR 21.A.701;

2. The ways in which the aircraft does not comply with the applicable airworthiness requirements;

3. The flight conditions approved in accordance with MSTAR 21.A.7101.

(c) Where the flight conditions are not approved at the time of application for a Permits to Fly, an application for approval of the flight conditions shall be made in accordance with MSTAR 21.A.709.



**21.A.708 Flight conditions**

Flight conditions include:

- (a) The configuration(s) for which the Permit to Fly is requested;
- (b) Any condition or restriction necessary for safe operation of the aircraft, including:
- GM**
1. The conditions or restrictions put on itineraries or airspace, or both, required for the flight(s);
  2. The conditions and restrictions put on the flight crew to fly the aircraft;
  3. The restrictions regarding carriage of persons other than flight crew;
  4. The operating limitations, specific procedures or technical conditions to be met (which may include the restrictions regarding carriage / release firing of weapons);
  5. The specific flight test programme (if applicable);
  6. The specific continuing airworthiness arrangements and the regime under which they will be performed.
- GM**
- (c) The substantiation that the aircraft is capable of safe flight under the conditions or restrictions of subparagraph(b);
- GM1**      **GM2**
- (d) The method used for the control of the aircraft configuration, in order to remain within the established conditions.

**GM**

**21.A.709 Application for approval of flight conditions**

(a) Pursuant to MSTAR 21.A.707(c) and when the applicant has not been granted the privilege to approve the flight conditions, an application for approval of the flight conditions shall be made to the Authority in a form and manner established by the Authority.

**AMC**

- (b) Each application for approval of the flight conditions shall include:
- AMC**
1. The proposed flight conditions;
  2. The documentation supporting these conditions; and
  3. A declaration that the aircraft is capable of safe flight under the conditions or restrictions of paragraph MSTAR 21.A.708(b).

**AMC**

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**21.A.710 Approval of flight conditions**

GM

- (a) When approval of the flight conditions is related to the safety of the design, the flight conditions shall be approved by:
1. The Authority; or
  2. An appropriately approved design organisation, under the privilege of MSTAR 21.A.263(c)(6).
- (b) When approval of the flight conditions is not related to the safety of the design, the flight conditions shall be approved by the Authority or the appropriately approved organisation that will also issue the Permits to Fly.
- (c) Before approving the flight conditions, the Authority, or the approved organisation under MSTAR 21.A.711(b) or MSTAR 21.A.711(c) must be satisfied that the aircraft is capable of safe flight under the specified conditions and restrictions. The Authority may make or require the applicant to make any necessary inspections or tests for that purpose.

**21.A.711 Issue of a Permit to Fly**

AMC

- (a) The Authority shall issue a Permit to Fly:
1. Upon presentation of the data required by MSTAR 21.A.707;
  2. When the conditions of MSTAR 21.A.708 have been approved in accordance with MSTAR 21.A.710; and
  3. When the Authority, through its own investigations, which may include inspections or through procedures agreed with the applicant, is satisfied that the aircraft conforms to the design defined under MSTAR 21.A.708 before flight.
- (b) An appropriately approved design organisation may issue a Permits to Fly (MSTAR Form 20b - Permit to Fly - Approved Organisation), under the privilege granted under MSTAR 21.A.263(c)(7), when the flight conditions referred to in MSTAR 21.A.708 have been approved in accordance with MSTAR 21.A.710.
- (c) An appropriately approved production organisation may issue a Permits to Fly (MSTAR Form 20b) under the privilege granted under MSTAR 21.A.163(e), when the flight conditions referred to in MSTAR 21.A.708 have been approved in accordance with MSTAR 21.A.710.
- (d) Reserved
- (e) The Permit to Fly shall specify the purpose(s) and any conditions and restrictions which have been approved in accordance with MSTAR 21.A.710.

GM

- (f) For permits issued under subparagraphs b, c., or d, a copy of the Permits to Fly and associated flight conditions shall be submitted to the Authority at the earliest opportunity but not later than three days from the permit being issued.

RESTRICTED

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- (h) Upon evidence that any of the conditions specified in MSTAR 21.A.723(a) are not met for a Permits to Fly that an organisation has issued pursuant to subparagraph b, c. or d, that organisation shall revoke that Permits to Fly immediately and inform without delay the Authority.

**21.A.713 Changes**

GM

(a) Any change that invalidates the flight conditions or associated substantiation established for the Permits to Fly shall be approved in accordance with MSTAR 21.A.710. When relevant, an application shall be made in accordance with MSTAR 21.A.709.

(b) A change affecting the content of the Permits to Fly requires the issuance of a new Permits to Fly in accordance with MSTAR 21.A.711.

**21.A.715 Language**

The manuals, placards, listings, and instrument markings and other necessary information required by applicable type-certification basis shall be presented in a language acceptable to the Authority.

**22.A.719 Transferability**

GM

A Permit to Fly is not transferable.

**21.A.721 Inspections**

The holder of, or the applicant for, a Permit to Fly shall provide access to the aircraft concerned at the request of the Authority.

**21.A.723 Duration and continued validity**

(a) A Permits to Fly shall be issued for a stated period of validity and shall remain valid subject to:

1. Compliance with the conditions and restrictions of MSTAR 21.A.711(e) associated to the Permits to Fly;
2. The Permits to Fly not being surrendered or revoked; or
3. The aircraft remaining on the same register.

(b) Reserved

(c) Upon surrender or revocation, the Permits to Fly shall be returned to the Authority.

**21.A.725 Renewal of Permits to Fly**

Renewal of the Permits to Fly shall be processed as a change in accordance with MSTAR 21.A.713.

**21.A.727 Obligations of the holder of a Permits to Fly**

The holder of a Permits to Fly shall ensure that all the conditions and restrictions associated with the Permits to Fly are satisfied and maintained.

**21.A.729 Record keeping**

GM

(a) All documents produced to establish and justify the flight conditions shall be held by the holder of the approval of the flight conditions at the disposal of the Authority and shall be retained in order to provide the information necessary to ensure the continued airworthiness of the aircraft.

(b) All documents associated to the issue of permits to fly under the privilege of approved organisations, including inspection records, documents supporting the approval of flight conditions and the Permits to Fly itself, shall be held by the related approved organisation at the disposal of the Authority and shall be retained in order to provide the information necessary to ensure the continued airworthiness of the aircraft.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 1****CHAPTER 17****SUBPART Q - IDENTIFICATION OF PRODUCTS, PARTS AND APPLIANCES****21.A.801 Identification of products**

- (a) The identification of products shall include the following information:
1. Manufacturer's name;
  2. Product designation;
  3. Manufacturer's Serial number; and
  4. Any other information the Authority finds appropriate.
- (b) Any organisation that manufactures an aircraft or engine under MSTAR 21 Subpart G or Subpart F shall identify that aircraft or engine by means of a fireproof plate that has the information specified in paragraph a, marked on it by etching, stamping, engraving, or other approved method of fireproof marking. The identification plate shall be secured in such a manner that it is accessible and legible and will not likely be defaced or removed during normal service or lost or destroyed in an accident.
- (c) Any organisation that manufactures a propeller, propeller blade, or propeller hub under MSTAR 21 Subpart G or Subpart F shall identify it by means of a plate, stamping, engraving, etching, or other approved method of fireproof identification that is placed on it on a non-critical surface, contains the information specified in paragraph (a), and will not likely be defaced or removed during normal service or lost or destroyed in an accident.
- (d) Reserved

**21.A.803 Handling of identification data**

- (a) No person shall remove, change, or place identification information referred to in MSTAR 21.A.801(a) on any aircraft, engine, propeller, propeller blade, or propeller hub, or in MSTAR 21.A.807(a) on an APU, without the approval of the Authority.
- (b) No person shall remove or install any identification plate referred to in MSTAR 21.A.801, or in MSTAR 21.A.807 for an APU, without the approval of the Authority.
- (c) By way of derogation from paragraphs (a) and (b), any organisation performing maintenance work under the applicable associated implementing rules may, in accordance with methods, techniques and practices established by the Authority:
1. Remove, change, or place the identification information referred to in MSTAR 21.A.801(a) on any aircraft, engine, propeller, propeller blade, or propeller hub, or in MSTAR 21.A.807(a) on an APU; or
  2. Remove an identification plate referred to in MSTAR 21.A.801, or MSTAR 21.A.807 for an APU, when necessary, during maintenance operations.
- (d) No person shall install an identification plate removed in accordance with

subparagraph (c)(2), on any aircraft, engine, propeller, propeller blade, or propeller hub other than the one from which it was removed.

#### 21.A.804 Identification of parts and appliances

- (a) Each part or appliance shall be marked permanently and legibly with:
1. A name, trademark, or symbol identifying the manufacturer in a manner identified by the applicable design data; and GM
  2. The part number, as defined in the applicable design data; and
  3. The letters PA (Part Approval) for parts or appliances produced in accordance with approved design data do not belong to the type certificate holder of the related product, except for TSO articles. AMC GM
- (b) By way of derogation from paragraph (a), if the Authority agrees that a part or appliance is too small or that it is otherwise impractical to mark a part or appliance with any of the information required by paragraph (a), the authorised release document accompanying the part or appliance, or its container shall include the information that could not be marked on the part.

#### 21.A.805 Identification of critical parts

In addition to the requirement of MSTAR 21.A.804, each manufacturer of a part to be fitted on a type certificated product which has been identified as a critical part shall permanently and legibly mark that part with a part number and a serial number.

#### 21.A.807 Identification of TSO articles

- (a) Each holder of a TSO authorisation under MSTAR 21 Subpart O shall permanently and legibly mark each article with the following information:
1. The name and address of the manufacturer;
  2. The name, type, part number or model designation of the article;
  2. The serial number or the date of manufacture of the article or both; and
  3. The applicable TSO numbers.
- (b) By way of derogation from paragraph (a), if the Authority agrees that a part is too small or that it is otherwise impractical to mark a part with any of the information required by paragraph (a), the authorised release document accompanying the part, or its container shall include the information that could not be marked on the part.
- (c) Each person who manufactures an APU under MSTAR 21 Subpart G or Subpart F shall identify that APU by means of a fire-proof plate that has the information specified in paragraph (a), marked on it by etching, stamping, engraving, or other approved method of fireproof marking. The identification plate shall be secured in such a manner that it is accessible and legible and will not likely be defaced or removed during normal service or lost or destroyed in an accident.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 1****ACCEPTABLE MEANS OF COMPLIANCE/ GUIDANCE MATERIAL (AMC/ GM)****INTRODUCTION**

1. The Technical Airworthiness Regulator (TAR) is responsible for the technical airworthiness management of state-registered aircraft, aeronautical products, and aircraft-related equipment. The responsibility includes airworthiness oversight for Aircraft Design, Production, and Certification. This includes the Organisation Approval of Design Organisation Approval, Production Organisation Approval, and other related Aircraft Certifications. Thus, this chapter provides an Acceptable Means of Compliance and Guidance Material (AMC/ GM) on how an organisation can comply with MSTAR 21.

**PURPOSE**

2. This chapter aims to provide Acceptable Means of Compliance and Guidance Material (AMC/GM) on MSTAR 21 for an organisation seeking DOA/ POA certification and aircraft certification.

**SCOPE**

3. The scope of this chapter is to provide guidance to assist an organisation by presenting an acceptable means of compliance and also amplification of the regulation for a better understanding of the regulation. Each information is presented in a form for easy referencing.

4. **Philosophy and Concept**. This information provides, from an airworthiness perspective, the reason for the regulation.

5. **Cross References**. The following references are relevant to the requirement of this regulation:

- a. Defence Aviation Safety Authority - Australian Defence Force – DASR 21 Release dated 27 Jul 23.
- b. European Military Airworthiness Requirement (EMAR) 21 Edition 2.0
- c. Technical Airworthiness Management Manual (TAMM) – 2<sup>nd</sup> Edition.

6. **Guidance Material**. Guidance material (GM) is non-binding explanatory and interpretation material, including examples, intended to assist the user in complying with regulations.

7. **Acceptable Means of Compliance (AMC)**. This information provides a means by which the regulation can be met. It should be noted that this might not necessarily be the only acceptable compliance method available to the organisation.

8. The AMC/ GM is structured as Part 2 of MSTAR 21 and grouped as Subparts starting from Subparts A, B, C, D, E, F, G, H to Q. The Subparts follow the same grouping/ naming/ writing convention as in AMC/ GM for DASR/ EMAR 21 airworthiness framework.

9. Each Subpart may have one or more regulations within the Subpart and each regulation will be followed with its AMC and GM in consecutive order. Each of the regulations will be

numbered. Regulation without AMC/ GM will be indicated as Not Applicable, while some regulations may come with either AMC or GM.

10. The numbering of appendixes at the end of this volume follows the same convention as the DASR/ EMAR 21 airworthiness framework. AMC/ GM and appendixes that follow with (MY) marking indicate guidance derived or adapted to the DGTA environment.

11. The writing format and number are maintained to ensure seamless cross-referencing and subsequent updating with the corresponding regulation in DASR/ EMAR 21 AMC/ GM. As such, the writing format may differ from service writing.

**Note:**

1. The Airworthiness Review Certificate (ARC) will be known as a Certificate of Airworthiness Renewal (CoA Renewal) in the DGTA State Aircraft environment.



**SUBPART A - GENERAL**1. **21.A.1 Scope****AMC 21.A.1 - Scope (MY)**

Any design, Instruction for Continued Airworthiness, and other product approved under TAMM continues to be applicable and authoritative under MSTAR for its equivalent purpose. Hence, it does not require re-approval under MSTAR by default.

2. **21.A.2 Undertaking by another organisation than the applicant for, or holder of, a certificate****AMC 21.A.2 - Undertaking by another organisation than the applicant for, or holder of, a certificate**

The actions and obligations required to be undertaken by the holder of, or applicant for, a certificate for a product, part or appliance under this Section may be undertaken on its behalf by **any organisation**, provided the holder of, or applicant for, that certificate can show that it has made an agreement with the **other organisation** such as to ensure that the holder's obligations are and will be properly discharged.

3. **21.A.3A Failures, malfunctions and defects****AMC 21.A.3A(a) - Collection, investigation, and analysis of data related to Flammability Reduction Means (FRM) reliability**

Holders of a type certificate, restricted type certificate, supplemental type certificate, or any other relevant approval deemed to have been issued under MSTAR 21 and which have included an FRM in their design should assess on an on-going basis the effects of aeroplane component failures on FRM reliability. This should be part of the system for the collection, investigation, and analysis of data required by MSTAR 21.A.3A(a). The applicant/ holder should do the following:

- a. Demonstrate effective means to ensure the collection of FRM reliability data. The means should provide data affecting FRM reliability, such as component failures.
- b. Unless alternative reporting procedures are approved by the Authority, provide a report to the Authority every six months for the first five years after service introduction. After that period, continued reporting every six months may be replaced with other reliability tracking methods found acceptable to the Authority or eliminated if it is established that the reliability of the FRM meets, and will continue to meet, the exposure specifications as defined by the applicable airworthiness requirements.
- c. Develop service instructions or revise the applicable aeroplane manual, according to a schedule approved by the Authority, to correct any failures of the FRM that occur in service that could increase any fuel tanks Fleet Average Flammability Exposure to more than that specified by the applicable airworthiness requirements.

**AMC1 21.A.3A(a) - System for collection, investigation, and analysis of data for structure and propulsion systems**

Some risks and hazards associated with the type design may only become evident from a longer-term view of relevant data. The system for collecting, investigating, and analysing reports of, and information related to, failures, malfunctions, defects, or other occurrences should therefore include longer-term aggregation, trending and analysis of such reports and information.

Investigation and analysis should compare failures, malfunctions, defects and other occurrences with the design and certification assumptions to ensure that the type certificate continues to comply with the applicable Type Certification Basis and that the risk of failure has been eliminated or otherwise minimised SFARP. This may identify the need to change the type certificate, including new/amended operating limitations or new/amended airworthiness limitations (see MSTAR AMC 21.A.41), or revise the Instructions for Continuing Airworthiness furnished to operators (see MSTAR 21.A.61, MSTAR 21.A.107, MSTAR 21.A.120 and MSTAR 21.A.449).

For aircraft structure and propulsion systems, longer-term aggregation, trending and analysis of relevant failures, malfunctions, defects, and other occurrences should be conducted through the **Aircraft Structural Integrity Program (ASIP) and Propulsion System Integrity Program (PSIP)** for each aircraft (see MSTAR 21.A.44(c)). Investigation and analysis of failures, malfunctions, defects, and other occurrences for aircraft structure and propulsion systems also often require specific skills due to the complex nature of these systems and their associated failure modes and the specialised design methods and tools typically employed. Each failure, malfunction, defect or other occurrence related to the aircraft structure and propulsion systems should therefore be promptly collected, investigated, and analysed using the expertise available within the ASIP, PSIP and/ or the responsible design organisation (if separate).

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**AMC2 21.A.3A(a) - System for collection, investigation, and analysis of data (MY)**

Airworthiness Directives (ADs), or equivalent, issued by airworthiness authorities other than DGTA should be treated in accordance with MSTAR 21.A.3A. Such ADs should be assessed for applicability to the type design by the holder of the airworthiness instrument listed in MSTAR 21.A.3A(a). ADs assessed as applicable should be further treated in accordance with MSTAR 21.A.3A(b) and MSTAR 21.A.3A(c) to this regulation.

As a minimum, the holder of an airworthiness instrument listed in MSTAR 21.A.3A(a) should monitor relevant ADs issued by any airworthiness authority whose prior certification was recognised by DGTA in issuing that instrument:

- a. Recognition Prior Acceptance.
- b. List of Recognised NAA/ MAA.

**GM 21.A.3A(a) - System for collection, investigation, and analysis of data**

In the context of this 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.

There are instances where a failure, malfunction or defect, or analysis of failures, malfunctions or defects represents some level of shortfall to the type design but may not result in a reportable occurrence in accordance with MSTAR 21.A.3A(b) based on an assessment of the available information at that time. In these situations, the holder ought to make a judgement as to whether the shortfall constitutes a risk or not.

Where the shortfall is judged to be within the level of safety inherent to the certification baseline, the holder should continue monitoring and assessing relevant information for risks to the type design.

Holder of the type certificate, restricted type certificate, supplemental type certificate, TSO authorisation, major repair design approval or any other relevant approval deemed to have been issued under this MSTAR, should formalise arrangements with operators of the product to ensure timely and effective characterisation and communication of risks when deficiencies are being managed. This may constitute immediate communication in support of the development of a Service Bulletin, PTF Flight Conditions, or other operator decisions affecting ongoing flying; or it may be periodic communication of shortfalls at the discretion of, or agreement with, the operator / down-stream duty holder.

### **GM 21.A.3A(b) - Occurrences Reporting**

Relevant design organisations are to independently report on the occurrences to the Authority, with a focus on impact to the on-going validity of the certified design.

Typically, relevant design organisations will be made aware of occurrences by MSTAR 145 and Continuing Airworthiness Management Organisations (CAMO), fulfilling their reporting requirements.

However, in the course of conduct of design activities, analysis, or relevant Malaysian State Type Certificate (MSTC) holder obligations, identified occurrences are to be reported to the Authority. These instances may not have a corresponding MSTAR 145 or CAMO Occurrence Report.

This is not a comprehensive list, and an additional requirement may need to be considered dependent on the scope of the organisations operations.

The following Sections are the most relevant to MSTAR 21J:

SECTION I: Aircraft Flight Operations

SECTION II: Aircraft Technical

SECTION V: Immediate Notification of Accidents and Serious Incidents

In particular:

The products and part and appliances design rules prescribe those occurrences defined as a failure, malfunction, defect, or other occurrence which has resulted in or may result in an unsafe condition must be reported to the Authority;

According to the product and part and appliances production rules, occurrences defined as a deviation which could lead to an unsafe condition must be reported to the Authority.

**AMC 21.A.3A(b)(2) - Reporting Occurrences to the Authority**

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 Authority expects to be advised immediately and by the fastest possible means of whatever details are available at that time. This initial report should be followed up by a full written report within 72 hours. A typical example would be an uncontained engine failure resulting in damage to the aircraft's 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 a maximum of three days in order to provide more details.

**AMC1 21.A.3A(b)(2) - Reporting Occurrences to the Authority**

Occurrence Reports may be transmitted by any method.

Urgent unsafe conditions should be reported verbally, i.e. via telephone, in the first instance. All reporting should be followed up by a written report, as time allows.

The occurrence reporting process, content and format should be defined in the MSTAR 21J – Design Organisation Exposition.

Each report should contain at least the following information:

- a. organisation details,
- b. information necessary to identify the subject aircraft and/or products, parts, and appliances affected, including software version, (if applicable) details of the occurrence,
- c. implications to ongoing validity of the type design (recommended), as to whether an unsafe condition exists, and
- d. any other relevant information.

**4. 21.A.3B Airworthiness Directives****GM 21.A.3B(a) - Airworthiness Directives (MY)**

TAR will use Technical Airworthiness Directives (TAD) or Technical Airworthiness Advisory Circular (TAAC) to communicate this type of information.

**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:

- 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 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 Authority considers there is an unsafe condition. There may be other cases where overriding safety considerations may lead the Authority 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.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 that 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 (AFM) performance calculations,

- the systems safety analyses give predictions of what the systems failure modes, effects and probabilities may be,
- the system component's 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 continuing 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 MSTAR AMC 21.A.3B(b) for definition of 'unsafe condition' used in MSTAR 21.A.3B(b).2.

## 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: Malaysian State Type certificates (MSTC) or Supplemental Type certificates (STC) for aircraft, engines or propellers, or Technical Standard Orders (TSO).

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 are to 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 has to be assessed from a human-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, 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 has to 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, as guidance, in EASA Certification Specification for Large Aircraft (CS-25) 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 are to 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.

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 the results of maintenance or flight crew checks. This failure probability is, therefore, to 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 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 locating 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, eg Cockpit Voice Recorder, Flight Data Recorder, preventing them to perform their intended function, the Authority 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 applicable airworthiness requirements. Further guidance at the engine level for those failures considered as hazardous can be found in CS-E-510 under EASA Certification Specification – Engines (CS-E).

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 applicable airworthiness requirements. Further guidance at the propeller level for those failures considered as hazardous can be found in CS-P-70 under EASA Certification Specification – Propellers (CS-P).

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 is to be used to assess whether the crew or maintenance error raises issues that require regulatory action (whether in design or other areas) or is to 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 is to 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.

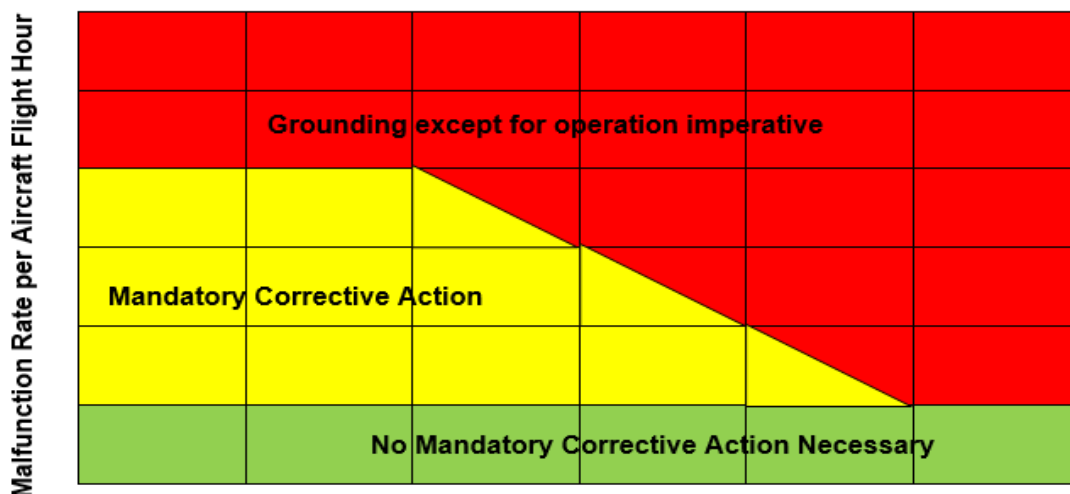
Apart from a design change, the corrective actions, if found necessary, may consist of modifications of the manuals, inspections, training programmes, and/or information to the operators about particular design features. The Authority may decide to make mandatory such corrective action if necessary.

#### **GM 21.A.3B(d)(4) - Compliance time charts for state aircraft**

If it is not possible to find mitigations and/or limitations that re-establish compliance with all the applicable safety requirements, an increased risk for an individual failure could be acceptable for a fixed period of time if it is demonstrated that during this period, the cumulative probability of catastrophic event per flight hour is still compliant with the type certification basis.

Exceptions are possible in accordance with National regulations.

The residual risk during the time allowed to fix the defect is to be identified and minimised. Risk assessment techniques could be used to establish the deadline period to fix defects as agreed by the National Authority.

**Risk and Reaction Times**

**Number of Aircraft Flights Exposure (Aircraft x Utilisation x Time)**

The civil regulations EASA Part 21 (21.A.3B) allow a time period that is directly related to the level of risk, i.e., the higher the risk, the shorter the time period. These regulations have hard limits for the maximum instantaneous risk, the maximum risk for an individual aircraft, and the maximum cumulative risk for the fleet. The basis of these regulations considers the typical civil operation of 10 major safety campaigns during an aircraft life, a hull life of 60,000 hours, and that 75% of the risk is attributed to the design. Using the above assumptions, they calculate an acceptable time period for restoration of risk levels to certification levels.

For state aircraft, the above assumptions are not necessarily valid, and the acceptable levels of risk are likely to be different. However, the principles of the civil system can be equally applied to the state aircraft regulations. The graphical representation below, on a logarithmic scale, is adapted from civil regulations AMC to EASA Part 21.A.3B, without the numerical limits, and can be used to enable the Authority (where national regulations allow) to determine appropriate numerical limits, considering the role of the aircraft. There will be different limits for Catastrophic and Hazardous failures.

**AMC 21.A.4(b) - Transferring of information on eligibility and approval status from the design organisations to production organisations**

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

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

**Information to be provided:**

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

**Date:** the date at which the information is released.

**Eligibility:** indicate the specific products or articles, in case of TSO 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 continuing airworthiness could be stated. Marking requirements of MSTAR 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 TSO authorisation 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 (AMC1 to 21.A.133(b) and AMC1 to 21.A.133(c))
- b. Information regarding eligibility for installation (replacement parts, repair, modification, etc.)
- c. Direct Delivery Authorisation (AMC1 to 21.A.133(b) and AMC1 to 21.A.133(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 MSTC, 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 12 of the Form 1 - Authorised Release Certificate.

**Approval:** provide reference information related to the approval of the data (Authority 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 Authority.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 2****SUBPART B - MALAYSIAN STATE TYPE CERTIFICATES (MSTC) AND RESTRICTED MALAYSIAN STATE TYPE CERTIFICATES (RMSTC)****1. 21.A.14 - Demonstration of capability****AMC 21.A.14(b) - Alternative procedures**

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

**1. Scope**

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

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

**2. Management of the (supplemental) type certification process**

2.1 **Certification Programme:** See MSTAR AMC 21.A.15(b) for type certification and MSTAR AMC 21.A.93(b) for supplemental type certification.

2.2 **Compliance documentation:** See MSTAR AMC 21.A.20(c).

**3. Management of changes to type certificates, repair designs, and production deviations**

**3.1 Management of changes to a type certificate or supplemental type certificate (hereinafter referred to as 'changes'), repairs, and production deviations from the approved design data.**

The applicant should provide procedures that are acceptable to the Authority for classification and approval of changes (see paragraphs 3.2 and 3.3), repair designs, and production deviations from the approved design data (see paragraph 3.4).

**3.2 Classification****3.2.1 – Content**

The procedure should address the following points:

- identification of the changes;
  - airworthiness classification;
  - changes to type design initiated by subcontractors;
  - documents to justify the classification;
  - authorised signatories.
- Criteria used for classification should be in compliance with MSTAR 21.A.91 and corresponding interpretations.

### 3.2.2 – **Identification of changes**

The procedure should indicate how the following are identified:

- major changes;
- those minor changes where additional work is necessary to demonstrate compliance with the airworthiness requirements;
- other minor changes requiring no further demonstrating of compliance.

### 3.2.3 – **Airworthiness classification**

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

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

### 3.2.4 – **Control of changes initiated by subcontractors**

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

### 3.2.5 – **Documents to justify the classification**

All decisions of classification of changes should be documented and approved by the Authority. 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 Authority for approval.

### 3.3 **Approval of changes**

#### 3.3.1 – **Content**

The procedure should 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 demonstrate compliance with the applicable airworthiness requirements is necessary, compliance documentation should be established in accordance with MSTAR AMC 21.A.20(c).

#### 3.3.3 – **Approval process**

A. For the approval of major changes to type design, a certification programme as defined in MSTAR AMC 21.A.93(b) should be established.

B. For major changes and minor changes 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 should include at least:

- identification and a 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 should define a means:

- to identify the change;
- to present the change to the Authority for approval.

#### 3.3.4 – **Authorised signatories**

The procedure should identify the persons authorised to sign the change before release to the Authority 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 should be established for the classification and approval of repairs and unintentional deviations from the approved design data occurring in production (concessions or non-conformances). For repairs, the procedure should be established in accordance with MSTAR 21 Section A Subpart M and associated acceptable means of compliance (AMC) or guidance material (GM).

## 4. Issue of data and information (including instructions) to owners, operating organisations and others required to use the data and information

### 4.1 General

(Reserved)

### 4.2 Data related to changes

The data and information (including instructions) issued by the holder of a design approval (an MSTC, STC, approval of a change, approval of repair design) are intended to provide the owners of a product with all necessary data to embody a change or repair on the product, or to inspect it.

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

### 4.3 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 Authority 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 MSTC, 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 Authority approval.

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

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

**6. Control of design subcontractors**

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

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

Design organisations approved under MSTAR 21 Section A Subpart J (Subpart J DOA) is to 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 Authority in accordance with MSTAR 21.A.14, MSTAR 21.A.112B and MSTAR 21.A.432B.

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

**Products with simple or limited scope of design**

As the complexity of a product grows, so does the size of a design organisation, along with an increasing degree of specialisation of various parts of the organisation to meet the growing demands of different disciplines. This creates complex communication relationships and workflows.

'Simple or limited scope of design' should, therefore, be understood as the opposite of 'complex'; see also MSTAR AMC 21.A.15(b)(6) Level of involvement (LoI).

When determining the complexity of the scope of design, the complexity of the product, as well as the structure of the design organisation and relationships with suppliers, should be considered.

**AMC 21.A.14(c) - Alternative Demonstration**

In specific cases, governmental organisations might be required to act as the holders of Malaysian state-type certificates or restricted Malaysian state-type certificates. Often, these entities do not meet the qualification requirement of 21.A.14(a) by own means. In such cases, 21.A.2 is usually considered being sufficient to discharge actions and obligations to another person or organisation. However, some legal arrangements still require the accountability to remain with the government-owned entity, in which case the qualification requirement of 21.A.14(a) can only be met jointly. In such cases, the agreement required by 21.A.2 should also provide sufficient detail on the processes and procedures governing the cooperation, including the allocation of tasks, rights, obligations, and privileges among the entities involved.

To undertake actions and obligations on behalf of the holder of a military certificate, the contracted organisation shall

- ensure the necessary access to the data related to the type design.
- establish sufficient cooperation with the Authority to ensure oversight.

In the case that alternative procedures (refer to MSTAR 21.A.14(b)) for establishing a Design Assurance System are used, such procedures shall be acceptable to the Authority in fulfilling the obligations required under MSTAR 21.A.44 - Obligations of the holder.

## 2. **21.A.15 Application**

### **AMC 21.A.15(a) -Form and manner**

When the application for an MSTC (including RMSTC or STC) is based on a Type Certificate issued under a different legal framework (such as EASA), such a Type Certificate may contain OSD as approved data. The OSD available will be dependent of the class of the Aircraft in the following areas:

1. Minimum syllabus of pilot type rating training, including determination of type rating.
2. Definition of scope of the aircraft validation source data to support the objective qualification of simulator(s) associated to the pilot type rating training, or provisional data to support their interim qualification.
3. Minimum syllabus of maintenance certifying staff type rating training, including determination of type rating.
4. Determination type specific data for cabin crew training.
5. The master minimum equipment list.
6. Other type-related operational suitability elements.

The application for approval of such OSD will lead to the validation of this data in the scope of the military type definition and military operation of the aircraft, taking into account the difference in the assumptions that were the basis for the previously approved OSD, as well as the compatibility with Flight Crew (including Cabin Crew with airworthiness tasks such as Loadmaster) training and Maintenance Certifying Staff training.

### **AMC1 21.A.15(a) - Application for approval of Operational Suitability Data (OSD)**

Where Operational Suitability Data (OSD) is already available for the product and/or where it is required by national regulations, an application under Subpart B, D or E should be supplemented by an application for approval of OSD.

### **GM 21.A.15(a) - Application for a Malaysian State Type Certificate**

When the application for an MSTC (including MSRTC or STC) is based on a Type Certificate issued under a different legal framework (such as EASA), such a Type

Certificate may contain OSD as approved data. The OSD available will be dependent of the class of the Aircraft in the following areas:

1. Minimum syllabus of pilot type rating training, including determination of type rating.
2. Definition of the scope of the aircraft validation source data to support the objective qualification of the simulator(s) associated with the pilot type rating training or provisional data to support their interim qualification.
3. Minimum syllabus of maintenance certifying staff type rating training, including determination of type rating.
4. Determination of type-specific data for cabin crew training.
5. The master minimum equipment list.
6. Other type-related operational suitability elements.

The application for approval of such OSD will lead to the validation of this data in the scope of the military type definition and military operation of the aircraft, taking into account the difference in the assumptions that were the basis for the previously approved OSD, as well as the compatibility with Flight Crew (including Cabin Crew with airworthiness tasks such as Loadmaster) training and Maintenance Certifying Staff training.

#### **AMC 21.A.15(b) -Content of the certification programme**

The certification programme is a document that allows the applicant and the Authority to manage and control the evolving product type design, as well as the process of compliance demonstration by the applicant and its verification by the Authority when required.

The certification programme may be based on modules that may be updated independently.

The level of detail in the certification programme depends on the complexity of the product and its intended use.

In particular, the following information should typically be expected:

#### **General**

1. Identification of the key organisations (eg Acquisition Project Office, prime design organisation) and of the relevant personnel who make decisions affecting airworthiness and environmental protection, and who will interface with the Authority, unless otherwise identified to the Authority (e.g. within the DOA procedures).
2. Identification of any prior certification intended to be leveraged, including details of which Type Certification Basis (TCB) elements will leverage prior certification, and how compliance will be demonstrated when prior certification can only be partially leveraged.
3. A project schedule including major milestones.

4. Subcontracting arrangements for design, environmental protection and/or production as well as design organisation approval (DOA) responsibility sharing.  
**MSTAR 21.A.15(b)(1) 'a detailed description of the type design, including all the configurations to be certified'**

An overview of the:

5. architecture, functions, systems;
6. dimensions, design weights, payloads, design speeds;
7. engines and power/thrust rating;
8. materials and technologies;
9. maximum passenger seating capacity, minimum flight and cabin crew;
10. cabin configuration aspects;
11. options (e.g. weight variants, power/thrust rating variants, optional avionics equipment items, auxiliary power unit (APU) choices, brake options, tire options, floats, skids);
12. mission (role) configuration options (other than cabin configuration), including aircraft-level provisions for external stores, pods, tanks, or other similar equipment options,
13. other items, if considered to be more appropriate, that address the specific aeronautical product.

**MSTAR 21.A.15(b)(2) 'proposed operating characteristics and limitations'**

14. Operating speed limitations.
15. Service ceiling, maximum airfield elevation.
16. Cabin pressure.
17. Limit load factors.
18. Number of passengers, minimum crew, payload, range.
19. Weight and centre-of-gravity (CG) envelope and fuel loading.
20. Performance.
21. Environmental envelope.
22. Runway surface conditions.
23. Other items, if considered to be more appropriate, that address the specific aeronautical product.

**MSTAR 21.A.15(b)(3) ‘the intended use of the product and the kind of operations for which certification is requested’**

24. Category of aircraft (for example, the civil categories defined under the FARs/CSs or the kind of military aircraft such as small, fast jet, heavy airlift, rotary wing, etc.), ditching, take-off and landing on water, emergency floatation equipment.
25. Extended overwater operation, high-altitude operation (above 41,000 ft).
26. High-airfield operation, steep approach, short take-off and landing, Long Range Operations (DLRO), all-weather operations (AWO), visual flight rules (VFR) / instrument flight rules (IFR), reduced vertical separation minimum (RVSM), performance-based navigation (PBN) type, increased bank angles, single-pilot operation, the flight into known icing conditions, air to air refueling.
27. Flight in ice crystal icing.
28. Engine operations in ice-forming conditions, helicopter hoist operations, operation on the unpaved runways, and operation on the narrow runways.
29. Take-off and landing in tail wind.
30. Volcanic-ash operation (for example, operations of the type covered by EASA CS 25.1593).
31. Design service goal (DSG)/limit of validity targets.
32. Fatigue missions (general description of assumptions for flight durations, main phases, and parameters, as appropriate).
33. Military kind of operations (e.g., Air Air refueling, Low-Level Flight, Ship-Based-Operations and Landing, carriage or release of weapons and stores).
34. Other items, if considered to be more appropriate, that address the specific aeronautical product.

**MSTAR 21.A.15(b)(4) ‘a proposal for the initial type certification basis and environmental protection requirements, considering the requirements and options specified in MSTAR 21.A.17A, and 21.A.18’**

The proposed certification basis should include applicable airworthiness codes, proposed special conditions, proposed equivalent safety findings, as well as a proposed ‘elect to comply’ and proposed exceptions, as applicable.

**MSTAR 21.A.15(b)(5) ‘a proposal for a breakdown of the certification programme into meaningful groups of compliance demonstration activities and data, hereinafter referred as “compliance demonstration items” (CDIs), including references to their proposed means of compliance and related compliance documents’**

See MSTAR AMC 21.A.15(b)(5) for the determination of the compliance demonstration items (CDIs).

**MSTAR 21.A.15(b)(6) on information relevant for the determination of the level of involvement (LoI)**

The applicant should provide sufficient detailed information about the novelty, complexity, and criticality aspects of each proposed CDI.

Further interpretative material on the necessary level of details is provided in MSTAR AMC 21.A.15(b)(6).

The applicant should provide detailed information about the proposed means of compliance with the applicable requirements identified under MSTAR 21.A.15(b)(4). The information provided should be sufficient for the Authority to determine its (initial) LoI. This should include the following, as far as this information is available at the time of submission to the Authority:

35. A compliance checklist addressing each requirement, the proposed means of compliance (see **Appendix A to MSTAR AMC 21.A.15(b)** below for the relevant codes), and the related compliance document(s);

36. Identification of industry standards (Society of Automotive Engineers (SAE), American Society for Testing and Materials (ASTM), European Organisation for Civil Aviation Equipment (EUROCAE), AeroSpace and Defence Industries Association of Europe (ASD), Standard and Industrial Research Institute of Malaysia (SIRIM) etc.), methodology documents, handbooks, technical procedures, technical documents and specifications specified in the type certificate data sheet, certification memoranda, policy statements, guidance material, etc., that should be followed in the demonstration of compliance;

37. When the compliance demonstration involves testing, a description of the ground and flight test article(s), test method(s), test location(s), test schedule, test house(s), test conditions (e.g. limit load, ultimate load), as well as of the intent/objective(s) of the testing; and

38. When the compliance demonstration involves analyses/calculations, a description/identification of the tools (e.g. name and version/release of the software programs) and methods used, the associated assumptions, limitations, and/or conditions, as well as of the intended use and purpose; furthermore, the validation and verification of such tools and methods should be addressed.

For every aspect mentioned above, the applicant should clearly identify whether the demonstration of compliance involves any method (analysis or test) which is novel or unusual for the applicant. This should include any deviations from the published AMC to the relevant airworthiness requirements (e.g., EASA AMC for EASA CSs, FAA ACs for FARs, MILSTDs for military-certified aircraft).

**GM 21.A.15(b) - Operating Characteristics and Intended Use of the Product**

The requirements of 21.A.15(b)2 and (b)3 will normally be covered in the aircraft Statement of Operating Intent and Usage (SOIU). Where the requirements of 21.A.15(b)2 and (b)3 have been addressed, to the level of detail specified in AMC 21.A.15(b), through an SOIU which has received endorsement from the Authority, the certification programme can include reference to the SOIU without need for duplication of that information. Any detail not sufficiently covered in an endorsed SOIU will need to be provided in the certification programme.

**GM1 to 21.A.15(b) - Certification Programme**

The certification programme for the issue of an MSTC/ RMSTC provided to the Authority by the applicant may take a variety of forms depending on the acquisition arrangements:

if the applicant is a DOA holder, then the DOA holder will develop and submit the certification programme;

if the applicant is a Project Office and the prime design / integration organisation is a DOA holder, or recognised equivalent, then the certification programme will be developed by the prime designer /integrator and provided to the Authority through the Project Office;

if the Project Office is the integrator of multiple design elements, then the Project Office develops and submits the certification programme as the Applicant; or

if design organisation/s do not hold a DOA or recognised equivalent, or have not been contracted to develop a certification programme, then the Project Office will be required to develop and submit the certification programme as the Applicant.

For software certification aspects, the Authority encourages applicants to develop a Plan for Software Aspects of Certification (PSAC), or equivalent document, and provide it as an enclosure to the certification programme.

**AMC 21.A.15(b)(5) -Breakdown of the certification programme into compliance demonstration items (CDIs)****1. What is a CDI?**

A CDI is a meaningful group of compliance demonstration activities and data identified in the certification programme which can be considered in isolation for the purpose of performing the risk assessment that allows the Authority to determine its level of involvement (Lol) using a risk-based approach.

The possibility to create this grouping of compliance demonstration activities and data is intended to facilitate the risk assessment. However, there may be cases in which the risk assessment may also be performed at the level of the compliance demonstration activity or data, or at the level of the whole certification project.

The chosen breakdown into CDIs may affect the resulting risk classes (please refer to MSTAR 21.A.15(b)(6) and AMC 21.A.15(b)(6)), but should not have any effect on the compliance demonstration itself or on the Authority's Lol.

**2. The grouping of compliance demonstration activities and data**

The compliance demonstration activities and data grouped in a CDI may demonstrate compliance with are requirement, a group of requirements, or even a part of a requirement. In this context, 'requirement' means any element of the type certification basis as specified in MSTAR 21.A.17A, or the environmental protection requirements as specified in MSTAR 21.A.18.

A CDI may comprise any of the means of compliance listed in **Appendix A to MSTAR AMC 21.A.15(b)**.

CDIs may be tailored to the scope and size of the project. On simple projects, a CDI may address all the compliance demonstration activities within a given technical area (e.g. avionics, flight, structures, hydromechanical systems, etc.) or of the whole project.

A CDI should not be too large, by combining completely unrelated compliance demonstration activities or data, so that it becomes meaningless, but neither should it be so small that it might not be considered in isolation from some other related compliance demonstration activities or data.

A way of meaningfully grouping compliance demonstration activities and data, for example, is to select some activities and data and group them into a single CDI, as the certification programme must already contain the applicable requirements, the proposed means of compliance for each requirement, as well as the associated compliance documents for each means of compliance. Another way to meaningfully group the data is to do it at the level of the technically related compliance demonstration activities and data. This may facilitate the assessment of those activities and data against the novelty, complexity, and criticality criteria (see MSTAR 21.A.15(b)(6) and AMC 21.A.15(b)(6)). The resultant CDI may encompass various means of compliance.

#### **AMC 21.A.15(b)(6) - Level of Involvement (LoI)**

The proposed assessment shall take into account at least the following elements:

1. novel or unusual features of the certification project, including operational, organisational and knowledge management aspects;
2. complexity of the design and/or demonstration of compliance;
3. criticality of the design or technology and the related safety and environmental risks, including those identified on similar designs; and
4. performance and experience of the design organisation of the applicant in the domain concerned.

Based on this assessment, the application shall include a proposal for the involvement of the Authority in the verification of the compliance demonstration activities and data.

#### 1. Definitions

**Risk:** the combination of the likelihood and the potential impact of non-compliance with part of the certification basis.

**Likelihood:** a prediction of how likely an occurrence of non-compliance with part of the certification basis is, based on a combination of the novelty and complexity of the proposed design and its related compliance demonstration activities, as well as on the performance of the design organisation.

**Criticality:** a measure of the potential impact of a non-compliance with part of the certification basis on product safety or on the environment.

**Compliance demonstration item (CDI):** a meaningful group of compliance demonstration activities and data of the certification programme, which can be considered in isolation for the purpose of performing a risk assessment.



**Certification panels:** The Authority's certification team may be structured in sub-groups (like EASA panels) covering dedicated areas of expertise and being composed of one or more experts who are responsible for a particular technical area.

**Discipline:** a discipline is a technical subarea of a certification panel.

**Level of involvement (Lol):** the compliance demonstration activities and data that the Authority retains for verification during the certification process, as well as the depth of the verification.

## 2. Background

The applicant has to submit a certification programme for their compliance demonstrations in accordance with MSTAR 21.A.15(b). The applicant has to break down the certification programme into meaningful groups of compliance demonstration activities and data, hereinafter referred as 'CDIs', and provide their proposal for the Authority's Lol.

The applicant should also indicate the certification panel(s) that is (are) affected by each CDI.

This AMC explains:

- (a) how to propose the Authority's Lol for each CDI as per MSTAR 21.A.15(b)(6), 21.A.93(b)(3)(iii), 21.A.432C(b)(6) as well as 21.A.113(b); and
- (b) how the Authority will determine its Lol on the basis of the criteria established in MSTAR 21.B.100.

The Authority will review the proposal and determine its Lol. Both parties, in mutual trust, should ensure that the certification project is not delayed through the Lol proposal and determination.

Additionally, in accordance with MSTAR 21.A.20, the applicant has the obligation to update the certification programme, as necessary, during the certification process, and report to the Authority any difficulty or event encountered during the compliance demonstration process which may require a change to the Lol that was previously notified to the applicant.

In such a case, or when the Authority has other information that affects the assumptions on which the Lol was based, the Authority will revisit its Lol determination.

In accordance with MSTAR 21.A.33, 21.A.447 and 21.A.615, irrespective of the Lol, the Authority has the right to review any data and information related to compliance demonstration.

Note: This AMC should not be considered to be interpretative material for the classification of changes or repairs.

## 3. Principles and generic criteria for the Lol determination

The Authority determines its Lol based on the applicant's proposal in view of the risk (the combination of the likelihood of an unidentified non-compliance and its potential impact). This is performed after proper familiarisation with the certification project in three steps:

- Step 1: identification of the likelihood of an unidentified non-compliance,
- Step 2: identification of the risk class, and
- Step 3: determination of the Authority's Lol.

This AMC contains criteria, common to all certification panels, for the determination of:

- any novel or unusual features of the certification project, including operational, organisational and knowledge management aspects;
- the complexity of the design and/or compliance demonstration;
- the performance and experience of the design organisation of the applicant in the domain concerned;
- the criticality of the design or technology and the related safety and environmental risks, including those identified on similar designs; and
- the data and activities to be retained by the Authority.

Note: EASA provides additional information on the criteria for the determination of the Lol in product certification, e.g. as contained in EASA Certification Memorandum (CM) 21.A/21.B-001, which may be used for reference but should not be considered to be AMC.

### **3.1. Lol determination at CDI level**

The determination of the Authority's Lol is performed at the level of the CDI (please refer to AMC 21.A.15(b)(5)).

The applicant should demonstrate that all affected elements of the type certification basis as specified in MSTAR 21.B.80, of the OSD certification basis as specified in MSTAR 21.B.82, and of the environmental protection requirements as specified in 21.B.85, the corresponding means, and methods of compliance, as well as the corresponding certification activities and data, are fully covered by the proposed CDIs. If the provided data does not clearly show that this is the case, the applicant should clearly state to the Authority that all the above-mentioned elements are fully covered.

Note: There could be different ways to 'clearly show' that all the elements of the certification basis are included in at least one CDI. For instance, this could be achieved by means of a 'CDI reference' column added in the table that lists all the elements of the certification basis.

### **3.2. Method for determining the likelihood of an unidentified non-compliance.**

#### **3.2.1. Principle**

The likelihood of an unidentified non-compliance is assessed on the basis of the following criteria:

- novelty,
- complexity, and

- the performance of the design organisation.

### 3.2.2. Novelty

For the purpose of risk class determination, the following simplification has been made: a CDI may be either novel or non-novel.

Whether or not a CDI is novel is based on the extent to which the respective elements of the certification project, as well as the related requirement or means of compliance, are new/novel to either the industry as a whole, or to the applicant, including their subcontractors, or from a certification panel perspective.

The determination that a CDI is novel may be driven by the use of new technology, new operations, new kinds of installations, the use of new requirements, or the use of new means of compliance.

When an applicant utilises a type of technology for the first time, or when that applicant is relatively unfamiliar with the technology, this technology is considered to be 'novel', even if other applicants may be already familiar with it. This also means that a type of technology may no longer be novel for one applicant, while it may still be novel for other applicants.

The following list includes some examples:

- new materials or combinations of materials;
- a new application of materials or combinations of materials;
- new manufacturing processes;
- a new or unusual aircraft configuration and/or system architecture;
- a novel reconfiguration of systems;
- a new interface or interaction with other parts or systems;
- the unusual location of a part or a system, or an unusual construction;
- a new or unusual use;
- new functions;
- new kinds of operations;
- the potential for new failure modes;
- the introduction of a new threat (e.g. new threats regarding fire, fuel, hydrogen, energy storage devices, etc.) or a new prevention/detection/mitigation method;
- new maintenance techniques;
- novel operating conditions or limitations;
- a new human-machine interface (HMI); or

- new flight or cabin crew tasks.

**Note:** Flight crew may also consist of additional crew members, such as load master or jump master, hoist operator etc., as applicable.

Another consideration is the extent to which the requirements, means of compliance or guidance have changed or need to be adapted due to particular novel features of the design. The following list includes some examples:

- recently issued or amended airworthiness codes with which the applicant has little or no experience;
- new or adapted special conditions;
- new or adapted equivalent safety findings;
- new or adapted deviations;
- new or adapted guidance or interpretative material;
- new or adapted means of compliance (i.e. other than those previously applied by the applicant) or unusual means of compliance (different from the existing guidance material and/or different from industry standard practices), e.g. the replacing of tests by simulation, numerical models or analytical methods;
- the use of new or adapted industry standards or in-house methods, as well as the Authority's familiarity with these standards and methods;
- a change in methodology, tools or assumptions (compared with those previously applied by the applicant), including changes in software tools/programs; or
- novelty in the interpretation of the results of the compliance demonstration, e.g. due to in-service occurrences (compliance demonstration results are interpreted differently from the past).

Additional new guidance/ interpretative material, e.g in the form of new EASA certification memoranda (EASA CM), may be considered for the determination of novelty if its incorrect application/use may lead to an unidentified non-compliance. In the context of novelty, the time between the last similar project and the current project of the applicant should also be considered.

Regardless of the extent of an organisation's previous experience in similar projects, a CDI may be classified as novel if there are specific discontinuities in the process for transferring information and know-how within the organisation.

### 3.2.3. Complexity

For the purpose of risk class determination, the following simplification has been made: a CDI may be either complex or non-complex. For each CDI, the determination of whether it is complex or not may vary based on factors such as the design, technology, associated manufacturing process, compliance demonstration (including test set-ups or analysis), interpretation of the results of the compliance demonstration, interfaces with other technical disciplines/CDIs, and the requirements. The compliance demonstration may be considered to be 'complex' for a complex (or highly integrated)

system, which typically requires more effort from the applicant. The following list includes some examples:

- Compliance demonstration in which challenging assessments are required, e.g.:
  - for requirements of a subjective nature, i.e. they require a qualitative assessment and do not have an explicit description of the means of compliance with that requirement, or the means of compliance are not a common and accepted practice; this is typically the case where the requirement uses terms such as 'subjective', 'qualitative', 'assessment' or 'suitable'/'unsuitable'
  - in contrast, engineering judgment for a very simple compliance demonstration should not be classified as 'complex';
  - a test for which extensive interpretation of the results may be anticipated;
  - an analysis that is sensitive to assumptions and could potentially result in a small margin of safety;
  - the classification of structures, depending on the conservatism of the method;
  - an advanced analysis of dynamic behaviour;
  - a multidisciplinary compliance demonstration in which several panels are involved and interface areas need to be managed (e.g. sustained engine imbalance, extended-range twin-engine operation performance standards (ETOPS), 2X.1309 assessment, flight in known icing conditions, full authority digital engine control (FADEC)-controlled engines, etc.);
  - when the representativeness of a test specimen is questionable, e.g. due to its complexity;
- the introduction of complex work-sharing scheme with system or equipment suppliers.

For major changes, the complexity of the change should be taken into account, rather than the complexity of the original system.

Whether or not a CDI is complex should be determined in a conservative manner if this cannot be determined at an early stage of the certification project. When greater clarity has been achieved, the complexity may be re-evaluated and the Lol adapted accordingly.

#### 3.2.4. Performance of the design organisation

The assessment of the level of performance of the design organisation takes into account the applicant's experience with the applicable certification processes, including their performance on previous projects and their degree of familiarity with the applicable certification requirements.

For approved design organisations, the Authority uses relevant data to consider the design organisation's expected performance at an organisational, panel or discipline level, depending on the availability of data.

This data stems from design organisation audits, the applicant's measured level of performance on previous projects, and their performance during the familiarisation phase. The Authority shares the data with the respective design organisation in an appropriate manner.

**Note:** The ultimate objective is to define the organisation's performance at the discipline level.

For each CDI proposed by the applicant, the DOA holder's performance associated with the affected disciplines or panels is to be considered.

If one CDI affects more panels or disciplines than the others, a conservative approach should be followed in selecting the lower performance level. As an alternative, CDI may be assessed separately for each affected certification panel or discipline.

If, for a well-established organisation, there is no shared performance data available at the panel level, it may be acceptable to propose the overall DOA holder's performance. If the organisation or its scope are fundamentally new, the 'unknown' level of performance should be conservatively proposed by the applicant.

The determination of the performance of the design organisation may also take into consideration information that is more specific or more recent than the information on the DOA holder's dashboard, e.g. experience gained during technical familiarisation with the current certification project, the performance of compliance verification engineers and of the affected technical areas, as well as the performance of the design organisation in overseeing subcontractors and suppliers.

The performance of some applicants' organisations is not known if:

- the Authority has agreed in accordance with MSTAR 21.A.14(b) that the applicants may use procedures that set out specific design practices, as an alternative means to demonstrate their capability (excluding technical standard order (TSO) applicants for other than APU, covered by MSTAR 21.B.100(b))

In these cases, the assumed level of performance is 'unknown'.

Exceptionally, the Authority may consider a higher level of performance for a specific CDI if that is proposed and properly justified by the applicant.

The following list includes some examples:

- a CDI with which the Authority is fully familiar and satisfied (from previous similar projects) regarding the demonstration of compliance proposed by the applicant;
- if the applicant fully delegates the demonstration of compliance to a supplier that holds a DOA, the performance level of the supplier may be proposed.

### 3.2.5. Likelihood of an unidentified non-compliance

Assessing the likelihood of an unidentified non-compliance is the first step that is necessary to determine the risk class.

The likelihood of an unidentified non-compliance should not be confused with the likelihood of occurrence of an unsafe condition as per AMC 21.A.3B(b). In fact, that AMC provides the Authority's confidence level that the design organisation addresses

all the details of the certification basis for the CDI concerned, and that a non-compliance will not occur.

The likelihood of an unidentified non-compliance is established as being in one of four categories (very low, low, medium, high), depending on the level of performance of the design organisation as assessed by the Authority, and on whether the CDI is novel or complex, as follows:

<b>Step 1 — Likelihood of an unidentified non-compliance</b>			
CDI Performance level of the DOAH	No novel aspects, no complex aspects	No novel aspects, but complex ones; Novel aspects, but no complex ones	Novel and complex aspects
High	Very low	Low	Medium
Medium	Low	Medium	High
Low or unknown	Medium	High	High

### 3.3. Criticality

The second step that is necessary to determine the risk class is the assessment of the potential impact of a non-compliance on part of the certification basis regarding the airworthiness or the environmental protection of the product. For the purpose of risk class determination, the following simplification has been made: the impact of non-compliance can be either critical or non-critical.

Some of the guidance below has been derived from GM 21.A.91, not due to a major/minor change classification, but because the same considerations may be applied to determine the effect of non-compliance on the airworthiness or environmental protection at the CDI level. It is, therefore, normal that some of the CDIs of a major change that consists of several CDIs may be critical, and others may be non-critical.

The potential impact of non-compliance within a CDI should be classified as critical if, for example:

- a function, component or system is introduced or affected where the failure of that function, component or system may contribute to a failure condition that is classified as hazardous or catastrophic at the aircraft level, for instance, for 'equipment, systems and installations', e.g. where applicable as defined in EASA CS.2X.1309;
- a CDI has an appreciable effect on the human-machine interface (HMI) (displays, approved procedures, controls, or alerts);
- airworthiness limitations or operating limitations are established or potentially affected;
- a CDI is affected by an existing airworthiness directive (AD), or affected by an occurrence (or occurrences) potentially subject to an AD, a known in-service issue, or by a safety information bulletin (SIB); or

- a CDI affects parts that are classified as critical, e.g. as per EASA CS 27.602/29.602, CS-E 515, or that have a hazardous or catastrophic failure consequence (e.g. a principal structural element as per EASA CS 25.571).

If the classification of the potential impact of non-compliance within a CDI as critical is based on the criterion that the CDI is affected by an AD, then the impact of non-compliance within that CDI may be reclassified by the Authority as non-critical due to the involvement of the Authority in the continued-airworthiness process.

During the early stages of a project, the criticality in terms of the potential safety consequence of a failure may not always be known but should be conservatively estimated, and the Lol should be subsequently re-evaluated, if appropriate.

### 3.4. Method for the determination of risk classes

The risk is determined as a combination of the potential impact of an unidentified non-compliance with part of the certification basis (vertical axis) and of the likelihood of the unidentified non-compliance (horizontal axis) using the following matrix. As a consequence, four qualitative risk classes are established at the CDI level.

Step 2 — Risk classes				
Likelihood (see Section 3.2.5) Criticality (see Section 3.3)	Very low	Low	Medium	High
Non-critical	Class 1	Class 1	Class 2	Class 3
Critical	Class 1	Class 2	Class 3	Class 4

The various inputs and the resulting risk class determination are of a continuous nature, rather than consisting of discrete steps. The selected risk class provides the order of magnitude of the Authority's involvement and is used as a qualitative indicator for the determination of the Authority's involvement described in Section 3.5 below.

Under specific circumstances, the risk class that is determined on the basis of the above criteria may be reduced or increased on the basis of justified and recorded arguments.

For a reused and well-proven item of compliance demonstration for which:

- the CDI is independent of the affected product type or model; and
- the design, operation, qualification, and installation of the product are basically the same; and
- the certification process is identical to one that was used in a modification already approved by the Authority,

the CDI may be accepted as being similar, resulting in reduced Lol, as the likelihood of an unidentified non-compliance is low. Furthermore, when an identical CDI is reused for the compliance demonstration in a new project, there is no involvement in the compliance demonstration verification, as the likelihood of an unidentified non-compliance is very low.



### 3.5. Determination of the Authority's Lol

The Authority's Lol in the verification of compliance demonstration is proposed by the applicant and determined by the Authority in Step 3 on the basis of the qualitative risk class identified per CDI in Step 2, as well as by applying sound engineering judgement.

The Authority's Lol is reflected in a list of activities and data, in which the Authority retains the verification of compliance demonstration (e.g. review and acceptance of compliance data, witnessing of tests, etc.), as well as the depth of the verification. The depth of the verification for individual compliance reports, data, test witnessing, etc., may range from spot checks to extensive reviews. The Authority always responds to those retained compliance demonstration activities and data with corresponding comments or a 'statement of no objection'.

In addition, some data that is not retained for verification may be requested for information. In this case, no 'statement of no objection' will be provided.

It is recommended that an Lol should be proposed for each of the technical areas (see certification panels and disciplines) involved. Depending on the risk classes determined in Section 3.4 above, the Authority's Lol in:

- (a) compliance demonstration verification data; and
- (b) compliance demonstration activities (witnessing of tests, audits, etc.), may be as follows:
  - risk Class 1: there is no Authority involvement in verifying the compliance data/activities performed by the applicant to demonstrate compliance at the CDI level;
  - risk Class 2: the Authority's Lol is typically limited to the review of a small portion of the compliance data; there is either no participation in the compliance activities, or the Authority participates in a small number of compliance activities (witnessing of tests, audits, etc.);
  - risk Class 3: in addition to the Lol defined for Class 2, the Authority's Lol typically comprises the review of a large amount of compliance data, as well as the participation in some compliance activities (witnessing of tests, audits, etc.); and
  - risk Class 4: in addition to the Lol defined for Class 3, the Authority's Lol typically comprises the review of a large amount of compliance data, the detailed interpretation of test results, and the participation in a large number of compliance activities (witnessing of tests, audits, etc.).

By default, the following activities require the Authority's involvement in all cases:

- initial issues of, and changes to, a flight manual (for those parts that require approval by the Authority and that do not fall under the DOA holder's privilege);
- classification of failure cases that affect the handling qualities and performance, when:
  - performed through test (in flight or in a simulator); and
  - initial issues of, and non-editorial changes to, airworthiness limitations.

If the risk assessment (Steps 1 and 2 above) is made on the level of a compliance demonstration activity or on the level of a document, the risk class provides an indication for the depth of the involvement, i.e. the verification may take place only for certain compliance data within a compliance document.

#### **4. Documentation of the Lol**

The Lol proposal in the certification programme should include the applicant's proposal regarding the compliance demonstration verification activities and data that would be retained by the Authority, as well as the data on which the Lol proposal has been based. For this purpose, the applicant should appropriately document the analysis per CDI, considering the above criteria. In cases where the rationale for the assessment is obvious, it is considered to be sufficient for the applicant to indicate whether or not a CDI is novel or complex, and whether or not the impact is critical.

The Authority documents the Lol determination by accepting the certification programme or, if it deviates from the proposal, by recording its analysis regarding the deviations from the proposal, and notifies the applicant accordingly.

#### **5. Sampling during surveillance of the DOA holder**

It should be noted that all the previously defined risk classes may be complemented by the sampling of project files during surveillance of the DOA holder, independently from the ongoing certification project. This is necessary in order to maintain confidence in the DOA system and to constantly monitor its performance.

#### **GM 21.A.15(b)(6) - Level of Involvement**

The Authority will determine the depth and extent of its inspections for each group of compliance demonstration activities and data, based on the information provided in the certification programme and the applicant proposal.

The Authority determination of Lol will be confirmed as part of the Authority's acceptance of the certification programme. The Authority Lol must be confirmed as completed prior to the applicant issuing the final declaration of compliance required by MSTAR 21.A.20(d).

The depth and extent of the Authority inspections may change throughout the project in order to account for changes that affect the basis of initial determinations. The provisions of MSTAR 21.A.257(b) continue to apply.

The Authority may appoint individuals outside the Authority, including individuals within another NAA/MAA, to complete the Authority inspections.

#### **GM 21.A.15(c) - Updates to the certification programme**

MSTAR 21.A.15(b) recognises that the initial submission of the certification programme may not be fully complete, e.g. due to schedule constraints of the design, analysis and testing activities.

Furthermore, even if the initial submission of the certification programme is complete, it may be necessary to amend it throughout the duration of the project.

The certification programme should be updated and resubmitted to the Authority as required, in particular when there are updates to the following elements:

1. any complementary information that was not included in the initial submission of the certification programme;
2. any change in the intended use or kind of operations of the product itself or of the aircraft on which the product is installed;
3. a change in the key characteristics of the product such as but not limited to any declared limits that are intended to be recorded in the type certificate data sheet (TCDS);
4. any change in the product design or its characteristics that may affect the criteria used to assess the likelihood of an unidentified non-compliance with the type certification basis or the environmental protection requirements, including the potential impact of that non-compliance on product safety or environmental protection, as defined in MSTAR 21.A.15(b)(6) and MSTAR AMC 21.A.15(b)(6);
5. any change to the initial type certification basis or environmental protection requirements, as applicable to the product, regardless of whether the change is initiated by the Authority or by the applicant;
6. any change in the breakdown of the certification programme into compliance demonstration items (CDIs) or in the content of those CDIs;
7. any change in the proposed means of compliance, including its/their methodology;
8. any change in the structure of compliance documents that may affect the determination of the Authority's level of involvement (Lol), based on the criteria in MSTAR AMC 21.A.15(b)(6);
9. any relevant change to the design organisation approval (DOA) holder's personnel (and design organisation (DO) suppliers) who are involved in the project; and
10. any changes to the schedule that impact on the Authority Lol.

Following each update to the certification programme as submitted by the applicant, the Authority may update the determination of its Lol.

**GM 21.A.15(e) - Period of validity for the application for a Malaysian State Type Certificate (MSTC) or Restricted Malaysian State Type Certificate (RMSTC)**

MSTAR 21.A.15(e) establishes a maximum period of validity for an application for an MSTC or an MSRTC. During this period, the type certification basis and the environmental protection requirements (hereinafter referred to as the 'certification basis'), established in accordance with MSTAR 21.A.17A, and MSTAR 21.A.18, remain effective. However, the period of validity of the certification basis is limited so that the standards established as part of the certification basis at the time of application do not become outdated

For various reasons (e.g. development, business, commercial, etc.), the applicant may not be able to complete the certification within the established time limit. In this case,

the applicant can apply for an extension of the initial application (see MSTAR 21.A.15(f)):

In this case, the applicant proposes a 'new target date' to the Authority for the issuance of the certificate. Respecting the time limits established under 21.A.15(e), the Authority may then use that date to notify airworthiness codes and standards that will become the reference for a revised certification basis.

**GM 21.A.15(f) - Period of validity for the application for a Malaysian State Type Certificate (MSTC) or Restricted Malaysian State Type Certificate (RMSTC)**

MSTAR 21.A.15(e) establishes a maximum period of validity for an application for an MSTC or an RMSTC. During this period, the type certification basis and the environmental protection requirements (hereinafter referred to as the 'certification basis'), established in accordance with MSTAR 21.A.17A, and 21.A.18, remain effective. However, the period of validity of the certification basis is limited so that the standards established as part of the certification basis at the time of application do not become outdated.

For various reasons (e.g. development, business, commercial, etc.), the applicant may not be able to complete the certification within the established time limit. In this case, the applicant can apply for an extension of the initial application (see MSTAR 21.A.15(f)):

In this case, the applicant proposes a 'new target date' to the Authority for the issuance of the certificate. Respecting the time limits established under 21.A.15(e), the Authority may then use that date to notify airworthiness codes and standards that will become the reference for a revised certification basis.

3. **21.A.16A Airworthiness Codes**

**GM 21.A.16A – Airworthiness Codes**

Rather than define a DGTA-unique Airworthiness Code, the Authority has elected to recognise the suite(s) of airworthiness design requirements, i.e. Airworthiness Codes, prescribed by several other NAAs and MAAs that have been demonstrated to achieve safe flight, and then prescribe supplementation as required.

4. **21.A.16B Special Conditions**

**AMC 21.A.16B - Special Conditions**

Authority prescribed 'Special Conditions' may be documented as Certification Review Items (CRI) or inserted directly in the aircraft Type certification Basis (TCB).

**GM 21.A.16B - Special Conditions**

**General**

The term 'novel or unusual design features' should be judged in view of the applicable certification basis for the product. A design feature, in particular, should be judged to be a 'novel or unusual design feature' when the certification basis does not sufficiently cover this design.

The term 'unsafe condition' is used with the same meaning as described in MSTAR GM 21.A.3B(b).

The term 'newly identified hazards' is intended to address new risks that may be recognised in the design (e.g. questionable features) or its operational characteristics (e.g. volcanic ash) for which there is not yet enough in-service experience.

#### **GM1 21.A.16B - Special Conditions**

The Airworthiness Code selected for use under MSTAR 21.A.16A may contain deficiencies against contemporary airworthiness requirements and/or may not account for SAO's unique Configuration, Role and operating Environment (CRE). This may require the application of special conditions in addition to an Airworthiness Code. The Aviation Design Requirements Manual (ADRM) (To be inserted later) defines 'essential' design requirements and standards that must be applied as special conditions to supplement Airworthiness Codes due to deficiencies in the Codes or to account for the SAO CRE in addition to the reasons described in MSTAR 21.A.16B(a). The ADRM also defines a number of 'recommended' design requirements and standards for which compliance is not prescribed, but which should be applied where reasonably practicable.

#### **5. 21.A.17A Type certification basis for a type certificate or restricted type certificate**

##### **AMC 21.A.17A - Type certification basis**

Airworthiness requirements specified in the Type Certification Basis (TCB) shall include; the applicable requirements from the Authority recognised Primary Certification Code selected as a basis for the SAO aircraft certification; the applicable 'essential' requirements prescribed in the Aviation Design Requirements Manual (ADRM) (To be inserted later); and any supplementation or tailoring approved by the Authority in accordance with MSTAR AMC1 to 21.A.17A.

The scope of the TCB shall be limited to those requirements necessary to cover all the criteria listed in the European Military Airworthiness Certification Criteria (EMACC) for the intended Configuration, Role, and Operating Environment (CRE). For novel aircraft designs, where necessary and sufficiently applicable airworthiness criteria are not included in the EMACC, additions may be approved by the Authority.

##### **AMC1 21.A.17A – Supplementation and tailoring of primary certification code.**

Supplementation to, or tailoring of, a Primary Certification Code (PCC), as described at 21.A.17A(a)1- (a)3, (b) and (c), shall be agreed with the Authority and documented via Certification Review Items (CRIs) as follows:

a. **Elect to Comply.** Compliance with requirements at later amendments (per MSTAR 21.A.17A(a)(1)) shall be documented in an Elect to Comply MCRI when further justification for adoption of the later amendment is required to be recorded. Further justification would be required if there is a need to establish why the change to the later amendment does not have a negative impact on safety or where there is a need to place limits or conditions on the use of the later amendment. Other uses of later amendments may be documented directly in the TCB section of the Type Certificate Data Sheet (TCDS).

- b. **Equivalent Safety Finding.** Any alternative to a designated airworthiness requirement justified via an equivalent level of safety (per MSTAR 21.A.17A(a)(2)) shall be documented in an Equivalent Safety Finding MCRI.
- c. **Exception.** Exceptions (per MSTAR 21.A.17A(a)(3)) shall be documented in an Exception MCRI, which must be underpinned by an understanding of the risk associated with the compliance shortfall, and management of that risk in accordance with MSTAR SMS.A.25(b)2.2.
- d. **Special Condition.** Special conditions (per MSTAR 21.A.17A(b) and 21.A.16B) shall be documented in a Special Condition MCRI where they implement a requirement that requires tailoring, discussion, or explanation, or where the special condition relates to internal SAO documents which are not readily available to external designers. In all other cases, the special condition may be implemented via direct reference to the relevant requirement/standard within the TCB section of the TCDS.
- e. **Interpretive Material/Means of Compliance/Acceptable Means of Compliance (IM/MOC/AMC).** An IM/MOC/AMC MCRI may be used to record the development of new interpretative material or acceptable means of compliance for TCB elements or where the applicant proposes to use an extant IM/MOC/AMC, but only in parts or with some changes to the content.

Requirements for military operations (per MSTAR 21.A.17A(c)) may include requirements in the form of special conditions, alternate requirements justified via an equivalent level of safety, or exceptions against requirements to account for military capability imperatives. These shall be documented per the above guidance for each type of requirement/ tailoring.

**Note:** A single CRI may collate multiple claims if the applicable elements are all related, e.g. fatigue and damage tolerance shortfalls may affect multiple elements of a TCB and hence one CRI may be appropriate.

### **GM 21.A.17A - Type certification basis for Malaysian State Type Certificate (MSTC) or Restricted Malaysian State Type Certificate (RMSTC)**

#### **1. Introduction**

This GM addresses the type certification basis for an MSTC or an RMSTC.

#### **2. Applicable Requirements of the Airworthiness Code (see MSTAR 21.A.17A(a))**

The type certification basis for an MSTC or an RMSTC consists of the requirements from the established airworthiness code that were effective on the date of application and were applicable for that certificate.

The effectivity date of the initial application may be changed, as per MSTAR 21.A.15(f)(2), when the period of validity of an application for a type certificate is exceeded, or it is evident that it will be exceeded, and the applicant requests an extension; see MSTAR GM 21.A.15(e) and (f).

The certification basis is then revised accordingly.

**3. Elect to Comply (see MSTAR 21.A.17A(a)(1))**

It is also possible for an applicant to elect to comply with an airworthiness requirement that entered into force after the date on which the applicant has submitted the application.

The Authority will assess whether the proposed certification basis is appropriate to ensure that the 'elect to comply' proposal includes any other airworthiness requirements that are 'directly related' to one or several of the airworthiness requirements in it. Directly related airworthiness requirements are those that are deemed to contribute to the same safety objective by building on each other's requirements, addressing complementary aspects of the same safety concern, etc. Typically, they are adopted simultaneously with, or prior to, the airworthiness requirements with which the applicant has elected to comply.

**4. Equivalent Level of Safety (see MSTAR 21.A.17A(a)(2))**

In cases in which the applicable airworthiness requirements cannot be literally complied with, either fully or in part, the Authority may accept a suitable alternative which provides an equivalent level of safety through the use of appropriate compensating factors.

In cases in which the requirements contain not only objectives but also prescriptive parts, an equivalent level of safety may be accepted if:

- the objectives are met by designs or features other than those required in the airworthiness requirements; or
- suitable compensating factors are proposed.

**5. Exceptions (see MSTAR 21.A.17A(a)(3))**

**To be inserted in a later date.**

**6. Special Conditions (see MSTAR 21.A.16B)**

The Authority may also prescribe special conditions in accordance with MSTAR 21.A.16B. Guidance on special conditions is provided in MSTAR GM 21.A.16B, MSTAR GM1 21.A.16B and MSTAR GM2 21.A.16B.

**GM1 21.A.17A - Type certification Basis**

The Type Certification Basis (TCB) for a new state aircraft should be developed and agreed with the Authority as early as practicable in the aircraft acquisition lifecycle. While an Authority-agreed TCB should be pursued prior to entering into an acquisition contract, this will not always be possible. In those cases, the SAO may elect to present a draft TCB for Authority assessment as a cost and schedule risk reduction measure.

The TCB for a state aircraft must be consistent with SAO intended role and operating environment for the aircraft. Information on the intended role and operating environment is to be provided in the certification programme, per the requirements at MSTAR 21.A.15(b)4 and (b)5 but will normally reference out to an endorsed Statement of Operating Intent and Usage (SOIU) which provides this detail. TCB agreement is obtained through approval of the certification programme in accordance with MSTAR 21.A.15(b).

In the aircraft Type Certification domain, Configuration, Role and operating Environment (CRE) is a pivotal concept. Where an ab initio Type Certification programme is proposed for a State aircraft, defining the CRE is essential to ensure that the basis of certification is consistent with the intended SAO use of the aircraft.

Where the state aircraft Type Certification programme intends to leverage prior certification from a recognised N/MAA to any extent, a CRE delta assessment is required to confirm the applicability of that prior certification to the intended SAO use. Areas where the prior certification is not entirely applicable to the SAO CRE must be addressed through further compliance demonstration evidence, inclusion of additional requirements in the TCB, or tailoring of requirements for the TCB.

#### **AMC 21.A.17A(a) – Date of Application**

In cases where the certification approach for an MSTC or RMSTC relies on prior certification from another NAA/MAA, the Authority may agree to consider the 'date of application' IAW MSTAR 21.A.17A(a) to be the date of application to the original certifying NAA/MAA, for the purpose of determining the applicable airworthiness requirements under 21.A.17A(a). In assessing a request to use the date of application of the original NAA/MAA certification, the Authority shall consider the following:

- The period of time since the original NAA/MAA certification was provided.
- The safety improvements in the relevant airworthiness code since the original NAA/MAA certification was provided.
- The deltas in configuration, role, and operating environment which would limit the extent to which the prior certification could be leveraged.

#### **GM 21.A.17A(a)(3) - Type-certification Basis**

The EMACC Guidebook offers guidance on how to tailor the criteria for the type certification basis based on the intended military use of the product.

### **6. 21.A.20 Demonstration of compliance with the type certification basis and environmental protection requirements**

#### **AMC 21.A.20 Demonstration of compliance with the type certification basis and environmental protection requirements**

##### **1. Demonstration of Compliance**

The applicant shall demonstrate compliance with the type certification basis either:

- a. through Compliance Demonstration evidence developed by a DOA holder (or alternative as agreed by the Authority); or
- b. through appropriate evidence of prior certification provided by another NAA/ MAA.

**Note:** Compliance Demonstration evidence comprises of reports, drawings, specifications, calculations, analysis etc. and provides a record of the means by



which compliance with the applicable Type Certification Basis (TCB) and environmental protection requirements is demonstrated.

## 2. Prior Certification from another NAA/ MAA

Where SAO is procuring off-the-shelf aircraft or equipment, the applicant may seek relief from the need to develop Compliance Demonstration evidence. The applicant may claim that requisite inspections/ analyses/ tests (as required by MSTAR 21.A.33 – Inspections and tests) have already been performed, as evidenced by an extant certification by an NAA / MAA whose certification is recognised by the Authority. The applicant, in leveraging a prior certification to claim part or full relief against the requirement to develop Compliance Demonstration evidence shall ensure:

- a. the certification is within the scope, conditions, and caveats specific to DGTA Recognition of the certifying NAA / MAA;
- b. the NAA / MAA is sufficiently experienced in certification of the particular design activity;
- c. the certification requirements employed by the NAA / MAA are understood, and any deltas from the SAO TCB have been addressed through additional compliance demonstration evidence or changes to the TCB in accordance with MSTAR AMC1 to 21.A.17A;
- d. the Configuration, Role, and operating Environment (CRE) applied to the prior certification is understood, and any deltas from the intended SAO CRE have been addressed through additional compliance demonstration evidence or changes to the TCB in accordance with MSTAR AMC1 to 21.A.17A;
- e. any safety risks associated with the NAA / MAA certification:
  - i. have been identified, and
  - ii. have been eliminated or otherwise minimised using ALARP/ SFARP or other DGTA acceptable methods for the SAO CRE.

The list of recognised NAA / MAA whose prior certification may be exploited by applicants in seeking relief from developing compliance demonstration evidence is available via the DGTA website: *Recognition of other Aviation Authorities* or the respective department in DGTA. Individual recognition certificates establish scope, conditions, and caveats.

If, during the course of the project, SAO learns of some breakdown or deficiency in the application of the NAA / MAA usual processes, those cannot be ignored. The Authority will determine what additional Compliance Demonstration evidence must be produced by the DOA holder (or Authority-accepted equivalent) as a result of the breakdown or deficiency.

### GM 21.A.20 – Compliance Demonstration Process

MSTAR 21.A.20 applies to the compliance demonstration process for a Malaysian State Type Certificate (MSTC) (or a Restricted Malaysian Type Certificate (RMSTC)) and, by cross references to MSTAR Part 21 Subpart D and E, to compliance demonstration processes for major changes to an TC (see MSTAR 21.A.97(b)(3)) and

an MSTC (see MSTAR 21.A.115(b)(4)).

Applicants for an MSTC (or an RMSTC) should apply MSTAR 21.A.20 in full. Applicants for a major change to an MSTC (or an STC) are required (see MSTAR 21.A.97(b)(3) and MSTAR 21.A.115(b)(4)) to apply MSTAR 21.A.20 as applicable to the change.

'As applicable to the change' means that:

1. The certification programme to be followed is the one prepared for the major change or STC in accordance with MSTAR 21.A.93, as accepted by the Authority; and
2. The certification basis (consisting of the type certification basis and the environmental protection requirements) is the one established in accordance with MSTAR 21.A.101.

MSTAR 21.A.20 also applies to major changes to an MSTC or an STC approved by design organisation approval (DOA) holders under their privilege as per MSTAR 21.A.263(c)(8) or (9) (see also MSTAR 21.A.97(b)(3) and MSTAR 21.A.115(b)(4)). As in this case, there is no application and no involvement of the Authority, MSTAR 21.A.20 should be applied with the following adaptations:

- the certification programme to be followed, including the certification basis and the detailed means of compliance, should be almost identical to the one accepted by the Authority for a major change or an MSTC when approved for the scope of the privilege as per MSTAR 21.A.263(c)(8) or (9); it may differ in some aspects (e.g. the detailed description of the changes), but it should be shown to remain in the frame of the corresponding justification document; and
- the means by which such compliance has been demonstrated (see MSTAR 21.A.20(a)) and the final declaration of compliance (see MSTAR 21.A.20(e)) should be kept on record and submitted to the Authority only if requested during its DOA continued surveillance process.

#### **GM 21.A.20(b) – Reporting on the Compliance Demonstration Process**

The applicant should report to the Authority any unexpected difficulty or event encountered during the compliance demonstration that invalidates or appreciably affects the assumptions previously made, for example:

1. An increase in the severity of the consequences of a certain condition (e.g. failure mode) of the product;
2. Significantly reduced margin(s) for the 'pass-fail' criteria of the compliance demonstration;
3. Changes to the test sequences and conditions that are not in line with the certification specifications or guidance;
4. An unusual interpretation of the results of the compliance demonstration; and
5. Any significant failure or finding resulting from the tests performed as per MSTAR 21.A.33 or MSTAR 21.A.35.

The applicant should also evaluate whether the unexpected difficulty or event encountered will impact on the certification programme and, if necessary, amend it as per MSTAR 21.A.15(c).

### **AMC 21.A.20(c) – Compliance Documentation**

1. Compliance documentation comprises one or more test or inspection programmes/plans, reports, drawings, design data, specifications, calculations, analyses, etc., and provides a record of the means by which compliance with the applicable type certification basis and environmental protection requirements is demonstrated.
2. Each compliance document should normally contain:
  - The reference of the elements of airworthiness requirements prescribed in the certification basis, special conditions or environmental protection requirements addressed by the document;
  - Substantiation data demonstrating compliance (except test or inspection programmes/plans);
  - A statement by the applicant declaring that the document provides the proof of compliance for which it has been created; and
  - The appropriate authorised signature.
3. Each compliance document should be unequivocally identified by its reference and issue date. The various issues of a document should be controlled and comply with MSTAR 21.A.55.

### **GM 21.A.20(d) – Final Statement**

All compliance demonstrations in accordance with the certification programme, including all the inspections and tests in accordance with MSTAR 21.A.33 and all flight tests in accordance with MSTAR 21.A.35, should be completed before the issuance of the final statement of compliance required by MSTAR 21.A.20(d).

If so agreed by the Authority, some compliance documentation may be produced after the issuance of the final statement of compliance required by 21.A.20(d).

'No feature or characteristics' in MSTAR 21.A.20(d)2 means the following: while every effort is made to address in the applicable certification basis all the risks to product safety or to the environment that may be caused by the product, experience shows that safety-related events may occur with products in service, even though compliance with the certification basis is fully demonstrated. One of the reasons may be that some existing risks are not properly addressed in the certification basis. Therefore, the applicant has to declare that they have not identified any such features or characteristics.

MSTAR 21.A.20 also applies by reference to minor changes, in which case the risk to product safety or to environmental protection is quite low. Nevertheless, minor changes should not be approved if either the applicant/design organisation approval (DOA) holder approving minor changes under their privileges, or the Authority, is aware of a feature or characteristic that may make the product unsafe for the uses for which certification is requested.

Where a recognised certified design has been leveraged to relieve the applicant from developing compliance demonstration evidence, the basis upon which the declaration of compliance is made is the applicant's completion of the requirements of MSTAR AMC 21.A.20.

7. **21.A.21 Issue of a type certificate**

**GM 21.A.21(a)(3)(i) - Issue of a type certificate for Engines and Propellers**

While an MSTC will be issued for every aircraft type to be State Registered aircraft, MSTC will not ordinarily be issued for engines and propellers of State registered aircraft unless exceptional circumstances exist. Exceptional circumstances include, but are not limited to, an engine or propeller not previously type certified under another recognised airworthiness authority, or where SAO elects to manage the engine or propeller configuration independently from other users of the same engine or propellers.

8. **21.A.33 Inspections and tests**

**AMC 21.A.33 - Inspections and tests**

Use of the term 'applicant': MSTAR 21.A.33 is applicable to type certification, major changes, major repairs, and supplemental type certificates (STCs), and through reference in MSTAR 21.A.604 to TSO for auxiliary power units (APUs). Despite using the word 'applicant', it is also applicable to major repairs approved under DOA privileges (see MSTAR 21.A.263(c)(5)).

Proposed type design: this term defines the type design (or the portion of the type design) as it is determined at the time when the inspection or test is undertaken.

Statement of conformity: for each certification inspection or test, the statement of conformity issued in accordance with MSTAR 21.A.33(c) must address the conformity of the test specimen (see MSTAR 21.A.33(b)(1)) as well as of the test equipment and measuring equipment (see MSTAR 21.A.33(b)(2)).

Conformity of the test specimen: the statement of conformity required by MSTAR 21.A.33(c) is intended to ensure that the manufactured test specimen adequately represents the proposed type design. Possible types of non-conformity may be the following:

1. Non-conformity between the design of the test specimen and the proposed type design at the time of the test. These are typically identified in the early stage of the test planning, and should be addressed as early as possible (e.g. in the test plan). There may be several reasons for such a non-conformity: to account for interfaces with the test equipment, to conservatively cover several or future design configurations, etc.
2. Non-conformity between the manufactured test specimen and the design of the test specimen. Such a non-conformity may be the result of the manufacturing of the test specimen.

While it is convenient to define any possible non-conformity in (a) as early as possible, the applicant does not need to make the distinction between the two types of non-conformity above as long as they are explicitly addressed and justified in the statement of conformity or by cross reference to the test plan or other documents.

Type certification is typically an iterative process in which the design is under continuous evolution. If the type design evolves after the time of the inspection or test, then the final type design should be checked against the proposed type design (as it was at the time of the inspection or test), and the differences (if any) should be analysed to ensure that the inspection or test results are representative of the final configuration. However, such changes made to the type design may lead to the invalidation of the inspection or test results and a need to repeat the inspection or test. It is recommended that the design organisation should have a thorough configuration management process to track the evolving type design.

Conformity of test and measuring equipment: the configuration of the test and measuring equipment should be defined in the test plan and include the following:

3. Definition/design of the test equipment (relevant tools, mechanical parts, electronic components used to execute the test); and
4. Definition of the measuring equipment:
  - type/model of sensors, together with their technical characteristics;
  - position and orientation of exciters and sensors; and
  - electronic measuring equipment (in some cases, this may also include the acquisition and post-processing of data).

The configuration of the test and measuring equipment should be defined and controlled through certification test plans and supporting documentation, according to the design assurance system, if applicable. The test plan should also include the following elements:

5. the test cases, methods, and procedures for test execution;
6. the pass–fail criteria; and
7. pre-, during- and post-test inspections.

The statement of conformity of MSTAR 21.A.33(c) should confirm that the test and measuring equipment conform to its purpose, and that the sensors and measuring system are appropriately calibrated. Any non-conformity should be assessed, and it should be justified that it will not compromise the test purpose and results. This can be done either in the statement of conformity or by cross reference to other documents (test minutes of meetings, test notes, etc.).

Use of the term 'adequate': the test specimen, as well as the test and measuring equipment, are considered to be 'adequate' as long as the test execution on the manufactured test specimen (including any non-conformity) and the use of the installed test set-up does not compromise the test purpose and results (for example, by providing better performance than the proposed type design, or masking any potential failure mode or behaviour).

Changes that affect the validity of the statement of conformity (see MSTAR 21.A.33(e)(2)): if changes need to be introduced to the test specimen or to the test and measurement equipment after the statement of conformity is issued (and before the test is undertaken), the statement of conformity must be updated. The updated

statement of conformity must be made available to the Authority before the test if the Authority has informed the applicant that it will witness or carry out the tests.

Development versus certification tests: sometimes, tests of specimens that conform to a preliminary design, but are not intended for certification (known as development tests), are performed as part of a risk control strategy and to develop knowledge of a subject. Problems and failures found during development are part of the process of increasing the understanding of the design, including its failure modes and the potential for optimisation. Such development tests do not need to meet the requirements of MSTAR 21.A.33.

Any planned test event should be classified in advance as either a development test or a certification test. Tests that support the compliance demonstration should be classified as certification tests.

Nevertheless, if agreed by the Authority, it is acceptable for a development test to finally form part of the compliance demonstration, and it may be declared afterwards to be a certification test as long as it meets the requirements of MSTAR 21.A.33. For this reason, it is important to keep the configuration of such tests under the control of the design organisation.

In addition to this, the level of involvement (LoI) notified by the Authority should be taken into account: if the Authority has determined that it will witness or conduct a certain test, this test may need to be repeated so that the Authority can witness or conduct the test.

If the test specimen used for a certification test has already undergone a series of previous tests that may affect or ultimately invalidate its acceptance as required by MSTAR 21.A.33(b), this aspect should be considered when issuing the statement of conformity required by MSTAR 21.A.33(c), and specific analyses or inspections may be required to support such a statement.

Because of the above aspects, the Authority advises applicants to inform the Authority if they intend to conduct a campaign of development tests that may eventually be used as certification tests.

Availability of compliance data (see MSTAR 21.A.33(d)(1)): data and information requested from the applicant for review should be made available in a reliable and efficient way that is agreed between the applicant and the Authority.

MSTAR 21.A.33(d)(1) refers to any data or information related to compliance data; the scope of that requirement is therefore not limited to inspections and tests. In particular, MSTAR 21.A.33(d)(1) is not limited to data and information related to compliance demonstration items (CDIs) in which the Authority is involved.

#### **GM 21.A.33(d) - Inspections and tests**

The applicant should inform the Authority sufficiently in advance about the execution of inspections and tests that are used for compliance demonstration purposes unless the Authority has explicitly excluded these inspections and tests from its involvement.

Additionally, the applicant may propose to the Authority to perform or witness flight or other tests of particular aspects of the product during its development and before the type design is fully defined. However, before the Authority performs or witnesses any flight test, the applicant should ensure by appropriate means that the design is mature

enough so that no features of the product preclude the safe conduct of the evaluation requested.

The Authority may require any such tests to be repeated once the type design is fully defined to ensure that subsequent changes have not adversely affected the conclusions from any earlier evaluation.

9. **21.A.35 Flight Tests**

**GM 21.A.35 - Flight Tests**

Detailed material on flight testing is included in the applicable certification criteria and GM.

**GM 21.A.35(b)(2) – Objective, Content of function and reliability testing**

**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 will continue to do so in service.

**Content of function and reliability testing**

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

It may be possible to combine this testing with any required to demonstrate compliance with the applicable certification criteria. This will be agreed on a case-by-case basis with the Authority.

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

A substantial proportion of the flying is to be on a single aircraft. The flying is to 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 is to include a range of representative ambient operating conditions and airfields.

**GM 21.A.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 MSTAR 21.A.35(f)(1). At least 150 of the 300 flying hours are to 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 21.A.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 MSTAR 21.A.35(f)(2).

10. **21.A.41 Type certificate and restricted type certificate****AMC 21.A.41 - Structural and Propulsion System Critical Parts and Airworthiness Limitation****CRITICAL PARTS**

It is vital to have an understanding of which parts of the aircraft structure and propulsion system are essential for safe flight and therefore could have a significant impact on safety if they were to fail or not perform their intended function. The applicant for a type certificate should identify a list of critical parts, as required by the Type Certification Basis (TCB) and the intended SAO Configuration Role and Environment (CRE), and submit this to the Authority as part of the application.

Once reviewed by the Authority, the definition and list of critical parts should be included, either directly or by reference, in the Aircraft Structural / Propulsion System Integrity Management Plan (ASIMP/PSIMP). Relevant chapters in TAAC-E-005 to be read together.

The primary consideration for defining structural or propulsion system critical parts should be the certification basis for the aircraft and propulsion system. In recognition that not all airworthiness codes are equivalent, and that some are not explicit on a definition for critical parts, the Authority provides applicants with the following acceptable definitions.

**STRUCTURAL CRITICAL PART ACCEPTABLE DEFINITION**

Any structural part or element where the failure of that part or element could result in a fatality or loss of aircraft. The fatality or loss of aircraft could occur immediately upon failure or subsequently if the failure remained undetected. A structural part is one that contributes significantly to the carrying of flight, ground, or pressurization loads. For rotorcraft, identification of structural critical parts should include consideration of the rotors, rotor drive systems between the engines and rotor hubs, controls, fuselage, fixed and movable control surfaces, engine and transmission mountings, landing gear, and their related primary attachments.

**PROPULSION SYSTEM CRITICAL PART ACCEPTABLE DEFINITION**

Rotating and major static structural parts, and sub-systems of the propulsion system whose primary failure is likely to result in a hazardous propulsion system effect. Typically, propulsion system critical parts include, but are not limited to disks, spacers, hubs, shafts, high-pressure casings, propellers and non-redundant mounts or non-redundant sub-system components.

For the purposes of this section, a hazardous propulsion system effect is any of the following conditions:

- a. Non-containment of high-energy debris, including release of the propeller or any major portion of the propeller.



- b. Concentration of toxic products in the engine bleed air intended for the cabin sufficient to incapacitate crew or passengers.
- c. Significant thrust in the opposite direction to that commanded by the pilot.
- d. Uncontrolled fire.
- e. Failure of the engine mount system leading to inadvertent engine separation.
- f. Complete inability to shut the engine down.
- g. Propeller failure resulting in the development of excessive drag or excessive imbalance.
- h. Partial or complete loss of thrust or power for single-engine aircraft. **NOTE:** Typically, in the case of multi-engine aircraft, discrete failures in which the only consequence is a partial or complete loss of thrust or power (and associated engine services) from an engine are typically not considered a hazardous propulsion system effect.

#### AIRWORTHINESS LIMITATIONS

Airworthiness Limitations (AwLs) are established through the certification process as being essential for preventing and/or detecting failures that may lead to unsafe conditions. AwLs may apply to many systems including the aircraft structure, propulsion system, wiring and Certification Maintenance Requirements (CMRs) arising from system safety analyses. For aircraft structures and propulsion systems, AwLs will be associated with critical parts, as identified above. AwLs are mandatory actions and should be segregated from the other elements of the Instructions for Continuing Airworthiness (ICA).

For the aircraft structure and propulsion system, AwLs are considered to encompass:

- a. Mandatory modification, retirement or replacement intervals
- b. Mandatory inspection requirements: including inspection interval(s) and the inspection method
- c. Mandatory post-flight inspections and maintenance actions associated with any use of either the rated 30-Second One-Engine-Inoperative (OEI) or 2-Minute OEI Power (for rotorcraft engines with such power ratings)
- d. The definition of the interval under a. and b. above includes:
  - i. The interval metric, eg flight hours, landings, Equivalent Flight Hours (EFH), Fatigue Index (FI) / Fatigue Life Expended Index (FLEI), engine cycles etc, and
  - ii. Any algorithm, equation, factor(s) or other engineering data which must be used to calculate life accrual against the interval.

Under point b. above, the inspection method is considered to include the inspection technique, reference standards, and any other inspection procedure parameters which impact the detectable flaw size or Probability of Detection (POD).

The applicant for a type certificate should define and identify the AwLs for the aircraft structure and propulsion system, as required by the TCB and the intended SAO CRE, and submit this to the Authority as part of the application. When prior certification is being leveraged then detailed assessment is required to ensure the baseline structural and propulsion system AwLs adequately account for the SAO CRE (see MSTAR 21.A.20).

Once approved by the Authority, the definition and list of AwLs should be included, either directly or by reference, in the Type Certificate Data Sheet (TCDS) and ASIMP/PSIMP.

### **CONTINUED VALIDITY OF CRITICAL PARTS LIST AND AIRWORTHINESS LIMITATIONS**

The list of critical parts and AwL should be maintained by the MSTC holder based on actual operational experience, changes in the SAO CRE and information received from other operators and NAA/NMAAs (see MSTAR 21.A.3A(a) and MSTAR 21.A.44(c)).

#### **11. 21.A.42 Integration**

##### **GM 21.A.42 - Integration**

The principles for the military type certification (taking in account MSTAR 21.A.17A) are predicated on the hierarchy of the Malaysian State Type Certificate and subordinate certification:

- a. The use of the MSTC is limited to Products, namely aircraft, engine or propeller.
- b. The certification of Parts is to be undertaken in accordance with Subpart K.

#### **12. 21.A.44 Obligations of the holder**

##### **AMC 21.A.44 - Obligations of the holder**

MSTC's will be issued by the Authority to SAO.

Duties of the holding organisation consist of the following:

- a. Responsibilities specific to the MSTC:
  - i. Obligations of the holder (under MSTAR 21.A.44).
  - ii. The integration of Products, Weapons and other Systems onto the aircraft, except for approvals under Subpart E (under MSTAR 21.A.42).
  - iii. Manage all applications for approval of major changes to a type design under MSTAR 21.A.92(a).

- iv. Make arrangements with STC applicants under MSTAR 21.A.115 with respect to the STC impact on the MTC or MRTC, including the effect of any major design changes on certification basis elements.
- b. Responsibility for holding subsequent MSTAR STC and major repair design approvals issued against the MSTC, which entails:
  - i. For MSTC, obligations of the holder (under MSTAR 21.A.118A).
  - ii. For Major Repairs, obligations of the holder (under MSTAR 21.A.451(a)).
- c. For all MSTC, STC and major repair design approvals held, ensure that a system for the in-service management of product hazards is implemented and maintained.

Where the holding organisation is unable to provide the holder services internally an external design or engineering organisation that is compliant to MSTAR 21.A.14(a) or (b) may be contracted/ tasked to perform any outstanding holder duties defined in paragraphs (a) through (b) above.

The Authority will issue all major design change approvals, STC and major repair design approvals to MSTCs. The holder organisation will be responsible for the holder obligations of those instruments as defined in MSTAR 21.A.118A for STC and MSTAR 21.A.451(a) for major repairs.

#### **GM 21.A.44 - Obligations of the holder**

MSTAR GM 21.A.14 defines the role of a government MSTC holder organisation in holding all DGTA issued MSTC/ RMSTC and subsequent major design change approval, STCs and major repair design approvals.

#### **AMC 21.A.44(a) - Continue to meet qualifications requirement for the eligibility**

To ensure that the holder of a type certificate or restricted type certificate remains capable to undertake the required actions and obligations, MSTAR 21.A.44 (a) also requires the holder to continue to meet the requirements of MSTAR 21.A.14

To comply with this requirement, the holder of a type certificate or restricted type certificate shall inform the Authority without undue delay of any circumstances that significantly affect the ability of the holder to effectively discharge its obligations.

If the actions and obligations of the holder of a type certificate or restricted type certificate are undertaken on its behalf by another person or organisation in accordance with MSTAR 21.A.2, these circumstances shall include any changes to the relevant arrangements with the other organisation or findings regarding its safety performance.

#### **AMC 21.A.44(c) - Continues Integrity of Aircraft Structural and Propulsion System**

In order to demonstrate compliance with product integrity requirements in the Type Certification Basis (TCB), assumptions are made by OEMs during design regarding factors such as operational usage, loads and environment; material performance; and manufacturing and assembly processes.

The periodic assessments undertaken by the MSTC holder should ensure that the assumptions made during design and certification that could affect the integrity of structural and propulsion system-critical parts (see MSTAR AMC 21.A.41) remain valid for the SAO Configuration Role and Environment (CRE). Periodic assessments should identify whether there is a need to update the type certificate (including Airworthiness Limitations (AwL)), Instructions for Continuing Airworthiness or monitoring provisions (e.g. life tracking or health monitoring) in order to ensure continued compliance with the TCB. These subsequent updates are separate to the periodic assessment process and should be conducted in accordance with the relevant MSTAR.

The MSTC holder should undertake ongoing monitoring of service experience throughout the operational life of the fleet in order to determine the periodicity of assessments, and collect the data required for the assessments. Relevant service experience data should include but is not limited to: operational usage; failures, malfunctions, defects and other occurrences (see MSTAR 21.A.3A(a)), and other unserviceabilities; maintenance findings, results of inspections and repair data; health monitoring data; and detailed inspection or testing of parts with service history. Where available, service experience from other operators should also be considered. The MSTC holder should define the data required and establish a relationship with the operator(s) to collect this data.

Ongoing monitoring and periodic assessment for aircraft structures should include capture and routine evaluation of data through usage monitoring and structural condition monitoring, as well as periodic structural integrity assessments.

Ongoing monitoring and periodic assessment for propulsion systems should be achieved through the periodic conduct of a mission analysis. The mission analysis should be undertaken by the respective Original Equipment Manufacturer (OEM) or a suitably experienced organisation with access to necessary type design data. The mission analysis should explicitly confirm (through formal written correspondence from the OEM/organisation) that the propulsion system critical part AwLs (defined in MSTAR AMC 21.A.41) remain valid for the SAO CRE.

The MSTAR ASIMP/PSIMP includes essential design requirements related to ongoing monitoring and periodic assessment for aircraft structures and propulsion systems. Compliance with these essential design requirements ensures that the relevant system and process requirements are clearly defined up-front as part of type certification.

The MSTC holder obligations under MSTAR 21.A.44(c) should be implemented as part of the Aircraft Structural Integrity Program (ASIP) and Propulsion System Integrity Program (PSIP) for each aircraft. The Aircraft Structural / Propulsion System Integrity Management Plan (ASIMP/PSIMP) for each platform should detail the systems, processes and responsibilities for ongoing monitoring and periodic assessment. Relevant chapters in TAAC-E-005 to be read together.

13. **21.A.55 Record keeping**

**GM 21.A.55 - Record keeping**

Records should be retained for at least two years after the removal from service of the last aircraft of the type certified.

14. **21.A.57 Manuals****GM 21.A.57 – Manuals**

The system to produce, maintain and update manuals shall ensure:

- a. manuals are complete, current, and uniquely identified;
- b. manuals contain their authority for use, document name, date of issue, and document / amendment status details;
- c. manuals are provided in a medium compatible with user requirements;
- d. new issues, re-issues and/or amendments are approved and/or endorsed by appropriate appointments prior to their release, noting that the process to update a manual may be separate from the process to approve or authorise the content of the manual, e.g. approve AwL limitations in ICA;
- e. manual management records are accurately maintained, controlled, traceable and are accessible; and
- f. manuals can be reproduced to any previous amendment status.

15. **21.A.61 Instructions for continuing airworthiness****AMC 21.A.61 - Instructions for continuing airworthiness**

Instructions for Continuing Airworthiness (ICA) shall be distributed in accordance with MSTAR AMC 21.A.57 – Manuals.

The system for distributing ICA and their amendments to users shall ensure that:

- a. details of the authorised distribution of ICA to each user is recorded; and
- b. ICA are accessible to organisations and personnel.

**GM 21.A.61 - Instructions for continuing airworthiness**

Instructions for Continuing Airworthiness (ICA) details the methods, inspections, processes, and procedures necessary for the air operator to keep aircraft and / or engine, propeller, parts and appliances airworthy during its intended life.

The contents of ICA can be divided into two categories:

- a. an approved airworthiness limitations (AwL) section as defined by the applicable airworthiness codes during the certification process, which forms part of the type design/ type certificate (MSTAR 21.A.31(a)(3) and MSTAR 21.A.41):
  - i. any limitations determined through the certification of the product, and instructions on how to determine that these limits have been exceeded.
  - ii. any inspection, servicing or maintenance actions determined to be necessary by the certification process.

b. sections that do not contain approved data from the certification process and are not considered as part of type design/type certificate:

i. any inspection or troubleshooting actions determined to be necessary to establish the nature of faults and the necessary remedial actions.

ii. sufficient general information on the operation of the product to enable an understanding of the instructions in paragraphs (a)(i), (a)(ii), and (b)(i) above.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 2**

**CHAPTER 3**

**SUBPART C – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 4****SUBPART D - CHANGES TO MALAYSIAN STATE TYPE CERTIFICATES AND RESTRICTED MALAYSIAN STATE TYPE CERTIFICATES****1. 21.A.90 Scope****GM 21.A.90 – Scope**

The term 'changes to the type certificate' is consistently used in MSTAR 21 Section A Subpart D and E, as well as in the related AMC and GM. This term does not refer to changing the document that reflects the Malaysian State Type Certificate (MSTC) but to the elements of the MSTC as defined in MSTAR 21.A.41. It means that the processes for the approval of changes, as described in the said two Subparts, do not only apply to changes to the type design, but may also apply to changes to:

- the operating limitations;
- the type certificate data sheet (TCDS) for airworthiness;
- the applicable type certification basis and environmental protection requirements with which the applicant has to demonstrate compliance;
- any other conditions or limitations prescribed for the product by the Authority.

**2. 21.A.91 Classification of changes to a type certificate****GM 21.A.91 - Classification of changes to a Malaysian State Type Certificate (MSTC)****1. Purpose of classification**

1.1 Classification of changes to a Malaysian State Type Certificate (MSTC) into 'MAJOR' or 'MINOR' is to determine the approval route to be followed in MSTAR 21 Section A Subpart D, ie either MSTAR 21.A.95 or MSTAR 21.A.97, or alternatively whether application and approval has to be made in accordance with MSTAR 21 Section A Subpart E

**2. Introduction**

2.1 MSTAR 21.A.91 proposes criteria for the classification of changes to an MSTC as minor and major.

(a) This GM is intended to provide guidance on the term 'appreciable effect' affecting the airworthiness of the product or affecting any of the other characteristics mentioned in MSTAR 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 change to the MSTC in order to fulfil the requirements of MSTAR 21.A.91 and MSTAR 21.A.117 where classification is the first step of a procedure.



**NOTE:** For classification of Repairs see MSTAR GM 21.A.435(a).

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

2.2 For an TSO authorisation, MSTAR 21.A.611 gives specific additional requirements for design changes to TSO articles. For APU, this GM 21.A.91 is to be used.

### 3. **Assessment of a design change for classification**

#### 3.1 **Changes to the MSTC**

MSTAR 21.A.91 addresses all changes to any of the aspects of an MSTC. This includes changes to a type design, as defined in MSTAR 21.A.31, as well as to the other constituents of an MSTC, as defined in MSTAR 21.A.41.

#### 3.2 **(Reserved)**

#### 3.3 **Classification Process (see diagram in Appendix A to GM 21.A.91)**

MSTAR 21.A.91 requires all changes to be classified as either major or minor, using the criteria of MSTAR 21.A.91

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

When the strict application of the paragraph 3.4 criteria results in a major classification, the applicant may request reclassification, if justified, and the Authority could take the responsibility in reclassifying the change.

A simple design change planned to be mandated by an airworthiness directive may be reclassified minor due to the involvement of the Authority in the continued airworthiness process when this is agreed between the Authority and the DOA holder.

The reasons for a classification decision should be recorded.

#### 3.4 **Complementary guidance for classification of changes**

A change to the MSTC is judged to have an 'appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product or its environmental characteristics' and, therefore, should be classified as major, in particular but not only, when one or more of the following conditions are met:

(a) Where the change requires an adjustment of the type certification basis (such as special conditions, equivalent safety findings or exceptions) other than electing to comply with airworthiness requirements that are derived from a later amendment to an airworthiness code;

(b) Where the applicant proposes a new interpretation of the airworthiness requirements used for the type certification basis that has not been published as AMC material or otherwise agreed with the Authority;

- (c) Where the demonstration of compliance uses methods that have not been previously accepted as appropriate for the nature of the change;
- (d) 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;
- (e) Where the change alters the airworthiness limitations or the operating limitations;
- (f) Where the change is made mandatory by an airworthiness directive or the change is the terminating action of an airworthiness directive (reference MSTAR 21.A.3B), see NOTE 1; and
- (g) Where the change introduces or affects functions where the failure effect is classified catastrophic or hazardous.

**NOTE 1:** A change previously classified as minor and approved prior to the airworthiness directive issuance decision needs no reclassification. However, the Authority retains the right to review the change and reclassify/reapprove it if found necessary.

**NOTE 2:** The conditions listed in (a) through (g) above are an explanation of the criteria noted in MSTAR 21.A.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 21.A.91**

### 3.5 (Reserved)

### 3.6 Complementary guidance for the classification of changes to aircraft flight manuals (AFMs)

The following changes to the AFM are deemed to be minor:

- (a) revisions to the AFM associated with changes to the type design that are classified as minor in accordance with MSTAR 21.A.91;
- (b) revisions to the AFM that are not associated with changes to the type design (also identified as stand-alone revisions) which fall into one of the following categories:
  - 1. changes to limitations or procedures that remain within already certified limits (e.g. weight, structural data, noise, etc.);
  - 2. consolidation of two or more previously approved and compatible AFMs into one, or the compilation of different parts taken from previously approved and compatible AFMs that are directly applicable to the individual aircraft (customisation); and
  - 3. the introduction into a given AFM of compatible and previously approved AFM amendments, revisions, appendices or supplements; and
- (c) administrative revisions to the AFM, defined as follows:

1. for the AFMs issued by the MSTC holder:
  - i. editorial revisions or corrections to the AFM;
  - ii. changes to parts of the AFM that do not require approval by the Authority;
  - iii. conversions of previous Authority approved combinations of units of measurement added to the AFM in a previously approved manner;
  - iv. the addition of aircraft serial numbers to an existing AFM where the aircraft configuration, as related to the AFM, is identical to the configuration of aircraft already covered by that AFM;
  - v. the removal of references to aircraft serial numbers no longer applicable to that AFM;
2. for AFM supplements issued by MSTC holders:
  - i. editorial revisions or corrections to the AFM supplement;
  - ii. changes to parts of the AFM supplement that are not required to be approved by the Authority;
  - iii. conversions of previous authority-approved combinations of units of measurement added to the AFM supplement in a previously approved manner;
  - iv. the addition of aircraft serial numbers to an existing AFM supplement where the aircraft configuration, as related to the AFM supplement, is identical to that of the aircraft already in that AFM supplement;
  - v. 'identical' means here that all the aircraft have to belong to the same type and model/variant;
  - vi. the addition of a new MSTC to an existing AFM supplement, when this supplement is fully applicable to the new MSTC;
  - vii. the removal of references to aircraft serial numbers that are no longer applicable to that AFM supplement.

3. **21.A.92 Eligibility**

**GM 21.A.92(a) – Eligibility to apply for approval of a major change to type certificate**

The expression "Only the type certificate holder may apply for approval of a major change to a type certificate under this Subpart" includes any person or organisation acting on behalf of the type certificate holder in accordance with MSTAR 21.A.2, subject to the arrangements with the Holder.

#### 4. **21.A.93 Application**

##### **AMC 21.A.93 - Application - Form and Manner**

The application referenced in MSTAR 21.A.93 refers to the initial formal notification to the Authority of the intent to seek approval of a change. This can be achieved through submission of MSTAR Form 31. In the absence of a Form 31, submission of the first version of the certification programme will be taken as the initial application.

Final applications for approval of changes to type certificates should be made as follows:

- For a 'major' change to type design, via MSTAR Form 31a.
- For a 'major' repair, via MSTAR Form 31b.
- For a 'minor' change to type design or a 'minor' repair, via MSTAR Form 32.
- For other changes to type certificates, DGTA should be contacted to confirm the appropriate Form and Manner for the application.

##### **AMC 21.A.93(b) -Certification programme for a change to an MSTC or an STC**

The description of the change should include an explanation of the purpose of the change, the pre-modification and post-modification configuration(s) of the product, schematics/pictures, and any other detailed features and boundaries of the physical change (this may be supplemented by drawings or outlines of the design, if this helps to understand the design change), as well as the identification of the changes in areas of the product that are functionally affected by the change, and the identification of any changes to the approved manuals. Guidance on areas that are changed and affected by the change is found in MSTAR GM 21.A.101, Section 3.9.1.

Identification of reinvestigations referred to in MSTAR 21.A.93(b)(2), necessary to demonstrate compliance, does not mean the demonstration of compliance itself, but the list of affected items of the applicable certification basis for which a new demonstration is necessary, together with the means (e.g. calculation, test or analysis) by which it is proposed to demonstrate compliance.

Before submitting the application for a change, the analysis and classification activities of MSTAR 21.A.91 and MSTAR 21.A.101 should be performed using the corresponding GM.

For repair designs, the analysis of MSTAR 21.A.91 should be performed using MSTAR GM 21.A.435(a). For a major change, MSTAR AMC 21.A.15(b) should be used as applicable to the change.

##### **GM 21.A.93(b) - 'Simple' Major Changes**

For a 'simple' major change, the certification programme may be provided with the final application for approval.

A 'simple' major change is a change which does not require long or complex compliance demonstration activities, where the proposal for the Authority Level of Involvement

(based on MSTAR 21.A.93(b)3(iii)) is nil. A change which requires tailoring of the certification basis would not normally be considered simple unless the tailoring can be assessed without an understanding of the specific programme (for example, inclusion of a Special Condition covering MSTAR requirements for a capability or technology not currently covered in the TCB). Tailoring must be formally agreed with the Authority before submission of the final application and the associated declaration of compliance.

Some examples of major changes that may be considered 'simple' are:

- Changes to Airworthiness Limitations (AwLs) and Certification Maintenance Requirements (CMRs) or revised OEM source publications previously certified by a recognised NAA/MAA.
- Changes to the Operating Limitations of an MSTC previously certified by a recognised NAA/MAA.
- Other major changes previously certified by a recognised NAA/MAA, where there are no CRE deltas.

While the above examples would typically be considered 'simple' the Authority may, on presentation of an application, identify a requirement for Lol or otherwise identify an issue with the presented certification programme. These issues may result in additional work and/or a requirement for the certification programme to be separated from the final application.

#### **GM1 21.A.93(b) - Software aspects of a Certification Programme**

The certification programme may include software certification requirements for Major changes to type design. The Authority encourages applicants to develop a Plan for Software Aspects of Certification (PSAC), or equivalent document, and provide it as an enclosure to the certification programme.

#### **GM 21.A.93(b)(2) - Type certification Basis for a change to a type certificate**

The type certification basis referenced in MSTAR 21.A.93(b)2 is established through MSTAR 21.A.95 for a minor change and MSTAR 21.A.101 for a major change. MSTAR 21.A.95 and MSTAR 21.A.101 state that the existing certification basis established in the type certificate is considered adequate for 'minor' and non-significant 'major' changes. Updates to applicable standards may provide insight into hazards and potential controls that are not identified in the version of the standards prescribed in the existing aircraft's type certificate. The requirements prescribed in the MSTAR provide a source of requirements and standards that can assist engineers to satisfy their obligation to exercise reasonable knowledge of hazards and associated controls in aircraft design.

#### **AMC 21.A.93(b)(3)(iii) – Level of Involvement**

The proposed assessment shall take into account at least the following elements:

1. novel or unusual features of the certification project, including operational, organisational and knowledge management aspects;
2. complexity of the design and/or demonstration of compliance;
3. criticality of the design or technology and the related safety and environmental risks, including those identified on similar designs; and

4. performance and experience of the design organisation of the applicant in the domain concerned.

Based on this assessment, the application shall include a proposal for the Authority's involvement in the verification of the compliance demonstration activities and data.

#### **GM 21.A.93(b)(3)(iii) – Level of Involvement**

For guidance on Authority determination of Level of Involvement see MSTAR GM 21.A.15(b)(6).

#### **GM 21.A.93(c) – Period of Validity for the application**

For guidance on the determination of the period of validity for the application, refer to GM 21.A.15(e) and (f).

### 5. **21.A.95 Requirements for approval of a minor changes**

#### **AMC 21.A.95 - Requirements for approval of a minor changes**

##### (a) Applicability of MSTAR 21.A.95

MSTAR 21.A.95 has to be complied with by applicants for the approval of a minor change to a Malaysian State Type Certificate (MSTC), and by Design Organisation Approval (DOA) holders that approve minor changes under their own privileges.

MSTAR 21.A.95(e), however, only applies to projects for which an application is submitted to the Authority. For DOA holders that approve minor changes under their privileges, the substantiating data and the statement of compliance required by MSTAR 21.A.95(e) should be produced but do not need to be submitted to the Authority. They should be, however, kept on record and submitted to the Authority on request during its DOA continued surveillance process.

##### (b) The approval processes

The approval process comprises the following steps:

**Note:** Steps 1, 2 and 5 should be followed only by applicants for minor changes approved by the Authority. DOA holders that approve minor changes under their privileges should refer to MSTAR AMC1 to 21.A.263(c)(2) or MSTAR AMC2 to 21.A.263(c)(2), as applicable to their approval process.

1. Application
2. When the minor change is approved by the Authority, an application should be submitted to the Authority as described in MSTAR 21.A.93(a) and MSTAR 21.A.93(b) and in MSTAR AMC 21.A.93(a).
3. Certification programme

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The certification programme should consist of the information defined in MSTAR 21.A.93(b)(1) and MSTAR 21.A.93(b)(2). Please refer to MSTAR AMC 21.A.93(b) for further information.

4. Certification basis
5. Demonstration of compliance
6. Statement of compliance

(c) Certification basis

The certification basis for a minor change consists of a subset of the elements of the product's certification basis 'incorporated by reference in the type certificate' (see also the additional guidance below on the meaning of airworthiness requirements that became applicable after those 'incorporated by reference in the type certificate'), which have been identified in accordance with MSTAR 21.A.93(b)(2) due to a reinvestigation of compliance being necessary because compliance was affected by the minor change (see also additional guidance below on the meaning of 'specific configurations').

The certification basis 'incorporated by reference in the type certificate' is the certification basis for the product as recorded in the type certificate data sheet (TCDS) for the product type/model in the configuration(s) identified in accordance with MSTAR 21.A.93(b)(1)(i).

The certification basis contains the applicable airworthiness and environmental protection requirements specified by reference to their amendment level, as complemented by special conditions, equivalent safety findings, exceptions, and 'elect to comply', etc., as applicable.

By way of exception from the above, airworthiness requirements that became applicable after those incorporated by reference in the MSTC may be used for the approval of a minor change (see the guidance below on airworthiness requirements that became applicable after those 'incorporated by reference in the type certificate')

If other changes are required for the embodiment of the minor change, the certification basis corresponding to the product modified by these other changes should also be considered when determining the certification basis for the minor change.

(d) Demonstration of compliance required by MSTAR 21.A.95(b)(1) and (2)

The applicant needs to demonstrate compliance with the certification basis established for the minor change for all areas that are either physically changed or functionally affected by the minor change.

1. Means of compliance: the applicant should define and record the means (calculation, test or analysis, etc.) by which compliance is demonstrated. Appendix A to AMC 21.A.15(b) may be used to describe how compliance is demonstrated.
2. Compliance documents: the compliance demonstration should be recorded in compliance documents. For minor changes, one comprehensive

compliance document may be sufficient, provided that it contains evidence of all aspects of the compliance demonstration. AMC 21.A.20(c) can also be used, where applicable.

See also the additional guidance in item (e).

3. Aircraft manuals: where applicable, supplements to manuals (e.g. aircraft flight manual (AFM), aircraft maintenance manual (AMM), etc.) may be issued.

See also additional guidance below on embodiment/installation instructions (item (f)).

(e) Definition of the change to the type certificate

The change to the type certificate should be defined in accordance with GM 21.A.90A.

(f) Embodiment/installation instructions

The instructions for the embodiment/installation of the change (e.g. service bulletin, modification bulletin, production work order, etc.) should be defined. This may include the installation procedure, the required material, etc.

(g) (Reserved)

(h) Meaning of 'specific configurations' in MSTAR 21.A.95(f)

These 'specific configurations' are defined as the combination of the product type/model (on which the minor change will be installed) with (if applicable) the list of those already approved changes (minor, major, Supplemental Type Certificate (STC)) that are required for the installation of the minor change.

(i) Airworthiness requirements that became applicable after those incorporated by reference in the type certificate

1. Minor changes are those changes that do not affect the airworthiness of the product and thus are, by definition, non-significant as per MSTAR 21.A.101. This means that the certification basis for the minor change may consist of the items of the certification basis incorporated by reference in the TCDS of the product type/model, and normally it should not be necessary for a minor change to use airworthiness requirements that became applicable after those that are incorporated by reference in the type certificate.

2. On the other hand, the applicant may elect to use later amendments of the affected airworthiness requirements for the compliance demonstration. This does not affect the classification of the change; however, the applicant should also comply with any other airworthiness requirements that the Authority considers to be directly related.

3. If other changes are required for the installation of the minor change (as explained in 'specific configurations'), the certification basis for the minor change should also take into account the corresponding certification basis.

(j) Meaning of 'no feature or characteristics' in MSTAR 21.A.95(b)(4)



See GM 21.A.20(d).

**GM 21.A.95(b) - Requirements for approval of a minor changes**

The level of detail of the documents that are referred to in MSTAR 21.A.93(b) should be the same regardless of whether the change is approved by the Authority or under a Design Organisation Approval (DOA) privilege, to allow the change to be assessed in the frame of the DOA surveillance.

6. **21.A.97 Requirements for approval of a major change**

**AMC 21.A.97 - Requirements for approval of a major change**

1. AMC/GM to MSTAR 21.A.20 should be used for a major change approved by the Authority.

2. (Reserved).

3. In accordance with MSTAR 21.A.97(d), the compliance demonstration process always takes into account the specific configuration(s) in the Malaysian State Type Certificate (MSTC) to which the major change under approval is applied. These configurations may be defined by type models/variants or by design changes to the type design. The demonstration of compliance covers these applicable specific configurations. Consequently, the approval of the major change excludes any other configurations, in particular those that already exist but are not considered in the compliance demonstration process, as well as those that may be certified in future.

4. For major changes approved by the design organisation approval (DOA) holder on the basis of their privilege as per MSTAR 21.A.263(c)(8), the process described under AMC2 MSTAR 21.A.263(c)(5), (8) and (9) applies.

5. For major changes approved by the holder of a type certificate on the basis of their privilege as per MSTAR 21.A.263(d)(2), the process described under MSTAR AMC1 21.A.263(d)(1) and (2) applies.

**AMC1 21.A.97 - Structural and Propulsion System Critical Parts and Airworthiness Limitation**

Where critical parts or airworthiness limitations are affected by a major change, the applicant should refer to MSTAR AMC 21.A.41 and submit the necessary data to the Authority.

**GM 21.A.97(b) - Requirements for approval of a major change**

The level of detail of the documents that are referred to in MSTAR 21.A.93(b) should be the same regardless of whether the change is approved by the Authority or under a military design organisation approval (DOA) privilege, to allow the change to be assessed in the frame of the DOA surveillance.

7. **21.A.101 Type certification basis and environmental protection requirements for a major change to a type certificate**

**AMC 21.A.101 - Type certification basis and environmental protection requirements for a major change to a type certificate**

In addition to the design requirements applied during initial type certification of the aircraft, 'MAJOR' changes to type design that are determined by the Authority to be significant shall comply with the relevant 'essential' design requirements defined in the Airworthiness Design Requirements Manual (ADRM) or equivalent document referred by DGTA and the latest amendments of standards used during initial certification of the aircraft.

AMC1 to 21.A.17A is to be used to determine where a Certification Review Item (CRI) is required to record changes to the certification basis for the product as recorded in the type certificate data sheet (TCDS).

### **GM 21.A.101 – Establishing certification basis for changes aeronautical products**

This guidance material (GM) provides guidance for the application of the 'Changed Product Rule (CPR)', pursuant to MSTAR 21.A.101, Type certification basis and environmental protection requirements for a major change to a type certificate, and MSTAR 21.A.19, Changes requiring a new type certificate, for changes made to type-certified aeronautical products.

## **1. INTRODUCTION**

### **1.1 Purpose.**

This GM provides guidance for establishing the certification basis for changed aeronautical products pursuant to MSTAR 21.A.101, Type certification basis and environmental protection requirements for a major change to a type certificate. The guidance is also intended to help applicants and approved design organisations to determine whether it will be necessary to apply for a new Malaysian State Type Certificate (MSTC) under MSTAR 21.A.19, Changes requiring a new type certificate. The guidance describes the process for establishing the certification basis for a change to an MSTC, for a Supplemental Type Certificate (STC), or for a change to an STC, detailing the requirements (evaluations, classifications, and decisions) throughout the process.

### **1.2 Applicability.**

1.2.1 This GM is for an applicant that applies for changes to MSTCs under Subpart D, for STCs, or changes to STCs under Subpart E, or for changes to Technical Standard Order (TSO) authorisations for auxiliary power units (APUs) under Subpart O.

1.2.2 This GM applies to major changes under MSTAR 21.A.101 for aeronautical products certified under Part 21, and the airworthiness requirements applicable to the changed product. References to 'change' include the change and areas affected by the change pursuant to MSTAR 21.A.101.

1.2.3 (Reserved)

1.2.4 This GM also applies to changes to restricted type certificates.

1.2.5 The term 'aeronautical product', or 'product', means a type-certified aircraft, aircraft engine, or propeller and, for the purpose of this GM, a TSO approved APU.

1.2.6 This GM primarily provides guidance for the designation of applicable airworthiness requirements for the type certification basis for the changed product. This GM is not intended to be used to determine the applicable environmental protection requirements for changed products.

1.2.7 This GM is not mandatory. This GM describes an acceptable means, but not the only means, to comply with MSTAR 21.A.101. However, an applicant who uses the means described in this GM must follow it entirely.

1.3 **Reserved.**

1.4 **GM Content.**

This GM contains 5 chapters.

1.4.1 This chapter clarifies the purpose of this GM, describes its content, specifies the intended audience affected by this GM, clarifies which changes are within the scope of this GM, and references the definitions and terminology used in this GM.

1.4.2 Chapter 2 provides a general overview of MSTAR 21.A.101 and MSTAR 21.A.19, clarifies the main principles and safety objectives, and directs an applicant to the applicable guidance contained in subsequent chapters of this GM.

1.4.3 Chapter 3 contains guidance for the implementation of MSTAR 21.A.101(b) to establish the certification basis for changed aeronautical products. It describes in detail the various steps for developing the certification basis, which is a process that applies to all changes to aeronautical products. Chapter 3 also addresses the MSTAR 21.A.19 considerations for identifying the conditions under which an applicant for a change is required to submit an application for a new MSTC, and it provides guidance regarding the stage of the process at which this assessment is performed.

1.4.4 Chapter 4 is reserved.

1.4.5 Chapter 5 contains considerations for:

- design-related operating requirements,
- defining a baseline product,
- using special conditions under MSTAR 21.A.101(d),
- documenting revisions to the MSTC basis,
- incorporating STCs into the type design,
- removing changes,
- determining a certification basis after removing an approved change, and
- sequential changes.

1.4.6 **Appendix A** contains a reference to examples of typical type design changes for products (small aeroplanes, large aeroplanes, rotorcraft, engines, and propellers), as categorised by the European Union Aviation Safety Agency (EASA) into individual tables according to the classifications of design change: 'substantial', 'significant', and 'not significant'.

1.4.7 **Appendix B** contains the application chart for applying the MSTAR 21.A.101 process.

1.4.8 **Appendix C** contains a reference to the method proposed by the European Union Aviation Safety Agency (EASA) for determining the changed and affected areas of a product.

1.4.9 **Appendix D** contains additional guidance on affected areas that is not discussed in other parts of this GM.

1.4.10 **Appendix E** is Reserved.

1.4.11 **Appendix F** provides guidance and reference to examples on the use of relevant service experience in the certification process as one way to demonstrate that a later amendment may not contribute materially to the level of safety, allowing the use of earlier airworthiness codes or specifications.

1.4.12 **Appendix G** provides guidance on the structure of a CPR decision record.

1.4.13 **Appendix H** provides a reference to examples of documenting a proposed certification basis list.

1.4.14 **Appendix I** lists MSTAR 21 requirements related to this GM.

1.4.15 **Appendix J** lists the definitions and terminology applicable for the application of the changed product rule.

## 1.5 **Terms Used in this GM.**

1.5.1 The following terms are used interchangeably and have the same meaning: 'specifications', 'standards', 'airworthiness requirements', 'requirements' and 'certification standards'. They refer to the elements of the type certification basis for airworthiness. See the Airworthiness Design Requirements Manual (ADRM) Section 1 Chapter 1 for discussion on the differences between requirements and standards. (To be inserted later)

1.5.2 The term 'certification basis' refers to the type certification basis for airworthiness provided for in MSTAR 21.A.17A.

1.6 For more terms, consult **Appendix A**.

## 2. **OVERVIEW OF MSTAR 21.A.19 AND MSTAR 21.A.101**

### 2.1 **MSTAR 21.A.19.**

2.1.1 MSTAR 21.A.19 requires an applicant to apply for a new MSTC for a changed product if the Authority finds that the change to the design, power,

thrust, or weight is so extensive that a substantially complete investigation of compliance with the applicable type certification basis is required.

2.1.2 Changes that require a substantial re-evaluation of the compliance findings of the product are referred to as 'substantial changes'. For guidance, see paragraph 3.3 in Chapter 3 of this GM.

2.1.3 If the Authority determines through MSTAR 21.A.19 that a proposed change does not require a new MSTC, see MSTAR 21.A.101 for the applicable requirements to develop the certification basis for the proposed change. For guidance, see Chapter 3 of this GM.

## 2.2 **MSTAR 21.A.101.**

### 2.2.1 MSTAR 21.A.101(a).

MSTAR 21.A.101(a) requires a change to an MSTC, and the areas affected by the change to comply with the airworthiness requirements that are applicable to the changed product and that are in effect on the date of application for the change (i.e. the latest airworthiness requirements in effect at the time of application), unless the change meets the criteria for the exceptions identified in MSTAR 21.A.101(b), or unless an applicant chooses to comply with the airworthiness requirements of later effective amendments\* in accordance with MSTAR 21.A.101(f). The intent of MSTAR 21.A.101 is to enhance safety by incorporating the latest requirements into the certification basis for the changed product to the greatest extent practicable.

**\*NOTE:** Airworthiness requirements that were amended after the date of application.

### 2.2.2 MSTAR 21.A.101(b).

MSTAR 21.A.101(b) pertains to when an applicant may show that a changed product complies with an earlier amendment of an airworthiness requirement, provided that the earlier amendment is considered to be adequate and meets the criteria in MSTAR 21.A.101(b)(1), MSTAR 21.A.101(b)(2), or MSTAR 21.A.101(b)(3). When changes involve features or characteristics that are novel and unusual in comparison with the airworthiness standards at the proposed amendment, more recent airworthiness standards and/or special conditions will be applied for these features.

Compliance with earlier amendments of the airworthiness requirements may be considered in accordance with MSTAR 21.A.101(b), when:

- a. a change is not significant (see MSTAR 21.A.101(b)(1));
- b. an area, system, part or appliance is not affected by the change (see MSTAR 21.A.101(b)(2));
- c. compliance with a later amendment for a significant change does not contribute materially to the level of safety (see MSTAR 21.A.101(b)(3)); or
- d. compliance with the latest amendment would be impractical (see MSTAR 21.A.101(b)(3)).

Earlier amendments may not precede the amendment level of the certification basis of the identified baseline product.

MSTAR 21.A.101(b)(1)(i) and MSTAR 21.A.101(b)(ii) pertain to changes that meet the automatic criteria where the change is significant.

2.2.3 (Reserved)

2.2.4 MSTAR 21.A.101(d).

MSTAR 21.A.101(d) provides for the use of special conditions, under MSTAR 21.A.16B, when the proposed certification basis and any later airworthiness requirements do not provide adequate standards for the proposed change because of a novel or unusual design feature.

2.2.5 MSTAR 21.A.101(e) provides the basis under which an applicant may propose to certify a change and the areas affected by the change against alternative requirements to those established under 21.A.101(a) and 21.A.101(b).

2.2.6 MSTAR 21.A.101(f).

MSTAR 21.A.101(f) requires that if an applicant chooses (elects) to comply with an airworthiness requirement that is effective after the filing of the application for a change to an MSTC, the applicant shall also comply with any other airworthiness requirements that the Authority finds are directly related. The airworthiness requirements which are directly related must be, for the purpose of compliance demonstration, considered together at the same amendment level to be consistent.

### **3. PROCESS FOR ESTABLISHING THE CERTIFICATION BASIS FOR CHANGED PRODUCTS**

#### **3.1 Overview.**

3.1.1 The applicant and the Authority both have responsibilities under MSTAR 21.A.101(a) and MSTAR 21.A.101(b). As an applicant for the certification of a change, the applicant must demonstrate that the change and areas affected by the change comply with the latest applicable airworthiness requirements unless the applicant proposes exception(s) under MSTAR 21.A.101(b). An applicant proposing exception(s) should make a preliminary classification of whether the change is 'significant' or 'not significant' and propose an appropriate certification basis. The Authority is responsible for determining whether the applicant's classification of the change and proposal for the certification basis is consistent with the applicable rules and their interpretation. The Authority determination does not depend on whether the MSTC holder or applicant for an MSTC is originating the change. The certification basis can vary depending on the magnitude and scope of the change. The steps below present a streamlined approach for making this determination.

3.1.2 The tables referred to in Appendix A of this GM are examples of classifications of typical type design changes. See paragraph 3.6.3 of this chapter for instructions on how to use those tables.

3.1.3 The following steps in conjunction with the flow chart in Figure 3-1 of this GM can be used to develop the appropriate certification basis for the change. For clarification, the change discussed in the flow chart also includes areas affected by the change. See paragraph 3.9.1 of this GM for guidance about affected areas.

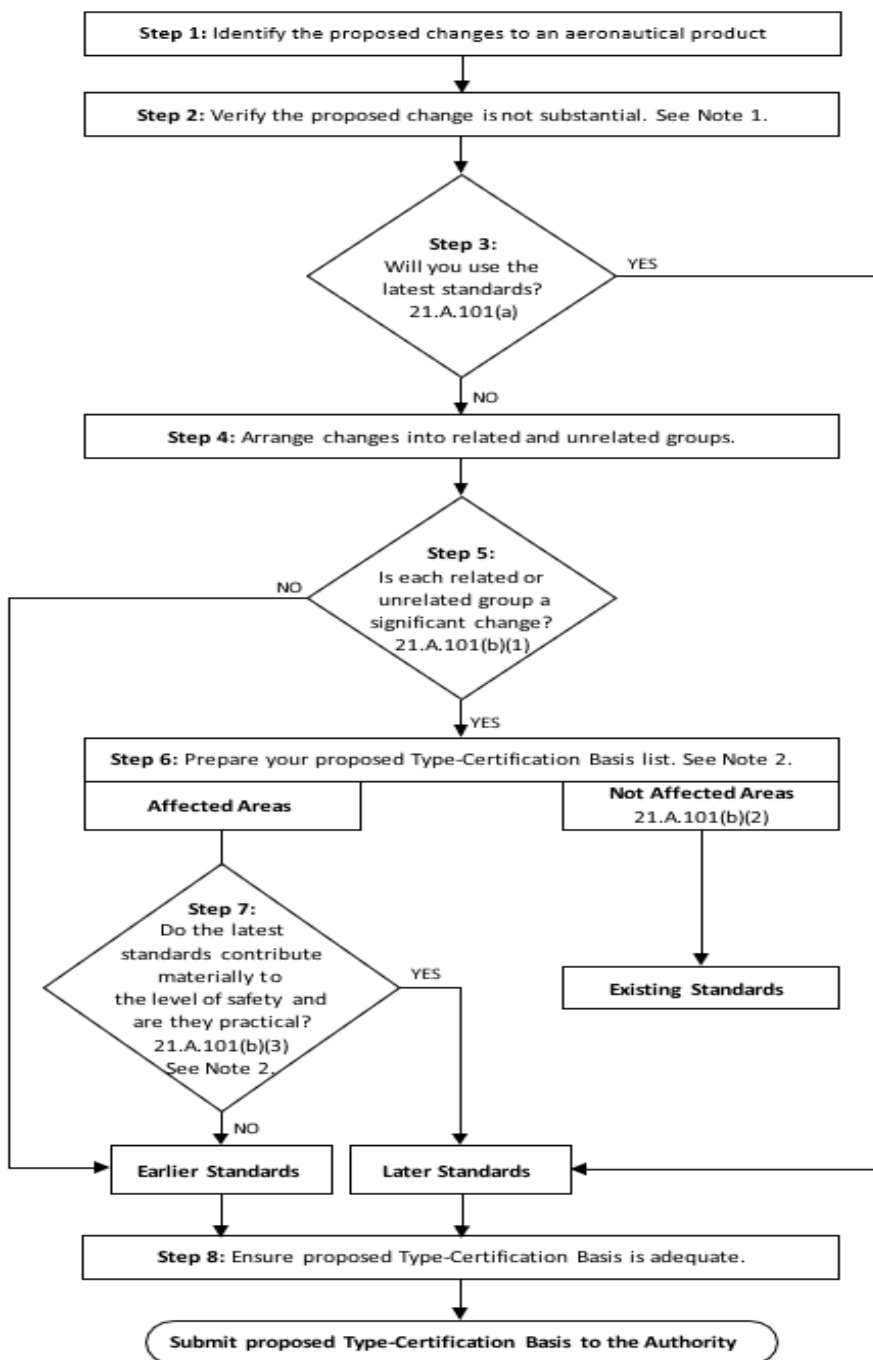


Figure 3-1. Developing a Proposed Certification Basis for a Changed Product Pursuant to MSTAR 21.A.101

**Notes:**

1. Changed products that are substantially changed do not follow this flowchart. Refer to MSTAR 21.A.192.
2. Process and propose each applicable standard individually. If standards are linked

together, then they should be assessed together.

### 3.2 **Step 1. Identify the proposed changes to an aeronautical product.**

- Identify the type design being changed (the baseline product).
- Identify the proposed change.
- Use high-level descriptors.

#### 3.2.1 **Identify the type design being changed (the baseline product).**

Prior to describing the proposed change(s), it is important to clearly identify the specific type design configuration being changed.

**Note:** For additional guidance on the baseline product, see paragraph 5.3 of this GM.

#### 3.2.2 **Identify the proposed change.**

3.2.2.1 The purpose of this process step is to identify and describe the change to the aeronautical product. Changes to a product can include physical design changes and functional changes (e.g. operating envelope or performance changes). An applicant must identify all changes and areas affected by the change, including those where they plan to use previously approved data. The Authority considers all of these changes and areas affected by the change to be part of the entire proposed type design and they are considered as a whole in the classification of whether the proposed change is substantial, significant, or not significant. The change can be a single change or a collection of changes. In addition to the proposed changes, an applicant should consider the cumulative effect of previous relevant changes incorporated since the last time the certification basis was upgraded. An applicant for a change must consider all previous relevant changes and the amendment level of the airworthiness requirements in the certification basis used for these changes.

3.2.2.2 When identifying the proposed changes, an applicant should consider previous relevant changes that create a cumulative effect, as these may influence the decisions regarding the classification of the change later in the process. By 'previous relevant changes,' the Authority means changes where effects accumulate, such as successive thrust increases, incremental weight increases, or sectional increases in fuselage length. An applicant must account for any previous relevant changes to the area affected by the proposed change that did not involve an upgrade of the certification basis in the proposed change.

#### 3.2.2.3 Example:

An applicant proposes a 5 percent weight increase, but a previous 4 percent and another 3 percent weight increase were incorporated into this aircraft without upgrading the existing certification basis. In the current proposal for a 5 percent weight increase, the cumulative effects



of the two previous weight increase that did not involve an upgrade of the certification basis will now be accounted for as an approximate 12 percent increase in weight. Note that the cumulative effects the applicant accounts for are only those incremental increases since the last time the airworthiness requirements in the type certification basis applicable to the area affected by the proposed change were upgraded.

### 3.2.3 Use High-Level Descriptors.

To identify and describe the proposed changes to any aeronautical product, an applicant should use a high-level description of the change that characterises the intent of, or the reason for, the change. No complex technical details are necessary at this stage. For example, a proposal to increase the maximum passenger-carrying capacity may require the addition of a fuselage plug, and as such, a 'fuselage plug' becomes one possible high-level description of this change. Similarly, a thrust increase, a new or complete interior, an avionics system upgrade, or a passenger-to-cargo conversion are all high-level descriptions that characterise typical changes to the aircraft, each driven by a specific goal, objective, or purpose.

### 3.2.4 Evolutionary Changes

Evolutionary changes that occur during the course of a certification program may require re-evaluation of the certification basis, and those changes that have influence at the product level may result in re-classification of the change.

## 3.3 Step 2. Verify the proposed change is not substantial.

3.3.1 MSTAR 21.A.19 requires an applicant to apply for a new MSTC for a changed product if the change to design, power, thrust, or weight is so extensive that a substantially complete investigation of compliance with the applicable regulations is required. A new MSTC could be required for either a single extensive change to a previously type-certified product or for a changed design derived through the cumulative effect of a series of design changes from a previously type-certified product.

3.3.2 A 'substantially complete investigation' of compliance is required when most of the existing substantiation is not applicable to the changed product. In other words, an applicant may consider the change 'substantial' if it is so extensive (making the product sufficiently different from its predecessor) that the design models, methodologies, and approaches used to demonstrate a previous compliance finding could not be used in a similarity argument. The Authority considers a change 'substantial' when these approaches, models, or methodologies of how compliance was shown are not valid for the changed product.

3.3.3 A substantial change requires an application for a new MSTC. See MSTAR 21.A.17A, MSTAR 21.A.18, and MSTAR 21.A.19. If the change is not substantial, proceed to step 3.

### 3.4 **Step 3. Will the applicant use the latest standards?**

3.4.1 An applicant can use the latest airworthiness requirements for their proposed change and the area affected by the change. If they use the latest airworthiness requirements, they will have met the intent of MSTAR 21.A.101 and no further classification (significant or not significant) and justification is needed. Even though an applicant elects to use the latest airworthiness requirements, the applicant will still be able to apply MSTAR 21.A.101 for future similar changes and use the exceptions under MSTAR 21.A.101(b). However, the decision to comply with the latest airworthiness requirements sets a new basis for all future related changes to the same affected area for that amended MSTC.

- If using the latest airworthiness requirements, an applicant should proceed to Step 6 (in paragraph 3.9 of this GM)
- If not using the latest airworthiness requirements, an applicant should proceed to Step 4 below.

### 3.5 **Step 4. Arrange changes into related and unrelated groups.**

3.5.1 An applicant should now determine whether any of the changes identified in Step 1 are related to each other. Related changes are those that cannot exist without another are co-dependent or are a prerequisite of another. For example, a need to carry more passengers could require the addition of a fuselage plug, which will result in a weight increase, and may necessitate a thrust increase. Thus, the fuselage plug, weight increase, and thrust increase are all related, high-level changes needed to achieve the goal of carrying more passengers. A decision to upgrade the flight deck to more modern avionics at the same time as these other changes may be considered unrelated, as the avionics upgrade is not necessarily needed to carry more passengers (it has a separate purpose, likely just modernisation). The proposed avionics upgrade would then be considered an unrelated (or a stand-alone) change. However, the simultaneous introduction of a new cabin interior is considered related since occupant safety considerations are impacted by a cabin length change. Even if a new cabin interior is not included in the product-level change, the functional effect of the fuselage plug has implications on occupant safety (e.g. the dynamic environment in an emergency landing, emergency evacuation, etc.), and thus the cabin interior becomes an affected area. Figure 3-2 below illustrates the grouping of related and unrelated changes using the example of increasing the maximum number of passengers.

**Note:** An applicant who plans changes in sequence over time should refer to the discussion on 'sequential design changes' in paragraph 5.13 of this GM.

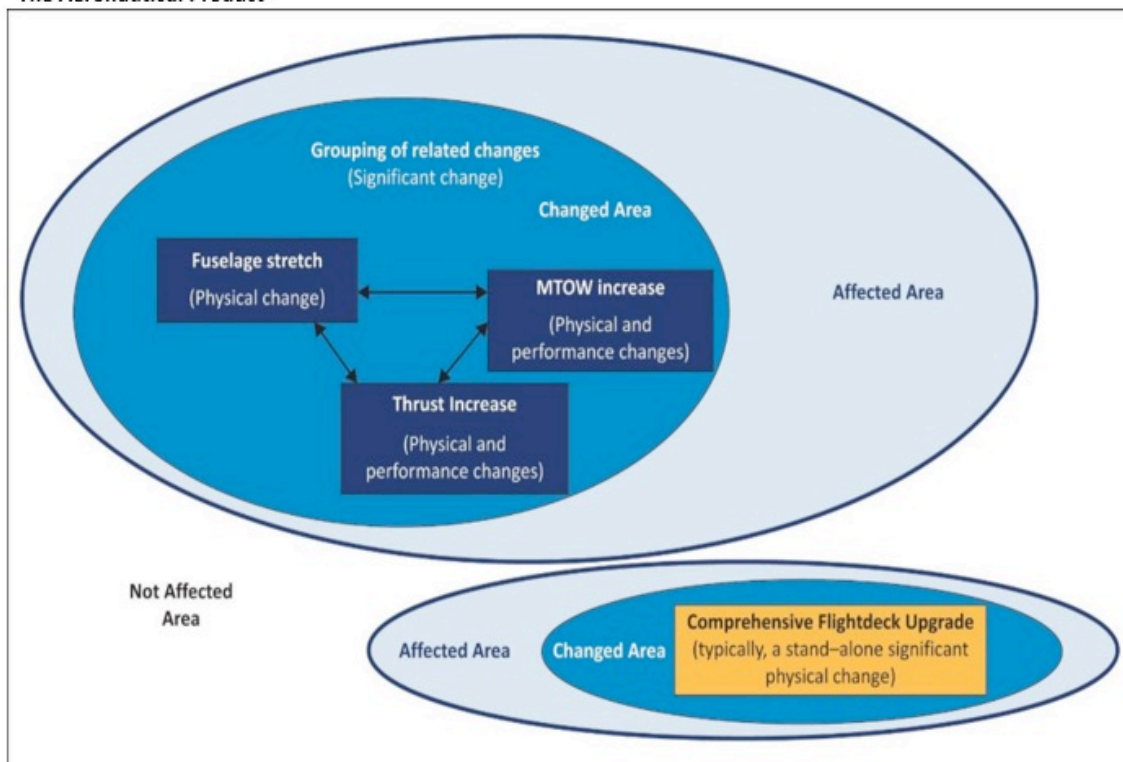
*The Aeronautical Product*

Figure 3-2. Related and Unrelated Changes for Example of Increasing the Maximum Number of Passengers

3.5.2 Once the change(s) is (are) organised into groupings of those that are related and those that are unrelated (or stand-alone), an applicant should proceed to Step 5 below.

**3.6 Step 5. Is each group of related changes or each unrelated (stand-alone) change a significant change?**

3.6.1 The applicant is responsible for proposing the classification of groups of related changes or unrelated changes as 'significant' or 'not significant'. Significant changes are product-level changes that could result from an accumulation of changes or occur through a single significant change that makes the changed product distinct from its baseline product. The grouping of related and unrelated changes is particularly relevant to the Authority's significant Yes/No decision (MSTAR 21.A.101(b)(1)) described in Step 1 of Figure 3-1. The Authority evaluates each group of related changes and each unrelated (stand-alone) change on its own merit for significance. Thus, there may be as many evaluations for significance as there are groupings of related and unrelated changes. Step 1 of Figure 3-1 explains the accumulation of changes that an applicant must consider. Additionally, MSTAR 21.A.101(b)(1) defines a change as 'significant' when at least one of the three automatic criteria applies:

3.6.1.1 Changes where the general configuration is not retained (significant change to general configuration).

A change to the general configuration at the product level is one that distinguishes the resulting product from other product models, for

example, performance or interchangeability of major components. Typically, for these changes, an applicant will designate a new product model, although this is not required.

3.6.1.2 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 reinvestigation to demonstrate compliance is one where the principles of construction are not retained.

3.6.1.3 Product-level changes that invalidate the assumptions used for certification of the baseline product. Examples include:

- change of an aircraft from an unpressurised to pressurised fuselage,
- change of operation of a fixed-wing aircraft from land-based to water-based, and
- operating envelope expansions that are outside the approved design parameters and capabilities.

3.6.2 The above criteria are used to determine whether each change grouping and each stand-alone change is significant. These three criteria are assessed at the product level. In applying the automatic criteria an applicant should focus on the change and how it impacts the existing product (including its performance, operating envelope, etc.). A change cannot be classified or reclassified as a significant change on the basis of the importance of a later amendment.

3.6.3 Appendix A of this GM includes references to tables of typical changes (examples) for various product classes (e.g. small aeroplanes, transport aeroplanes, rotorcraft, engines, and propellers) that would meet the criteria for a significant design change. These references also include tables of typical design changes that would not be classified as significant. The tables can be used in one of two ways:

3.6.3.1 To identify the classification of a proposed design change listed in the table, or

3.6.3.2 In conjunction with the three automatic criteria, to help classify a proposed design change not listed in the table by comparison to determinations made for changes with similar type and magnitude.

In any case, the final classification should be accepted by the Authority.

3.6.4 In many cases, a significant change may involve more than one of these criteria and will be obvious and distinct from other product improvements or production changes. There could be cases where a change to a single area, system, component, or appliance may not result in a product-level change. There could also be other cases where the change to a single system or component might result in a significant change due to its effect on the product

overall. Examples may include the addition of winglets or leading-edge slats, or a change to primary flight controls of a fly-by-wire system.

3.6.5 If an unrelated (stand-alone) change or a grouping of related changes is classified as:

**3.6.5.1 Significant (MSTAR 21.A.101(a)):**

You must comply with the latest airworthiness standards for certification of the change and areas affected by change, unless you justify use of one of the exceptions provided in MSTAR 21.A.101(b)(2) or (3) to show compliance with earlier amendment(s). The final certification basis may consist of a combination of the requirements recorded in the certification basis ranging from the original aircraft certification basis to the most current regulatory amendments.

**3.6.5.2 Not Significant (MSTAR 21.A.101(b)(1)):**

You may comply with the existing certification basis unless the standards in the proposed certification basis are deemed inadequate. In cases where the existing certification basis is inadequate or no regulatory standards exist, later requirements and/or special conditions will be required. See paragraph 3.11 of this GM for a detailed discussion.

3.6.6 A new model designation to a changed product is not necessarily indicative that the change is significant under MSTAR 21.A.101. Conversely, retaining the existing model designation does not mean that the change is not significant. Significance is determined by the magnitude of the change.

3.6.7 The Authority determines the final classification of whether a change is significant or not significant. To assist an applicant in its assessment, the Authority may predetermine the classification of several typical changes that an applicant could use for reference. Such examples are referred to in Appendix A of this GM.

3.6.8 At this point, the determination of significant or not significant for each of the groupings of related changes and each stand-alone change is completed. For significant changes, an applicant that proposes to comply with an earlier amendment of a requirement should use the procedure outlined in paragraph 3.7 below. For changes identified as not significant, see paragraph 3.8 below.

**3.7 Proposing an amendment level for a significant change.**

3.7.1 Without prejudice to the exceptions provided for in MSTAR 21.A.101(b), if the classification of a group of related changes or a stand-alone unrelated change is significant, all areas, systems, components, parts, or appliances affected by the change must comply with the airworthiness requirements at the amendment level in-effect on the date of application for the change, unless the applicant elects to comply with airworthiness requirements that have become effective after that date (see MSTAR 21.A.101(a)).

3.7.2 In certain cases, an applicant will be required by the Authority to comply with airworthiness requirements that have become effective after the date of application (see MSTAR 21.A.101(a)):

3.7.2.1 If an applicant elects to comply with a specific airworthiness requirement or a group of airworthiness requirements at an amendment which has become effective after the date of application, the applicant must comply with any other airworthiness requirement that the Authority finds is directly related (see MSTAR 21.A.101(f)).

3.7.2.2 In a case where the change has not been approved, or it is clear that it will not be approved under the time limit established, the applicant will be required to comply with an upgraded certification basis established according to MSTAR 21.A.17A and 21.A.18 from the airworthiness requirements that have become effective since the date of the initial application.

3.7.3 Applicants can justify the use of one of the exceptions in MSTAR 21.A.101(b)(2) or (3) to comply with an earlier amendment, but not with an amendment introduced earlier than the existing certification basis. See paragraphs 3.9 and 3.10 of this GM. Applicants who elect to comply with a specific airworthiness requirement or a group of airworthiness requirements at an earlier amendment will be required to comply with any other airworthiness requirements that the Authority finds are directly related.

3.7.4 The final certification basis may combine the latest, earlier (intermediate), and existing amendment levels of requirements, but cannot contain airworthiness requirement preceding the existing certification basis.

### 3.8 **Proposing an amendment level for a not significant change.**

3.8.1 When the Authority classifies the change as insignificant, the MSTAR 21.A.101(b) rule allows compliance with earlier amendments but not prior to the existing certification basis. Within this limit, the applicant may propose an amendment level for each airworthiness requirement for the affected area. However, each applicant should be aware that the Authority will review their proposals for the certification basis to ensure that the certification basis is adequate for the proposed change under Step 8. (See paragraph 3.11 of this GM.)

3.8.2 Even for a not significant change, an applicant may elect to comply with airworthiness requirements which became applicable after the date of application. Applicants may propose to comply with a specific airworthiness requirement or a group of airworthiness requirements at a certain amendment of their choice. In such a case, any other airworthiness requirements of that amendment that are directly related should be included in the certification basis for the change.

### 3.9 **Step 6. Prepare the proposed certification basis list.**

As part of preparing the proposed certification basis list, an applicant must identify any areas, systems, parts, or appliances of the product that are affected by the change and the corresponding airworthiness requirements associated with these areas. For each group, the applicant must assess the physical and/or functional effects of the change on any areas, systems, parts, or appliances of

the product. The characteristics affected by the change are not only physical changes, but also functional changes brought about by the physical changes. Examples of physical aspects are structures, systems, parts, and appliances, including software in combination with the affected hardware. Examples of functional characteristics are performance, handling qualities, aeroelastic characteristics, and emergency egress. 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 updated or rewritten.

3.9.1 An area affected by the change is any area, system, component, part, or appliance of the aeronautical product that is physically and/or functionally changed. 3.9.2 Figure 3-3 of this GM illustrates concepts of physical and functional changes of an affected area. For each change, it is important for the applicant to properly assess the effects of such change on any areas, systems, parts, or appliances of the product because areas that have not been physically changed may still be considered part of the affected area. If a new compliance finding is required, regardless of its amendment level, it is an affected area.

3.9.2 Figure 3-3 of this GM illustrates concepts of physical and functional changes of an affected area. For each change, it is important for the applicant to properly assess the effects of such change on any areas, systems, parts or appliances of the product because areas that have not been physically changed may still be considered part of the affected area. If a new compliance finding is required, regardless of its amendment level, it is an affected area.

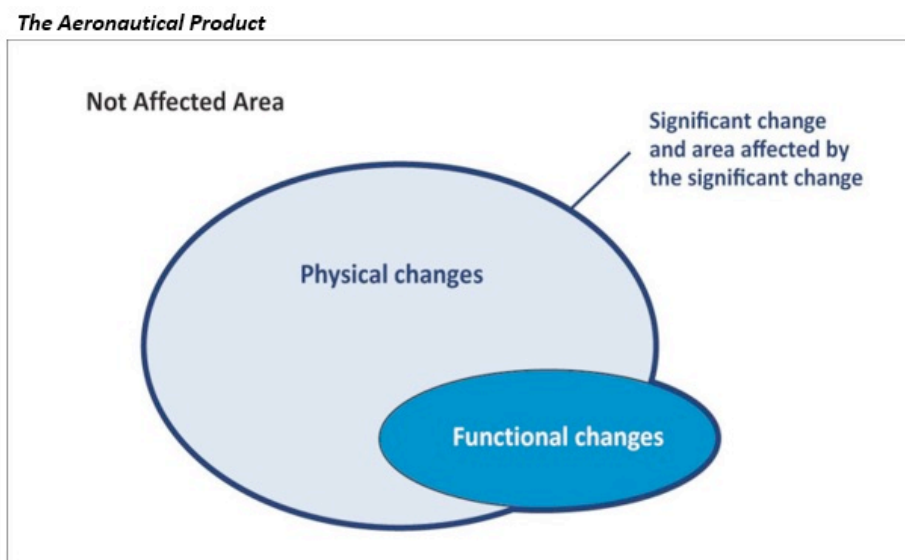


Figure 3-3. Affected Areas versus Not Affected Areas

3.9.3 An area not affected by a change can remain at the existing certification basis, provided that the applicant presents to the Authority an acceptable justification that the area is not affected.

3.9.4 For sample questions to assist in determining affected areas, see below. If the answer to any of these questions is yes, then the area is considered to be affected.

- Is the area changed from the identified baseline product?

- Is the area impacted by a significant product-level change?
- Is there a functional effect on the unchanged area by a change to the system or system function that it is a part of?
- Does the unchanged area need to comply with a system or product-level certification specification that is part of the change?
- Are the product-level characteristics affected by the change?
- Is the existing compliance for the area invalidated?

3.9.5 Consider the following aspects of a change:

**3.9.5.1 Physical aspects.**

The physical aspects include direct changes to structures, systems, equipment, components, and appliances and may include software/airborne electronic hardware changes and the resulting effects on systems functions.

**3.9.5.2 Performance/functional characteristics.**

The less obvious aspect of the word 'areas' covers general characteristics of the type-certified product, such as performance features, handling qualities, emergency egress, structural integrity (including load carrying), aeroelastic characteristics, or crashworthiness. A product-level change may affect these characteristics. For example, adding a fuselage plug could affect performance and handling qualities, and thus the airworthiness requirements associated with these aspects would be considered to be part of the affected area. Another example is the addition of a fuel tank and a new fuel conditioning unit. This change affects the fuel transfer and fuel quantity indication system, resulting in the aircraft's unchanged fuel tanks being affected. Thus, the entire fuel system (changed and unchanged areas) may become part of the affected area due to the change to functional characteristics. Another example is changing turbine engine ratings and operating limitations, affecting the engine rotors' life limits.

3.9.6 All areas affected by the proposed change must comply with the latest airworthiness requirements, unless the applicant shows that demonstrating compliance with the latest amendment of a requirement would not contribute materially to the level of safety or would be impractical. Step 7 below provides further explanation.

3.9.7 The applicant should document the change and the area affected by the change using high-level descriptors along with the applicable airworthiness requirements and their proposed associated amendment levels. The applicant proposes this change to the certification basis that the Authority will consider for documentation in the type certificate data sheet (TCDS) or MSTC, if they are different from that recorded for the baseline product in the TCDS.



**3.10 Step 7. Do the latest standards contribute materially to the level of safety, and are they practical?**

Pursuant to MSTAR 21.A.101(a), compliance with the latest airworthiness requirements is required. However, exceptions may be allowed pursuant to MSTAR 21.A.101(b)(3). The applicant must provide justification to support the rationale for the application of earlier amendments for areas affected by a significant change in order to document that compliance with later standards in these areas would not contribute materially to the level of safety or would be impractical. Such a justification should address all the aspects of the area, system, part, or appliance affected by the significant change. See paragraphs 3.10.1 and 3.10.1.4 of this GM.

**3.10.1 Do the latest standards contribute materially to the level of safety?**

Applicants could consider compliance with the latest standards to 'not contribute materially to the level of safety' if the existing type design and/or relevant experience demonstrates a level of safety comparable to that provided by the latest standards. In cases where design features provide a level of safety greater than the existing certification basis, applicants may use acceptable data, such as service experience, to establish the effectiveness of those design features in mitigating the specific hazards addressed by a later amendment. Applicants must provide sufficient justification to allow the Authority to make this determination. This exception could be applicable in the situations described in the paragraphs below.

Note: Compliance with later standards is not required where the amendment is of an administrative nature and made only to correct inconsequential errors or omissions, consolidate text, or to clarify an existing requirement.

**3.10.1.1 Improved design features.**

Design features that exceed the existing certification basis standards, but do not meet the latest airworthiness requirements, can be used as a basis for granting an exception under MSTAR 21.A.101(b)(3) since complying with the latest amendment of the airworthiness requirements would not contribute materially to the level of safety of the product. If the Authority accepts these design features as justification for an exception, the applicant must incorporate them in the amended type design configuration and record them, where necessary, in the certification basis. The description of the design feature would be provided in the TCDS or MSTC at a level that allows the design feature to be maintained but does not contain proprietary information. For example, an applicant proposes to install winglets on a large aeroplane, and part of the design involves adding a small number of new wing fuel tank fasteners. Assuming that the latest applicable amendment of the certification requirement requires structural lightning protection, the applicant could propose an exception from these latest structural lightning protection

requirements because the design change uses new wing fuel tank fasteners with cap seals installed. The cap seal is a design feature that exceeds the requirement of the previous amendment level but does not meet the latest amendment. If the applicant can successfully substantiate that compliance with the latest amendment would not materially increase the level of safety of the changed product, then this design feature can be accepted as an exception to compliance with the latest amendment.

#### 3.10.1.2 Consistency of 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 components may be identical to the existing components. The level of safety may not materially increase by applying the latest airworthiness requirements in the area of the fuselage plug. Compliance of the new areas with the existing certification basis may be acceptable.

#### 3.10.1.3 Service experience.

3.10.1.3.1 Relevant service experience, such as experience based on fleet performance or utilisation over time (relevant flight hours or cycles), is one way of showing that the level of safety will not materially increase by applying the latest amendment, so the use of earlier amendments of requirements could be appropriate.

3.10.1.3.2 When establishing the highest practicable level of safety for a changed product, the Authority has determined that it is appropriate to assess the service history of a product, as well as the later airworthiness standards. It makes little sense to mandate changes to well-understood designs, whose service experience has been acceptable, merely to comply with new standards. The clear exception to this premise is if the new standards were issued to address a deficiency in the design in question, or if the service experience is not applicable to the new standards.

3.10.1.3.3 There may be cases where relevant data may not be sufficient or not available at all because of the low utilisation and the insufficient amount and type of data available. In such cases, other service history information may provide sufficient data to justify the use of earlier amendments of 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.

3.10.1.3.4 The Authority will determine whether the proposed service experience levels necessary to demonstrate the appropriate level of safety as they relate to the proposed design change are acceptable.

### 3.10.1.4 Secondary changes.

3.10.1.4.1 The change proposed by the applicant can consist of physical and/or functional changes to the product. See Figure 3-4 below. There may be aspects of the existing type design of the product that the applicant may not be proposing to change directly, but that are affected by the overall change. For example, changing an airframe's structure, such as adding a cargo door in one location, may affect the frame or floor loading in another area. Further, upgrading engines with new performance capabilities could require additional demonstration of compliance for minimum control speeds and aeroplane performance requirements.

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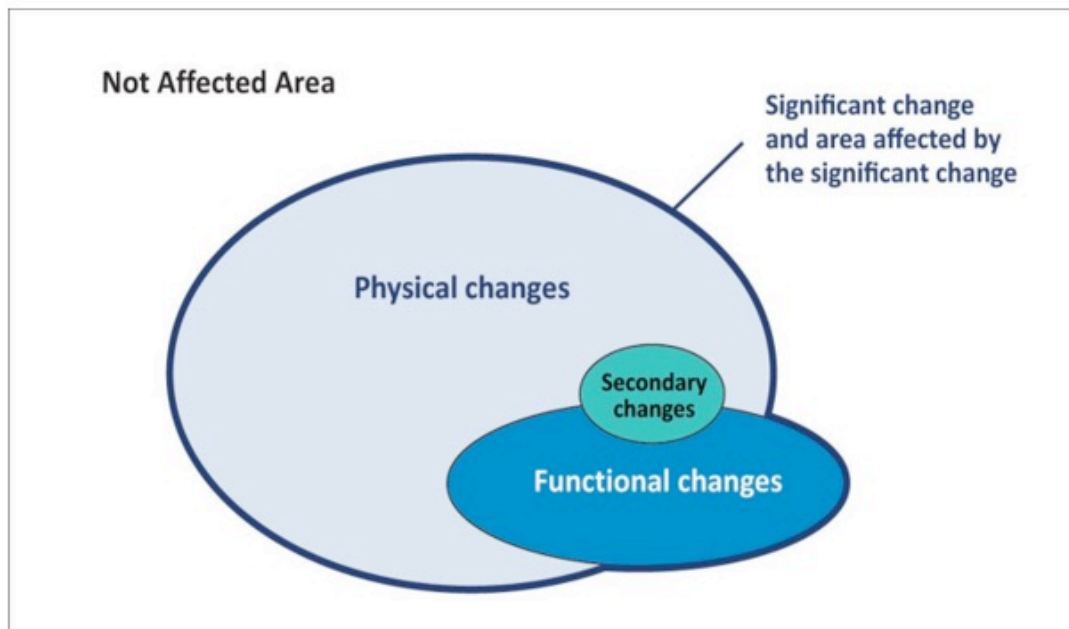


Figure 3-4. Change-Affected Areas with Secondary Change

3.10.1.4.2 For each change, it is important that the effects of the change on other systems, components, equipment, or appliances of the product are properly identified and assessed. 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 rewritten.

3.10.1.4.3 In assessing the areas affected by the change, it may be helpful to identify secondary changes. A secondary change is a change to physical and/or functional aspects that is part of, but consequential to, a significant physical change, whose only purpose is to restore, and not add or increase, existing functionality or capacity. The term 'consequential' is intended to refer to:

- a change that would not have been made by itself; it achieves no purpose on its own;
- a change that has no effect on the existing functionality or capacity of areas, systems, structures, components, parts, or appliances affected by the change; or
- a change that would not create the need for: (1) new limitations or would affect existing limitations; (2) a new aircraft flight manual (AFM) or instructions for continued airworthiness (ICA) or a change to the AFM or ICA; or (3) special conditions, equivalent safety findings, or Exceptions.

3.10.1.4.4 A secondary change is not required to comply with the latest airworthiness requirements because it is considered to be 'not contributing materially to the level of safety' and, therefore, eligible for an exception under MSTAR 21.A.101. Determining whether a change meets the description for a secondary change, and is thus eligible for an exception, should be straightforward. Hence, the substantiation or justification need only be minimal. If this determination is not straightforward, then the proposed change is not a secondary change.

3.10.1.4.5 In some cases, a secondary area of change that restores functionality may in fact contribute materially to the level of safety by meeting a later amendment. If this is the case, it is not considered a secondary change.

### 3.10.2 Are the latest standards practical?

The intent of MSTAR 21.A.101 is to enhance safety by applying the latest airworthiness requirements to the greatest extent practicable. The concepts of contributing materially and practicality are linked. If compliance with the latest airworthiness requirements does contribute materially to the level of safety, then the applicant may assess the incremental costs to see whether they are commensurate with the increase in safety. The additional resource requirements could include those arising from changes required for compliance and the effort required to demonstrate compliance but excluding resource expenditures for prior product changes. The cost of changing compliance documentation and/or drawings is not an acceptable reason for an exception.

3.10.2.1 Applicants should support their position that compliance is impractical with substantiating data and analyses. While evaluating that position and the substantiating data regarding impracticality, the Authority may consider other factors (e.g. the costs and safety benefits for a comparable new design).

3.10.2.2 A review of large aeroplane projects showed that, in certain cases where the Authority allowed an earlier amendment of applicable airworthiness requirements, the applicants made changes that nearly complied with the latest amendments. In these cases, the applicants successfully demonstrated that full compliance would require a

substantial increase in the outlay or expenditure of resources with a very small increase in the level of safety. These design features can be used as a basis for granting an exception under MSTAR 21.A.101(b)(3) on the basis of 'impracticality.'

### 3.10.2.3 (Reserved)

3.10.2.3.1 The exception of impracticality is a qualitative and quantitative cost–safety benefit assessment for which it is difficult to specify clear criteria. Experience to date with applicants has shown that a justification of impracticality is more feasible when both the applicant and the Authority agree during a discussion at an early stage that the effort (in terms of cost, changes to manufacturing, etc.) required to comply would not be commensurate with a small incremental safety gain. This would be clear even without the need to perform any detailed cost–safety benefit analysis (although an applicant could always use cost analysis to support an appropriate amendment level). However, there should be enough detail in the applicant's rationale to justify the exception.

**Note:** An applicant should not base an exception due to impracticality on the size of the applicant's company or their financial resources. The applicant must evaluate the costs to comply with a later amendment against the safety benefit of complying with the later amendment.

3.10.2.3.2 For example, a complex redesign of an area of the baseline aircraft may be required to comply with a new requirement, and that redesign may affect the commonality of the changed product with respect to the design and manufacturing processes of the existing family of models. Relevant service experience of the existing fleet of the baseline aircraft family would be required to show that there has not been a history of problems associated with the hazard that the new amendment in question was meant to address. In this way, the incremental cost/impact to the applicant is onerous, and the incremental safety benefit realised by complying with the later amendment would be minimal. This would be justified by demonstrated acceptable service experience in relation to the hazard that the new airworthiness requirement addresses.

## 3.11 **Step 8. Ensure the proposed certification basis is adequate.**

The Authority considers a proposed certification basis for any change (whether it is significant or not significant) to be adequate when:

- the airworthiness requirements provide an appropriate level of safety for the intended change, and
- the change and the areas affected by the change do not result in unsafe design features or characteristics for the intended use.

3.11.1 For a change that contains new design features that are novel and unusual for which there are no applicable airworthiness requirements at a later

amendment level, the Authority will designate special conditions pursuant to MSTAR 21.A.16B. The Authority will impose later airworthiness requirements that contain adequate or appropriate safety standards for this feature, if they exist, in lieu of special conditions. An example is adding a flight-critical system, such as an electronic air data display on a large aeroplane whose existing certification basis does not cover protection against lightning and high-intensity radiated fields (HIRF). In this case, the Authority will require compliance with the airworthiness requirements for lightning and HIRF protection, even though the Authority determined that the change is not significant.

3.11.2 For new design features or characteristics that may pose a potential unsafe condition for which there are no later applicable airworthiness requirements, new special conditions may be required.

3.11.3 In cases where inadequate or no standards exist for the change in the existing certification basis, but adequate standards exist in a later amendment of the applicable airworthiness requirements, the later amendment will be made part of the certification basis to ensure the adequacy of the certification basis.

3.11.4 The Authority determines the final certification basis for a product change. This may consist of a combination of those standards ranging from the existing certification basis of the baseline product to the latest amendments and special conditions.

4. **(Reserved)**

5. **Other Considerations**

5.1 **Design-related requirements from other aviation domains.**

Some implementing rules in other aviation domains (air operations, ATM/ANS) impose airworthiness standards that are not required for the issue of a MSTC or STC. If not already included in the certification basis, any such applicable airworthiness standard may be added to the type certification basis by mutual agreement between the applicant and the Authority. The benefit of adding these airworthiness standards to the type certification basis is to increase awareness of these standards, imposed by other implementing rules, during design certification and future modifications to the aircraft. The use of exceptions under MSTAR 21.A.101(b) is not intended to alleviate or preclude compliance with operating regulations.

5.2 **(Reserved)**

5.3 **Baseline product.**

A baseline product consists of one unique type design configuration, an aeronautical product with a specific, defined, approved configuration and certification basis that the applicant proposes to change. As mentioned in paragraph 3.2.1 of this GM, it is important to clearly identify the type design configuration to be changed. The Authority does not require applicants to assign a new model name for a changed product. Therefore, there are vastly different changed products with the same aircraft model name, and there are changed products with minimal differences that have different model names. The identification of the baseline product, for the purposes of MSTAR 21.A.101, is as defined below.

The baseline product is an approved type design that exists at the date of application and is representative of:

- a single certified build configuration, or
- multiple approvals over time (including MSTC(s) or service bulletins) and may be representative of more than one product serial number.

**Note:** The type design configuration, for this purpose, could also be based on a proposed future configuration that is expected to be approved at a later date but prior to the proposed changed product.

5.4 **(Reserved)**

5.5 **Special conditions, MSTAR 21.A.101(d).**

MSTAR 21.A.101(d) allows for the application of special conditions, or for changes to existing special conditions, to address the changed designs where neither the proposed certification basis nor any later amendments of requirements in the certification basis provide adequate standards for an area, system, part or appliance related to the change. The objective is to achieve a level of safety consistent with that provided for other areas, systems, parts or appliances affected by the change by the other requirements in the proposed certification basis. The application of special conditions to a design change is not, in itself, a reason to classify it as either a substantial change or a significant change. Whether the change is significant, with earlier amendments of airworthiness requirements allowed through exceptions, or not significant, the level of safety intended by the special conditions must be consistent with the agreed certification basis.

5.6 **(Reserved)**

5.7 **(Reserved)**

5.8 **(Reserved)**

5.9 **Documentation.**

5.9.1 Documenting the proposal.

In order to efficiently determine and agree upon a certification basis with the Authority, the following information is useful to understand the applicant's position:

- The current certification basis of the product being changed, including the amendment level.
- The amendment level of all the applicable airworthiness requirements at the date of application.
- The proposed certification basis, including the amendment levels.
- Description of the affected area.
- Applicants who propose a certification basis that includes amendment levels earlier than what was in effect at the date of application

should include the exception as outlined in MSTAR 21.A.101(b) and their justification if needed.

#### 5.9.2 (Reserved)

#### 5.9.3 Documenting the certification basis.

5.9.3.1 The Authority will amend the certification basis for all changes that result in a revision to the product's certification basis on the amended TCDS or MSTC.

### 5.10 Incorporation of STCs into the Type Design.

The incorporation of STCs into the product type design may generate an additional major change when that change is needed to account for incompatibility between several STCs that were initially not intended to be applied concurrently.

5.10.1 If the incorporation of the STC(s) does not generate an additional major change, the incorporation is not evaluated pursuant to MSTAR 21.A.101. The existing certification basis should be updated to include the later amendments of the STC(s) being incorporated.

5.10.2 If the incorporation of the STC(s) generates an additional major change, the change must be evaluated pursuant to MSTAR 21.A.101, and the existing certification basis should be updated to include the amendments resulting from the application of MSTAR 21.A.101.

### 5.11 Removing changes.

Approved changes may be removed after incorporation in an aeronautical product. These changes will most commonly occur via an STC or a service bulletin kit.

5.11.1 The applicant should identify a product change that they intend at its inception to be removable as such and should develop instructions for its removal during the initial certification. The Authority will document the certification basis for both the installed and removed configuration separately on the TCDS or STC.

5.11.2 If specific removal instructions and a certification basis corresponding to the removed condition are not established at the time of the initial product change certification, the removal of changes or portions of those changes may constitute a significant change to type design. A separate STC or an amended MSTC may be required to remove the modifications and the resulting certification basis established for the changed product.

### 5.12 The certification basis is part of the change.

A new change may be installed in a product during its production or via a service bulletin or STC. In terms of MSTAR 21.A.101, each of the approved changes has its own basis of certification. If an applicant chooses to remove an approved installation (e.g. an interior installation, avionics equipment) and install a new installation, a new certification basis may be required for the new installation, depending on whether the change associated with the new installation is considered significant compared to the baseline configuration that the applicant chooses. If the new installation is a not significant change, the unmodified product's certification basis may be used (not the previous installation certification basis), provided the certification basis is adequate.



**5.13 Sequential changes — cumulative effects.**

5.13.1 Any applicant who intends to accomplish a product change by incorporating several changes in a sequential manner should identify this to the Authority up front when the first application is made. In addition, the cumulative effects arising from the initial change, and from all of the follow-on changes, should be included as part of the description of the change in the initial proposal. The classification of the intended product change will not be evaluated solely on the basis of the first application, but rather on the basis of all the required changes needed to accomplish the intended product change. If the Authority determines that the current application is a part of a sequence of related changes, then the Authority will re-evaluate the determination of significance and the resulting certification basis as a group of related changes.

5.13.2 Example: Cumulative effects — advancing the certification basis.

The type certificate for aeroplane model X lists three models, namely X-300, X-200, and X-100. The X-300 is derived from the X-200, which is derived from the original X-100 model. An applicant proposes a change to the X-300 aeroplane model. During the review of the X-300 certification basis and the airworthiness requirements affected by the proposed change, it was identified that one requirement, damage tolerance, remained at the same amendment level as the X-100 original certification basis (exception granted on the X-200). Since the amendment level for this particular requirement was not changed for the two subsequent aeroplane models (X-200 and X-300), the applicant must now examine the cumulative effects of these two previous changes that are related to the proposed change and the damage tolerance requirements to determine whether the amendment level needs to advance.

**Appendix A to GM 21.A.101 - Classification of design changes**

**Appendix B to GM 21.A.101 - Application charts for changed product rule**

**Appendix C to GM 21.A.101 - A method to determine the changed and affected areas**

**Appendix D to GM 21.A.101 - Other guidance for affected areas**

**Appendix E to GM 21.A.101 - Reserved**

**Appendix F to GM 21.A.101 - The use of service experience in the exception process**

**Appendix G to GM 21.A.101 - Changed product rule (CPR) decision record**

**Appendix H to GM 21.A.101 - Examples of documenting the proposed certification basis list**

**Appendix I to GM 21.A.101 - Related documents**

**Appendix J to GM 21.A.101 - Definitions and terminology**

**8. 21.A.107 Instructions for Continuing Airworthiness****AMC 21.A.107 - Instructions for Continuing Airworthiness**

Instructions for Continuing Airworthiness (ICA) shall be distributed in accordance with MSTAR AMC 21.A.57 – Manuals.

The system for distributing ICA and their amendments to users shall ensure that:

- a. details of the authorised distribution of ICA to each user is recorded; and
- b. ICA are accessible to organisations and personnel.

**GM 21.A.107 - Instructions for Continuing Airworthiness**

Instructions for Continuing Airworthiness (ICA) detail the methods, inspections, processes, and procedures necessary for the air operator to keep aircraft and / or engine, propeller, parts, and appliances airworthy during its intended life.

The contents of ICA can be divided into two categories:

- a. an approved airworthiness limitations (AwL) section as defined by the applicable airworthiness codes during the certification process, which forms part of the type design / type certificate (MSTAR 21.A.31(a)(3) and MSTAR 21.A.41):
  - i. any limitations determined through the certification of the product and instructions on how to determine that these limits have been exceeded.
  - ii. any inspection, servicing, or maintenance actions determined to be necessary by the certification process.
- b. sections that do not contain approved data from the certification process and are not considered as part of type design/type certificate:
  - i. any inspection or troubleshooting actions determined to be necessary to establish the nature of faults and the necessary remedial actions.
  - ii. sufficient general information on the operation of the product to enable an understanding of the instructions in paragraphs (a)(i), (a)(ii), and (b)(i) above.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 5****SUBPART E - SUPPLEMENTAL TYPE CERTIFICATES****1. 21.A.112B - Demonstration of capability****GM 21.A.112B - Demonstration of capability for supplemental type certificate cases**

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

The following examples of major changes to type design (see MSTAR 21.A.91) are classified in two groups. Group 1 contains cases where a design organisation approved under MSTAR 21 Section A Subpart J ('Subpart J DOA') will be required, and Group 2 cases where the alternative procedure may be accepted. They are typical examples but each STC case is to 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 MSTC	GROUP
<b>SMALL AIRCRAFT</b> (products where Subpart J DOA is required for STC)			
<b>NOTES:</b>			
* STC which leads to re-assess the loads on large parts of primary structure will be in Group 1.			
* 2/1 means that an assessment of consequences in terms of handling qualities, performance or complexity of demonstration of compliance may lead to classification in Group 1.			
	<b>Aircraft</b>		
		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 Maximum Take-off Weight (MTOW)	1

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	<b>Structures</b>		
		Stretcher installation	2
		Change to seating configuration	2
		Windshield replacement (heated, single piece, etc)	2
		Light weight floor panels	2
		Ski installations	2/1
	<b>Propulsion</b>		
		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
	<b>Equipment</b>		
		Avionics upgrades (Electronic Flight Instrument System (EFIS), Global Positioning System (GPS), etc)	2/1
		Engine instrument replacements	2
		Carburetor ice detection system	2
		Autopilot system installation	1
		Wing tip landing light; recognition lights	2
		Weather (WX) radar installation	2
		Aeromedical system installations	2
		De- and anti-ice system installations	1
		Emergency power supply installations	2

PRODUCT	DISCIPLINE	KIND OF MSTC	GROUP
<b>LARGE AIRCRAFT</b>			
	<b>Cabin safety</b>		
<b>NOTE:</b> Basically all changes related to cabin configuration will 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
	<b>Structure</b>		
<b>NOTE:</b> MSTC which leads to reassess the loads on large parts of primary structure will be in Group 1.		Cargo door	1
		Change from Passenger to Freighter configuration	1
	<b>Avionics</b>		
<b>NOTES:</b> For large aircraft products, the existence of TSO 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.		Cockpit Voice Recorder (CVR)	2
		Very High Frequency (VHF)	2
		Navigation (NAV) - (Automatic Direction Finder (ADF), VH Omnidirectional Range (VOR), GPS, Basic Area Navigation (B-RNAV)	2
		Autopilot, Head-up Display (HUD), EFIS, Flight Management System (FMS)	1
		Digital Flight Data Recorder (DFDR)	2/1
		Meteo radar	2
		Instrument Landing System (ILS) Cat 3	1
		Reduced Vertical Separation Minima (RVSM)	1

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		Traffic Collision Avoidance System (TCAS), Enhanced Ground Proximity Warning System (EGPWS)	1
		Ground Proximity Warning System (GPWS)	2
	<b>Powerplant</b>		
		Auxiliary fuel tanks	1
		Thrust Reverser system	1
		Hushkit	1
		Fire detection	1
		Fuel gauging	1
		Change of Engine or Propeller	1

PRODUCT	DISCIPLINE	KIND OF MSTC	GROUP
HELICOPTERS			
	All Disciplines		
<b>NOTE:</b> 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
		Very Important Person (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
		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

### **AMC 21.A.112B(c) - Alternative Demonstration**

In some countries a government organisation is approved by the Authority to execute the Supplemental Type Certificate (STC) holder responsibilities. This government organisation may apply for a Malaysian State supplemental type certificate, without being the original design organisation. In this case the government organisation should, in accordance with MSTAR 21.A.2, enter an agreement with a design organisation which has access to the Type Design data to ensure the undertaking of specific actions and obligations. Any alternative procedures for establishing a Design Assurance System and Safety Management System should be acceptable to the Authority in fulfilling the obligations required under MSTAR 21.A.118A.

Where an TC holder or Project Office applies under these provisions, the MSTAR AMC 21.A.14(c) requirements for 'DGTA recognition of NAA/ NMAA' and 'Project Office demonstration of capability' also apply.

## **2. 21.A.113 Application for a Supplemental Type certificate**

### **AMC 21.A.113(a) - Form and Manner**

The application referenced in MSTAR 21.A.113 refers to the initial formal notification to the Authority of the intent to seek issue of an STC. This can be achieved through submission of MSTAR Form 31. In the absence of a Form 31, submission of the first version of the certification programme will be taken as the initial application.

Final applications for an STC should be made using MSTAR Form 31a.

## **3. 21.A.115 Requirements for approval of major changes in the form of a supplemental type certificate**

### **AMC 21.A.115 -Requirements for the approval of major changes in the form of a Supplemental Type Certificate (STC)**

(a) For STCs approved by the Authority, the AMC and GM to MSTAR 21.A.20 should be followed by the applicant.

(b) (Reserved).

(c) In accordance with MSTAR 21.A.115(d), the compliance demonstration process must always cover the specific configuration(s) in the Malaysian State Type Certificate (MSTC) to which the STC under approval is applied. These configurations should be defined by the change to the type certificate considering the type certificate datasheet (TCDS) and the relevant optional installations. The demonstration of compliance should cover these specific applicable configurations. Consequently, the approval of the STC excludes any other configurations, in particular those that already existed, but were not considered



in the compliance demonstration process, and those that may be certified in future.

(d) For STCs approved by the design organisation approval (DOA) holder under their privilege as per MSTAR 21.A.263(c)(9), the process described under MSTAR AMC2 21.A.263(c)(5), (8) and (9) applies.

#### **GM 21.A.115 - Issue of a Supplemental Type Certificate**

In response to applications the Authority shall issue all STC or major design change approval to the relevant government MSTC holder.

#### **4. 21.A.118A Obligations and Parts Approval marking**

##### **AMC 21.A.118A – Continue to meet the criteria of MSTAR 21.A.112B**

To ensure that the holder of a supplemental type certificate remains capable to undertake the required actions and obligations, MSTAR 21.A.118(a) also requires the holder to continue to meet the criteria of MSTAR 21.A.112B.

To comply with this requirement, the holder of a supplemental type certificate shall inform the Authority without undue delay of any circumstances that significantly affect the ability of the holder to effectively discharge its obligations.

If the actions and obligations of the holder of a supplemental type certificate are undertaken on its behalf by another person or organisation in accordance with MSTAR 21.A.2, these circumstances shall include any changes to the relevant arrangements with the other organisation or findings regarding its safety performance.

#### **5. 21.A.119 Manuals**

##### **AMC 21.A.119 – Manuals**

The system to produce, maintain and update manuals shall ensure:

- (a) manuals are complete, current, and uniquely identified;
- (b) manuals contain their authority for use, document name, date of issue, and document / amendment status details;
- (c) manuals are provided in a medium compatible with user requirements;
- (d) new issues, re-issues and/or amendments are approved and/or endorsed by appropriate appointments prior to their release, noting that the process to update a manual may be separate from the process to approve or authorise the content of the manual, eg approve AwL limitations in ICA;
- (e) manual management records are accurately maintained, controlled, traceable and are accessible; and
- (f) manuals can be reproduced to any previous amendment status.

**6. 21.A.120A Instructions for Continuing Airworthiness****AMC 21.A.120A - Instructions for Continuing Airworthiness**

Instructions for Continuing Airworthiness (ICA) shall be distributed in accordance with MSTAR AMC 21.A.57 – Manuals

The system for distributing ICA and their amendments to users shall ensure that:

- a. details of the authorised distribution of ICA to each user is recorded; and
- b. ICA are accessible to organisations and personnel.

**GM 21.A.120A - Instructions for Continuing Airworthiness**

Instructions for Continuing Airworthiness (ICA) details the methods, inspections, processes, and procedures necessary for the air operator to keep aircraft and / or engine, propeller, parts and appliances airworthy during its intended life.

The contents of ICA can be divided into two categories:

- (a) an approved airworthiness limitations (AwL) section as defined by the applicable airworthiness codes during the certification process, which forms part of the type design / type certificate (MSTAR 21.A.31(a)(3) and MSTAR 21.A.41):
  - i. any limitations determined through the certification of the product, and instructions on how to determine that these limits have been exceeded.
  - ii. any inspection, servicing or maintenance actions determined to be necessary by the certification process.
- (b) sections that do not contain approved data from the certification process and are not considered as part of type design/type certificate:
  - i. any inspection or troubleshooting actions determined to be necessary to establish the nature of faults and the necessary remedial actions.
  - ii. sufficient general information on the operation of the product to enable an understanding of the instructions in paragraphs (a)(i), (a)(ii), and (b)(i) above.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 2**

**CHAPTER 6**

**SUBPART F – (RESERVED)**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 7****SUBPART G - PRODUCTION ORGANISATION APPROVAL FOR PRODUCTS, PARTS AND APPLIANCES****1. 21.A.131 Scope****GM 21.A.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 TSO authorisation and released in a controlled manner to a production organisation approval holder. This is to 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 MSTC, STC, approval of repair or minor change design or TSO authorisation, or equivalent, design data is defined as 'not approved' but parts and appliances may be released with a MSTAR Form 1 as a certificate of conformity.

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

For the purpose of Subpart G of MSTAR 21, the term 'applicable design data' includes the information related to the applicable engine exhaust emissions and aeroplane CO2 emissions production cut-off requirements.

**2. 21.A.133 Eligibility****GM 21.A.133 - Issue of Production Organisation Approval**

(a) Where a production organisation has an extant EASA Part 21 production organisation approval, and when the production activity is within the scope of the EASA term of approval, the organisation may be accepted by the Authority to satisfy the MSTAR 21 requirements for that scope of work with any further investigation limited only to the delta between the two approvals. The Authority is to be kept informed by the production organisation of significant changes to the organisation and of any EASA findings that may impact the production activity.

(b) Where a production organisation has an extant EASA Part 21 production organisation approval, and when the scope of the EASA term of approval does not entirely cover the production activity, those parts of the organisation's EASA Part 21 exposition that are equally applicable to satisfy the MSTAR 21 may be accepted by the Authority as equivalent in respect of the MSTAR 21 requirements. It is permissible that only those parts of the organisation that are specific to the activity or requirements are addressed in the MSTAR 21 exposition. Those requirements covered by read-across of the sections of the EASA exposition document are to be identified and the EASA document clause reference quoted.

**GM 21.A.133(a) Eligibility – Approval 'appropriate' for showing conformity**

'Appropriate' is to be understood as follows:

- a) The applicant produces or intends to produce aeronautical products, parts and/or appliances intended for airborne use as part of a type certificated product (this excludes simulators, ground equipment and tools).
- b) The applicant will be required to show a need for an approval, normally based on one or more of the following criteria:
- i. Production of aircraft, engines or propellers (except if the Authority considers a POA inappropriate);
  - ii. Production of TSO articles and parts marked MPA;
  - iii. Direct delivery to users such as owners or operators' maintenance organisations with the need for exercising the privileges of issuing Authorised Release Certificates – MSTAR Form 1;
  - iv. Participation in an international co-operation programme where working under an approval is considered necessary by the Authority;
  - v. Criticality and technology involved in the part or appliance being manufactured. Approval in this case may be found by the Authority as the best tool to exercise its duty in relation to airworthiness control;
  - vi. Where an approval is otherwise determined by the Authority.
- c) It is not the intent of the 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.
- d) Where standard parts, materials, processes or services are included in the applicable design data (see guidance on applicable design data in GM MSTAR 21.A.131) their standards are to 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:
- i. consumable materials;
  - ii. raw materials;
  - iii. standard parts;
  - iv. parts identified in the product support documentation as 'industry supply' or 'no hazard';
  - v. non-destructive testing or inspection;
  - vi. processes (heat treatment, surface finishing, shot peening, etc.).

**AMC1 21.A.133(b) and (c) Eligibility – Link between design and production organisations**

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

To achieve satisfactory coordination the documented arrangements should at least define the following aspects irrespective of whether the two organisations are separate legal entities or not:

- a) 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.);
- b) The responsibilities and procedures of a POA holder/applicant for developing, where applicable, its own manufacturing data in compliance with the airworthiness data package;
- c) 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.);
- d) The scope of the arrangements should cover MSTAR 21 Section A Subpart G requirements and associated AMC and GM, in particular: MSTAR 21.A.145(b), MSTAR 21.A.165(c), (f) and (g);
- e) The responsibilities of a POA holder/applicant, in case of products prior to type certification to assist a design organisation in demonstrating compliance with airworthiness requirements (access and suitability of production and test facilities for manufacturing and testing of prototype models and test specimen);
- f) The procedures to deal adequately with production deviations and non-conforming parts;
- g) 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;
- h) The identification of the responsible persons/offices who control the above;
- i) The acknowledgment by the holder of the TC/STC/repair or change approval/ TSO 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 MSTAR 21.A.133.

When the design and production organisations 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 (refer to AMC MSTAR 21.A.4).

### AMC2 21.A.133(b) and (c) Eligibility – Link between design and production organisations

In accordance with AMC No.1 to MSTAR 21.A.133(b) and (c) the POA holder should demonstrate to the Authority that it has entered into an arrangement with the design organisation. The arrangement should be documented irrespective of whether the two organisations are separate legal entities or not.

The documented arrangement should facilitate the POA holder to demonstrate compliance with the requirement of MSTAR 21.A.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 Authority.

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

Arrangement Sample Form:

ARRANGEMENT in accordance with MSTAR 21.A.133(b) and (c)	
The undersigned agree on the following commitments:	Relevant interface procedures
<p>The design organisation [NAME] takes responsibility to</p> <ul style="list-style-type: none"> <li>– 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]</li> <li>– provide visible statement(s) of approved design data.</li> </ul>	
<p>The production organisation approval holder [NAME] takes responsibility to</p> <ul style="list-style-type: none"> <li>– assist the design organisation [NAME] in dealing with continuing airworthiness matter and for required actions</li> <li>– assist the design organisation [NAME] in case of products prior to type certification in demonstrating compliance with certification specifications</li> <li>– develop, where applicable, its own manufacturing data in compliance with the airworthiness data package.</li> </ul>	
<p>The design organisation [NAME] and the POA holder [NAME] take joint responsibility to</p> <ul style="list-style-type: none"> <li>– 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</li> <li>– achieve adequate configuration control of manufactured parts, to enable the POA holder to make the final determination and identification for conformity.</li> </ul>	

The scope of production covered by this arrangement is detailed in <i>[DOCUMENT REFERENCE/ATTACHED LIST]</i>	
<i>[When the design organisation is not the same legal entity as the production organisation approval holder]</i>	
<b>Transfer of approved design data:</b>	
The TC/STC/MTSOA holder <i>[NAME]</i> acknowledges that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved by the Authority and therefore the parts and appliances manufactured in accordance with these data and found in a condition for safe operation may be released certifying that the item was manufactured in conformity to approved design data and is in a condition for safe operation.	
<i>[When the design organisation is not the same legal entity as the production organisation approval holder]</i>	
<b>Direct Delivery Authorisation:</b>	
This acknowledgment includes also <i>[OR does not include]</i> the general agreement for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.	
For the <i>[NAME of the design organisation/DOA holder]</i>	For the <i>[NAME of the POA holder]</i>
<b>Date: Signature:</b>	<b>Date: Signature:</b>
XX.XX.XXXX <i>[NAME in block letters]</i>	XX.XX.XXXX <i>[NAME in block letters]</i>

**Instructions for completion:**

**Title:** The title of the relevant document should clearly indicate that it serves the purpose of a design/production interface arrangement in accordance with MSTAR 21.A.133(b) and MSTAR 21.A.133(c).

**Commitment:** The document should include the basic commitments between the design organisation and the POA holder as addressed in MSTAR AMC 21.A.4 and AMC1 to 21.A.133(b) and MSTAR 21.A.133(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.).

**Scope of arrangement:** The scope of arrangement should 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 MSTAR 21.A.131 and MSTAR GM 21.A.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 is also to be identified (see MSTAR 21.A.4 and MSTAR AMC 21.A.4).

**Direct Delivery Authorisation:** Where the design organisation and the MPOA holder are separate legal entities the arrangement should 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 should be available that this intermediate organisation has received authority from the design organisation to grant Direct Delivery Authorisation.

**Signature:** AMC1 to 21.A.133(b) and 21.A.133(c) requests the identification of the responsible persons/offices who control the commitments laid down in the arrangement. Therefore, the basic document should be signed mutually by the authorised representatives of the design organisation and the POA holder in this regard.

3. **21.A.134 Application**

**AMC 21.A.134 - Application (MY)**

Organisations seeking an POA from the TAR are required to submit an application accompanied by a POE and a copy of all procedures, plans or instructions referenced in the POE.

A. The applicant shall submit an application for an POA to TAR.

(1) By the applicant directly when it is the SAO organisation.

(2) Through the MAO when the applicant is a commercial organisation.

(3) For an application from a commercial organisation, the MAO and/ or POA shall include a copy of the clauses of the formal instrument to enforce the regulations.

(4) Formal instrument by MAO and/ or POAs for those commercial organisations.

**GM 21.A.134 Application – Application form and manner**

MSTAR Form 50—Application for MSTAR 21 Production Organisation Approval, is to be obtained from the 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 Authority.

Organizations recognized by competent civil aviation authorities or certified as per AS/EN 9100 or the equivalent AQAP, may re-use part or all of the same process evidences in the demonstration of compliance with MSTAR 21 Section A Subpart G, as agreed by the Authority.

4. **21.A.135 Issue of Production Organisation Approval**

**GM 21.A.135 - Issue of Production Organisation Approval**

(a) Where a production organisation has an extant Part 21 Production Organisation Approval (POA) issued by a recognised NAA/ NMAA, and when the production activity is within the scope of the NAA/MAA term of approval, the organisation may be accepted by the Authority to satisfy the MSTAR 21 requirements for that scope of work with any further investigation limited only to the delta between the two approvals. The Authority

is to be kept informed by the production organisation of significant changes to the organisation and of any NAA/ NMAA findings that may impact the production activity.

(b) Where a production organisation has an extant Part 21 POA issued by a recognised NAA/ NMAA, and when the scope of the NAA/ NMAA term of approval does not entirely cover the production activity, those parts of the organisation's NAA/ NMAA Part 21 exposition that are equally applicable to satisfy the MSTAR 21 may be accepted by the Authority as equivalent in respect of the MSTAR 21 requirements. It is permissible that only those parts of the organisation that are specific to the activity or requirements are addressed in the MSTAR 21 exposition. Those requirements covered by read-across of the sections of the NAA/ NMAA exposition document are to be identified and the NAA/ NMAA document clause reference quoted.

(c) The civil airworthiness release certificates signed under the civil POA authority can be recognised and accepted. Authorised signatures may be accepted by the NMAA for the common parts manufactured and delivered to a military organisation. Appropriate procedures are to be established to demonstrate that validation of the military applicability of civil parts installed is performed. Suitable consideration must be given to the impact on continued airworthiness especially with regard to the implementation of applicable civil Military Airworthiness Directives.

## 5. **21.A.139 Quality System**

### **GM1 21.A.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 is to 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:

- (a) procedures, instructions, data to cover the issues of MSTAR 21.A.139(b)(1) are available in a written form,
- (b) distribution of relevant procedures to offices/persons is made in a controlled manner,
- (c) procedures which identify persons responsible for the prescribed actions are established,
- (d) the updating process is clearly described.

The manager responsible for ensuring that the quality system is implemented and maintained is to be identified.

The 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.

### **GM2 21.A.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 Government Furnished Equipment (GFE) items.

To discharge this responsibility the quality system needs an organisational structure and procedures to adequately control suppliers. Elements of the quality system for the control of suppliers may be performed by other parties provided that the conditions of AMC1 or AMC2 to 21.A.139(b)(1)(ii) are met.

Control can be based upon use of the following techniques (as appropriate to the system or product orientation necessary to ensure conformity):

- a. qualification and auditing of supplier's quality system,
- b. evaluation of supplier capability in performing all manufacturing activities, inspections and tests necessary to establish conformity of parts or appliances to type design,
- c. first article inspection, including destruction, if necessary, to verify that the article conforms to the applicable data for new production line or new supplier,
- d. incoming inspections and tests of supplied parts or appliances that can be satisfactorily inspected on receipt,
- e. identification of incoming documentation and data relevant to the showing of conformity to be included in the certification documents,
- f. a vendor rating system which gives confidence in the performance and reliability of this supplier,
- g. 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:

- a. personnel responsible in charge of these tasks satisfy the competency standards of the POA quality system,
- b. quality measurements are clearly identified,
- c. 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 supplier's MSTAR 21.A.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 21.A.139(b)(1) - Quality System – Elements of the quality system**

- a. The control procedures covering the elements of MSTAR 21.A.139(b)(1) are to document the standards to which the production organisation intends to work.
- b. An organisation having a Quality system designed to meet a recognised Standard such as AS/EN 9100 (relevant to the scope of approval being requested) is to expand it to include at least the following additional topics, as appropriate, in order to demonstrate compliance with the requirements of MSTAR 21 Section A Subpart G:
  - i. Mandatory Occurrence Reporting and continued airworthiness as required by MSTAR 21.A.165(e);
  - ii. Control of work occasionally performed (outside the POA facility by POA personnel);
  - iii. Co-ordination with the applicant for, or holder of, an approved design as required by MSTAR 21.A.133(b), MSTAR 21.A.133(c) and MSTAR 21.A.165(g);
  - iv. Issue of certifications within the scope of approval for the privileges of MSTAR 21.A.163;
  - v. Incorporation of airworthiness data in production and inspection data as required in MSTAR 21.A.133(b), MSTAR 21.A.133(c) and MSTAR 21.A.145(b);
  - vi. 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;
  - vii. 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;
  - viii. Personnel training and qualification procedures especially for certifying staff as required in MSTAR 21.A.145(d).
- c. 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 MSTAR Section A Subpart G. In all cases, the Authority will still need to be satisfied that compliance with MSTAR 21 Section A Subpart G is established.

**AMC1 21.A.139(b)(1)(ii) - Vendor and sub-contractor assessment, audit and control – Production Organisation Approval holder using documented arrangements with other parties for assessment and surveillance of a supplier.**

**1. General**

**NOTE:** For the purpose of this AMC, vendors and sub-contractors are hereafter referred to as 'suppliers', regardless of whether or not they hold a POA and audit and control is hereafter referred to as 'surveillance'.

The production organisation is required by MSTAR 21 to demonstrate that it has established and maintains a quality system that enables the organisation to ensure that each item produced conforms to the applicable design data and is in a condition for safe operation. To discharge this responsibility, the quality system should have, among other requirements, procedures to adequately carry out the assessment and surveillance of suppliers.

The use of Other Parties (OP), such as a consulting firm or quality assurance company, for supplier assessment and surveillance does not exempt the POA holder from its obligations under MSTAR 21.A.165. The supplier assessment and surveillance, corrective action and follow-up activity conducted at any of its supplier's facilities may be performed by OP.

The purpose of using an OP cannot be to replace the assessment, audit and control of the POA holder. It is to allow an element, ie the assessment of the quality system, to be delegated to another organisation under controlled conditions.

The use of OP to perform supplier assessments and surveillance should be part of the production organisation quality system and fulfil the conditions of this AMC.

This AMC is applicable to a method whereby a POA holder has a documented arrangement with OP for the purpose of assessing and/or surveying a POA's supplier.

**2. Approval by the Authority**

Implementing or changing procedures for using OP for supplier assessment and surveillance is a significant change to the quality system and requires approval in accordance with MSTAR 21.A.147.

**3. Conditions and criteria for the use of OP to perform supplier assessment and surveillance**

a. The POA holder should include the use of OP for supplier assessment and surveillance in the POA holders' quality system to demonstrate compliance with the applicable requirements of MSTAR 21.

b. Procedures required for using OP for supplier assessment and surveillance should be consistent with other procedures of the POA holders' quality system.

c. Procedures of the POA holder that uses OP to perform supplier assessment and surveillance should include the following:

1. Identification of the OP that will conduct supplier assessment and surveillance.

2. A listing of suppliers under surveillance by the OP. This listing should be maintained by the POA holder and made available to the Authority upon request.
3. The method used by the POA holder to evaluate and monitor the OP. The method should include the following as a minimum:
  - i. Verification that standards and checklists used by the OP are acceptable for the applicable scope.
  - ii. Verification that the OP is appropriately qualified and have sufficient knowledge, experience, and training to perform their allocated tasks.
  - iii. Verification that the OP surveillance frequency of the suppliers is commensurate with the complexity of the product and with the surveillance frequency established by the POA holder's suppliers control programme.
  - iv. Verification that the suppliers' assessment and surveillance is conducted on-site by the OP.
  - v. Verification that the OP has access to applicable proprietary data to the level of detail necessary to survey suppliers' functions.

Where the POA holder uses an OP accredited and working in accordance with an aviation standard, eg AS/EN9104 series of requirements, that describes requirements for the other party assessment and surveillance, the items (ii) and (iv) above should be deemed to be complied with.

4. A definition to what scopes the OP will conduct suppliers' surveillance on behalf of the POA holder. If the OP replaces surveillance in part, the POA holder should identify the functions that will continue to be surveyed by the POA holder.
  5. The procedures used by the OP to notify the POA holder of non-conformities discovered at the supplier's facility, corrective action and follow-up.
- d. The POA should make arrangements that allow the Authority to make investigation in accordance with MSTAR 21.A.157 to include OP activities.

**AMC2 21.A.139(b)(1)(ii) - Vendor and sub-contractor assessment, audit and control - Production Organisation Approval holder using other party supplier certification.**

**1. General**

**NOTE:** For the purpose of this AMC, vendors and sub-contractors are hereafter referred to as 'suppliers, regardless of whether or not they hold a POA and audit and control is hereafter referred to as 'surveillance'. Other party supplier certification is a method whereby a supplier contracts with an appropriately recognised or accredited

Other Party (OP) for the purpose of obtaining a certification from that OP. Certification indicates that the supplier has satisfactorily demonstrated to meet the applicable standard on a continuing basis. OP certification results in placing the supplier on the OP list of certified organisations, or in the supplier receiving a certificate identifying the requirements that have been met. Periodic follow-up evaluations are conducted by the OP to verify continued compliance with the requirements of the applicable standard. The production organisation is required by MSTAR 21 to demonstrate that it has established and maintains a quality system that enables the organisation to ensure that each item produced conforms to the applicable design data and is in a condition for safe operation. To discharge this responsibility, the quality system should have, among other requirements, procedures to adequately carry out the assessment and surveillance of suppliers. The assessment and surveillance of suppliers by an OP should be deemed to satisfy the requirements of MSTAR 21.A.139(b)(1)(ii) when the conditions of this AMC are satisfied. The assessment and surveillance of suppliers by OP as part of supplier certification does not exempt the POA holder from its obligations under MSTAR 21.A.165. The supplier assessment and surveillance, corrective action and follow-up activity conducted at any of its supplier's facilities may be performed by OP.

The purpose of using an OP cannot be to replace the assessment, audit, and control of the POA holder. It is to allow an element, i.e. the assessment of the quality system, to be delegated to another organisation under controlled conditions.

The use of suppliers that are certified by OP in accordance with this AMC should be part of a production organization quality system.

## **2. Approval by the Authority**

Implementing or changing procedures for using suppliers that are certified by an OP is a significant change to the quality system and requires approval in accordance with MSTAR 21.A.147.

## **3. Conditions and criteria for using supplier certification for the supplier assessment and surveillance.**

a. The POA holder should include the use of supplier certification for the supplier assessment and surveillance in the POA holder's quality system to demonstrate compliance with the applicable requirements of MSTAR 21.

b. Procedures required for use of supplier certification for the supplier assessment and surveillance should be consistent with other procedures of the POA holders' quality system.

c. Procedures of the POA holder that uses supplier certification for the supplier assessment and surveillance should include the following:

1. Listing of the OP that has certified or will certify suppliers and will conduct supplier assessment and surveillance or the scheme under which the accreditation of the OP is controlled. This listing should be maintained by the POA holder and made available to the Authority upon request.

2. A listing of the certified suppliers under surveillance by the OP and used by the POA holder. This listing should be maintained by the POA holder and made available to the Authority upon request.

3. The method used by the POA holder to evaluate and monitor the certification process of any OP certification body or OP certification scheme used. This applies not only to new suppliers, but also to any decision by the POA holder to rely on OP certification of current suppliers. The method should include the following as a minimum:

- i. Verification that certification standards and checklists are acceptable and applied to the applicable scope.
- ii. Verification that the OP is appropriately qualified and has sufficient knowledge, experience, and training to perform its allocated tasks.
- iii. Verification that the OP surveillance frequency of the suppliers is commensurate with the complexity of the product and with the surveillance frequency established by the POA holder's suppliers control programme.
- iv. Verification that the suppliers' surveillance is conducted on-site by the OP.
- v. Verification that the surveillance report will be made available to the Authority upon request.
- vi. Verification that the OP continues to be recognised or accredited.
- vii. Verification that the OP has access to applicable proprietary data to the level of detail necessary to survey suppliers' functions.

Where the POA holder uses an OP accredited and working in accordance with an aviation standard, e.g. AS/EN9104 series of requirements, that describes requirements for the OP certification, the items (ii), (iv) and (v) above should be deemed to be complied with.

4. A definition to what scopes the OP will conduct suppliers' surveillance on behalf of the POA holder. If the OP replaces surveillance in part, the POA holder should identify the functions that will continue to be surveyed by the POA holder.

5. Procedures that ensure that the POA is aware of the loss of an existing certification.

6. Procedures that ensure that the POA holder is aware of non-conformities and has access to detailed information of these non-conformities.

7. Procedures to evaluate the consequences of non-conformities and take appropriate actions.

d. The POA should make arrangements that allow the Authority to make investigation in accordance with MSTAR 21.A.157 to include OP activities.



**GM1 21.A.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.

**GM2 21.A.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 MSTAR 21.A.139(a).

The quality assurance function to ensure the above is to perform planned continuing and systematic evaluations or audits of factors that affect the conformity (and, where required, safe operation) of the products, parts or appliances to the applicable design. This evaluation is to include all elements of the quality system in order to demonstrate compliance with MSTAR 21 Section A Subpart G.

**6. 21.A.143 Production Organisation Exposition****GM 21.A.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 MSTAR 21.A.143(a). Where this information is documented and integrated in manuals, procedures and instruction, the POE is to provide a summary of the information and an appropriate cross reference.

The 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 MSTAR GM 21.A.147(a)) is to be approved by the 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 MSTAR 21 Section A Subpart G except that the supplement is to 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 is to be easily identifiable.

**AMC 21.A.143(a)(13) - Flight Test Operations Manual**

The flight test operations manual shall include:

- a. a description of the organisation's processes for flight test, including the flight test organisation involvement into the Permit to Fly issuance process, see MSTAR 21 Subpart P – Permit to Fly;
- b. crewing policy, including composition, competency, currency and flight time limitations;
- c. procedures for the carriage of persons other than crew members and for flight test training, when applicable;
- d. a policy for risk and safety management and associated methodologies;
- e. procedures to identify the instruments and equipment to be carried; and
- f. a list of documents that need to be produced for flight test.

The flight test operations manual should be owned by the organisation conducting the flight test. If the flight test is to be conducted by an organisation outside that of the POA holder, e.g. a State Aircraft Operator (SAO), reference to that organisation's flight test operations manual (or equivalent) is acceptable.

## 7. **21.A.145 Approval Requirements**

### **GM 21.A.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 are to 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 are to demonstrate 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 is to 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 is to include, where appropriate, verification that specific qualification standards have been implemented, for example NDT, welding. Training is to be organised to establish and maintain the personal competence levels determined by the organisation to be necessary.

### **GM 21.A.145(b)(2) Approval Requirements – Airworthiness and environmental protection, production/quality data procedures**

(a) 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.

(b) Procedures are required to define the manner in which airworthiness, and where applicable, 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 is also to define the traceability of such data to each individual product, part, or appliance for the purpose of certifying conditions for safe operation and issuing an MSTAR Form 52—Statement of Conformity or MSTAR Form 1—Authorised Release Certificate.

#### **GM 21.A.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 them to fulfill the function provided their 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 MSTAR 21 Section A Subpart G.

The manager needs to have sufficient knowledge and authority to enable them to respond to the Authority regarding major issues of the production approval and implement necessary improvements.

The manager needs to be able to demonstrate that they are fully aware of and support the quality policy and maintains adequate links with the quality manager.

#### **GM 21.A.145(c)(2) - Approval Requirements – Responsible managers**

The person or persons nominated is to represent the management structure of the organisation and be responsible for all functions as specified in MSTAR 21 Section A Subpart G. It therefore follows that, depending on the size of the MSTAR 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 Authority requires the nominated managers to be identified and their credentials submitted on a MSTAR Form 4—Nominated Personnel Approval, to the 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 MSTAR 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 are to be defined in such a way that all responsibilities are covered.

Where a MSTAR 21 Section A Subpart G organisation chooses to appoint managers for all or any combination of the identified MSTAR 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, they are to 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 MSTAR 21 Section A Subpart G and requesting remedial action as necessary by the other managers or the Accountable Manager as appropriate. They are to have direct access to the Accountable Manager.

**AMC 21.A.145(d)(1) - Approval Requirements – Certifying staff**

- a. Certifying Staff are nominated by the production organisation to ensure that products, parts and/or appliances qualify for MSTAR Form 52—Statements of Conformity or MSTAR Form 1—Release Certificates. Certifying Staff positions and numbers are to be appropriate to the complexity of the product and the production rate.
- b. 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.
- c. Training should be given to develop a satisfactory level of knowledge of organisation procedures, aviation legislation, and associated implementing rules, airworthiness requirements and GM, relevant to the particular role.
- d. For that purpose, in addition to general training policy, the organisation should define its own standards for training, including pre-qualification standards, for personnel to be identified as certifying staff.
- e. Training policy is part of the Quality System and its appropriateness forms part of investigation by the Authority within the organisation approval process and subsequent surveillance of persons proposed by managers.
- f. The training should be updated in response to experience gained and changes in technology.
- g. A feedback system to ascertain that the required standards are being maintained should be put in place to ensure the continuing compliance of personnel to authorisation requirements.
- h. For release of products, parts or appliances, the responsibilities to issue statements of conformity/release certificates (MSTAR Form 1) or permit to fly including approval of flight conditions are allocated to the certifying staff identified in MSTAR 21.A.145(d)(2).
- i. The 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 21.A.145(d)(2) - Approval Requirements – Record of certifying staff**

- a. The following is the minimum information to be recorded in respect of each certifying person:
  - i. Name;
  - ii. Date of Birth;
  - iii. Basic Training and standard attained;

- iv. Specific Training and standard attained;
  - v. If appropriate – Continuation Training;
  - vi. Experience;
  - vii. Scope of the authorisation;
  - viii. Date of first issue of the authorisation;
  - ix. If appropriate – expiry date of the authorisation;
  - x. Identification Number of the authorisation.
- b. The record may be kept in any format and should be controlled by an internal procedure of the organisation. This procedure forms part of the quality system.
- c. Persons authorised to access the system should 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.
- d. The certifying person should be given reasonable access on request to their own records.
- e. Under the provision of MSTAR 21.A.157 the Authority has a right of access to the data held in such a system.
- f. The organisation should 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 21.A.145(d)(3) - Approval requirements – Evidence of authorisation**

- a. The authorisation document should 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.
- b. 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 Authority.

**8. 21.A.147 Changes to the approved production organisation**

**GM 21.A.147(a) - Changes to the approved production organisation – Significant changes**

- a. Changes to be approved by the Authority include:
  - i. Significant changes to production capacity or methods;
  - ii. Changes in the organisation structure especially those parts of the organisation in charge of quality;

- iii. A change of the Accountable Manager or of any other person nominated under MSTAR 21.A.145(c)(2);
  - iv. Changes in the production or quality systems that may have an important impact on the conformity/airworthiness of each product, part or appliance;
  - v. Changes in the placement or control of significant sub-contracted work or supplied parts.
- b. To ensure that changes do not result in non-compliance with MSTAR 21 Section A Subpart G it is in the interest of both the 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 is to also permit agreement on the need for variation of the terms of approval (see MSTAR 21.A.143(a)(9)).
- c. Where a change of name or ownership results in the issue of a new approval the investigation will normally take account of the Authority's knowledge and information from the preceding approval.
- d. Changes of location are addressed in MSTAR 21.A.148 and changes of ownership in MSTAR 21.A.149, change of scope of approval in MSTAR 21.A.153.

## 9. **21.A.148 Changes to location**

### **AMC 21.A.148 Changes of location – Management during change of location**

- a. 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 Authority as prescribed in MSTAR 21.A.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 Authority, in advance of the relocation, which can allow continuation of the approval.
- b. 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 Authority has indicated its satisfaction with the arrangements.
- c. 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:
- i. 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 Authority;
  - ii. The basis of the co-ordination plan, e.g., whether by product or area;
  - iii. Planned timing of each phase of relocation;

- iv. Arrangements for maintaining the standards of the approval up to the point where the production area is closed down;
  - v. Arrangements for verifying continued production quality upon resumption of work at the new location;
  - vi. Arrangements for check and/or re-calibration of inspection aids or production tools and jigs before resuming production;
  - vii. Procedures which ensure that goods are not released from the new location until their associated production and quality systems have been verified;
  - viii. Arrangements for keeping the Authority informed of progress with the relocation.
- d. From the co-ordination plan, the Authority can determine the points at which it wishes to conduct investigation.
- e. If an agreed co-ordination plan is in operation, the 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.

10. **21.A.149 Transferability**

**GM 21.A.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 MSTAR 21.A.145 - Approval (Production) Requirements.

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 Authority could suspend or revoke the approval under MSTAR 21.A.245 -Approval (Design) Requirements

In order for the Authority to agree to a transfer of approval, it will normally prescribe it as a condition in accordance with MSTAR 21.A.147(b) - Changes to the approved production organisation, requirements. that the obligations and responsibilities of the former organisation are to be transferred to the new organisation, otherwise transfer is not possible and application for a new approval will be required.

11. **21.A.151 Terms of approval****GM 21.A.151 - Terms of approval – Scope and categories**

Terms of approval document(s) will be issued by the Authority under MSTAR 21.A.135 to identify the scope of work, the products, and/or categories for which the holder is entitled to exercise the privileges defined in MSTAR 21.A.163.

The codes shown against each scope of work item are intended for use by the 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 MSTAR 21.A.163 will be described by the Authority as follows:

**FOR PRODUCTS:**

- a. General area, similar to the titles of the corresponding certification codes;
- b. Type of Product, in accordance with the type certificate.

**FOR PARTS AND APPLIANCES:**

- a. General area, showing the expertise, eg mechanical, metallic structure;
- b. Generic type, eg wing, landing gear, tyres.

SCOPE OF WORK	PRODUCT / CATEGORIES
	INSERT TYPES
A1 Large Aeroplanes	“
A2 Small Aeroplanes	“
A3 Large Helicopters	“
A4 Small Helicopters	“
A5 Gyroplanes	“
A6 Sailplanes	“
A7 Motor Gliders	“
A8 Crewed Balloons	“
A9 Airships	“
A11 Very Light Aeroplanes	“
A12 Other	“
M1 Aircraft for transport of troops, reconnaissance, patrols, tankers, electronic warfare missions, etc.	“



RESTRICTED

PU 2103

M2 Combat fixed wing aircraft and advanced trainers	“
M3 Combat helicopter	“
U1 Fixed wing UAV <150kg	“
U2 Fixed wing UAV >150kg	
U4 Rotary wing UAV <150kg	
U5 Rotary wing UAV >150kg	
B1 Turbine Engines	“
B2 Piston Engines	“
B3 APU's	“
B4 Propellers	“
C1 Appliances:	State appliance generic types eg Tyres, Altimeter, etc.) Examples include: Avionics, Com/Nav/Pulse  Computer System,  Aircraft/Engine/Avionics  Instruments, Mechanical/Electrical/ Gyroscopic/Electronic  Mechanical/Hydraulic/Pneumatic
C2 Parts:	State part generic types eg Wing, Landing Gear  Examples include:  Structural, Metallic/non-metallic  Mechanical/Hydraulic/Pneumatic  Electrical Electronic  Defensive Aids
C3 Weapons	
C4 Other Equipment	
D1 Maintenance	State aircraft types
D2 Issue of Permit to Fly	State aircraft types

12. **21.A.153 Changes to the Terms of Approval**

**AMC 21.A.153 Changes to the terms of approval – Application for a change to the terms of approval**

MSTAR Form 51 must be obtained from the Authority and completed in accordance with the procedures of the production organisation exposition (POE).

The information entered on the form is the minimum required by the Authority to assess the need for change of the production organisation approval.

The completed form and an outline of the changed POE, and details of the proposed change to POA terms of approval must be forwarded to the Authority.

13. **21.A.157 Investigations**

**GM 21.A.157 - Investigations – Arrangements**

The arrangements made by the applicant for, or holder of an approval under MSTAR 21 Section A Subpart G are to allow the 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 Authority may make an investigation of a sample product part or appliance and its associated records, reports and certifications.

The arrangements are to enable the organisation to give positive assistance to the 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 Authority has been given full and free access to the facilities and to any information relevant to demonstrate compliance to MSTAR 21 Section A Subpart G requirements, and assistance (personnel support, records, reports, computer data, etc, as necessary).

Assistance to the Authority includes all appropriate means associated with the facilities of the production organization to allow the 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 Authority seeks to have an open relationship with the organisation and suitable liaison personnel are to be nominated to facilitate this, including suitable representative(s) to accompany Authority staff during visits not only at the organisations own facilities but also at sub-contractors, partners or suppliers.

14. **21.A.158 Findings**

**GM1 21.A.158(a) Uncontrolled non-compliance with applicable design data**

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

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

**GM2 21.A.158(a) – Examples of Level 1 findings**

Examples of Level 1 findings are non-compliances with any of the following MSTAR 21 paragraphs, that could affect the safety of the aircraft:

MSTAR 21.A.139, MSTAR 21.A.145, MSTAR 21.A.147, MSTAR 21.A.148, MSTAR 21.A.151, MSTAR 21.A.163 and MSTAR 21.A.165(b) to MSTAR 21.A.165(g).

It is to 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 MSTAR 21.A.157, in particular to obtain access to facilities, after denial of one written request are to be classified as a Level 1 finding.

**15. 21.A.159 Duration and continued validity****GM 21.A.159 - Duration and continued validity (MY)**

1. An EAC issued to a SAO DOA is valid until it is surrendered or until the Authority suspends or revokes it.
2. An EAC issued to a commercial DOA is valid for the period of the three (3) years or until the formal instrument which it relates expires or the Authority suspends or revokes it.
3. An EAC issued to a commercial DOA without formal instrument is valid for a period of one (1) year or until the Authority suspends or revokes it.

**GM 21.A.159(a)(3) - Evidence of a lack of satisfactory control**

A positive finding by the Authority of:

- a. an uncontrolled non-compliance with type design data affecting the airworthiness of product part or appliance;
- b. an incident/accident identified as caused by POA holder;
- c. non-compliance with the POE and its associated procedures which could affect conformity of manufactured items to design data;
- d. insufficient competence of certifying staff;
- e. insufficient resources in respect of facilities, tools and equipment;
- f. insufficient means to ensure good production work standards;

- g. a lack of effective and timely response to prevent a recurrence of any of paragraph's a. to f.

16. **21.A.163 Privileges**

**AMC 21.A.163(c) - Reserved**

**AMC 21.A.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 organization intends to maintain the aircraft beyond that point, it would have to apply for and obtain an appropriate maintenance approval.

When the Authority is satisfied that the procedures required by MSTAR 21.A.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:

- a. Preservation, periodic inspection visits, etc.;
- b. Embodiment of a Service Bulletin;
- c. Application of airworthiness directives;
- d. Repairs;
- e. Maintenance tasks resulting from special flights;
- f. Maintenance tasks to maintain airworthiness during flight training, demo flights and other non-revenue flights.

Any maintenance activities should be recorded in the Aircraft Log Book. It should be signed by certifying staff or 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 should use MSTAR Form 53— Certificate of Release to Service, which should 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 MSTAR AMC 21.A.163(c) (MSTAR Form 1—Authorised Release Certificate).

Records relevant to continued airworthiness or retirement lives, such as engine runs, flight hours, landings, etc, which affect part retirement of maintenance schedules should 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 MSTAR 145, classified and released as 'used'.

17. **21.A.165 Obligations of the holder**

**GM 21.A.165(a) - Obligations of the holder – Basic working document**

Compliance with the POE is a prerequisite for obtaining and retaining a production organisation approval.

The organisation is to make the POE available to its personnel where necessary for the performance of their duties. A distribution list is to, therefore, be established. Where the POE mainly refers to separate manuals or procedures, the distribution of the POE could be limited.

The organisation is to 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.

**GM1 21.A.165(c) - Obligations of the holder – Conformity of prototype models and test specimens**

MSTAR 21.A.33 requires determination of conformity of prototype models and test specimens to the applicable design data. The MSTAR Form 1 - Authorised Release Certificate, may be used as a conformity certificate as part of the assistance a POA holder provides to a design approval holder/applicant.

**GM2 21.A.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 are to have been approved by the design approval holder, or when necessary, by the Authority.

**GM3 21.A.165(c) - Obligations of the holder – Condition for safe operation**

Before issue of the Statement of Conformity to the Authority, the holder of a production organisation approval is to make an investigation so as to be satisfied in respect of each of the items listed below. The documented results of this investigation are to 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:

- a. Equipment or modifications which do not meet the requirements of the State of manufacture but have been accepted by the Authority;
- b. Identification of products, parts, or appliances which:

- i. Are not new;
  - ii. Are furnished by the buyer or future operator (including those identified in MSTAR 21.A.801 and MSTAR 21.A.805).
- c. Technical records which identify the location and serial numbers of significant components that have special traceability requirements for continued airworthiness purposes including those identified in MSTAR 21.A.801 and MSTAR 21.A.805;
- d. Logbook and a modification record book for the aircraft as required by the Authority;
- e. Logbooks for products identified in MSTAR 21.A.801 installed as part of the type design as required by the Authority;
- f. A weight and balance report for the completed aircraft;
- g. A record of missing items or defects which do not affect airworthiness these for example could be furnishing or GFE (Items may be recorded in a technical log or other suitable arrangement such that the operator and Authority are formally aware);
- h. Product support information required by other implementing rules and associated airworthiness requirements 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;
- i. Records which demonstrate completion of maintenance tasks appropriate to the test flight flying hours recorded by the aircraft. These records are to show the relationship of the maintenance status of the particular aircraft to the manufacturer-recommended maintenance task list and the MRB document/report;
- j. 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;
- k. Details of the approved interior configuration if different from that approved as part of the type design;
- l. An approved Flight Manual which conforms to the build standard and modification state of the particular aircraft is to be available;
- m. Show that inspections for foreign objects at all appropriate stages of manufacture have been satisfactorily performed;
- n. The registration has been marked on the exterior of the aircraft as required by SAO policy. Where required by national legislation fix a fireproof owners nameplate;
- o. Where applicable there is to be a certificate for noise and for the aircraft radio station;

- p. The installed compass and or compass systems have been adjusted and compensated and a deviation card displayed in the aircraft;
- q. Software criticality list;
- r. A record of rigging and control surface movement measurements;
- s. Details of installations which will be removed before starting operations, e.g. ferry kits for fuel, radio or navigation;
- t. Where maintenance work has been performed under the privilege of MSTAR 21.A.163(d) issue a release to service that includes a statement that the aircraft is in a condition for safe operation;
- u. List of all applicable Service Bulletins and airworthiness directives that have been implemented.

#### **GM4 21.A.165(c) - Airworthiness Release or Conformity Certificate**

The MSTAR Form 1 - Authorised Release Certificate, when used as a release certificate as addressed in MSTAR 21.A.165(c)(2) and MSTAR 21.A.165(c)(3), may be issued in two ways:

- a. As an airworthiness release, only when by virtue of the arrangement described in MSTAR 21.A.133(b) and MSTAR 21.A.133(c), it can be determined that the part conforms to the approved design data and is in condition for safe operation.
- b. As a conformity Certificate, only when by virtue of the arrangement described in MSTAR 21.A.133(b) and MSTAR 21.A.133(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 12. Parts released with a MSTAR Form 1 as a conformity Certificate are not eligible for installation in a type certificated aircraft.

The MSTAR Form 1 is to 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 21.A.165(d) - 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 is to 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 is to be subject to appropriate procedures in the Quality System required by MSTAR 21.A.139.

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

The related organisation procedures are to:

- a. Identify records to be kept;
- b. Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information, eg by product, subject;
- c. Control access and provide effective protection from deterioration or accidental damage;
- d. Ensure continued readability of the records;
- e. Demonstrate to the Authority proper functioning of the records system;
- f. Clearly identify the persons involved in conformity determination;
- g. Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:
  - i. Data which supports conformity of a product, part, or appliance are to be kept for not less than three years from the issue date of the related MSTAR Form 52—Statement of Conformity or MSTAR Form 1—Authorised Release Certificate;
  - ii. Data considered essential for continuing airworthiness are to be kept throughout the operational life of the product, part or appliance.
- h. 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 are to define in each case who is to retain the record data (organisation or partner, supplier or sub-contractor). They are to also define method for surveillance of the recording/record keeping system of the partners, suppliers or sub-contractors.

#### **GM 21.A.165(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 is to 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 is to be subject to appropriate procedures in the Quality System required by MSTAR 21.A.139.

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

The related organisation procedures are to:

- a. Identify records to be kept;
- b. Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information, eg by product, subject; a.
- c. Control access and provide effective protection from deterioration or accidental damage;
- d. Ensure continued readability of the records;
- e. Demonstrate to the Authority proper functioning of the records system;
- f. Clearly identify the persons involved in conformity determination;
- g. Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:
  - i. Data which supports conformity of a product, part, or appliance are to be kept for not less than three years from the issue date of the related MSTAR Form 52—Statement of Conformity or MSTAR Form 1—Authorised Release Certificate;
  - ii. Data considered essential for continuing airworthiness are to be kept throughout the operational life of the product, part, or appliance.
- h. 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 are to define in each case who is to retain the record data (organisation or partner, supplier, or sub-contractor). They are to also define method for surveillance of the recording/record keeping system of the partners, suppliers, or sub-contractors.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 8****SUBPART H - CERTIFICATES OF AIRWORTHINESS AND RESTRICTED  
CERTIFICATES OF AIRWORTHINESS****1. 21.A.171 Scope****AMC to Subpart H**

The initial airworthiness review is due within 12 months of the issue date of the aircraft's initial Certificate of Airworthiness (CoA) or Restricted Certificate of Airworthiness (RCoA).

**2. 21.A.172 Eligibility****GM 21.A.172 Eligibility**

In a participating Member State ('State of Registry') means 'on the State register' for Malaysian State Aircraft. To operate an aircraft on the State register requires issue of a Malaysian State Type Certificate or Restricted Malaysian State Type Certificate, as well as a Certificate of Airworthiness or Restricted Certificate of Airworthiness for that particular aircraft.

**3. 21.A.173 Classification****GM 21.A.173 Classification**

State registered aircraft types will each be issued with a Malaysian State Type Certificate (MSTC), from which Certificates of Airworthiness (CoA) can be issued. Non-State registered aircraft types are not subject to MSTAR 21; they are subject to the NAA/NMAA regulatory system of registration, e.g. CAAM. The provision for issuing a CoA based on a civil Type Certificate issued by a recognised Civil Authority is therefore not applicable to MSTAR 21, since there will always be a MSTC from which to issue CoAs for State aircraft.

**4. 21.A.174 Application****AMC 21.A.174 Application – Form and Manner**

**MSTAR Form 25A** - Application for Certificate of Airworthiness, should be completed by the applicant.

**GM1 21A.174(a) Application**

For the purpose of State aircraft, 'the State of Registry' means Malaysia (MY).

**GM2 21A.174(a) Application**

The authority must exercise a duty of care before adding individual aircraft as state-registered aircraft. This is particularly true for used aircraft, where records of usage, maintenance, modifications, and repairs may not be to the standard normally required by DGTA. The authority exercises its duty of care through issuing a Certificate of Airworthiness (CoA)(MSTAR Form 25), for individual aircraft that conform to their type

design. Applicants for a CoA are to submit MSTAR Form 25A - Application for Certificate of Airworthiness, to the Authority under a covering Minute.

For new civil derivative aircraft being delivered direct to SAO, the purchaser can seek a civil export CoA, via the prime aircraft Original Equipment Manufacturer, if there is a civil type certificate in force. This CoA can form a robust foundation for the issue of a Malaysian State CoA.

For instances where a civil type certificate is not in force or SAO is leasing an aircraft that has been in civilian use, the requirement for an NAA Certificate of Airworthiness can be demonstrated if an NAA authorised delegate provides a document that attests the aircraft would be eligible for issue of a Standard or

Export Certificate of Airworthiness if the aircraft was to be registered by a Civil Aviation Authority. DGTA will accept only a Standard Certificate of Airworthiness under MSTAR 21.A.172, MSTAR 21.A.173 and MSTAR 21.A.174. DGTA staff should be consulted for specific advice.

### **GM3 21A.174(a) Application (MY)**

#### **Issuance and Cancellation of Certificate of Airworthiness**

- a. Certificate of Airworthiness (CoA) shall mean a certificate attesting that:
  - (1) An individual aircraft has been examined and conforms to the Type Design.
  - (2) Any deviations to that aircraft have been approved.
  - (3) The aircraft is considered airworthy as at the date of the certificate.
- b. The Continuing Airworthiness Manager in CAMO shall submit to the TAR documentation to prove that the individual aircraft conforms to the Type Design and that all maintenance requirements have been complied with.
- c. The Continuing Airworthiness Manager in CAMO is eligible to a CoA recommendation from the TAR when all requirements have been complied with in accordance with these regulations.
- d. CoA shall be issued following the issuance of MSTC or STC for the aircraft type and before the operation of each aircraft.
- e. The TAR shall update the CoA for affected aircraft to reflect conformance to the Type Design following a major change to the Type Design.

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

Used aircraft require a more stringent inspection requirement than new build aircraft. The inspecting organisation should provide an Airworthiness Inspection Plan (AIP). Airworthiness inspections are to be performed by an appropriately qualified, independent, and experienced third-party organisation. A comprehensive review of the aircraft design, maintenance and operational documentation is to be conducted and verified by a physical inspection of the airframe structure, engines, and other systems. The inspecting organisation is to provide inspection reports detailing the airworthiness inspection result. As a minimum, reports should include the following:

- a. details of the aircraft inspected, including civil registration number, manufacturer, serial number, model designation, and NAA Certificate of Airworthiness number;
- b. last known inspected configuration of the aircraft;
- c. a summary of the usage and maintenance history of the aircraft, engines and propellers, including current maintenance, weight and balance, and lifed component status;
- d. details of any major structural and life-limited component changes made to items such as wings and tailplane, and a summary of the individual histories of such components, unless new when fitted;
- e. details of any accidents or incidents in which the aircraft has been involved;
- f. details of any major repairs or modifications performed on the aircraft, engines, and propellers and verification that they have been properly approved and incorporated;
- g. details of any applicable aircraft-general, type-specific, engine or equipment airworthiness directives or service bulletins and verification that the aircraft complies;
- h. a condition assessment of flight safety critical components and fatigue-sensitive structure;
- i. recommendations for the resolution of any airworthiness deficiencies or concerns arising as a result of the airworthiness inspection; and
- j. flight manuals and any other manuals.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 2**

**CHAPTER 9**

**SUBPART I – (RESERVED)**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 10****SUBPART J - DESIGN ORGANISATION APPROVAL****1. 21.A.234 Application****AMC 21.A.234 - Application - Form and manner**

**MSTAR Form 80** - Application for Design Organisation Approval, is to be obtained from the Authority, and completed by the Head of Design of the organisation.

The completed form, an outline of the design organisation exposition, and details of the proposed terms of approval are to be forwarded to the Authority.

Organisations approved by recognised national aviation authorities or certified under AS/EN 9100 or the equivalent Aerospace Quality Assurance Program (AQAP), may re-use part or all of the same process evidence in the demonstration of compliance with MSTAR 21 Section A Subpart J, as agreed by the Authority.

**AMC1 21.A.234 - Application - Form and manner (MY)**

1. For an application from a commercial organisation, the MAO shall include a copy of the clauses of the formal instrument to enforce the regulations in this regulation.

2. Under special circumstances where the MAO wish to sponsor an application from any commercial organisation that yet to have a formal instrument with the SAO, the MAO must justify the scope and appropriate timeline in obtaining the formal instrument for Authority consideration.

3. For an application from SAO organisation relying substantially upon subcontractors to perform the engineering activities listed in the applicant's DOE, the application must detail those subcontractors and the respective scopes of work to be subcontracted.

**AMC2 21.A.234 - Application - Form and manner (MY)****MAO**

1. MAO is an SAO organisation, commonly referred as the Head of SAO Aviation Engineering Organisation, who is responsible for the management of a formal instrument between the Government and a commercial organisation which requires that commercial organisation to operate as DOA.

2. MAO shall ensure that any formal instruments requiring a commercial organisation to operate as a commercial DOA are developed and administered to satisfy the requirements of these Sub Part.

3. MAO shall notify the Authority in writing:

a. Upon cessation of the formal instrument between the MAO and commercial DOA.

- b. When recommending that a commercial DOA certification be suspended or revoked.

### GM 21.A.234 - Application - Form and manner (MY)

1. The applicant shall submit an application for DOA to Authority:
  - a. By the applicant directly when it is the SAO organisation.
  - b. Through the MAO when the applicant is a commercial organisation.
2. **21.A.235 Issue of design organisation approval**

### GM 21.A.235 - Issue of a Design Organisation Approval

- a. Where a design organisation has an extant EASA Part 21 design organisation approval, and when the military design activity is in the scope of the EASA terms of approval, the organisation may be accepted by the Authority to satisfy the MSTAR 21 requirements for that scope of work with any further investigation limited only to the delta between the two approvals. The Authority is to be kept informed by the design organisation of significant changes to the organisation and of any EASA findings that may impact the military design activity.
  - b. Where a design organisation has an extant EASA Part 21 design organisation approval, and when the scope of the EASA terms of approval does not entirely cover the military design activity, those parts of the organisation's EASA Part 21 handbook that are equally applicable to satisfy MSTAR 21 may be accepted by the Authority as equivalent in respect of the MSTAR 21 requirements. It is permissible that only those parts of the organisation that are specific to the military activity or requirements are addressed in the MSTAR 21 DOE (Design Organisation Exposition). Those requirements covered by reading across the sections of the EASA handbook are to be identified with reference to the applicable procedures or other basic working documents as referred to in the EASA handbook.
3. **21.A.239 Design assurance system**

### GM1 21.A.239(a) - Design assurance system (MY)

#### 1. Purpose

This GM1 outlines some basic principles and objectives of MSTAR 21.A.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:

- a. To design products, or parts in accordance with the applicable airworthiness requirements and environmental protection requirements (where applicable);

- b. To demonstrate and verify the compliance with these requirements; and
- c. To receive a Design Acceptance Certificate from CAMO. Refer to MSTAR AMC M.A.708(d)
- d. To demonstrate this compliance to the Authority.
- e. For major changes to type design or major repairs to products, the Design Acceptance process shall be carried out, accepted by CAMO - CAM and approved by Authority.

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 demonstrate and verify and to maintain compliance with the applicable airworthiness requirements and environmental protection requirements (where applicable).

### 3. Design Assurance

The complete process, starting with the airworthiness and environmental protection (where applicable) 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, design assurance and type investigation 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 airworthiness and environmental protection (where applicable) requirements and will continue to comply after any change.

Two main aspects should therefore be considered:

- a. How the planned and systematic actions are defined and implemented, from the very beginning of design activities up to and including the continued airworthiness activities;
- b. How these actions are regularly evaluated and corrective actions implemented as necessary.



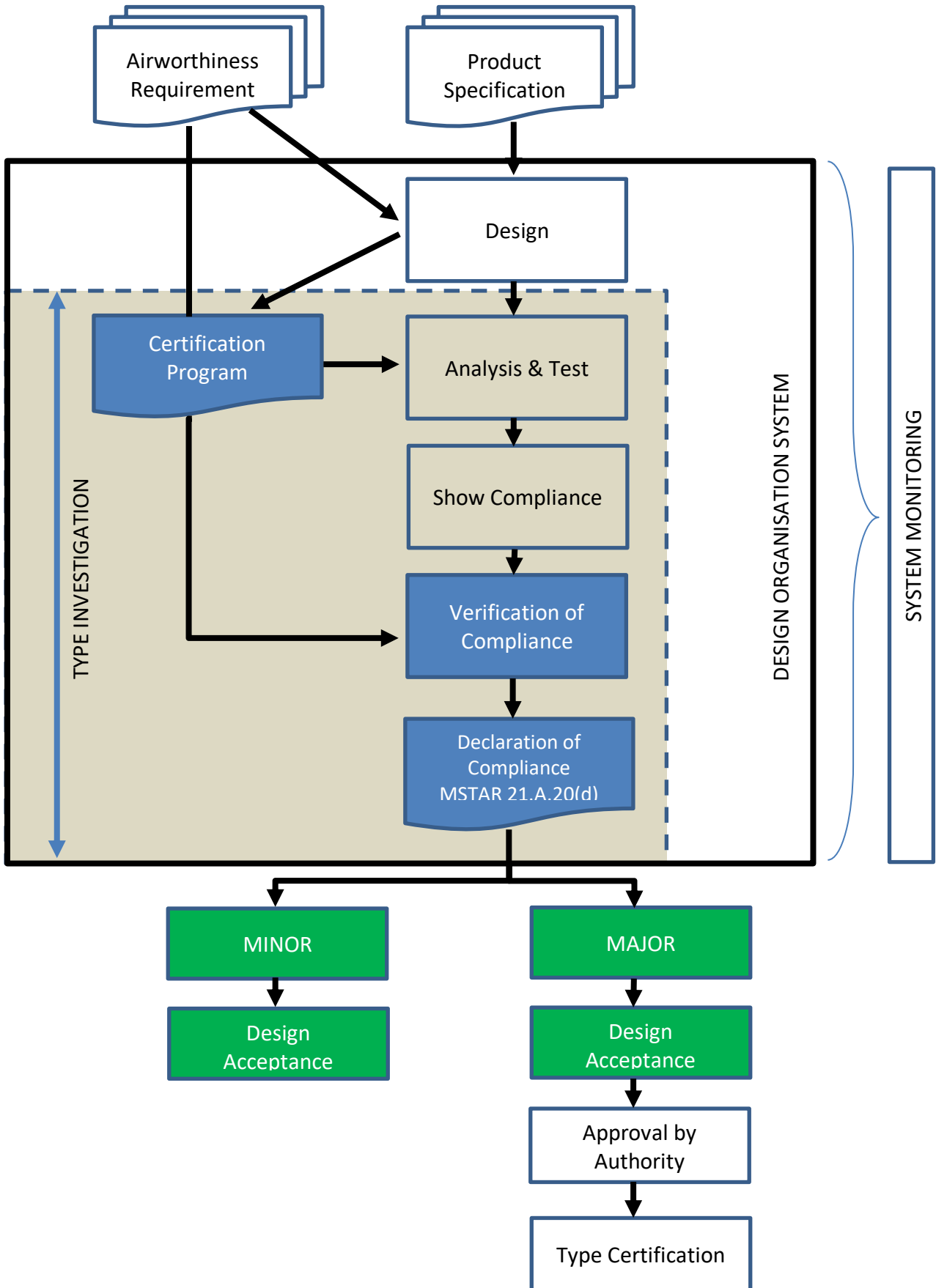


Figure 3 – Relationship between design, design assurance, and type investigation process

### 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 design organisation handbook in accordance with MSTAR 21.A.243, in particular to indicate the initiation of design activities on a product.
- b. To assure that all instructions of the handbook are adhered.
- 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 MSTAR 21.A.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 Authority that prototype models and test specimens adequately conform to the type design (see MSTAR 21.A.33(b)(1)).

#### 3.1.2 **Chief Executive and Head of design organisation (or their 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 MSTAR 21.A.20(d)) with the applicable airworthiness and environmental protection (where applicable) requirements after verification of satisfactory completion of the Type Investigation. In accordance with MSTAR 21.A.20(e), their signature on the declaration of compliance confirms that the procedures as specified in the DOE have been followed (see also MSTAR GM 21.A.265(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 programs and data, necessary for the verification of compliance with the applicable airworthiness and environmental protection (where applicable) requirements as defined in the certification program.
- b. Approval of the technical content (completeness, technical accuracy...), including any subsequent revisions, of the manuals approved by the Authority (Aircraft Flight Manual, the Airworthiness Limitations section of the Instructions for Continuing Airworthiness and the Certification Maintenance Requirements (CMR) document, where applicable).

### 3.1.4 Office of Airworthiness

- a. Liaison between the design organisation and the Authority with respect to all aspects of the certification programme.
- b. Ensuring that a handbook is prepared and updated as required in MSTAR 21.A.243.
- c. Co-operation with the Authority in developing procedures to be used for the type certification process.
- d. Issuing of guidelines for documenting compliance.
- e. Co-operation in issuing guidelines to ensure compliance with the regulations for the preparation of the manuals, Service Bulletins, drawings, specifications, and standards.
- f. Ensuring procurement and distribution of applicable airworthiness and environmental protection (where applicable) requirements and other specifications.
- g. Co-operating with the Authority in proposing the type certification basis.
- h. Interpretation of applicable airworthiness and environmental protection (where applicable) requirements and requesting decisions of the Authority in case of doubt.
- i. Advising of all departments of the design organisation in all questions regarding airworthiness, environmental protection (where applicable) approvals and certification.
- j. Preparation of the certification programme and co-ordination of all tasks related to Type Investigation in concurrence with the Authority.
- k. Regular reporting to the Authority about Type Investigation progress and announcement of scheduled tests in due time.
- l. Ensuring co-operation in preparing inspection and 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 demonstrate compliance with all airworthiness and environmental protection (where applicable) requirements, as well as for completeness, and signing for release of the documents.
- o. Checking the required type design definition documents described in MSTAR 21.A.31 and ensuring that they are provided to the Authority for approval when required.
- p. Preparation, if necessary, of a draft for a type certificate data sheet and/or type certificate datasheet 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 MSTAR 21.A.91 and granting the approval for minor changes in accordance with MSTAR 21.A.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 (where applicable) and granting the approval on behalf of the Authority.
- u. Ensuring the initiation of activities as a response to a failure (accident/incident/in-service occurrence) evaluation and complaints from the operation and providing of information to the Authority in case of airworthiness impairment (continuing airworthiness).
- v. Advising the Authority with regard to the issue of airworthiness directives in general based on Service Bulletins.
- w. Ensuring that the manuals approved by the Authority, including any subsequent revisions (the Aircraft Flight Manual, MMEL, the Airworthiness Limitations section of the Instructions for Continuing 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 Authority for approval.

### 3.1.5 Maintenance and Operating Instructions

- a. Ensuring the preparation and updating of all maintenance and operating instructions (including instructions for continuing airworthiness and services bulletins) needed to maintain airworthiness (continuing airworthiness) in accordance with relevant airworthiness requirements.

For that purpose, the applicant should:

- establish the list of all documents it is producing and that are to be delivered to the operator, such as Flight Manual, ICA, engine configuration and interface documentation (e.g. as required to comply with the applicable airworthiness requirements);
- establish a system to collect in-service experience to be used for the improvement of the instructions;
- define procedures and organisation to produce and issue these documents under the obligation of MSTAR 21.A.265(h); the procedures should cover:
  - preparation, including the format and language (available industrial standards can be referred to and used);
  - proofreading (checking for clarity, readability, typos, etc.);
  - checking of technical consistency with the corresponding approved change(s), repair(s) or approved data, including the effectivity, description, effects on airworthiness and environmental protection, especially when limitations are changed;
  - checking of feasibility in practical applications; and
  - responsibilities and authorised signatories.

b. In accordance with MSTAR 21.A.57, MSTAR 21.A.61, MSTAR 21.A.107, MSTAR 21.A.119, MSTAR 21.A.120A and MSTAR 21.A.449, ensuring that these documents are provided to all known operators and all involved authorities.

3.1.6 (Reserved).

### 3.1.7 Design Acceptance

The Design Acceptance process shall comprise of four phases:

a. **Specification of Requirement.** The state technical airworthiness requirements must be articulated via a specification document providing a suitable basis for Design Acceptance in that the requirements are sufficiently complete, verifiable and attainable. The specification document is referred to within the regulations as forming part of the Malaysian State Technical Airworthiness Regulation, Statement of Requirements (SOR).

b. **Determination of Competency.** The organisation performing the design must be assessed as having, and must be judged to have applied, the necessary Independent Monitoring System and competence to complete the design and development with acceptable levels of technical risk. The TAR's method of recognising organisational

competence is through certification as a DOA to an appropriate level and scope.

c. Verification of Requirement Satisfaction. The TAR must ensure that its requirements are satisfied prior to accepting a product. Therefore, Design Acceptance requires verification that the test and evaluation results produced by, or presented to the TAR provide adequate evidence that the design complies with the specification.

d. Certification of Requirement Satisfaction. Design certification is required from the design agency stating that the design meets the specification. The regulations refer to this as Design Approval certification.

### 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.

a. To ensure that the design of the products, parts and appliances or the design change or repair solution thereof, comply with the applicable type certification basis and environmental protection requirements (where applicable); and

b. To ensure that its responsibilities are properly discharged in accordance with:

(1) The appropriate provisions of this MSTAR; and

(2) The terms of approval issued under MSTAR 21.A.251.

c. To independently monitor the compliance with, and adequacy of, the documented procedures of the system. This monitoring shall include a feed-back system to a person or a group of persons having the responsibility to ensure corrective actions

### GM2 21.A.239(a) - Design assurance system for minor changes to type design or minor repairs to products (MY)

#### 1. Purpose

a) This GM outlines some basic principles and objectives in order to comply with MSTAR 21.A.239(a) for organisations designing only minor changes to type design or minor repairs to products.

b) For minor changes to type design or minor repairs to products, Design Acceptance process shall be carried out until CAMO – CAM without DGTA's involvement.

#### 2. Design assurance system

The design assurance system should include the following:

- a) an organisational structure to:
- i. control the design;
  - ii. to demonstrate compliance with applicable airworthiness and environmental protection (where applicable) requirements;
  - iii. independently check demonstrations of compliance;
  - iv. liaise with the Authority;
  - v. continuously evaluate the design organisation;
  - vi. control sub-contractors.
- b) Procedures and responsibilities associated with the functions listed above, taking due account of MSTAR 21 requirements applicable to design and approval of minor changes to type design or minor repairs to products.

**AMC 21.A.239(a)(3) - Design assurance system - Independent system monitoring**

The system monitoring function required by MSTAR 21.A.239(a)(3) may be undertaken by the existing quality assurance organisation when the design organisation is part of a larger organisation.

**AMC 21.A.239(b) - Design assurance system - Independent checking function of the demonstration of compliance**

1. The independent checking function of the demonstration 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 MSTC holder, and when these data are approved under the system of the authority of MSTC holder, then the STC applicant not need to provide, within its own DOA, the independent checking function required in MSTAR 21.A.239(b) for these data.

**GM 21.A.239(c) - Design assurance system**

In meeting the requirements of MSTAR 21.A.239(c) the applicant for a design organisation approval under MSTAR 21 Section A 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 MSTAR 21.A.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 Authority, the adequacy of that partner's/sub-contractor's design assurance system in accordance with MSTAR 21.A.243(b).

4. **21.A.243 Design Organisation Exposition (DOE)**

**AMC1 21.A.243(a) - Design Organisation Exposition (DOE) requirements**

The handbook (design organisation exposition) 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 turbojet and turbo-propeller aircraft, small aircraft, Unmanned Aircraft System (UAS) and 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 (where applicable) 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 airworthiness and environmental protection (where applicable) 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 continued airworthiness of the product it designs, including co-operation with the production organisation when dealing with any continued 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 MSTAR 21.A.55 and MSTAR 21.A.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 MSTAR 21.A.3A (see also MSTAR GM1 to 21.A.239(a), paragraphs 3.1.4(s) and 3.1.4(u)).
11. The names of the design organisation authorised signatories. Nominated persons with specific responsibilities such as mentioned in MSTAR 21.A.33 and MSTAR 21.A.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 MSTAR 21.A.57, MSTAR 21.A.61, MSTAR 21.A.107, MSTAR 21.A.119, MSTAR 21.A.120A and MSTAR 21.A.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.

16. (Reserved).

**AMC2 21.A.243(a) - Handbook (Design Organisation Exposition) Model content for organisations designing minor changes to type design or minor repairs to products**

**PART 1 - Organisation**

- 1.1 Objective of DOE 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 MSTAR GM2 to 21.A.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, ie (Services Bulletins).

## 2.6 Record keeping

### **AMC 21.A.243(a)1 - Flight Test Plan**

The flight test plan shall include:

- a. A description of the organisation's processes for flight test, including the flight test organisation involvement into the Permit to Fly issuance process. See MSTAR 21 Section A Subpart P – Permit to Fly.
- b. Crewing policy, including composition, competency, currency and flight time limitations.
- c. Procedures for the carriage of persons other than crew members and for flight test training, when applicable.
- d. A policy for risk and safety management and associated methodologies.
- e. Procedures to identify the instruments and equipment to be carried.
- f. A list of documents that need to be produced for flight test.

The flight test plan should be owned by the organisation conducting flight test. If flight test is to be conducted by an organisation outside that of the DOA holder, eg a State Aircraft Operator (SAO), reference to that organisation's flight test plan (or equivalent) is acceptable.

### **AMC 21.A.243(d) - Statement of qualifications and experience (MY)**

#### **QUALIFICATIONS AND EXPERIENCE REQUIREMENTS FOR KEY PERSONNEL**

##### **HEAD OF DESIGN**

Qualifications:

Bachelor of Engineering degree in Mechanical, Mechatronics, Aerospace, Aeronautical, Electronics, Software or Electrical Engineering or any related field appropriate to the scope of DOA.

**NOTE:** Qualifications shall be Malaysian accredited or assessed to be equivalent to the Malaysian Qualification Agency (MQA) or by the Board of Engineers (BEM) Malaysia.

Experience:

1. Ten years of aviation experience.
2. Broad exposure to design or maintenance activities which applicable to the scope of DOA application.
3. Demonstrably high level of professional knowledge on the applicable aircraft system, equipment, or technology, acquired either through relevant prior experience, and/or formal training courses.

**NOTE:**

1. For commercial applicants: Ten years of aviation experience shall comprise of at least two years combined experience as staff of DGTA/ SAO DOA, or an organisation holding a Design Organisation Approval under EASA, CAAM, EMAR or MSTAR 21 Section A Subpart J - Design Organisation Approval.
2. For SAO applicants: Ten years of aviation experience shall comprise of combined experience in Squadron/ *Cawang Kejuruteraan/ Markas/ CAESE/ DGTA*.

### **CHIEF OF OFFICE OF AIRWORTHINESS**

#### Qualifications:

Bachelor of Engineering degree in Mechanical, Mechatronics, Aerospace, Aeronautical, Electronics, Software or Electrical Engineering or any related field appropriate to the scope of DOA.

**NOTE:** Qualifications shall be Malaysian accredited or assessed to be equivalent to Malaysian Qualification Agency (MQA) or by Board of Engineers (BEM) Malaysia.

#### Experience:

1. Eight years of Aviation experience.
2. Broad exposure to design or maintenance activities which applicable to the scope of DOA application.
3. Demonstrably high level of professional knowledge of the applicable aircraft system, equipment, or technology acquired either through relevant prior experience and/or formal training courses.

#### **NOTE:**

1. For commercial applicants: Eight years of aviation experience shall comprise of at least two years combined experience as staff of DGTA/ SAO DOA, or an organisation holding a Design Organisation Approval under EASA, CAAM, EMAR or MSTAR 21 Section A Subpart J - Design Organisation Approval.
2. For SAO applicants: Eight years of aviation experience shall comprise of combined experience in Squadron/ *Cawang Kejuruteraan/ Markas/ CAESE/ DGTA*.

### **CHIEF OF THE INDEPENDENT MONITORING FUNCTION**

#### Qualification:

Successfully completed a Lead Auditor course or a Diploma in Quality Auditing delivered by a registered training organisation or equivalent qualification which accepted by DGTA.

#### Experience:

1. Eight years of aviation experience.
2. Broad exposure to design or maintenance activities which applicable to the scope of DOA application.

**NOTE:**

1. For commercial applicants: Eight years of aviation experience shall comprise:
  - a. Two years' experience as staff of DGTA / SAO DOA, or an organisation holding a Design Organisation Approval under EASA, CAAM, EMAR or MSTAR 21 Section A Subpart J - Design Organisation Approval.
  - b. Three years' experience in aviation quality management.
2. For SAO applicants: Eight years of aviation experience shall comprise of combined experience in Squadron/ *Cawang Kejuruteraan/ Markas/ CAESE/ DGTA.*

**GM1 21.A.243(d) - Statement of qualifications and experience****1. Purpose**

This GM provides guidelines on the following points:

- Who are the persons covered by MSTAR 21.A.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 MSTAR 21 Section A Subpart J or in associated AMC and GM, using qualified and experienced personnel:

- the Chief Executive [see MSTAR GM1 21.A.239(a) paragraph 3.1.2, MSTAR GM 21.A.249 and MSTAR GM 21.A.265(b)].
- the other management staff:
- the Head of the design organisation [see MSTAR GM1 21.A.239(a) paragraph 3.1.2, MSTAR GM1 21.A.245 paragraph 4.1, MSTAR GM 21.A.265(b)];
- the Chief of the Office of Airworthiness, or [see MSTAR GM1 21.A.245 paragraph 4.2];
- the Chief of the independent monitoring function of the design assurance system [see MSTAR AMC1 21.A.243(a)(3) and MSTAR AMC1 21.A.243(a) paragraph 2].
- the personnel making decisions affecting airworthiness and environmental protection (where applicable):
  - compliance verification engineers [see MSTAR GM1 21.A.239(a) paragraph 3.1.3; MSTAR AMC 21.A.239(b)];
  - personnel of the Office of Airworthiness making decisions affecting airworthiness and environmental protection (where applicable), especially those linked with the MSTAR 21.A.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 Service Bulletins, and minor revisions to the aircraft flight manual) [see GM1 to 21.A.239(a) paragraph 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 MSTAR 21 Section A 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 Authority on MSTAR Form 4 - Nominated Personnel Approval, 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. The 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 (where applicable)

For these personnel, no individual statement is required. The applicant should show to the Authority 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 Authority 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:
    - Name;
    - Date of birth;
    - Experience and training;
    - Position in organisation;
    - Scope of the authorisation;
    - Date of first issue of the authorisation;
    - If appropriate, date of expiry of the authorisation;
    - 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 MSTAR 21.A.257, the Authority has a right of access (subject to contract) to the data held in such a system.
- The organisation should keep the record for at least 2 years after a person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

**GM2 21.A.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 MSTAR 21.A.243(d) should be addressed as follows:

1. The nominated managers should be identified, and their credentials submitted to the Authority on MSTAR Form 4 - Nominated Personnel Approval, 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 [MSTAR 21.A.239(b)];
  - approve minor changes to type design and minor repairs [MSTAR 21.A.263(c)(2)];
  - issue information or instructions [MSTAR 21.A.265(h)].

Should be selected by the organisation in accordance with a procedure and criteria agreed with the Authority.

**5. 21.A.245 Approval requirements****GM1 21.A.245 - Requirements for approval****1. General**

The DOE submitted in accordance with MSTAR 21.A.243 should show that sufficient skilled personnel are available and suitable technical and organizational provisions have been made for carrying out the Type Investigation defined by MSTAR GM1 to 21.A.239(a), paragraph 2.c.

**2. Personnel**

The applicant should show that the personnel available to comply with MSTAR 21.A.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 airworthiness and environmental protection (where applicable) 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 airworthiness and environmental protection (where applicable) requirements. The test facilities may be subjected to additional technical conditions related to the nature of tests performed.

#### 4. Organisation

The DOE submitted in accordance with MSTAR 21.A.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 MSTAR 21 Section A Subpart 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 (where applicable) (see MSTAR GM1 to 21.A.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 MSTAR 21.A.239(a)(3) has been established:

- (a) to ensure quick and efficient reporting and resolution of difficulties encountered using the handbook and associated procedures;
- (b) to maintain the design assurance system;
- (c) to optimise auditing activities.

#### **GM2 21.A.245 - Requirements for approval - Organisations designing minor changes to type design or minor repairs to products**

The DOE submitted in accordance with MSTAR 21.A.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 Authority and to co-ordinate airworthiness and environmental protection (where applicable)

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.

## 6. **21.A.247 Changes in design assurance system**

### **GM 21.A.247 - Significant changes in the design assurance system**

In addition to a change in ownership (see MSTAR 21.A.249), the following changes to the design assurance system should be considered as 'significant' to the demonstration of compliance or to the airworthiness or environmental protection (where applicable) of the products:

#### 1. Organisation

- Relocation to new premises (see also MSTAR GM 21.A.249).
- Change in the industrial organisation (partnership, suppliers, design work sharing) unless it can be shown that the independent checking function of the demonstration of compliance is not affected.
- Change in the parts of the organisation that contribute directly to the airworthiness or environmental protection (where applicable) (independent checking function, office of airworthiness [or equivalent]).
- Change to the independent monitoring principles [see MSTAR 21.A.239(a)(3)].

#### 2. Responsibilities

- Change of the management staff
- the Head of the design organisation [MSTAR GM1 to 21.A.239(a), paragraph 3.1.2, MSTAR GM1 to 21.A.245, paragraph 4.1, MSTAR GM 21.A.265(b)];
- the Chief of the Office of Airworthiness [MSTAR GM1 to 21.A.245, paragraph 4.2];
- the Chief of the independent monitoring function of the design assurance system [MSTAR 21.A.239(a)(3) and MSTAR AMC1 to 21.A.243(a), paragraph 2].
- New distribution of responsibilities affecting airworthiness or environmental protection (where applicable).
- For organisations designing minor changes to type design or minor repairs to products, change of the persons identified in MSTAR GM2 to 21.A.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' [MSTAR 21.A.263(c)(1)];
- the treatment of major changes and major repairs;
- the approval of the design of minor changes and minor repairs [MSTAR 21.A.263(c)(2)];
- the approval of the design of certain major repairs MSTAR 21.A.435(b) or MSTAR 21.A.263(c)(5);
- the approval of the conditions under which a permit to fly can be issued (MSTAR 21.A.263(c)(6));
- the issue of a permit to fly (MSTAR 21.A.263(c)(7));
- the approval of certain major changes to a type certificate (MSTAR 21.A.263(c)(8));
- the approval of certain supplemental type certificates (MSTAR 21.A.263(c)(9));
- the approval of certain major changes to certain supplemental type certificates; (MSTAR 21.A.263(c)(9));
- the configuration control, when airworthiness and environmental protection (where applicable) is affected;
- continued airworthiness (see MSTAR 21.A.3A);
- the acceptability of design tasks undertaken by partners or subcontractors MSTAR 21.A.239(c);
- the issue of information and instructions under the obligation of MSTAR 21.A.265(h);

### 4. Resources

Substantial reduction in number and/or experience of staff (see MSTAR 21.A.245(a)).

## 7. **21.A.249 Transferability**

### **GM 21.A.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 Companies Commission of Malaysia (SSM) 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 Authority would be necessary such that the change would be classified as a re-approval.

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 organisation in which case the former paragraphs apply.

#### 8. **21.A.251 Terms of approval**

##### **GM1 21.A.251 - Terms of approval**

1. The terms of approval are stated on the certificate of approval issued by the Authority. 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 organization approval covering type-certification or TSO authorization 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 MSTAR 21.A.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 MSTAR 21.A.243. This handbook defines the tasks which may be performed under the approval.

4. Scopes of work are, for example, 'subsonic turbojet aircraft', 'turbo-propeller aircraft', 'small aircraft', 'rotorcraft'... Technologies are quoted in the scope of work when it is considered by the Authority 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.

##### **GM2 21.A.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 airworthiness and environmental protection requirements,

- demonstrating and verifying the compliance with these airworthiness and environmental protection requirements (where applicable).

2. Category of products

Any other indication if the Authority 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 the privileges granted with the approval, pursuant to MSTAR 21.A.263(c)(1) and (2).

9. **21.A.253 Changes to the terms of approval**

**AMC 21.A.253 - Application - Form and manner**

**MSTAR Form 82** - Application for Significant Changes to Design Organisation Approval, is to be obtained from the Authority, and completed by the Accountable Manager of the organisation.

The completed form, an outline of the design organisation exposition (handbook), and details of the proposed terms of approval are to be forwarded to the Authority.

10. **21.A.257 Investigations**

**GM 21.A.257 – Investigations**

The Authority may grant a delegation to a person in SAOs to make any investigations necessary for DOA's, their partners and subcontractors supporting specific aircraft types under this Subpart.

**GM 21.A.257(a) – Investigations**

Arrangements that allow the Authority 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 Authority in performing inspections and audits conducted during initial assessment and subsequent surveillance.

Assistance to the Authority includes all appropriate means associated with the facilities of the design organisation to allow the Authority to perform these inspections and audits, such as a meeting room and office support.

10. **21.A.259 Duration and continued validity**

**AMC 21.A.259(a) - Duration and continued validity (MY)**

1. An EAC issued to a SAO DOA is valid until it is surrendered or until the Authority suspends or revokes it.

2. An EAC issued to a commercial DOA is valid for the period of the three (3) years or until the formal instrument which it relates expires or the Authority suspends or revokes it.

3. An EAC issued to a commercial DOA without formal instrument is valid for a period of one (1) year or until the Authority suspends or revokes it.

11. **21.A.263 Privileges**

**AMC1 21.A.263(c)(1) - Procedure for the classification of changes to type certificate, supplemental type certificate (STC) and of repairs as minor and major**

1. Intent

This AMC provides a means to develop a procedure for the classification of changes to a TC, APU TSO, or to that part of the product covered by an STC and repair designs.

Each DOA applicant should develop its own internal classification procedure following this AMC, in order to obtain the associated privilege under MSTAR 21.A.263(c)(1).

2. Procedure for the classification of changes to a MSTC, APU TSO, or to that part of the product covered by an STC, and repair designs.

2.1 Content

The procedure should address the following points:

- a. the identification of changes to an MSTC, APU TSO , or to that part of the product covered by an STC, and repair designs;
- b. classification;
- c. justification of the classification;
- d. authorised signatories; and
- e. supervision of changes to a MSTC, APU TSO or to that part of the product covered by an STC, and repair designs initiated by subcontractors.

For changes to TC, APU AUSM TSO or to that part of the product covered by an STC, criteria used for classification should be in compliance with MSTAR 21.A.91 and MSTAR GM 21.A.91.

For repairs, criteria used for classification should be in compliance with MSTAR 21.A.435 and MSTAR GM 21.A.435.

2.2 Identification of changes to a TC, APU TSO or to that part of the product covered by an STC, and repair designs.

The procedure should indicate how the following are identified:

- major changes to a MSTC, APU TSO or to that part of the product covered by an STC or major repairs;
- those minor changes to a MSTC, APU TSO or to that part of the product covered by an STC or minor repairs where additional work is necessary

to demonstrate compliance with the applicable airworthiness and environmental protection requirements; and

- other minor changes to a MSTC, APU TSO or to that part of the product covered by an STC or minor repairs requiring no further demonstration of compliance.

## 2.3 Classification

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

If no specific airworthiness or environmental protection requirements are applicable to the change or repairs, the above review should be carried out at the level of the part or system where the change or repair is integrated and where specific airworthiness or environmental protection requirements are applicable.

### 2.3.1 Consultation with Operational Airworthiness Authorities (OAA)

For designs that require demonstration of compliance with certification basis elements that can only be conducted by aircrew, eg flight characteristics, human machine interface, the procedure should state requirements for consultation with an appropriate Operational Airworthiness Authority (OAA) prior to classifying the change.

## 2.4 Justification of the classification

All decisions of classification of changes to a MSTC, APU TSO or to that part of the product covered by an STC, and repair designs as 'major' or 'minor' should be recorded and, for those which are not straightforward, also documented. These records should be easily accessible to the Authority for sample check.

## 2.5 Authorised signatories

All classifications of changes to a MSTC, APU TSO or to that part of the product covered by an STC, and repair designs should be accepted by an appropriate authorised signatory, belonging to or tasked by the Office of Airworthiness, as explained in GM1 MSTAR 21.A.239(a)(3.1.4)(r).

The procedure should 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 should be described how the DOA holder manages its classification responsibility.

## 2.6 Supervision of changes to a MSTC, APU TSO or to that part of the product covered by an STC, and repairs designs initiated by subcontractors.

The procedure should indicate, directly or by cross-reference to written procedures, how changes to that part of the product covered by an STC, and

repair designs may be initiated and classified by subcontractors and are controlled and supervised by the DOA holder.

**AMC2 21.A.263(c)(1) - Privileges - Organisations that design minor changes to type certificate or supplemental type certificate (STC) and minor repairs to products : Classification procedure**

**1. Content**

The procedure should address the following points:

- configuration control rules, especially the identification of changes to a MSTC, APU TSO or to that part of the product covered by an STC, and repair designs;
- classification, in compliance with MSTAR 21.A.91 and MSTAR GM 21.A.91 for changes and MSTAR GM 21.A.435 for repairs;
- justification of the classification;
- authorised signatories.

**2. Identification of changes to an MSTC, APU TSO or to that part of the product covered by an STC, and repair designs**

The procedure should indicate how the following minor changes to an MSTC or minor repairs are identified:

- those minor design changes to type design or minor repairs where additional substantiation data is necessary to demonstrate compliance with the airworthiness or environmental protection requirements (where applicable);
- other minor design changes to an MSTC minor repairs requiring no further demonstration of compliance.

**3. Classification**

The procedure should 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 should be done at the level of the part or system where the change or repair is integrated and where specific airworthiness or environmental protection requirements are applicable.

For repairs, see also MSTAR GM 21.A.435.

**4. Justification of the classification**

All decisions regarding the classification of the changes to an MSTC, APU TSO, or to that part of the product covered by an STC, and repair designs as 'minor' should be recorded and, for those which are not straightforward, also documented.



These records should be easily accessible to the Authority for sample checks.

It may be in the format of meeting notes or register.

## 5. **Authorised signatories**

All classifications of changes to an MSTC, APU TSO or to that part of the product covered by an STC, and repair designs should be accepted by an appropriate authorised signatory.

The procedure should indicate the authorised signatories for the various products listed in terms of approval.

### **AMC1 21.A.263(c)(2) - Procedure for the approval of minor changes to Malaysian State Type Certificate (MSTC) or a supplemental type certificate (STC), and minor repairs**

#### 1. Intent

This AMC provides a means to develop a procedure for the approval of minor changes to a MSTC, APU TSO or to that part of the product covered by an STC, and minor repairs.

Each DOA applicant should develop its own internal procedures following this AMC, in order to obtain the associated privilege under MSTAR 21.A.263(c)(2).

#### 2. Procedure for the classification of changes to a MSTC, APU TSO, or to that part of the product covered by an STC, and repair designs.

##### 2.1 Content

The procedure should address the following points:

- compliance documentation;
- approval under the DOA privilege;
- authorised signatories;
- supervision of minor changes to a MSTC, APU TSO or to that part of the product covered by an STC, and minor repairs handled by subcontractors.

##### 2.2 Compliance documentation

For those minor changes to a TC, APU TSO or to that part of the product covered by an STC, and minor repairs where additional work to demonstrate compliance with the applicable airworthiness and environmental protection (where applicable) requirements is necessary, compliance documentation should be established and independently checked as required by MSTAR 21.A.239(b).

The procedure should describe how the compliance documentation is produced and checked.

## 2.3 Approval under the DOA privilege

2.3.1 For those minor changes to a MSTC, APU TSO or to that part of the product covered by an STC, and minor repairs where additional work to demonstrate compliance with the applicable airworthiness and environmental protection requirements is necessary, the procedure should define a document to formalise the approval under the DOA privilege.

This document should include at least:

- identification and brief description of the change or repair and reasons for change or repair;
- applicable airworthiness 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 demonstration of compliance;
- evidence of the approval under the privilege of MSTAR 21.A.263(c)(2) by an authorised signatory;
- date of the approval.

For repairs, see MSTAR AMC 21.A.433(b) and MSTAR AMC 21.A.447.

2.3.2 For the other minor changes to a MSTC, APU TSO or to that part of the product covered by an STC, and minor repairs, the procedure should 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 should 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 MSTAR 21.A.263(c)(2) should be identified (name, signature, and scope of authority) in appropriate documents that maybe linked to the design organisation handbook.

## 2.5 Supervision of minor changes to a TC, APU TSO or to that part of the product covered by an STC, and minor repairs handled by subcontractors.

For the minor changes to a TC, APU TSO or to that part of the product covered by an STC, and minor repairs described in paragraph 2.3.2, that are handled by subcontractors, the procedure should 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.

**AMC2 to 21.A.263(c)(2) - Privileges - Organisations designing minor changes to Malaysian State Type Design (MSTC), APU TSO or a supplemental type certificate (STC) and minor repairs to products: Procedure for the approval of minor changes to MSTC, APU TSO or minor repairs**

**1. Content**

The procedure should address the following points:

- compliance documentation;
- approval under the DOA privilege;
- authorised signatories.

**2. Compliance documentation**

For those minor changes to a MSTC, APU TSO or to that part of the product covered by an STC, and minor repairs where additional work to demonstrate compliance with the applicable airworthiness and environmental protection requirements (where applicable) is necessary, compliance documentation should be established and independently checked as required by MSTAR 21.A.239(b).

The procedure should describe how the compliance documentation is produced and checked.

**3. Approval under the DOA privilege**

3.1 For those minor changes to a MSTC, APU TSO or to that part of the product covered by an STC, and minor repairs where additional work to demonstrate compliance with the applicable airworthiness and environmental protection requirements is necessary, the procedure should define a document to formalise the approval under the DOA privilege.

This document should include at least:

- a) identification and brief description of the change or the repair and reason for change or repair;
- b) applicable airworthiness and environmental protection requirements and methods of compliance;
- c) reference to the compliance documents;
- d) effects, if any, on limitations and on the approved documentation;
- e) evidence of the independent checking function of the demonstration of compliance;
- f) evidence of the approval under the privilege of MSTAR 21.A.263(c)(2) by an authorised signatory;

g) the date of the approval.  
For repairs, see also MSTAR 21.A.433(b) and MSTAR 21.A.447.

3.2 For the other minor changes to a MSTC, APU TSO or to that part of the product covered by an STC, and minor repairs, the procedure should 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 should 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 MSTAR 21.A.263(c)(2) should be identified (name, signature and scope of authority) in appropriate documents that may be linked to the handbook.

#### **AMC3 21.A.263(c)(2) – Procedure for the approval of minor changes to a Malaysian State Type Certificate (MSTC) which affect flight manual (AFM)**

##### 1. Intent

This AMC provides additional guidance for developing a procedure for the approval of minor changes to a MSTC which affect the aircraft flight manual (AFM).

Each design organisation approval (DOA) applicant/holder should develop its own internal procedure, based on these guidelines. For guidance on the classification of changes to a MSTC which affect the AFM, see MSTAR GM 21.A.91.

##### 2. Procedure for the approval of minor changes to a MSTC which affect the AFM

###### 2.1 Content

The procedure should address the following points:

- assessment of any change to a MSTC for the impact of the change on the AFM;
- preparation of revisions or supplements to the AFM;
- classification of the change to a MSTC, taking into account the impact on the AFM;
- classification of stand-alone revisions or supplements to the AFM;
- control of the configuration of the AFM;
- approval of the revisions or supplements to the AFM; and
- the approval statements.

###### 2.2 Assessment of a change for its impact on the AFM

The procedure should include an assessment of whether or not the AFM is impacted by the change.

### 2.3 Preparation

The procedure should indicate how revisions or supplements to the AFM are prepared and how the coordination among the persons in charge of design changes is performed.

### 2.4 Classification

The procedure should indicate how changes to a MSTC which affect the AFM are classified, in accordance with the criteria of MSTAR GM 21.A.91 Section 3.4.

The procedure should indicate how classification decisions are recorded, documented and signed.

Easy accessibility of these records to the Authority for sample checking should be ensured. All classifications should be accepted by an appropriately authorised signatory. The procedure should indicate the authorised signatories for the various products listed in the terms of approval.

### 2.5 Configuration control of the AFM

The procedure should explain the traceability of changes in order to understand who has approved what. Especially if a given page or data module has been revised several times, it should be traceable which part(s) of the page or data module has (have) been approved directly by the Authority under which approval, and which part(s) has (have) been approved under the privilege of a DOA holder.

### 2.6 Approval

The procedure should indicate how the approval under the privilege of MSTAR 21.A.263(c)(2) is formalised.

The authorised signatories should be identified (name, signature), together with the scope of the authorisation, in a document that is linked to the DOA handbook.

### 2.7 Approval statement

The amended AFM, or the supplement to the AFM, approved under the privilege of MSTAR 21.A.263(c)(2) should be issued under the obligation of MSTAR 21.A.265(h) (see MSTAR 21.A.265(h) and the related GM) with a respective statement in the log of revisions.

## **AMC1 21.A.263(c)(5) – Scope and criteria**

### 1. Definition of 'certain major repairs'

'Certain major repairs' for which privileges may be granted as per MSTAR 21.A.263(c)(5) are:

- (a) major repairs to products or auxiliary power units (APUs) for which the design organisation approval (DOA) holder holds the Malaysian State Type Certificate (MSTC) or the supplemental type certificate (STC) or the technical standard order authorisation (TSOA); or
- (b) major repairs to products or APUs for which the DOA holder does not hold the MSTC or the STC or TSOA and that meet the criteria of 3(a), (b) and (c) below.

#### 1.1 Criteria for limitations on eligibility

An Authority approval may be required in cases of major repairs proposed by DOA holders who are the MSTC, STC or APU TSOA holders if the major repair is:

- (a) related to a new interpretation of any item of the certification basis as used for the type certification (such as the airworthiness requirements, certification review items for special conditions, equivalent safety findings, deviations or 'elect to comply'); and
- (b) related to the application of an airworthiness code or standard that is different from the one used for type certification.

**Note:** This should be established at the time of granting the privilege to the DOA holder, or later through an Authority-agreed procedure.

## 2. Definition of 'certain major changes' and 'certain supplemental type certificates'

'Certain major changes' and 'certain supplemental type certificates' for which privileges may be granted as per MSTAR 21.A.263(c)(8) and (9) are changes similar to those that have been previously approved by the Authority for the same DOA holder.

The similarity of the changes is to be seen in terms of the design, the installation, and the operational characteristics, whereas their repetitiveness is seen in terms of the applicable requirements and the compliance demonstration.

In this context, a 'requirement' means any element of the type certification basis as specified in MSTAR 21.A.17A, or the environmental protection requirements (where applicable) as specified in MSTAR 21.A.18.

#### 2.1 Criteria for limitations on eligibility

The following types of changes are not eligible:

- (a) changes that require a revision to a type certificate data sheet (TCDS) (e.g. the introduction of a derivative model or variant) or a type certificate data sheet for noise (TCDSN);
- (b) changes that require an amendment to the existing certification basis by a special condition, equivalent safety finding, deviation or 'elect to comply';
- (c) changes that revise airworthiness limitations or operating limitations, unless otherwise agreed with the Authority;

- (d) changes that are intended to be used as alternative method of compliance (AMOC) to an airworthiness directive (AD);
- (e) changes that are made mandatory by an AD or that are the terminating action of an AD;
- (f) changes that are classified as 'significant' in accordance with MSTAR 21.A.101;
- (g) changes for which, in the affected area and for the operations for which the design is to be certified, more conservative airworthiness requirements are applicable which were not used in the description of the Authority-approved procedure of the DOA holder, e.g. in the case of a type, model or modification with a later, more stringent certification basis;
- (h) changes that affect the noise and/or emissions characteristics of the changed product, unless otherwise agreed with the Authority;
- (i) changes that affect a part or system, a single failure of which may have a catastrophic effect upon the product, and for which critical characteristics have been identified, which should be controlled to ensure the required level of integrity;
- (j) changes to engines or propellers, a single failure of which may have a hazardous effect upon the product, and for which critical characteristics have been identified, which should be controlled to ensure the required level of integrity; and
- (k) changes for which a non-compliance has been found in the referenced change during the continued-airworthiness process.

3. Criteria for major repairs, major changes and STCs for which the privileges of MSTAR 21.A.263(c)(5) may be granted

The following criteria need to be met:

(a) Similarity

The installation on the product, the design, the operation, and the equipment qualification are basically the same as in projects for which the Authority has already been involved and issued an approval for the same DOA holder.

(b) Repetitiveness of the certification process

The whole certification process is repetitive, i.e. identical to, or part of, an already approved referenced process. For a change or repair that is a part of the referenced 'certain major repairs', 'certain major changes' or 'certain supplemental type certificates', the certification process is still identical to the one for the affected change. This is the case when each compliance demonstration is performed to the same extent in accordance with the same requirements, GM, and content of the interpretative material, as well as with the same means and method of compliance (not only the same means-of-compliance (MoC) code).

**Note:** In this AMC, a 'requirement' means any element of the type certification basis as specified in MSTAR 21.A.17A, or the environmental protection requirements (where applicable) as specified in MSTAR 21.A.18.

(c) Performance and experience in previous projects

To demonstrate 'similarity' and 'repetitiveness, the Authority should have classified the level of performance of the organisation as 'medium' or 'high' during at least the latest project referenced.

In addition, the Authority should have classified the likelihood of an unidentified non-compliance as 'low' or 'very low' for all the included compliance demonstration items (CDIs) identified in at least the latest project referenced, to demonstrate 'similarity' and 'repetitiveness' (applying the criteria for the determination of the Authority's level of involvement (LoI) in product certification, see MSTAR AMC 21.A.15(b)(6)

The process to obtain and to use the privileges of MSTAR 21.A.263(c)(5), (8) and (9) is described in AMC2 to MSTAR 21.A.263(c)(5).

**AMC2 21.A.263(c)(5) – Procedure for the approval of a major repair, a major change to a Malaysian State Type Certificate (MSTC), or a supplemental type certificate (STC) by a design organisation (DOA) holder under their privileges**

This AMC describes the process to be followed in order to obtain and use the privilege to approve 'certain major repairs' and 'certain major changes' to a TC, and 'certain supplemental type certificates' as defined in points 1(b) and 2 of MSTAR AMC1 21.A.263(c)(5).

1. Process for obtaining a privilege

A DOA holder that applies for the privileges referred to in MSTAR 21.A.263(c)(5) should do the following:

(a) Submit to the Authority an application for a significant change in the design assurance system (see MSTAR 21.A.247 and 21.A.253).

(b) Establish internal procedures for the application of the privilege covering the following elements, and add them to the application:

(1) The definition of the 'list associated with the privilege' of certain major repairs/changes/STCs. The 'list associated with the privilege' is a list of all 'certain major changes', 'certain STCs' and 'certain major repairs' (or families thereof) plus the associated 'justification document' references for which the privileges as per MSTAR 21.A.263(c)(5) have been granted.

(2) A 'justification document' for a 'certain major repair', 'certain major change' or a 'certain STC', as applicable. The 'justification document' should contain:

i. The reference(s) to the Authority-approved major change(s), STC(s) and major repair(s), which is (are) used to demonstrate the DOA holder's experience and performance.



**NOTE:** The number of already Authority-approved major change(s), STC(s) or major repair(s) used to demonstrate the DOA holder's experience and performance is based on an assessment of the scope of the 'certain major repairs', 'certain major changes' or 'certain supplemental type certificates' which is requested to be added to the 'list associated with the privilege', as well as on the performance of the DOA holder during previous projects.

ii. The certification programme(s) of the major change(s), STC(s), or major repair(s), accepted by the Authority, used to demonstrate the applicant's experience and performance.

iii. The applicable product configuration(s).

The applicant should list the type(s) and model(s) to which the major change(s)/STC(s)/repair(s) applies (apply) or may apply. Exceptionally, this may be done for a dedicated product, system, or equipment if the type or model has no technical influence on the major change(s)/STC(s)/repair(s), i.e. when the installation issues are negligible (e.g. the TCAS 7.1 software change for a certain equipment), such a listing is not mandatory, but it needs to be justified.

iv. The list of 'requirements' for the demonstration of compliance, if not identical to the ones referenced in the certification programme.

v. The certification process, if not identical to the one referenced in the certification programme.

vi. A detailed description with all the technical data relevant to the installation of the product, the design, the operation, and the qualification which ensures the proper use of the privilege for future major changes, major repairs or STCs. This description should include the criteria defining the conditions that should be met in order to apply the privileges.

vii. Any other limits on the use of the privilege.

(3) The assessment of the acceptability of using the privilege for major repairs, major changes or STCs against the 'list associated with the privilege' and the 'justification document' of 'certain major repairs', 'certain major changes' or 'certain STCs'.

(4) The approval process, including the templates to be used, the authorised signatories, records management, and the provision of a 'summary list' of major changes, major repairs and STCs approved under the privilege of MSTAR 21.A.263(c)(5), (8) and (9). This process should clarify that the approval is issued under the DOA holder's privilege.

The persons authorised under the privilege of MSTAR 21.A.263(c)(5), (8) and (9) should be identified by their names, signatures, and scopes of authority in the appropriate documents and referenced in the procedure.

A 'summary list' of all the major changes, STCs and major repairs approved under a privilege should be provided to the Authority on a regular basis, as agreed with the Authority.

(5) Extension of the 'list associated with the privilege' after the privilege is granted.

After the granting of the privilege, the initial list of 'certain major repairs', 'certain major changes' and 'certain STCs' under the privilege may be further extended by an agreement with the Authority, as shown in Section 2 as well as in Figures 2 and 3 below.

(c) Identify in the 'list associated with the privilege' the eligible major changes, major repairs or STCs proposed for inclusion in the scope of the privilege (see also AMC1 MSTAR 21.A.263(c)(5), (8) and (9)).

(d) Provide a 'justification document' for each proposed certain major change, certain major repair or certain STC identified under (c) above.

**Note:** The 'list associated to the privilege' identifying all certain major repairs, certain major changes and certain STCs and the associated 'justification document(s)' are to be referenced in the DOA holder procedure mentioned under (b) above.

The process for obtaining the privilege, referred to in MSTAR 21.A.263(c)(5), is summarised in Figure 1:

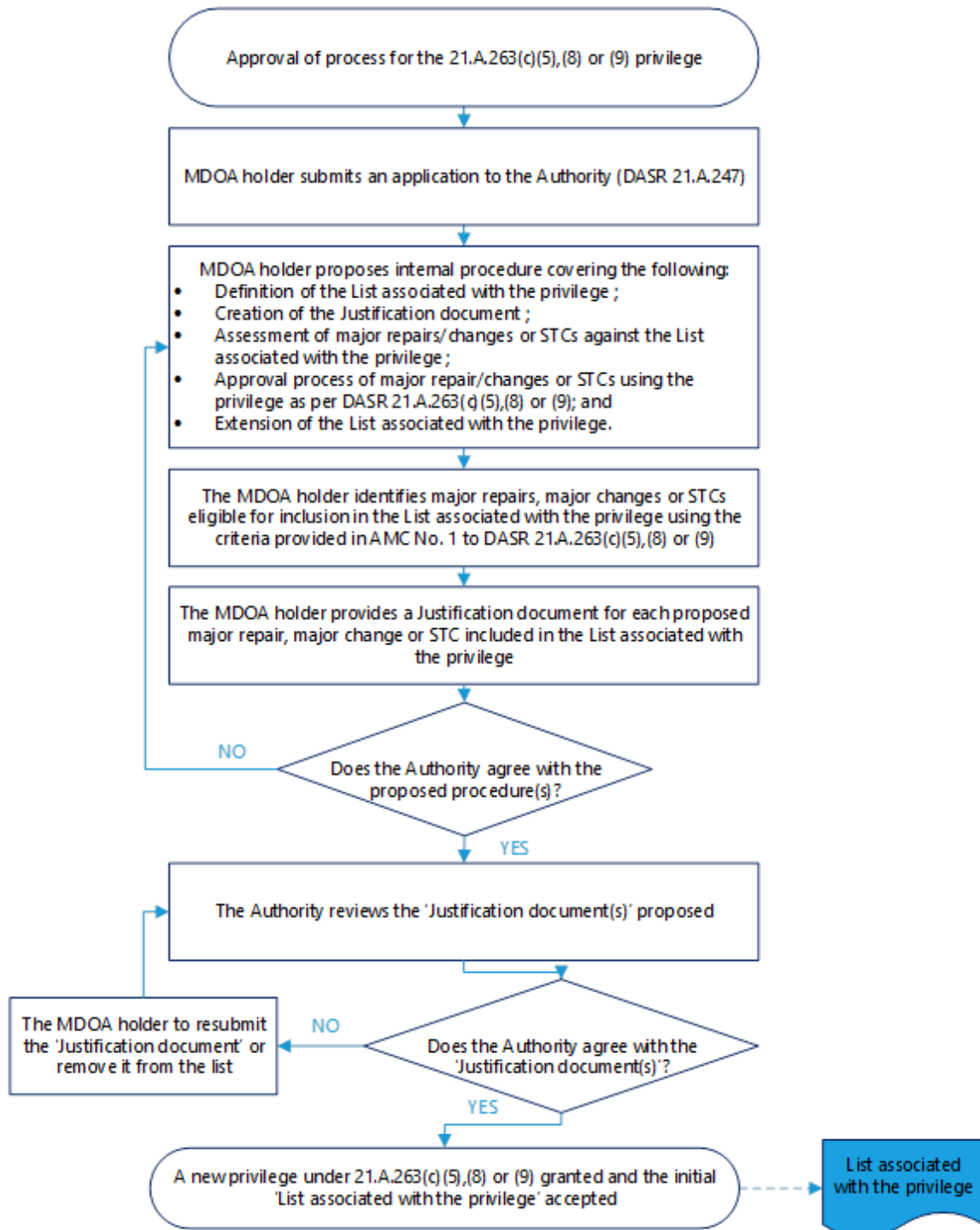


Figure 1

The privilege referred to in MSTAR 21.A.263(c)(5), (8) and (9) may be used by a DOA holder for the approval of major repairs, major changes or STCs, as applicable, under the following conditions:

- (a) the privilege has already been granted by the Authority;
- (b) the major repair/change/STC to be approved falls under the 'List associated with the privilege' agreed by the Authority; and

(c) the criteria established in the relevant 'Justification document' are met and the relevant assessment is recorded.

If all the above conditions are met, the privilege may be used and the approval of major repairs, major changes or STCs, as applicable, can be obtained by the DOA holder without the Authority's involvement.

2. Extension of the 'privilege list' of 'certain major repairs', 'certain major changes' or 'certain STCs' after the privilege is granted.

When the DOA holder intends to update the 'List associated with the privilege', a 'Justification document' needs to be provided to the Authority, as described in Section 1(b)(2) above. After the Authority agrees with the updated 'privilege list' as part of the DOA holder's procedure, the DOA holder may proceed as per Section 4 below.

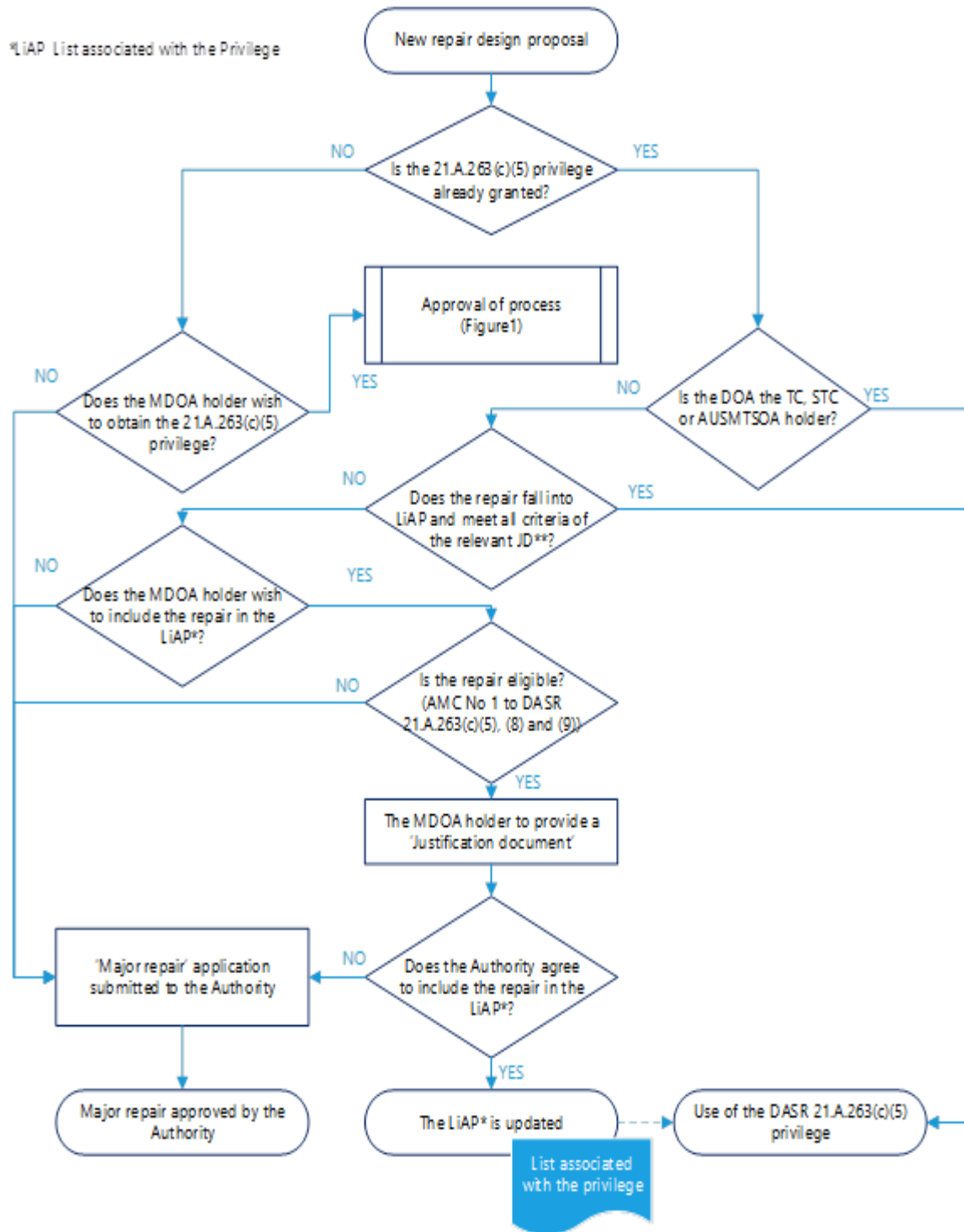


Figure 2

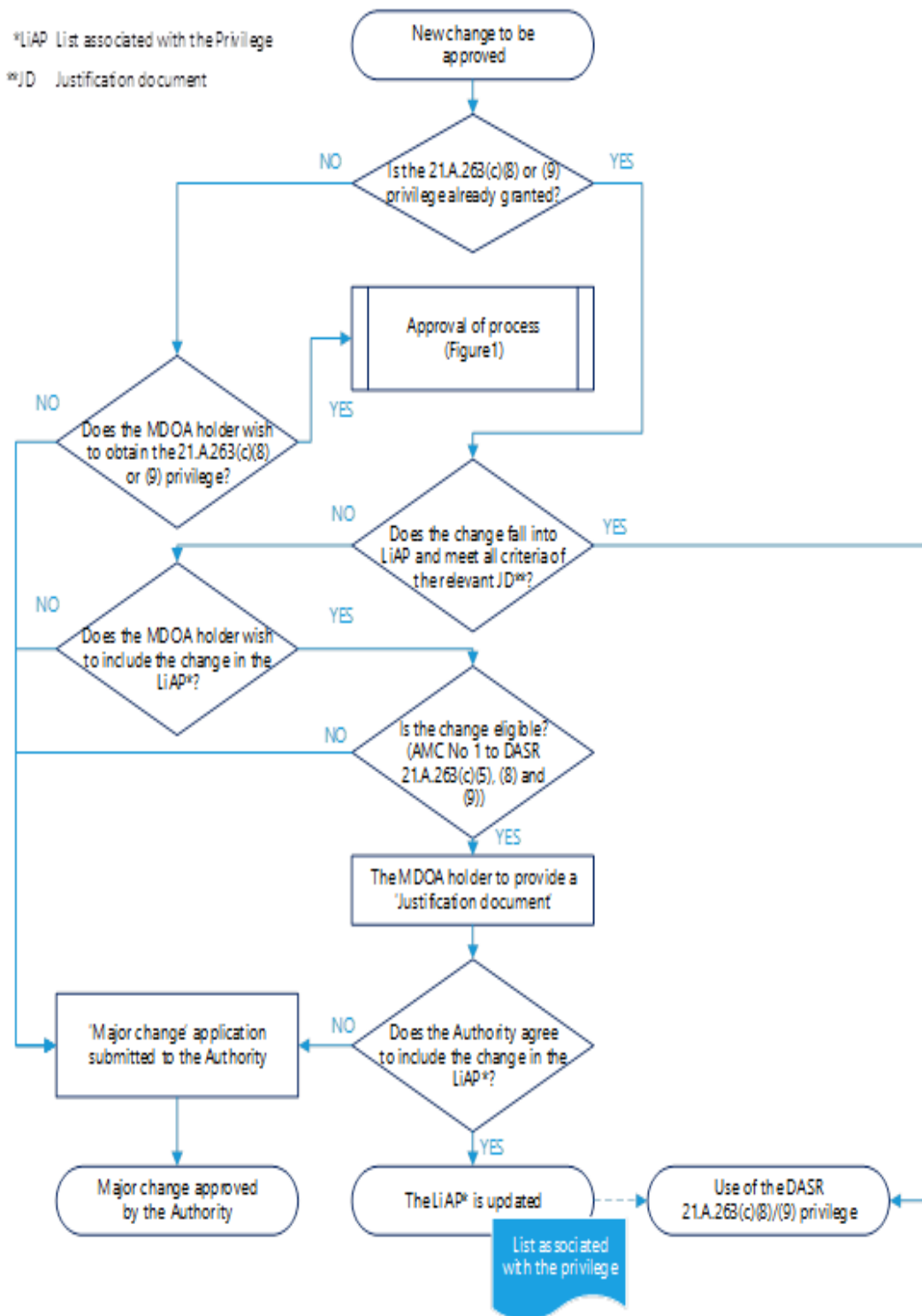


Figure 3

3. MCTC, STC or APU TSOA holder approval of a major repair under a major repair privilege - specific considerations

TC, STC or APU AUSMTSOA MDOA holders that intend to approve a major repair design under the privilege of MSTAR 21.A.263(c)(5) should ensure that:

- (a) the type certification basis for the product, part or appliance to be repaired is identified, together with all the other relevant requirements;
- (b) all the records and substantiation data, including the documents that demonstrate compliance with all the relevant requirements, are provided to the Authority for review; and
- (c) for repair designs created for a specific product serial number, an assessment is made as to whether or not the repair design is affected by the presence of any embodied STC, change or repair.

4. DOA holder's approval based on the privilege for a major repair, major change or STC - specific considerations.

For the approval of:

- major repairs by DOA holders that are not the MSTC, STC or APU TSO authorisation holders;
- major changes; and
- STCs

by a DOA holder under the privilege of MSTAR 21.A.263(c)(5), (8) and (9), the following should be considered.

4.1 Eligibility of the proposed major repair, major change or STC  
The DOA holder should assess the proposed major repair, major change or STC against the 'list associated with the privilege' and the 'justification document' of 'certain major repairs', 'certain major changes' or 'certain supplemental type certificates' in order to determine whether the criteria of AMC1 MSTAR 21.A.263(c)(5), (8) and (9) are met.

4.2 Forms for approval certificates

For the issuance of an approval under their privilege the DOA holder should use forms provided by the Authority.

If such forms are not available or if the DOA holder chooses to use their own forms, it must be ensured that at least the information as requested by the Authority is presented.

4.3 Approval under the DOA holder's privilege

When the DOA holder makes use of the privilege of MSTAR 21.A.263(c)(5), (8) or (9), they should include the following in the certification data package:

- a record of the assessment as described in 4.1 above;
- the reference to the 'justification document';
- the applicable product configuration;
- the applicable airworthiness requirements or environmental protection requirements and methods of compliance;

- the compliance documents;
- the effects, if any, on limitations and on the approved documentation;
- the evidence of the independent checking of the compliance demonstration;
- the approval document containing the statement of the approval under the privilege of MSTAR 21.A.263(c)(5) by an authorised signatory; and
- the date of approval.

In any case, before the major change, STC or major repair is approved under the DOA privilege, the DOA holder should ensure that the Part 21 requirements, in particular MSTAR 21.A.97, 21.A.115 and 21.A.433, are met.

#### 4.4 Authorised signatories

An authorised person that is identified and authorised as described in Section 1(b)(4) above should sign the approval under the privilege of MSTAR 21.A.263(c)(5).

#### 4.5 Summary list

The DOA holder should add to the 'summary list' as described in Section 1(b)(4) above the major change, STC or major repair approved under the privilege of MSTAR 21.A.263(c)(5).

## 12. 21.A.265 Obligations of the holder

### **AMC 21.A.265(a) - Administration of the Handbook (Design Organisation Exposition)**

1. The handbook (Design Organisation Exposition) 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 should be produced in a concise form with sufficient information to meet MSTAR 21.A.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, should be included to provide background information for the Authority.
- i) The certificate of approval should 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 Authority agreement to the handbook content in draft form. Arrangements for formal publication in a timely manner should be agreed before the certificate of approval is issued.

3. An updating system should 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 MSTAR 21.A.243 should be provided by giving appropriate cross references, and these documents should be made available, on request, to the Authority.

#### **GM 21.A.265(b) - Use of the Handbook (Design Organisation Exposition)**

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.

#### **GM 21.A.265(h) - Designation of data and information issued under the authority of a design organisation approval (DOA) holder**

1. Intent

This GM provides guidance for complying with the obligation of MSTAR 21.A.265(h), and addresses the various aspects that the DOA holder should cover in order to have a comprehensive procedure for the designation of data and information.

2. Scope

The term 'data and information' as used in MSTAR 21.A.265(h) also includes instructions.

Data and information referred to in MSTAR 21.A.265(h) are issued by a DOA holder and cover the following:

- embodiment instructions for design changes or repairs (usually in the form of a service bulletin, a modification bulletin, repair instructions or engineering order, etc.);
- manuals required by MSTAR 21 or the applicable airworthiness codes and standards (such as the aircraft flight manual (AFM), instructions for continued airworthiness (ICAs), etc.);
- (reserved);
- continued-airworthiness instructions (usually in the form of service bulletins) which may be covered by airworthiness directives (ADs);
- additional data to be defined by the DOA holder (e.g. alternative maintenance instructions that are not, per se, ICAs).

Note: This data and information may be issued in a digital or paper format.

The obligation does not apply to, and the statement provided with the data and information should not be used on, the following documents:

- certification documents (eg the certification programme, compliance checklist, etc.);
- compliance documents;
- design data transferred to production organisations; and
- production deviations (also referred to as 'unintended deviations' or 'concessions').

### 3. Rationale

The purpose of this obligation is to give certainty to the end users about the approval status of the data and information issued by the DOA holder.

### 4. Statement

The statement provided with the data and information should also cover those items prepared by subcontractors or vendors that the DOA holder has declared as applicable to their products. The technical content of the statement is related to the type certificate data and information.

The approval included in the statement means that:

- the type certificate data has been appropriately approved; and
- the information contains practical and well-defined installation or inspection methods, and, when those methods are implemented, the product is in conformity with the approved type certificate data.

Note: Data and information related to the measures required by MSTAR 21.A.3B(b) (airworthiness directives (ADs)) are submitted to the Authority to ensure their compatibility with the content of an AD (see MSTAR 21.A.265(e)), and contain a statement that they are, or will be, subject to an AD issued by the Authority.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 11****SUBPART K - PARTS AND APPLIANCES****1. 21.A.301 Scope****GM 21.A.301 - Scope**

Parts and appliances can include Government Furnished Equipment (GFE).

**2. 21.A.303 Compliance with applicable requirements.****AMC 21.A.303(c) - Standard Parts**

The definition of 'Standard Parts' is included in the Glossary. Equipment which must be approved in accordance with certification requirements is not considered a standard part.

**GM 21.A.303(c) - Officially Recognised Standards**

In this context 'officially recognised Standards' means:

- (a) Those standards established or published by an official body whether having legal personality or not, which are widely recognised by the aerospace sector as constituting good practice.
- (b) The standard used by the manufacturer of the equipment as mentioned in MSTAR AMC 21.A.303(c).

**AMC 21.A.303(d) - Specific equipment.**

The integration of specific equipment under this sub-clause should:

- a. Occur within an appropriate design process in accordance with MSTAR 21 Subpart B, D or E where the demonstration 'not to adversely affect the airworthiness of the aircraft' is conducted via development and validation of compliance demonstration evidence against aircraft TCB elements affected by the integration, for example - crashworthiness, EMI/ EMC, power draw requirements, mass and balance, and flammability.
- b. Include the establishment of configuration management arrangements to ensure:
  - i. the MSTC holder is aware of any modifications or repairs made to the specific equipment design where those changes may affect the airworthiness of the aircraft, and
  - ii. the physical items of the specific equipment are appropriately marked with sufficient information to enable the CAMO to clearly identify items that are approved for installation in the aircraft.

c. Define the document(s) that the CAMO or 145 maintenance organisation may accept as evidence that the equipment is eligible for installation in the aircraft and is serviceable when released from maintenance or production.

#### **GM 21.A.303(d) - Specific equipment**

##### **Purpose**

The purpose of this sub-clause is to:

- a. streamline the integration of certain equipment onto a type certificated product; and
- b. avoid unnecessarily strict requirements being applied to organisations designing, producing and maintaining such equipment.

##### **Criteria**

An item may be considered as specific equipment under this sub-clause if it is:

- a. Installed in or attached to the aircraft for operation in flight; and
- b. Not essential in order for the aircraft to comply with the applicable airworthiness standards; and
- c. Not able to control equipment or systems that are essential in order for the aircraft to comply with the applicable airworthiness standards.

#### **Treatment of parts and appliances under MSTAR 21.A.303(d)**

During a change to the type-design an DO may identify parts or appliances within the type-design that have been previously approved under MSTAR 21.A.303(a) but for which demonstration of compliance evidence under MSTAR 21.A.303(d) is suitable. In those cases, that part or appliance may be treated in accordance with MSTAR 21.A.303(d).

Where an DO requires clarification in regards to the applicability of airworthiness standards to a part or appliance, the relevant MSTC holder should be approached to provide clarification.

### **3. 21.A.307 Release of parts and appliances for installation**

#### **AMC 21.A.307 - Release of parts and appliances for installation**

Controls shall be established to ensure that aviation software is installed in the required configuration and verified to be installed correctly.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 2**

**CHAPTER 12**

**SUBPART L – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 13****SUBPART M - REPAIRS****1. 21.A.431A Scope****GM 21.A.431A - Scope**

Manuals and other instructions for continuing 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 Auxiliary Power Unit (APU) TSO 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 Authority, or by an appropriately approved design organisation.

Repairs approved under the framework of a recognised N/MAA may be implemented subject to the conditions in the relevant recognition certificate IAW MSTAR M.A.304(d) and without further approval under MSTAR 21 Subpart M.

**GM 21.A.431A(e) - Repairs to technical standard order (TSO) articles other than an APU**

A repair to an TSO article, other than an Auxiliary Power Unit (APU), can either be seen:

1. Under MSTAR 21.A.611, in the context of an TSO authorisation, i.e., when an article as such is specifically approved under MSTAR 21 Section A 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, MSTAR 21 Section A Subpart O, and MSTAR 21.A.611 in particular, should be followed; or
2. When a MSTAR 145 / MSTAR M 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 MSTAR 21 Section A 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'.

2. **21.A.431B Standard repairs****GM 21.A.431B Standard repairs – airworthiness codes**

The Authority will decide on the applicability of airworthiness codes (e.g. certification specifications contained in EASA CS-STAN) referred to in MSTAR 21.A.431B(a)(2). Guidance on the implementation of Standard Changes and Standard Repairs is to be provided by the Authority.

3. **21.A.432B Demonstration of capability****GM 21.A.432B(b) - Alternative procedures**

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

**AMC 21.A.143, 21.A.243, 21.A.14(b), 21.A.112B(b) and 21.A.432B(b) Flight Test Operations Manual (FTOM)**

## 1. General

- a. Scope: The FTOM covers flight test operations.

The FTOM complexity should be proportionate to the aircraft and the organisation complexity.

- b. Format

The FTOM may:

- be included in the Design Organisation Approval (DOA) / Production Organisation Approval (POA) /Alternative Procedure to DOA (ADOA) documents, or
- be a separate manual.

The FTOM may make reference to other documents to cover the contents listed below, e.g. for record-keeping.

- c. Use by contractors or sub-contractors:

When flight tests are performed by contractors or sub-contractors, they should comply with the FTOM of the primary organisations, unless they have established an FTOM in compliance with Part-21, the use of which has been agreed between the two organisations.

## 2. The FTOM should contain the following elements:

- a. Exposition (not applicable in the case of ADOA)2:

If the FTOM is presented as a separate document, it should include a chart indicating the structure of the organisation and, more specifically, the functional links of the people in charge of flight test activities. It should also mention the coordination between all departments affecting flight test, e.g. Design Office, Production and Maintenance, in particular coordination for the establishment and update of a Flight Test Programme.



b. Risk and safety management:

The FTOM should describe the organisation's policy in relation to risk and safety assessment, mitigation, and associated methodologies.

c. Crew members:

According to the flight test category, the FTOM should describe the organisation's policy on the composition of the crew (including the need to use a Lead Flight Test Engineer (LFTE)) and the competence and currency of its flight test crew members, including procedures for appointing crew members for each specific flight.

All crew members should be listed in the FTOM.

A flight time limitation policy should be established.

d. Carriage of persons other than crew members:

According to the flight test category, the FTOM should describe the organisation's policy in relation to the presence and safety on-board, of people other than crew members (i.e. with no flying duties).

People other than crew members should not be allowed on board for Category 1 flight tests.

e. Instruments and equipment:

The FTOM should list, depending on the nature of the flight, the specific safety-related instruments and equipment that should be available on the aircraft or carried by people on board.

The FTOM should contain provisions to allow flights to take place in case of defective or missing instruments or equipment.

f. Documents:

The FTOM should list the documents to be produced for flight test, and include (or refer to) the procedures for their issue, update and follow-up to ensure the documents' configuration control:

(i) documents associated with a Flight Test Programme:

– Flight Order for a given flight, which should include:

- a list of the tests to be performed and associated conditions;
- safety considerations relevant to the flight;
- category of the flight (e.g. Category 1);
- composition of the crew;
- names of persons other than crew members;

- aircraft configuration items relevant to the test to be highlighted to the crew;
  - loading of the aircraft;
  - reference to approved flight conditions; and
  - restrictions relevant to the flight to be highlighted to the crew.
- Flight crew report.
- (ii) documentation and information to be carried on the aircraft during flight test;
  - (iii) record-keeping: the FTOM should describe the policy relative to record-keeping.
- g. Permit to fly:
- The FTOM should describe the involvement of the flight test organisation or flight test team (as appropriate) in the process for the approval of flight conditions and the issue of permits to fly in accordance with Subpart P.
- h. Currency and training:
- The FTOM should describe how training for flight test is organised.
- Currency of the flight test crew may be ensured either through recent experience or refresher training.
- The FTOM should specify the requirements for a refresher training in order to ensure that crew members are sufficiently current to perform the required flight test activity.
- A system should be established to record the currency of the flight test crew's training.

#### **AMC 21.A.432B(c) Alternative Demonstration**

In some countries a government organisation is approved by the Authority to execute the Repair Approval Holder responsibilities. This government organisation may apply for a repair approval from its Authority, without being the original design organisation. In this case the government organisation should, in accordance with MSTAR 21.A.2, enter an agreement with a design organisation to ensure the undertaking of specific actions and obligations. Alternative procedures (refer to MSTAR 21.A.14(b)) for establishing a Design Assurance System to fulfil the obligations required under MSTAR 21.A.451 must be acceptable to the Authority.

#### **4. 21.A.432C Application for a repair design approval**

##### **AMC 21.A.432C - Authorisation Letter (MY)**

Organisations seeking a repair design approval from the TAR are required to submit an application accompanied all procedures, plans or instructions referenced in 21.A.432C(a) and (b).

- (a) The applicant shall submit an application for an repair approval to TAR.
- (1) By the applicant directly when it is the SAO organisation.
  - (2) Through the MAO when the applicant is a commercial organisation.
  - (3) For an application from a commercial organisation, the sponsor DOA shall include a copy of the authorisation letter to enforce the regulations.
  - (4) authorisation letter by MAOs for those commercial organisations.

#### **AMC 21.A.432C(a) - Form and manner**

Notification of an intended major repair requiring Authority approval can be made using **MSTAR Form 31** – Notification of Major Change/Major Repair. Submission of MSTAR Form 31 initiates dialogue that enables the Authority to guide the applicant through the major repair approval process. Application for approval of a major repair design should be made using MSTAR Form 31b.

Showings of compliance may leverage prior certification by a recognised NAA/MAA in accordance with AMC to MSTAR 21.A.20. The requirement for a detailed Certification Programme (CP) is determined in consultation with the Authority. In the case of major repairs, if long and complex compliance demonstration activities are deemed to not be required, the Certification Programme (CP) can be submitted in simplified form as part of the application.

#### **AMC 21.A.432C(b)(1) - Description**

The description of the repair should consist of:

- the pre- and post-repair configuration;
- a drawing or outline of the repair;
- a list of the detailed features;
- a description of the type and extent of the inspection; and
- an outline of the damage.

#### **AMC 21.A.432C(b)(3) - Identification of reinvestigations**

The identification of reinvestigations does not refer to the demonstration of compliance itself, but to the list of the affected airworthiness requirements, together with the means of compliance.

#### **AMC 21.A.432C(b)(6) - Level of involvement**

The proposed assessment shall take into account at least the following elements:

1. novel or unusual features of the certification project, including operational, organisational and knowledge management aspects;
2. complexity of the design and/or demonstration of compliance;

3. criticality of the design or technology and the related safety and environmental risks, including those identified on similar designs; and
4. performance and experience of the design organisation of the applicant in the domain concerned.

Based on this assessment, the application shall include a proposal for the involvement of the Authority in the verification of the compliance demonstration activities and data.

**5. 21.A.433 Requirements for a repair design**

**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. the identification of the damage and the reporting source;
  - b. the major repair design approval sheet identifying the applicable specifications and references of justifications;
  - c. the repair drawing and/or instructions and scheme identifier;
  - d. the correspondence with the holder of the Malaysian State Type Certificate (MSTC), Supplemental Type Certificate (STC), or auxiliary power unit technical standard order (APU TSO) authorisation, if its advice on the design has been sought;
  - e. the structural justification (static strength, fatigue, damage tolerance, flutter, etc.) or references to this data;
  - f. the effect on the aircraft, engines and/or systems (performance, flight handling, etc., as appropriate);
  - g. the effect on the maintenance programme;
  - h. the effect on airworthiness limitations, the flight manual and the operating manual;
  - i. any weight and moment changes; and
  - 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, a justification for the 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, the 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 MSTC or STC holder, when deemed necessary under 21.A.433(a)(4).

5. Repairs to engine or APU critical parts would normally only be accepted with the involvement of the MSTC holder.

#### **GM 21.A.433(a)(1) - Notification by the Authority**

The Authority may designate any amendments to the type certification basis incorporated by reference in, as applicable, either the type certificate, the supplemental type certificate or the APU TSO authorisation, which the Authority considers necessary for maintaining a level of safety equal to that previously established and notify them to the applicant for a repair design.

### **6. 21.A.435 Classification and approval of repair designs**

#### **AMC 21.A.435(a) - Classification of repairs (MY)**

1. As per MSTAR 21.A.435a – Classification and approval of Repairs – a repair must be classified as either minor or major IAW the criteria laid out in MSTAR 21.A.435a. Classification of repairs guides the Authority to apply appropriate assurance oversight and allows for the obligations of the holder of a repair design approval to be identified. Classification does not affect the certification basis, demonstration of compliance, independent checking or declaration of compliance and, as such, whether a repair is classified as major or minor does not affect the engineering rigour applied to the repair. Repair classification may be made by either the Authority or by an appropriately privileged design organisation under a procedure agreed to with the Authority.

2. GM to MSTAR 21.A.435a states that a new repair – a repair that has not previously been approved for the application being considered on the individual aircraft in question – is classified as major if it has an appreciable effect on structural performance, weight, balance, systems, operational characteristics or other characteristics affecting airworthiness. This is elaborated on to highlight that repair needing extensive static, fatigue or damage tolerance justification or testing, or requiring methods, techniques or practices that are unusual, are to be classified as major. This GM identifies repairs that require permanent changes to Airworthiness Limitations (AwLs) to be classified as major.

3. The paragraphs below give examples of what may need to be considered in developing a repair classification procedure. Each organisation must still develop its own procedure which meets the requirements of MSTAR 21.A.435a, 21.A.239, 21.A.263 and 21.A.243; and that is tailored to the particular scope of work which that organisation carries out. However, the considerations below, based on the guidance provided in the GM to MSTAR 21.A.435a and MSTAR 21.A.91, are provided to further clarify the Authority's expectations of such a procedure.

4. For clarity, classification may consider the following three characteristics of the repair design:

a. **Severity** – The effect of the repair on airworthiness.

b. **Complexity** – The complexity of the design and the certification requirements.

c. **Novelty** – Whether the design is IAW established methods and practices for the repair application in question.

5. Generally, repairs may be classified as major except when all of the following criteria are met:

a. Severity is low. Examples of the types of details that would be expected from repairs of low severity include:

(i) Structural performance, in terms of static strength, fatigue performance, damage tolerance performance, flutter and stiffness characteristics, is unaffected by the repair.

(ii) Load paths and load sharing in the vicinity of the repair are unaffected by the repair.

(iii) Weight and balance change is not greater than that allowed in the weight and balance manual or Original Equipment Manufacturer (OEM) repair guidance for weight and balance. This includes changes in centre of gravity and load distribution. Weight and balance of control surfaces can be particularly affected by even small changes.

(iv) Changes do not affect the operation or redundancy of a system, or an adjacent system.

(v) Changes do not affect operational characteristics.

(vi) Other characteristics related to airworthiness, or to environmental characteristics of the platform (such as noise, fuel venting and exhaust characteristics), are not affected including, but not limited to, fire protection, propulsion systems integrity and crashworthiness.

b. The repair design and the certification requirements are not complex. Examples of the types of details that would be expected from repairs of low complexity include:

(i) Repair requires no or minimal re-assessment or re-evaluation of original certification substantiation data.

(ii) Repair design elements are straightforward.

(iii) Original type certification data is available, or if not available appropriate data can be established without complex engineering, and no assumptions are required in the definition of the certification requirements.

c. There are no new or novel features to the repair. Examples of the types of details that would be expected from a repair that does not have new or novel features include:

(i) Techniques, methods and practices are those employed in the regular management of the platform and type of defect.

(ii) Techniques, methods and practices are those accounted for in

the platform Type Design.

6. It is recognised that in some cases not all data will be available at the time of initial repair classification, and so, judgement must be exercised. In the case where later data indicates that the initial classification is no longer valid, a repair may be reclassified (GM 21.A.91, paragraph 3.2). In this case, consultation with the Authority and, where necessary, reconsideration of the Certification Programme (CP), is expected.

7. These classification considerations are outlined in Figure 1.

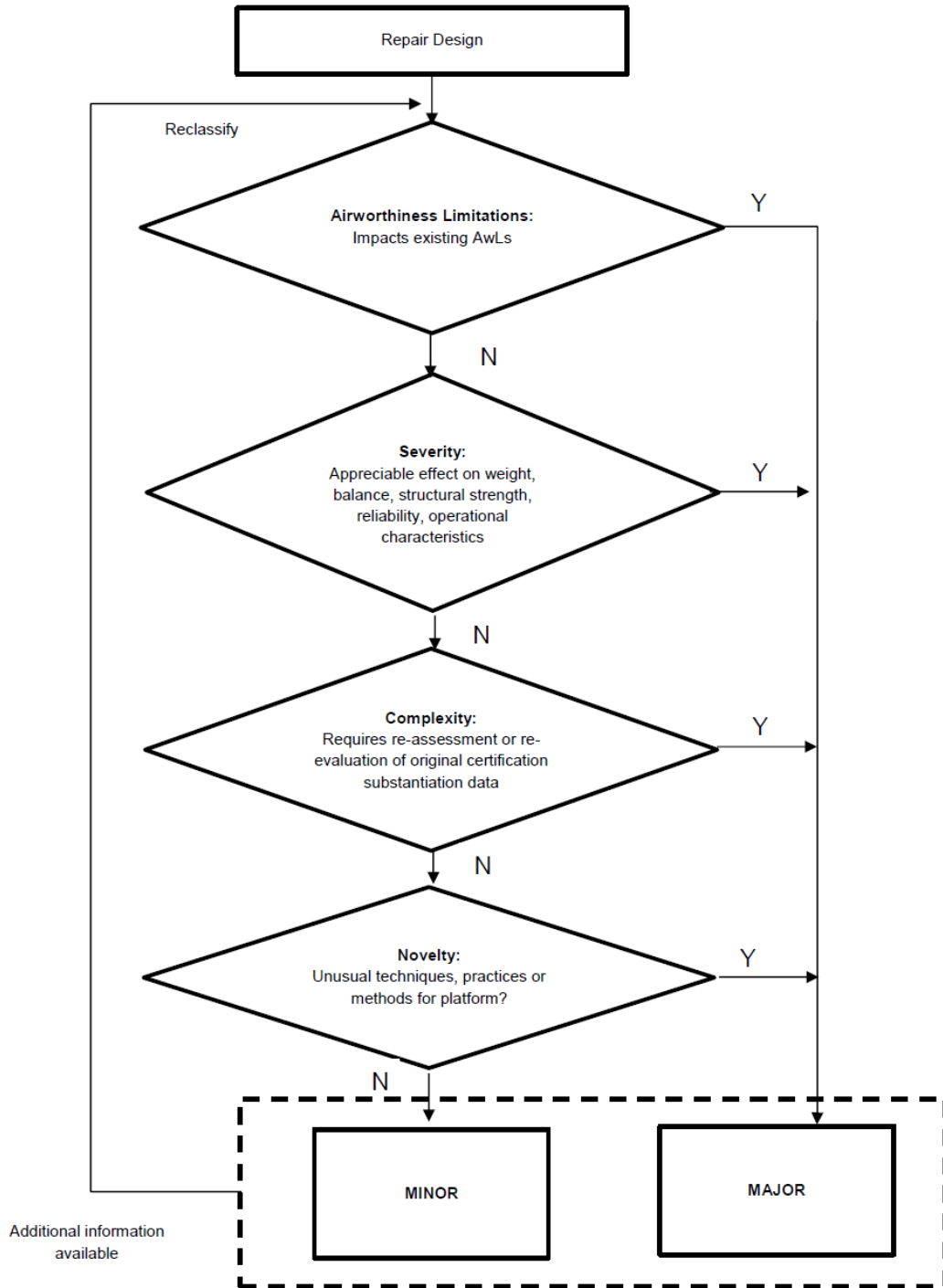


Figure 1: Classification Principles

**GM 21.A.435(a) - Classification of repairs****1. Clarification of the terms major/ minor**

In line with the definitions given in MSTAR 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.

**(a) 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;
- Reserved
- 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) - Repair design approval**

(a) Repair design approval by DGTA

DGTA approval is required in cases of major repair designs proposed by design organisation approval (DOA) holders that do not hold the necessary privilege as per MSTAR 21.A.263(c)(5) to approve certain major repair designs, as well as in cases of minor repair designs proposed by organisations that do not hold an DOA. In(a) response to applications (MSTAR Form 31B – Application for Approval of Major Repair Design), the Authority shall issue all 'major' repair design approvals to the relevant government TC holder.

DGTA may grant the applicant relief from some or all showings of compliance if the repair design has been previously approved by a recognised NAA / MAA and is suitable.

(b) Repair design approval by the DOA holder

1. Approval by the DOA holder

Approval of repairs through the use of procedures agreed with DGTA implies that the DOA holder issues the approval without DGTA's involvement. DGTA will monitor the 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 issued on the basis of its privilege.

2, Previously approved data for other applications

When it is intended to use previously approved data for other applications, it is expected that an appropriately approved design organisation has checked the applicability and effectiveness of this data. 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 previously approved repair design (structural justifications still valid, possible airworthiness limitations unchanged), the solution may be considered to be approved and may be used again.

3. Temporary repairs

These are life-limited repairs to be removed and replaced by permanent repairs after a limited service period. These repairs should be classified under point 21.A.435, and the service period should be defined when the temporary repair is approved.

4. Fatigue and damage tolerance

An approved design issued before the fatigue and damage-tolerance evaluation has been completed, should specify the limited service period.

7. **21.A.439 Production of repair parts**

**GM 21.A.439 - Production of repair parts**

A maintenance body, (organisation or person), may manufacture parts for repair purposes when approved under MSTAR 21 Section A Subpart G. In addition, a maintenance organisation may manufacture parts for its own repair purposes when expressly authorised by the Authority.

8. **21.A.441 Repair embodiment**

**GM 21.A.441 - Repair Embodiment**

Repairs should be accomplished by an organisation or person in accordance with the relevant airworthiness requirements.

The holder of a production organisation approval under MSTAR 21 Section A Subpart G may accomplish repairs to new aircraft, within its terms of approval, under the privilege of MSTAR 21.A.163(d).

9. **21.A.443 Limitations**

**GM 21.A.443 - Limitations**

Instructions and limitations associated with repairs should be specified and controlled by those procedures required by the applicable requirements (e.g. operations rules).

10. **21.A.445 Unrepaired damage**

**AMC 21.A.445 - Unrepaired damage**

A repair design approval using the provisions of MSTAR 21.A.445 can be used to establish that the aircraft is in an airworthy condition provided compliance with the applicable Type Certification Basis (TCB) requirements can be demonstrated. Demonstration of compliance can be subject to limitations such as additional inspections or a limit on the duration of the approval.

For damage to aircraft structure that is left unrepaired, and is not covered by previously approved data, the evaluation of the damage should ensure:

- a. The full extent of the damage is known (especially important for corrosion damage and composites materials).
- b. Compliance with the strength requirements of the TCB.
- c. The limitations account for anticipated damage growth and potential for initiation of secondary damage or failures.

**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.

11. **21.A.447 Record keeping**

**AMC 21.A.447 - Repair design and record keeping (MY)**

1. Relevant substantiation data associated with a new major repair design and record keeping should include:

- a. the identification of the damage and the reporting source;
- b. the major repair design approval sheet identifying the applicable specifications and references of justifications;
- c. the repair drawing and/or instructions and scheme identifier;
- d. the correspondence with the holder of the **Malaysian State Type Certificate (MSTC)**, **Supplemental Type Certificate (STC)**, or auxiliary power unit technical standard order (APU TSO) authorisation, if its advice on the design has been sought;
- e. the structural justification (static strength, fatigue, damage tolerance, flutter, etc.) or references to this data;

- f. the effect on the aircraft, engines and/or systems (performance, flight handling, etc., as appropriate);
  - g. the effect on the maintenance programme;
  - h. the effect on airworthiness limitations, the flight manual and the operating manual;
  - i. any weight and moment changes; and
  - 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, a justification for the 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, the 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 MSTC or STC holder, when deemed necessary under 21.A.433(a)(4).
5. Repairs to engine or APU critical parts would normally only be accepted with the involvement of the MSTC holder.

#### **AMC1 21.A.447 - Record keeping**

Records should be retained for at least two years after the removal of service of the last aircraft of the type certified.

### **12. 21.A.449 Instructions for continuing airworthiness**

#### **AMC 21.A.449 - Instructions for Continuing Airworthiness**

Instructions for Continuing Airworthiness (ICA) shall be distributed in accordance with MSTAR AMC 21.A.57 – Manuals.

The system for distributing ICA and their amendments to users shall ensure that:

- (a) details of the authorised distribution of ICA to each user is recorded; and
- (b) ICA are accessible to organisations and personnel.

#### **GM 21.A.449 - Instructions for Continuing Airworthiness**

Instructions for Continuing Airworthiness (ICA) details the methods, inspections, processes, and procedures necessary for the air operator to keep aircraft and / or engine, propeller, parts, and appliances airworthy during its intended life.

The contents of ICA can be divided into two categories:

- a. an approved airworthiness limitations (AwL) section as defined by the applicable airworthiness codes during the certification process, which forms part of the type design/ type certificate (MSTAR 21.A.31(a)(3) and MSTAR 21.A.41):
  - i. any limitations determined through the certification of the product, and instructions on how to determine that these limits have been exceeded.
  - ii. any inspection, servicing or maintenance actions determined to be necessary by the certification process.
- b. sections that do not contain approved data from the certification process and are not considered as part of type design/ type certificate:
  - i. any inspection or troubleshooting actions determined to be necessary to establish the nature of faults and the necessary remedial actions.
  - ii. sufficient general information on the operation of the product to enable an understanding of the instructions in paragraphs (a)(i), (a)(ii), and (b)(i) above.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 2**

**CHAPTER 14**

**SUBPART N – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 15****SUBPART O - TECHNICAL STANDARD ORDER AUTHORISATIONS****1. 21.A.601 Scope****GM 21.A.601 - Scope**

For the purpose of this Subpart:

- a. **'Article'** means any part and appliance (including Government Furnished Equipment (GFE)) to be used on military aircraft;
- b. **'technical standards and airworthiness specifications'** referred to should consider published Technical Standard Orders, including TSO standards issued by the FAA or equivalent, that are accepted by the 'Authority' establishing the minimum performance requirements for the specified articles;
- c. An article produced under a TSO authorisation is an approved article for the purpose of Subpart K.

**2. 21.A.602B Demonstration and capability****AMC 21.A.602B(b)(2) - Procedures for TSO authorisations****1. Scope.**

A manual of procedures should set out specific design practices, resources and sequence of activities relevant for the specific projects, taking account of MSTAR 21 requirements.

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

**2. Management of the TSO authorisation process.**

A procedure explaining how the application to the Authority certification process to obtain an TSO authorisation will be made, should be established.

**3. Management of design changes.**

A procedure taking into account MSTAR 21.A.611, should be established for the classification and approval of design changes on articles under TSO authorisation.

Repairs and production deviations from the approved design data.

Procedure for the classification and approval of repairs and unintentional deviations from the approved design data occurring in production (concessions or non conformance's) should be established.

**4. Obligations addressed in MSTAR 21.A.609.**

The applicant should establish the necessary procedures to show to the Authority how it will fulfil the obligations under MSTAR 21.A.609.

For issue of information and instructions, a procedure following the principles of MSTAR AMC 21.A.14(b), paragraph 4 should be established.

#### **5. Control of design subcontractors.**

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

### **3. 21.A.603 Application**

#### **AMC 21.A.603(a) - Application - Form and manner**

**MSTAR Form 34** - Application for Technical Standard Order Authorisation, is to be obtained from the Authority, and completed by the Accountable Manager of the organisation.

The completed form, an outline of the design organisation exposition, and details of the proposed terms of approval are to be forwarded to the Authority.

### **4. 21.A.608 Declaration of Design and Performance**

#### **AMC 21.A.608(a) - Declaration of Design and Performance**

Compliance demonstration evidence for TSO Authorisation applications may use prior certification by an NAA/ NMAA, whose certification is recognised by the Authority, in accordance with the principles of AMC to MSTAR 21.A.20 – Demonstration of compliance with the type certification basis and environmental protection requirements.

#### **AMC 21.A.608(b) - Declaration of Design and Performance**

**MSTAR Form DDP** - Declaration of Design and Performance, should be completed by the applicant.

### **5. 21.A.611 Design changes**

#### **GM 21.A.611 - Design changes**

A change to a TSO article is managed under either of the following two processes:

under MSTAR 21.A.611 in the context of a TSO authorisation, ie when an article as such is specifically approved under MSTAR 21 Section A 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 change to such an article, irrespective of installation on any aircraft, MSTAR 21 Section A Subpart O, and MSTAR 21.A.611 in particular, should be followed.

or

when an organisation is designing a change (based on data not published in the MSTC holder or Original Equipment Manufacturer (OEM) documentation) on an article installed on an aircraft, such a change can be considered as a change to the product



in which the article is installed, not to the article taken in isolation. Therefore, MSTAR 21 Section A Subpart D can be used for the approval of this change that will be identified as 'change to product x affecting article y', but not 'change to article y'.

6. **21.A.613 Record keeping**

**AMC 21.A.613 - Record keeping**

Records should be retained for at least two years after the removal from service of the last aircraft of the type certified.

## MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION

## PART 2

## CHAPTER 16

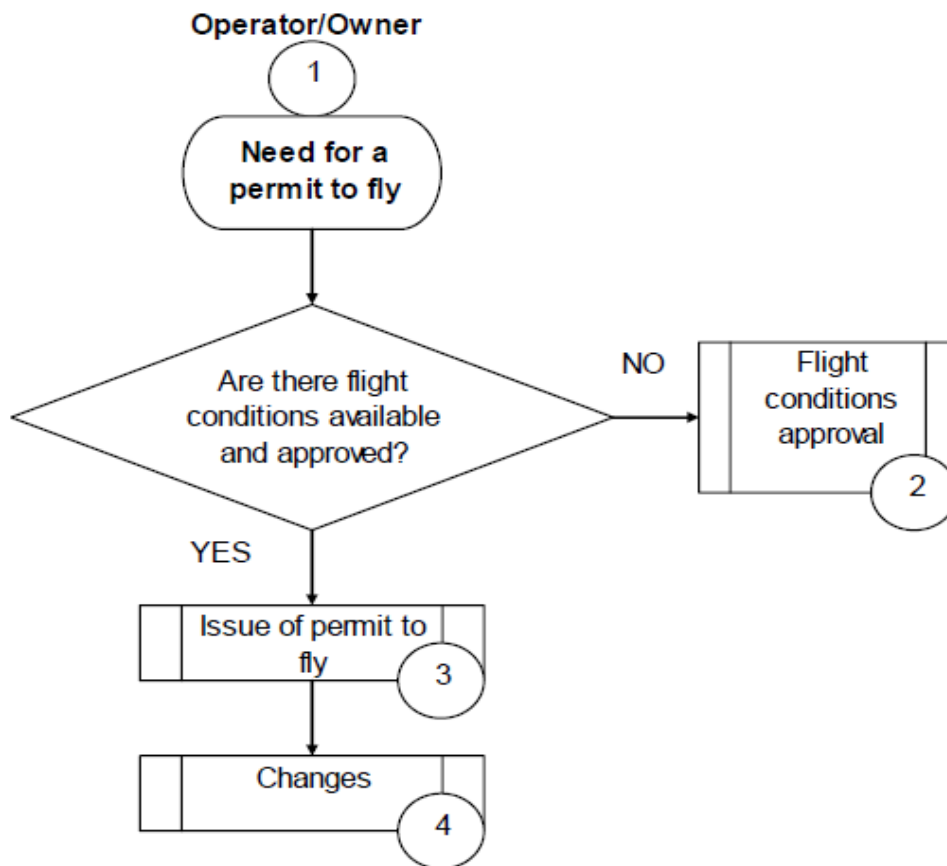
## SUBPART P - PERMIT TO FLY

## 1. SUBPART P PERMIT TO FLY

**GM to Subpart P**

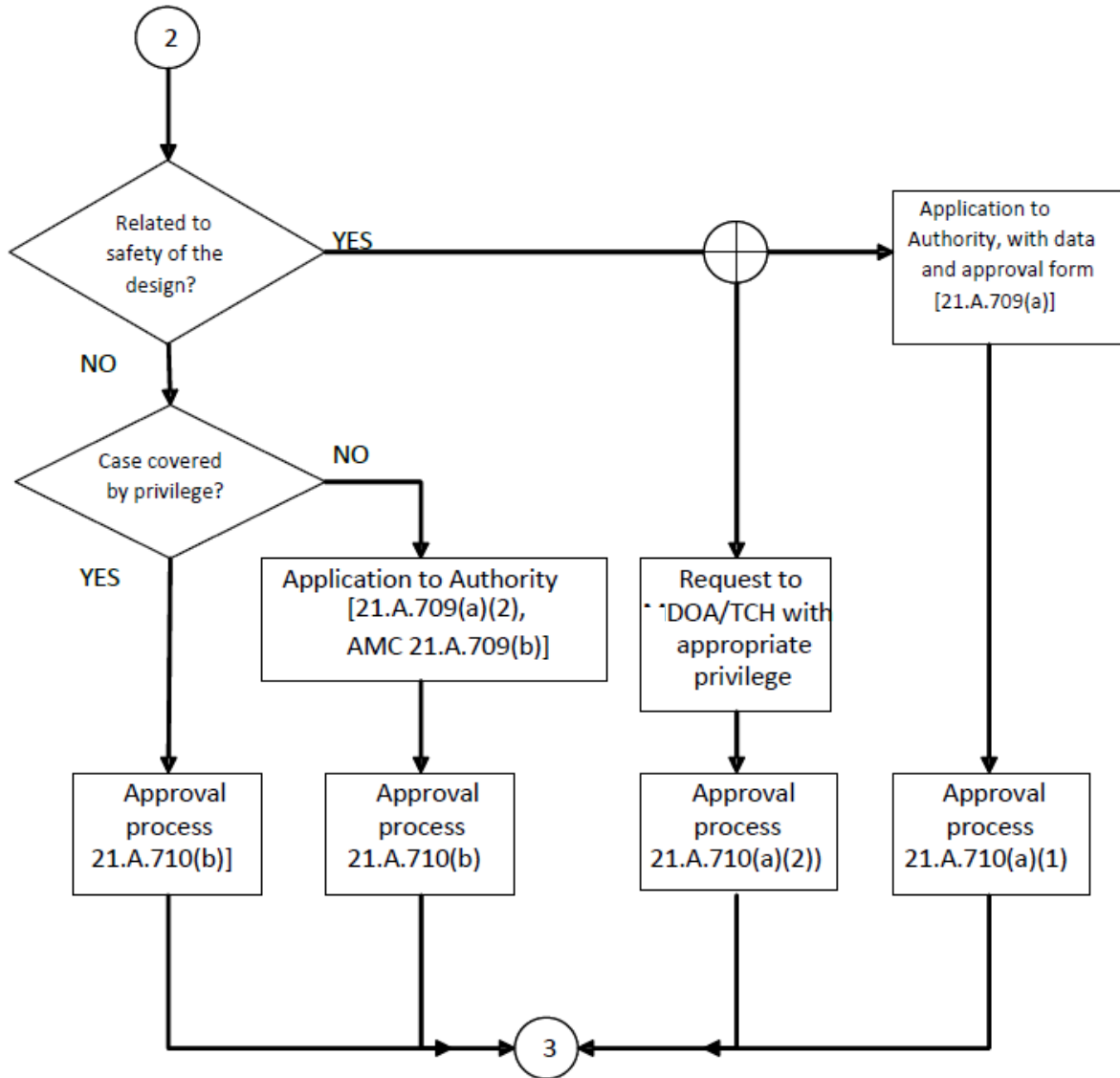
The process allowing a flight under a permit to fly can be described as follows:

1. Flow-chart 1: Overview;
2. Flow-chart 2: Approval of flight conditions;
3. Flow-chart 3: Issue of permit to fly;

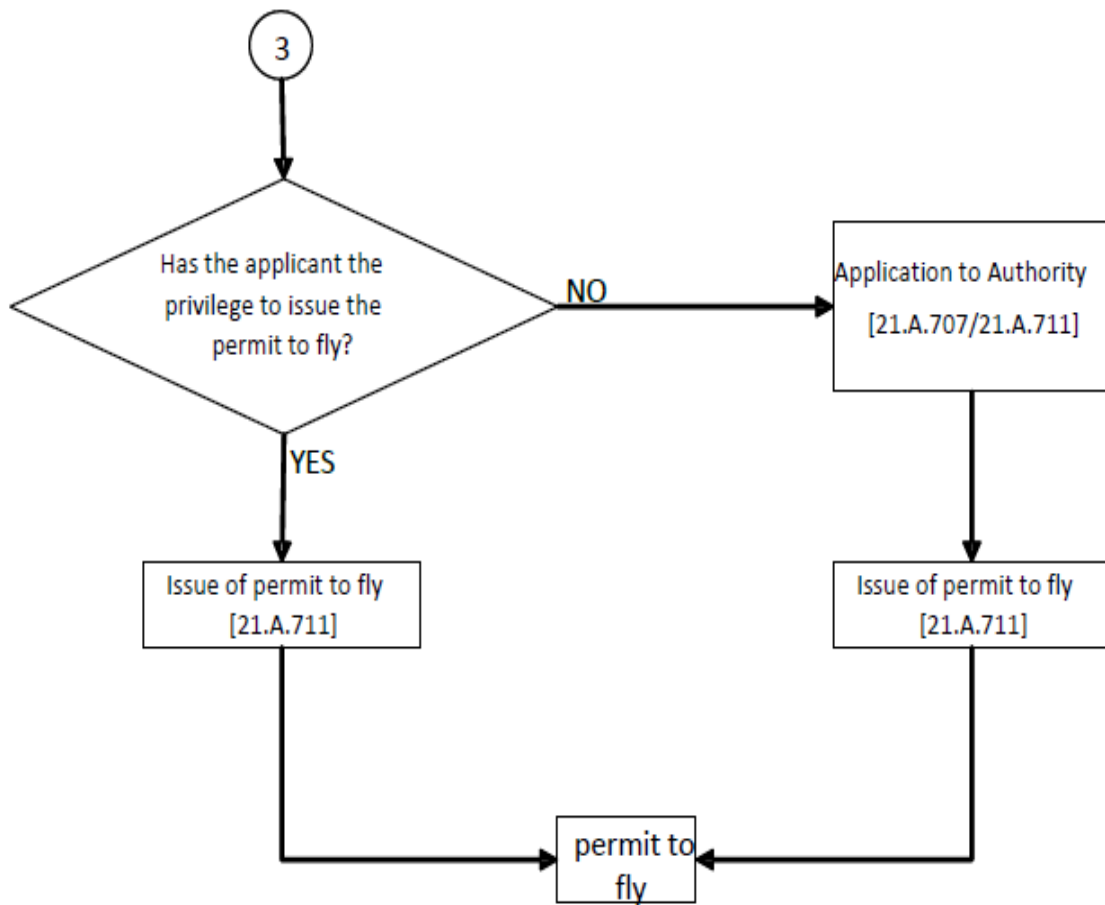


4. Flow-chart 4: Changes after first issue of permit to fly.

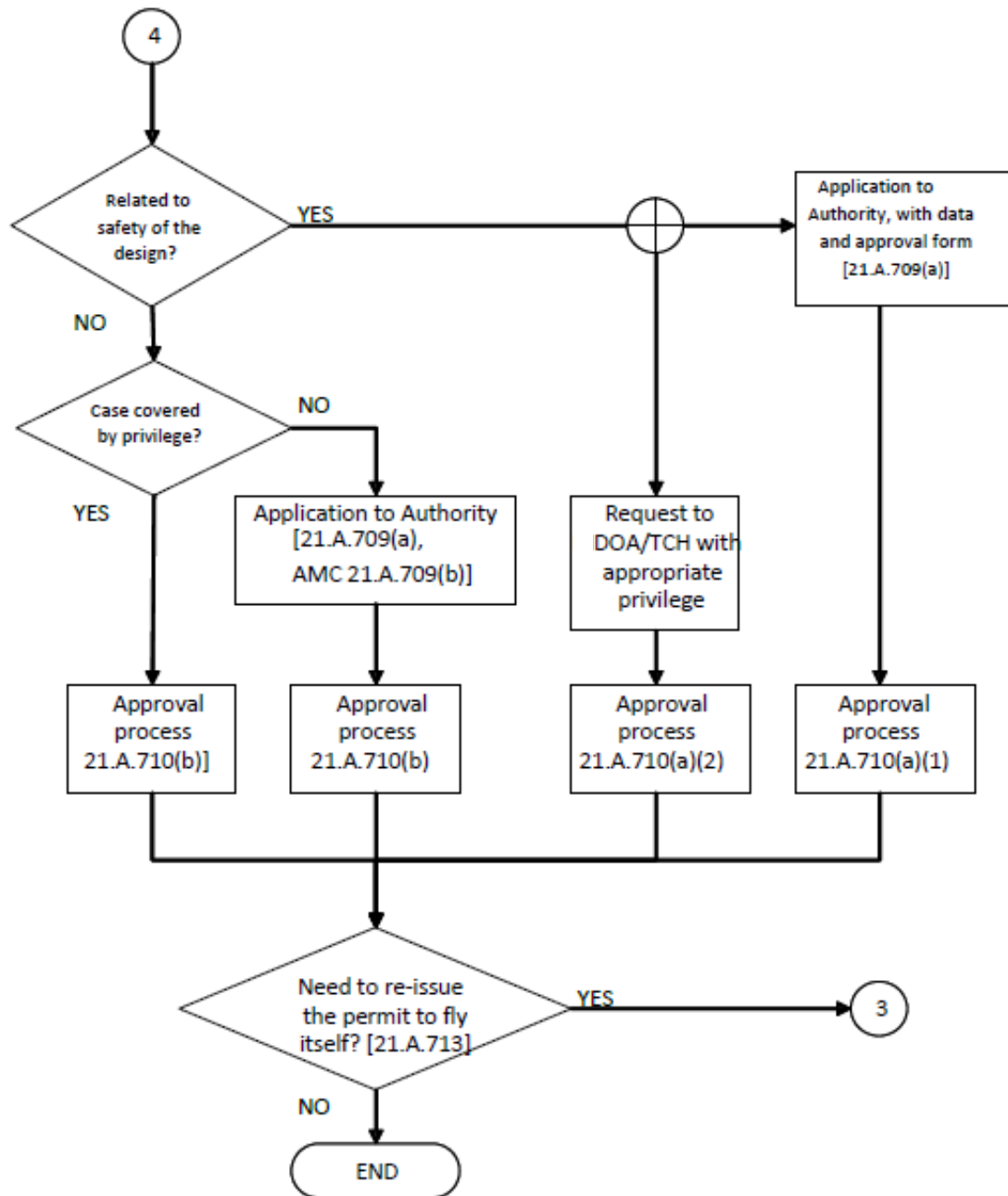
Flow-chart 1: Overview



Flow-chart 2: Approval of flight conditions



Flow-chart 3: Issue of permit to fly



Flow-chart 4: Changes after first issue of permit to fly

**2. 21.A.701 Scope****GM1 21.A.701 – Scope**

An aircraft registered 'outside the participating States (pMS), ie outside of those countries subject to DGTA regulations or outside of militaries using EMAR based technical regulations, and used for flight testing by an organisation which has its principle place of business in the pMS, remains under the Authority of its state of registry. The Authority or an appropriately approved design organisation can provide, on request, technical assistance to the state of registry for the issue of a Permit to Fly (MSTAR Form 20b - Permit to Fly (Approved Organisation)), under the state of registry applicable regulations.

**GM2 21.A.701 - Permit to Fly when certificate of airworthiness or restricted certificate of airworthiness is not appropriate**

A certificate of airworthiness or restricted category 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. MSTAR 21.A.701 identifies cases where the issuance of a (Restricted) Certificate of Airworthiness may not be possible or appropriate and this paragraph provides further information and typical examples for clarification where appropriate:

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

**a) Development:**

- i. testing of new aircraft or modifications;
- ii. testing of new concepts of airframe, engine propeller and equipment;
- iii. testing of new operating techniques.

**b) Demonstration of compliance with regulations or certification requirements:**

- i. certification flight testing for type certification, supplemental type certificates, changes to type certificates or TSO authorisation.

**c) Design organisations or production organisations crew training:**

- i. Flights for training of crew that will perform design or production flight testing before the design approval or Certificate of Airworthiness (C of A) can be issued.

**d) Production flight testing of new production aircraft:**

- i. For establishing conformity with the approved design, typically this would be the same programme for a number of similar aircraft.

**e) Flying aircraft under production between production facilities:**

- i. green aircraft ferry for follow on final production.

- f) **Flying the aircraft for customer acceptance:**
- i. Before the aircraft is sold and/or registered.
- g) **Delivering or exporting the aircraft:**
- i. Before the aircraft is registered in the State where the C of A will be issued.
- h) **Flying the aircraft for Authority acceptance:**
- i. In the case of inspection flight test by the Authority before the C of A is issued.
- i) **Market survey, including customer's crew training:**
- i. Flights for the purpose of conducting market survey, sales demonstrations and customer crew training with non-type certificated aircraft or aircraft or which conformity has not yet been established or for non-registered a/c and before the C of A is issued.
- j) **Exhibition and air show:**
- i. 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.
- k) **Flying the aircraft to a location where maintenance or airworthiness review are to be performed, or to a place of storage:**
- i. Ferry flights in cases where maintenance is not performed in accordance with approved programmes, where an Airworthiness Directive (AD) has not been complied with where certain equipment outside the Master Minimum Equipment List (MMEL) is unserviceable or when the aircraft as sustained damage beyond the applicable limits.
- l) **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:**
- i. Oversees ferry flights with additional fuel capacity.
- m) **Reserved.**
- n) **Flying aircraft meeting the applicable airworthiness requirements before conformity to the environmental requirements has been found:**
- i. Flying an aircraft which has been shown to comply with all applicable airworthiness requirements but not with environmental requirements.
- o) **For individual aircraft or types for which a certificate of airworthiness or restricted certificate of airworthiness is not appropriate:**
- i. For aircraft which cannot practically meet all applicable airworthiness requirements, such as ascertain aircraft without MSTC holder ('generically termed

orphan aircraft') or aircraft which have been under national systems of Permits 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 or restricted 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.

p) **Operation of new or modified capability, prior to certification, due to capability imperative:**

i. For aircraft which have been modified to improve capability or introduce a new capability, where certification activities are unable to be completed prior to a need to operate the aircraft. This may be due to modification of a single aircraft or flight-testing purposes, where it is not reasonably practicable to 'de-mod' that aircraft while certification is completed, or due to a need to incorporate a modification across all or part of the fleet for capability reasons in advance of certification being achieved. Note that operation under an PTF prior to certification should be limited to the minimum practicable duration, since extended operation for convenience under an PTF may not be defensible. Lack of resourcing is not normally considered a credible and defensible reason to continue operation under an PTF, and full certification (underpinned by MCRIs as required) should be pursued as soon as possible.

q) **Continued operation of aircraft where required maintenance has not been completed, due to a capability imperative:**

i. For aircraft where there is a capability imperative to continue operating beyond a required maintenance activity without completion of that maintenance. This includes operation beyond Airworthiness Limitations (AwLs) or directed activities in an Airworthiness Directive (AD) without other DGTA approval, and operations outside of ICA (other than AwLs) where it is not reasonably practicable to proceed through other means (for example through seeking amendment of the ICA from the MSTC holder or obtaining an approval to proceed under MSTAR M or MSTAR 145).

**NOTE:** The above listing is of cases when a Permits to Fly MAY be issued, in accordance with national regulations; it does not mean that in the described cases a Permits to Fly SHOULD be issued. If other legal means are available to allow the intended flight(s) they can also be used.

3. **21.A.703 Eligibility**

**GM 21.A.703 - Applicant for a Permits to Fly**

The applicant for a Permits to Fly may be a person other than the registered owner of the aircraft. As the holder of this permit will be responsible for ensuring that all the conditions and limitations associated with the Permits to Fly are continuously satisfied, the applicant for the permit should be a person or organization suitable for assuming these responsibilities. In particular, the organisations designing, modifying or maintaining the aircraft should normally be the holder of the associated permits to fly.

An appropriately approved design organisation can apply for the approval of the flight conditions when using its privilege in accordance with MSTAR 21.A.263(b)(1).



**4. 21.A.707 Application for Permit to Fly****GM 21.A.707(b) – Application**

The permit to fly application form, **MSTAR Form 21** - Application for Part 21 Permit to Fly, is to be obtained from the Authority.

**5. 21.A.708 Flight conditions****GM 21.A.708(b) - Flight conditions**

Flight conditions should also include:

- (a) required qualifications, training and experience of flight test personnel, role(s),
- (b) environmental aspects,
- (c) weather limitations,
- (d) concurrent tasking,
- (e) other aircraft (air to air refuelling, chase aircraft etc), and
- (f) ship-borne operation, eg first of class flight trials.

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

In most cases a simple reference to existing maintenance requirements will suffice for aircraft where the PTF supplements 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.

**GM1 21.A.708(c) - Safe flight**

Safe flight normally means continued safe flight and landing but in some limited cases, eg higher risk flight testing, it can mean that the aircraft is able to fly in a manner that will primarily ensure the safety of overflown 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's determination of safe flight should eliminate safety hazards and risks So Far As is Reasonably Practicable (SFARP) / ALARP or other method acceptable to DGTA, or if it is not reasonably practicable to do so, minimise these hazards and risks. This can be achieved through application of the risk management requirements to ensure, so far as is reasonably practicable 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.

**GM2 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 in flight.

For aircraft structure it is important to assess the likelihood that the maximum stress during flight will exceed the allowable value. For example, if the aircraft is overweight or under-strength due to damage, then flight envelope limitations can limit the maximum stress during flight and decrease the likelihood of structural failure. If the non-compliance is an overdue inspection, then the substantiation should quantify the likelihood that any damage present will exceed the residual strength capacity of the structure during continued operations.

**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 Permits to Fly.

All other changes should be approved in accordance with MSTAR 21.A.713 and when necessary, a new Permits to Fly should be issued in accordance with MSTAR 21.A.711.

**6. 21.A.709 - Application for approval of flight conditions****AMC 21A.709(a) - Application for approval of flight conditions - Form and manner**

The approval of flight conditions application, MSTAR Form 18b—Flight Conditions for a Permit to Fly – Approval Form (Authority), should be obtained from the Authority.

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

Together with the application, the documentation required by MSTAR 21A.709(b) should be submitted with **MSTAR Form 18b** - Flight Conditions for a Permit to Fly - Approval Form, (see MSTAR Forms Document), 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 should be provided only when all data are available, to allow the applicant to make the statement required in Block 9 of MSTAR Form 18b.

**AMC 21.A.709(b)(3) - Procedure to obtain Declaration of Safety (MY)**

The applicant must ensure that the documentation to meet MSTAR 21.A.708 - Flight Conditions, includes both technical and operational input:

a. **Technical.** Technical substantiation documentation must be obtained from a design or engineering organisation suitably knowledgeable of the certified Type Design and with access to Type Design information sufficient to support the scope of the technical substantiation.

b. **Operational.** Development of operational flight conditions and endorsement of the combined technical and operational conditions must be

provided by a competent staff of a State Aircraft Operator (SAO) organisation holding suitable knowledge pertaining to operation of the subject aircraft.

Flight conditions developed to support flight test activities, and operational endorsement, must be provided by a competent staff of an SAO as determined by the Authority/ [Continuing Airworthiness Manager in CAMO](#).

## 7. 21.A.710 - Approval of flight conditions

### GM 21.A.710 - Approval of flight conditions

1. The approval of flight conditions is related to the safety of the design, when:
  - a. the aircraft does not conform to an approved design; or
  - b. an Airworthiness Limitation, a Certification Maintenance Requirement or an Airworthiness Directive has not been complied with; or
  - c. the intended flight(s) are outside the approved envelope.
2. Examples when the approval of flight conditions is not related to the safety of the design are:
  - a. production flight testing for the purpose of conformity establishment;
  - b. delivery / export flight of a new aircraft the design of which is approved;
  - c. demonstrating continuing conformity with the standard previously accepted by the Authority for the aircraft or type of aircraft to qualify or re-qualify for a (restricted -) Certificate of Airworthiness.

## 8. 21.A.711 - Issue of a permit to fly

### AMC 21.A.711 - Issue of a permit to fly

As an alternative means of compliance to Subpart P requirements the Permits to Fly for an aircraft allocated for flight test development should be issued in compliance with the Permit to Fly (PTF) procedure in defining the approval process for the flight test conditions. The PTF process has been specifically developed for use in the Flight Test environment and enables closer cooperation between participating nations to utilise a single PTF.

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

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

## 9. 21.A.713 Changes

### GM 21.A.713 – Changes

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

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

10. **21.A.719 Transferability**

**GM 21.A.719 - Transfer of a permit to fly**

A permit to fly is issued based upon the applicant's declaration of many aspects of the proposed flight or flights, some of which are specific to the applicant. Accordingly, the basis upon which a permit to fly has been issued necessarily is no longer fully in place when the holder of a permit to fly changes, ownership changes, and/or there is a change of register. Such changes necessitate a new application under MSTAR 21.A.707.

11. **21.A.729 Record keeping**

**GM 21.A.729 - Record keeping**

Records should be retained for at least two years after the removal of service of the last aircraft of the type certified.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 2****CHAPTER 17****SUBPART Q - IDENTIFICATION OF PRODUCTS, PARTS AND APPLIANCES****1. 21.A.804 Identification of parts and appliances****GM 21.A.804(a)(1) - Identification of parts and appliances**

It is not the intent of MSTAR 21.A.804(a)(1) to introduce an obligation for a production organisation (manufacturer) to mark new parts or appliances with information which is not identified by the design approval holder. Therefore, the physical marking of parts and appliances is only required when established by the design approval (MSTC, STC, TSO, repair, change) holder.

**AMC 21.A.804(a)(3) - Identification of parts and appliances (MY)**

Mark 'EMPA' (European Military Part Approval) is a generic designation that is to be adapted by each Nation. Thus, the letter 'E' should be replaced by the ISO 3166–1:2006 (or STANAG 1059 Edition 8)\* three-letter code in order to distinguish the identification of parts and appliances produced under each nation's approval. This requirement has been incorporated into MSTAR by replacing 'EMPA' with **MYSPMA** or **MYMPA**.

For information: 'MYS' and 'MY' are the NATO codes for Malaysia.

**GM 21.A.804(a)(3) - Identification of parts and appliances**

Mark 'EPA' (European Part Approval) for parts and appliances produced under EASA approval that can be installed in military aircraft, should be considered as a recognised mark instead of 'MYSPA' (Malaysian Part Approval) in the same manner as defined on MSTAR AMC 21.A.804(a)(3) for parts and appliances produced under each nation approval.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 3****CHAPTER 1****APPENDICES****SUBPART A - GENERAL PROVISIONS****Annexe A to GM 21.A.3A(b)****Intent**

GM 21.A.3A(b) identifies which aviation safety occurrences should be reported to the Authority and details the timescale for submission of such reports. It also describes the objective of the overall occurrence reporting system including internal and external functions.

**Applicability**

This AMC applies to occurrence reporting by persons/ organisations regulated by the MSTAR. In most cases the obligation to report is to the holders of a certificate or approval, which are primarily organisations, but in some cases may be an individual. In addition, some reporting requirements are directed to persons. However, in order not to complicate the text, only the term 'organisation' is used throughout this AMC.

**NOTE:** This AMC does not apply to dangerous goods or explosive ordnance reporting.

**Objective of Occurrence Reporting**

The occurrence reporting system is an essential part of the overall monitoring function. The objective of the occurrence reporting, collection, investigation, and analysis systems described in operating and airworthiness regulation is to use the reported information to contribute to accident prevention and the improvement of aviation safety, and not to attribute blame or take other enforcement actions.

The detailed objectives of the occurrence reporting systems are:

To enable an assessment of the safety implications of each occurrence to be made, including previous similar occurrences, so that any necessary action can be initiated. This includes determining what and why it had occurred and what might prevent a similar occurrence in the future.

To ensure that knowledge of occurrences is disseminated so that others may learn from them.

The occurrence reporting system is complementary to the normal day-to-day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The occurrence reporting process is to identify those occasions where controls have failed.

Occurrences should remain in the databases when judged non-reportable by the person submitting the report as the significance of such reports may only become obvious at a later date.

## Reporting to the Authority

Requirements:

Occurrences are defined as an incident, malfunction, defect, technical defect, or exceedance of limitations that endangers or could endanger the safe operation of aircraft and must be reported to the Authority.

Reporting does not remove the reporter's or organisation's responsibility to commence corrective actions to prevent similar occurrences in the future. Known and planned preventive actions should be included within the report.

**NOTE:** Section I to IV of this AMC identifies what should be reported by an organisation or individual to the Authority.

## Notifying Other Authorities

Where applicable and relevant, other (domestic and international) civil and military aviation safety authorities should be advised of the occurrences.

## Reportable Occurrences

General. There are different reporting requirements for operators (and/or commanders), maintenance organisations, design organisations and production organisations. The criteria for all these different reporting lines are not the same. For example, the Authority will not receive the same kind of reports from a design organisation as from an operator or an Air Navigation Service Provider. This is a reflection of the different perspectives of the organisations based on their activities.

Many of the occurrences which are considered 'reportable occurrences' for crewed aircraft would not endanger safe operation of a UAS due to the absence of people on board. As such, reportable occurrences for UAS are found in the UAS implementing regulations.

List of reportable occurrences. Section I to IV is a list of reportable occurrences. Not all examples are applicable to each reporting organisation.

Section I - Aircraft Flight Operations

Section II - Aircraft Technical

Section III - Aircraft Maintenance and Repair

Section IV - Air Navigation Services, Aerodromes Facilities and Ground Services

Reportable occurrences are those where the safety of operation was or could have been endangered or which could have led to an unsafe condition. If in the view of the reporter an occurrence did not hazard the safety of the operation but if repeated in different but likely circumstances would create a hazard, then a report should be made.

## Immediate Notification of Accidents and Serious Incidents

Accidents and Serious Incidents are serious occurrences (deaths, serious injury and serious damage to aircraft and property or had a high potential/likelihood to do so due to the lack or remaining controls) require additional and immediate notification to the aviation safety investigation Authority. This immediate reporting requirement extends

to any occurrence where there is an exposure to a serious risk of death, injury or damage.

The need to report an occurrence in accordance with this AMC does not immediately constitute the need to conduct an Accident or Serious Incident investigation.

List of immediately notifiable occurrences. Section V is a list of accidents and serious incidents that require immediate notification to the aviation safety investigation Authority. It is possible for occurrences listed under **Reportable Occurrences** above, (SECTIONS I to IV), to be further categorised as serious incidents and would therefore subject to immediate notification requirements. In these instances, professional judgement is required.

## **Section V - Immediate Notification of Accidents and Serious Incidents**

### **Reporting Time**

The reporting time starts from when the occurrence took place or from the time when the reporter determined that there was, or could have been, a potentially hazardous or unsafe condition. The immediate notification of Accidents and Serious Incidents should occur as soon as reasonably practicable.

The reporting period for all other occurrences that have not required immediate notification is 72 hours. Within the overall limit of 72 hours for the submission of a report, the degree of urgency should be determined by the level of hazard judged to have resulted from the occurrence. Subsequent reporting from organisations made aware of an occurrence is to be within 72 hours of initial notification.

### **Content of Reports**

Notwithstanding other required reporting means as promulgated by other legislation, regulation or policy, reports may be transmitted in any form considered acceptable to the Authority. The amount of information in the report should be commensurate with the severity of the occurrence. Each report should at least contain the following elements, as applicable to each organisation:

Organisation details

Information necessary to identify the affected:

- aircraft and/ or component affected, including software version (if applicable),
- ANS system,
- Aerodrome.
- Date and time if relevant
- Summary description of the occurrence
- Any other specific/ relevant information

For any occurrence involving a system or component, which is monitored or protected by a warning and/or protection system, for example: fire detection/extinguishing or



separation alert, the occurrence report should always state whether such system(s) functioned properly.

### **Reporting Between Organisations**

Requirements exist that address the reporting of data relating to unsafe or unairworthy conditions. These reporting lines are:

- Production Organisation to the organisation responsible for the design;
- Maintenance organisation to the organisation responsible for the design;
- Maintenance organisation to operator;
- Operator to organisation responsible for the design;
- Production organisation to production organisation;
- Design organisation to production organisation.

The 'Organisation responsible for the design' is a general term, which can be any one or a combination of the following organisations:

- Holder of a Malaysian State Type certificate (MSTC) of an Aircraft, Engine or Propeller.
- Holder of a Supplemental Type certificate (STC) on an Aircraft, Engine or Propeller.
- Holder of an Approved Design.

**NOTE:** Figure 1 presents a simplified scheme of reporting lines for Initial and Continuing Airworthiness organisations.

SIMPLIFIED REPORTING LINES

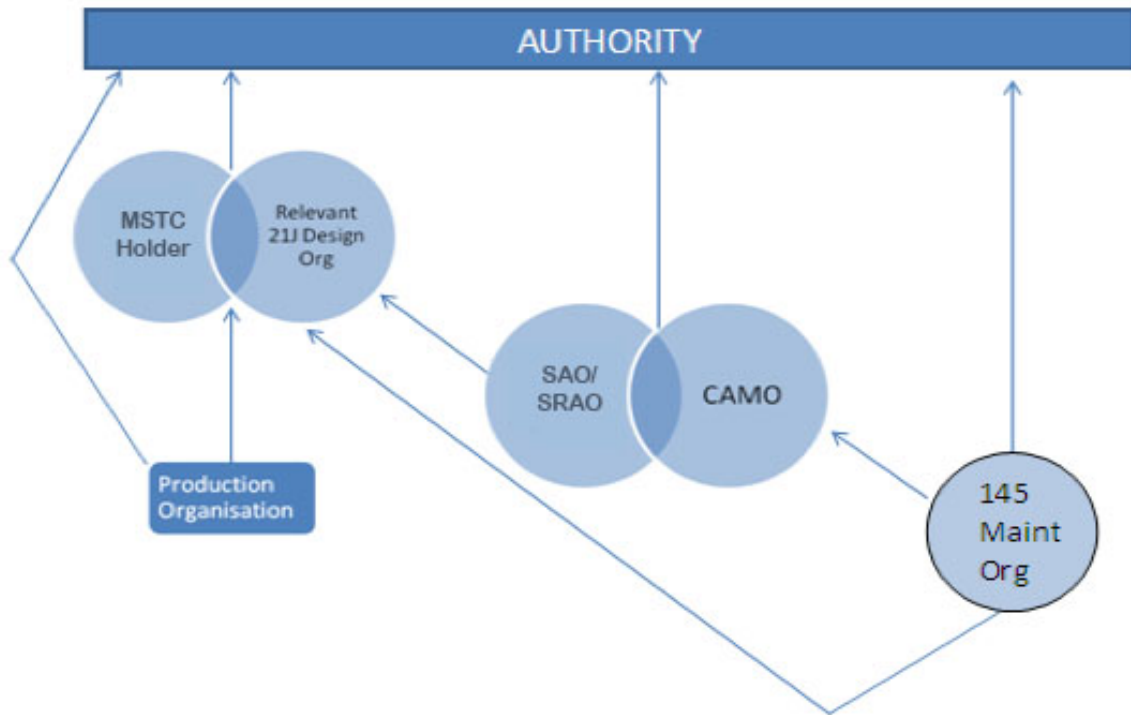


Figure 1 - Reporting Lines

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 3****CHAPTER 2****SUBPART B - MALAYSIAN STATE TYPE CERTIFICATES (MSTC) AND  
RESTRICTED MALAYSIAN STATE TYPE CERTIFICATES (RMSTC)****Appendix A to AMC 21.A.15(b)**

Appendix to AMC 21.A.15(b) Means of compliance codes

Type of compliance	Means of compliance	Associated compliance documents
Engineering evaluation	MCO: (a) Compliance statement (b) Reference to design data (c) Election of methods, factors, etc. (d) definitions	(a) Design data (b) Recorded statements
	MC1: design review	(c) Descriptions (d) Drawings
	MC2: Calculations/ Analysis	(e) Substantiation reports
	MC3: laboratory test	(f) Safety analysis
Tests	MC4: laboratory test	(g) Test programmes (h) Test reports (i) Test interpretations
	MC5: ground test on related products(s)	
	MC6: flight test	
	MC8: simulation	
Inspection	MC7: design inspection/ audit	(j) Inspection or audit reports
Equipment qualification	MC9: equipment qualification	Note: Equipment qualification is a process that may include all previous means of compliance at equipment level.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 3**

**SUBPART C – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION****PART 3****CHAPTER 4****SUBPART D - CHANGE TO MALAYSIAN STATE TYPE CERTIFICATES AND RESTRICTED MALAYSIAN STATE TYPE CERTIFICATES****Appendix A to GM 21.A.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 MSTAR 21.A.91 and GM 21.A.91 paragraph 3.4 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 are to 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.b).

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

In the MSTAR 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 MSTAR 21.A.91. Strictly speaking the words 'has appreciable effect' and 'appreciably affect(s)' would have been used, but this has not been done to improve readability.

**1. Structure**

- a) Changes such as a cargo door cut-out, fuselage plugs, change of dihedral, addition of floats;
- b) Changes to materials, processes or methods of manufacture of primary structural elements, such as spars, frames and critical parts;
- c) Changes that adversely affect fatigue or damage tolerance or life limit characteristics;
- d) Changes that adversely affect aero-elastic characteristics;
- e) Changes that affect primary structural element loads and their path.

**2. Cabin Safety**

- a) 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 layouts that affect evacuation path or access to exits;
  - installation of new galleys, toilets, wardrobes, etc.;
  - installation of new type of electrically powered galley insert.
- b) Changes to the pressurisation control system which adversely affect previously approved limitations.

### 3. Flight

- a) Changes which adversely affect the approved performance, such as high-altitude operation, brake changes that affect braking performance, deck landing, operation with night vision devices, air to air refuelling, low level flight.
- b) Changes which adversely affect the flight envelope.
- c) Changes which adversely affect the handling qualities of the product including changes to the flight control's function (gains adjustments, functional modification to software) or changes to the flight protection or warning system.

### 4. Systems

For systems assessed under the applicable airworthiness requirements the classification process is based on the functional aspects of the change and its potential effects on safety:

- a) Where failure effect is 'CATASTROPHIC' or 'HAZARDOUS', the change is to be classified as major.
- b) Where failure effect is 'MAJOR', the change is to be classified as major if:
- i.aspects of the compliance demonstration use means that have not been previously accepted for the nature of the change to the system; or
  - ii.the change affects the pilot/system interface (displays, controls, approved procedures); or
  - iii.the change introduces new types of functions/systems such as GPS primary, TCAS, Predictive wind-shear, HUD.

The assessment of the criteria for software changes to systems also needs to be performed.

When software is involved, account is to be taken also of the following guidelines:

Where a change is made to software produced in accordance with the guidelines of EUROCAE ED12C/RTCA DO-178C 'Software Considerations in Airborne Systems and Equipment Certification', the change is to be classified as major if either of the following apply, and the failure effect is CATASTROPHIC, HAZARDOUS or MAJOR:

- a) 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

- b) the software is upgraded to or downgraded from Level A, Level B or Level C; or
- c) the executable code, determined to be Level C, is deeply changed, eg after a software re-engineering process accompanying a change of processor.

For software developed to guidelines other than EUROCAE ED12C/RTCA DO-178C, the applicant is to assess changes in accordance with the foregoing principles. For other codes the principles noted above may be used. However, due consideration is to be given to specific requirements/interpretations.

## 5. Propellers

Changes to:

- a) diameter;
- b) airfoil;
- c) planform;
- d) material;
- e) blade retention system, etc.

## 6. Engines

Changes:

- a) that adversely affect operating speeds, temperatures, and other limitations;
- b) that affect or introduce parts (as identified by the applicable airworthiness requirements) where the failure effect has been shown to be hazardous;
- c) that affect or introduce engine critical parts (as identified by the applicable airworthiness requirements) or their life limits;
- d) to a structural part which requires a re-substantiation of the fatigue and static load determination used during certification;
- e) to any part of the engine which adversely affects the existing containment capability of the structure;
- f) that adversely affect the fuel, oil and air systems, which alter the method of operation, or require reinvestigation against the type-certification basis;
- g) that introduce new materials or processes, particularly on critical components.

## 7. Rotors and drive systems

Changes that:

- a) 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.
- b) affect systems the failure of which may have hazardous or catastrophic effects. The design assessment will include:
- cooling system;
  - lubrication system;
  - rotor controls.
- c) adversely affect the results of the rotor drive system endurance test, such as the rotor drive system required in EASA CS 27/29–917.
- d) adversely affect the results of the shafting critical speed analysis such as required by EASA CS 27/29–931.

## **8. Environment (where applicable)**

A change that introduces an increase in noise or emissions. Where a change is made to an aircraft or aircraft engine for which compliance with ICAO Standards and Recommended Practices for environmental protection (ICAO Annex 16) is required or stated, the effect of the change on the product's environmental characteristics should be taken into account. Examples of changes that might have an appreciable effect on the product's environmental characteristics, and might therefore be classified as major changes, can be found in Appendix A to MSTAR GM 21.A.91. The examples are not exhaustive and will not, in every case, result in an appreciable change to the product's environmental characteristics, and therefore, will not always result in a 'major change' classification.

## **9. Power plant Installation**

Changes which include:

- a) control system changes which affect the engine/propeller/airframe interface;
- b) new instrumentation displaying operating limits;
- c) modifications to the fuel system and tanks (number, size and configuration);
- d) change of engine/propeller type.

## **10. Operational capabilities**

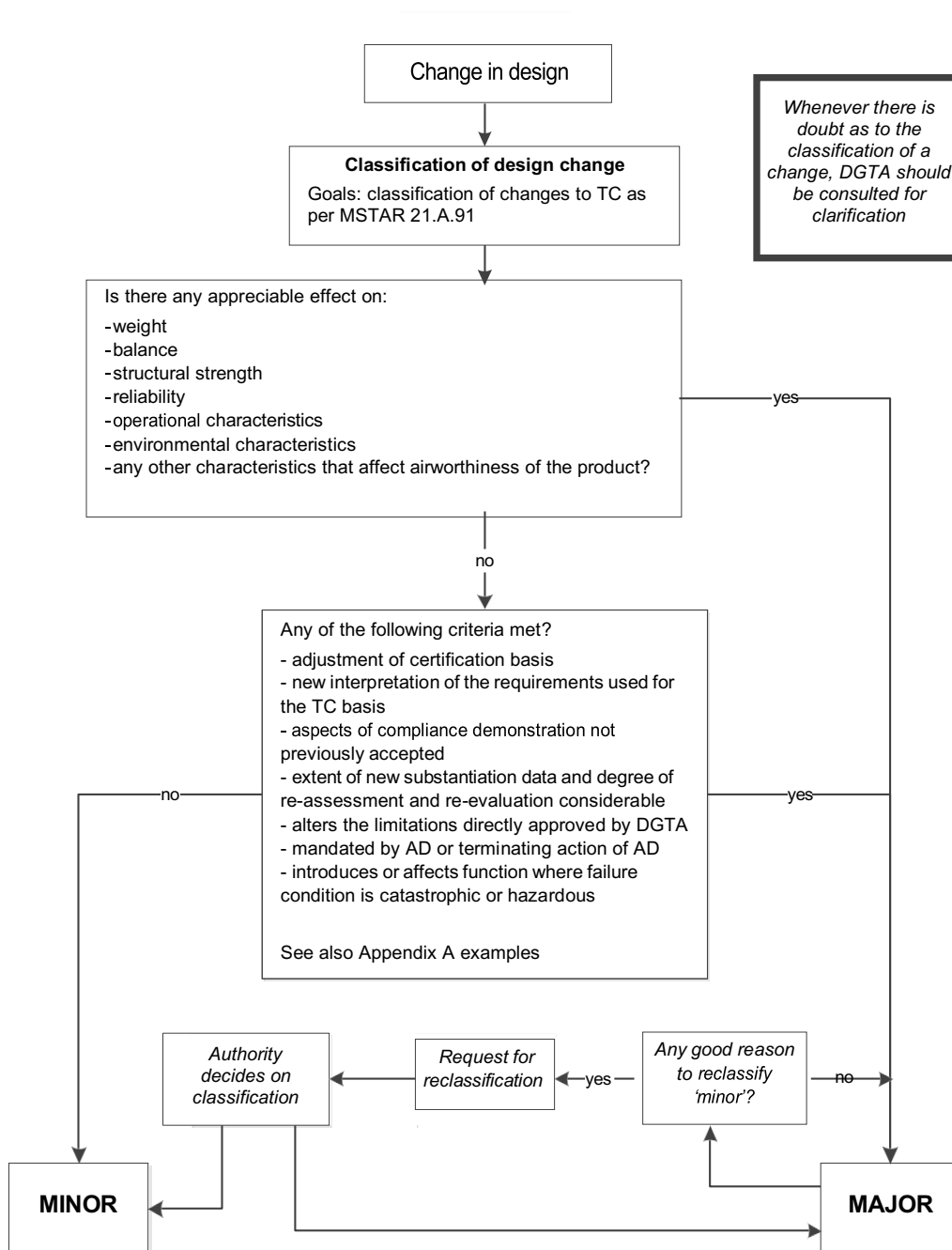
Integration or modification of mission equipment that could adversely affect safety of third parties include, but are not limited to:

- a) in-flight refuelling capabilities;
- b) external stores and tanks, including jettison devices;



- c) armament, including high power laser;
- d) equipment that may affect Electromagnetic Environmental Effects (E3) integrity, (e.g. new radar);
- e) aerial delivery systems;
- f) flare and chaff system;

**A classification process would be:zazzzz**



**Appendix A to GM 21.A.101 - Classification of design changes**

This appendix refers to Appendix A to EASA GM 21.A.101 Classification of design changes, as per ED Decision 2017/024/R, which contains tables of 'substantial', 'significant', and 'not significant' changes, that are adopted by the FAA, Agência Nacional de Aviação Civil (ANAC), the European Aviation Safety Agency (EASA), and Transport Canada Civil Aviation (TCCA) through international collaboration. These tables should be used as a reference for the classification of design changes to military aircraft. In any case, the aircraft category to be used should be confirmed by the Authority and the final classification may change due to cumulative effects and/or combinations of individual changes.

**Appendix B to GM 21.A.101 - Application charts for changed product rule**

This appendix contains the application chart for applying the MSTAR 21.A.101 process.

Substantial (21.A.19)	Significant (21.A.101(a) and (b))			Not Significant (21.A.101)(b)(1))	
<p><b>Substantially changed product</b> Compliance with all latest airworthiness codes and standards required for product certification. Previously approved type design and compliance data may be allowed if valid for the changed product.</p>	<p><b>Affected area</b> (Changed and/or affected areas) New demonstration of compliance is required Previously approved type design and compliance data may be allowed if valid for the changed product.</p>			<p><b>Affected area</b> (Changed and/or affected areas) New demonstration of compliance is required. The applicant may propose a certification basis using an earlier amendment but not earlier than in the existing TC basis. Previously approved type design and compliance data may be allowed if valid for the changed product.</p>	<p><b>Unaffected area</b> No new demonstration of compliance is required. Unaffected area continues to comply with the existing certification basis.</p>
	<p><b>Compliance with the latest amendment materially contributes to safety</b></p>	<p><b>No material contribution to safety</b></p>			
	<p><b>Practical</b> —</p>	<p><b>Impractical</b> The applicant may propose a certification basis using earlier airworthiness codes and standards, but not earlier than the existing TC basis.</p>	<p>The applicant may propose a certification basis using earlier airworthiness codes and standards, but not earlier than the existing TC basis.</p>		
<b>Certification Basis Proposed by the Applicant</b>					
<p>New certification basis using latest airworthiness codes and standards.</p>	<p>Airworthiness codes and standards at earlier amendments with supporting rationale.</p>		<p>Existing certification basis.</p>	<p>Existing certification basis including 'elects to comply'.</p>	<p>Existing certification basis.</p>
<b>Resultant Type-Certification Basis, subject to acceptance by the Authority</b>					
<p>New certification basis using the latest airworthiness codes and standards, and special conditions if required.</p>	<p>New certification basis using the airworthiness codes and standards at earlier approved amendments, and special conditions if required.</p>		<p>Existing certification basis.</p>	<p>Existing certification basis (if adequate); if not, first appropriate later amendment(s) and/or special conditions including 'elects to comply'.</p>	<p>Existing certification basis.</p>

**Appendix C to GM 21.A.101 - A method to determine the changed and affected areas**

When a product is changed, some areas may change physically, while others may change functionally. GM to MSTAR 21.A.101 refers to this combination as changed and affected areas. Appendix C to EASA GM 21.A.101 as per ED Decision 2017/024/R contains a process to determine physical and functional changes, including affected areas, and to develop the combined list of physical and functional changes with applicable requirements of airworthiness codes. In principle, this process may also be applied where airworthiness codes and standards other than EASA Certification Specifications (CS) are used.

**NOTE:** The referenced process is provided as guidance only.

**Appendix D to GM 21.A.101 - Other guidance for affected areas****D.1 Sample Questions in Determining Affected Areas.**

Below are sample questions to assist in determining whether an area is affected by the change. If the answer to any of these questions is yes, then the area is considered to be affected.

1. Is the area changed from the identified baseline product?
2. Is the area impacted by a significant product-level change?
3. Is there a functional effect on the unchanged area by a change to the system or system function that it is a part of?
4. Does the unchanged area need to comply with a system or product-level airworthiness requirement that is part of the change?
5. Are the product-level characteristics affected by the change?
6. Is the existing compliance for the area invalidated?

**D.2 Sub-Areas within an Affected Area**

Within areas affected by a change, there may be 'sub-areas' of the area that are not affected. For those sub-areas, the amendment levels at the existing certification basis remain valid, along with the previous compliance findings.

For example, if a passenger seat fitting is changed as part of a significant change, then the structure of the seat is affected. Thus, the amendment level for all applicable structural requirements (e.g. EASA CS 25.561 and EASA CS 25.562) would be at the amendment level on the date of application (unless an exception is granted). However, the seat fabric is not affected, so the amendment level of flammability requirements (e.g. EASA CS 25.853) may remain at the existing certification basis, and a new compliance finding would not be required.

**Appendix E to GM 21.A.101 – To be inserted later.**

## Appendix F to GM 21.A.101 - The use of service experience in the exception process

### F.1 Introduction.

Service experience may support the application of an earlier airworthiness codes or standards pursuant to EMAR 21.A.101(b)(3) if, in conjunction with the applicable service experience and other compliance measures, the earlier airworthiness code or standard provides a level of safety comparable to that provided by the latest airworthiness codes or standards. The applicant must provide sufficient substantiation to allow the Authority to make this determination. A statistical approach may be used, subject to the availability and relevance of data, but sound engineering judgment must be used. For service history to be acceptable, the data must be both sufficient and pertinent. The essentials of the process involve:

- A clear understanding of the change of the airworthiness code or standard, and the purpose for the change,
- A determination based on detailed knowledge of the proposed design feature,
- The availability of pertinent and sufficient service experience data, and
- A comprehensive review of that service experience data.

In case that civil service experience is used in the process, military specific kinds of operations and operational conditions must be sufficiently addressed and factored in. Similarly, it needs to be ensured that service experience from different operating organisations is relevant or representative for the intended use.

### F.2 Guidelines.

The substantiation by the applicant and the determination by the Authority should be documented together with the type certification basis.

**Note:** Special conditions (SCs), equivalent safety findings (ESFs) / equivalent level of safety (ELOSs), deviations, reversions, and most elects to comply (ETC) are formally part of the type certification basis (TCB). A process like the Certification Review Item (CRI) process of the European Union Aviation Safety Agency (EASA) may be used to keep record of the applicant's substantiation and the Authority's determination, either as a stand-alone CRI or included in the type certification basis CRI A-01.

The documentation provided by the applicant should support the following:

F.2.1 The identification of the differences between the airworthiness codes or standards in the existing basis and the airworthiness codes or standards as amended, and the effect of the change to the requirements.

F.2.2 A description as to what aspect(s) of the latest airworthiness codes or standards the proposed changed product would not meet.

F.2.3 Evidence showing that the proposed certification basis for the changed product, together with applicable service experience, relative to the hazard, provides a level of safety that approaches the latest airworthiness codes or standards, yet is not fully compliant with the latest airworthiness codes or standards.

F.2.4 A description of the design feature and its intended function.

F.2.5 Data for the product pertinent to the requirement.

F.2.5.1 Service experience from such data sources, such as:

- Accident reports,
- Incident reports,
- Service bulletins,
- Airworthiness directives,
- Repairs,
- Modifications,
- Flight hours/cycles for fleet leader and total fleet,
- World airline / operating organisation accident summary data,
- Service difficulty reports,
- Accident Investigation Board reports, and
- Warranty, repair, and parts usage data.

F.2.5.2 Show that the data presented represent all relevant service experience for the product, including the results of any operator surveys, and is comprehensive enough to be representative.

F.2.5.3 Show that the service experience is relevant to the hazard.

F.2.5.4 Identification and evaluation of each of the main areas of concern with regard to:

- Recurring and/or common failure modes,
- Cause,
- Probability by qualitative reasoning, and
- Measures already taken and their effects.

F.2.5.5 Relevant data pertaining to aircraft of similar design and construction may be included.

F.2.5.6 Evaluation of failure modes and consequences through analytical processes. The analytical processes should be supported by:

- A review of previous test results,
- Additional detailed testing as required, or
- A review of aircraft functional hazard assessments (FHA) and any applicable system safety assessments (SSA) as required.

F.2.6 A conclusion that draws together the data and the rationale.

F.2.7 These guidelines are not intended to be limiting, either in setting the 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.

F.3 Example: EASA CS/FAA FAR.25.1141(f) for Transport Category Aeroplanes. NOTE: This example is taken from the certification experience of the Federal Aviation Administration (FAA), so references to FAR sections and amendments are kept.

F.3.1 The following example, for transport category aeroplanes (§ 25.1141(f), APU Fuel Valve Position Indication System), illustrates the typical process an applicant follows. The process will be the same for all product types.



F.3.2 This example comes from a derived model transport aeroplane where significant changes were made to the main airframe components, engines and systems, and APU. The baseline aeroplane has an extensive service history. The example shows how the use of service experience supports a finding that compliance with the latest certification specifications would not contribute materially to the level of safety and that application of the existing certification basis (or earlier amendment) would be appropriate. The example is for significant derived models of transport aeroplanes with extensive service history. It illustrates the process, following the guidelines in this Appendix, but does not include the level of detail normally required.

F.3.2.1 Determine the differences between the certification specifications applied in the original certification basis and the latest certification specification, and the effect of the change to the certification specifications. The original certification basis of the aeroplane that is being changed is the initial release of Part 25. Amendment 25-40 added requirement § 25.1141(f), which mandates 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. The addressed hazard would be risk of APU fire due to fuel accumulation caused by excessive unsuccessful APU start attempts.

F.3.2.2 What aspect of the proposed changed product would not meet the latest certification specifications? 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).

F.3.2.3 The applicant provides evidence that the proposed certification basis for the changed product, together with applicable service experience of the existing design, provide a level of safety that approaches, yet is not fully compliant with, the latest certification specifications. 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. The existing fleet has achieved approximately (#) 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 108 cycles, which demonstrates that the valve successfully meets its intended function and complies with the intent of the certification specification.

F.3.2.4 The applicant provides 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. 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, and these features increase the level of functionality and safety, but the system does not indicate valve position as required by § 25.1141(f).

F.3.2.5 The FAA and the applicant record this in an issue paper. The FAA can use the G-1 or a technical issue paper for this purpose. An issue paper was coordinated, included data, or referenced reports documenting relevant service experience 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.

F.3.2.6 The conclusion, drawing together the data and rationale, is documented in the G-1 issue paper. 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.

**Appendix G to GM 21.A.101 - Changed product rule (CPR) decision record**

The changed product rule (CPR) decision should be recorded as part of the certification programme plan. Appendix G to EASA GM 21.A.101 as per ED Decision 2017/024/R may be used to determine the general structure and information that is expected for a changed product rule (CPR) decision record. Generally, the decision sheet should

- identify the project,
- identify the related MTC/MSTC No,
- document each step of the process outlined in GM to MSTAR 21.A.101 with appropriate justification and decision (YES/NO),
- detail the reference to the proposed certification basis to be accepted by the Authority.

**Appendix H to GM 21.A.101 - Examples of documenting the proposed certification basis list**

Appendix H to MSTAR GM 21.A.101 as per ED Decision 2017/024/R provides examples for establishing the applicable airworthiness codes or standards that will become part of the type certification basis for airworthiness as well as for documenting a proposed certification basis.

**Appendix I to GM 21.A.101 - Related documents****I.1** Related MSTAR 21 requirements.

- 21.A.15, Application.
- 21.A.16A, Airworthiness Codes.
- 21.A.16B, Special Conditions.
- 21.A.17A, Type certification basis for a type certificate or restricted type-certificate.
- 21.A.19, Changes requiring a new type certificate.
- 21.A.31, Type design.
- 21.A.41, Type certificate.
- 21.A.91, Classification of changes to a type certificate.
- 21.A.93, Application.
- 21.A.97, Requirements for approval of a major change.
- 21.A.101, Type certification basis, operational suitability data certification basis and environmental protection requirements for a major change to a type certificate.
- 21.A.113, Application for a supplemental type certificate.
- 21.A.115, Requirements for approval of major changes in the form of a supplemental type certificate.

## Appendix J to GM 21.A.101 - Definitions and terminology

### J.1 Aeronautical product.

The terms 'aeronautical product' or 'product' used in this guidance material include type-certified aircraft, engines, or propellers and, for the purpose of this GM, a TSO approved APU.

### J.2 Assumptions used for certification.

The assumptions used for certification are the evaluations and decisions that led to the approval of the baseline product's characteristics. Examples of the product's baseline characteristics include but are not limited to the following:

- Design methodologies, methods of compliance, and standards used to achieve compliance with the airworthiness requirements making up the certification basis;
- Structural, mechanical, electrical, propulsion, aerodynamic, performance, operational, and maintenance characteristics;
- Operational and flight envelopes defining the product performance and capabilities at specified weights, speeds, altitudes, load factors, and centres of gravity;
- Crashworthiness;
- Role or mission;
- Airworthiness and operational limitations; or
- Pilot training, if necessary.

### J.3 Baseline product.

It is an aeronautical product with a specific, defined approved configuration and certification basis that the applicant proposes to change.

### J.4 Certification basis.

The combination of the:

- airworthiness requirements as provided for in MSTAR 21.A.17A
- environmental protection requirements, as provided for in MSTAR 21.A.18, as
- established for the change according to MSTAR 21.A.101, as well as the:
- special conditions;
- equivalent safety findings;
- elects to comply; and
- exceptions

- applicable to the product to be certified.

**J.5 Change.**

The term 'change' refers to a change to a product type certificate (as defined in MSTAR 21.A.41) approved or to be approved under Subpart D or Subpart E (as a military supplemental type certificate) of Part 21, including a change to an STC or a change to the TSO approval for auxiliary power units (APUs) under Subpart O. A change may consist of a single stand-alone change to one MSTC component or several interrelated changes to different MSTC components (e.g. the type design, operating characteristics, environmental protection characteristics, etc. (see MSTAR 21.A.41 and GM to 21.A.90A)).

**J.6 Design change.**

The term 'design change' refers to a change to the type design (as defined in MSTAR 21.A.31) of an aeronautical product. In the context of this document, the terms 'change to the type design', 'modification', 'design change', and 'type design change' are synonymous.

**J.7 Earlier standards.**

The airworthiness requirements or previous standards in effect prior to the date of application for the change, but not prior to the existing certification basis.

**J.8 Existing certification basis.**

The airworthiness requirements or previous standards incorporated by reference in the type certificate of the baseline product to be changed.

**J.9 Latest standards.**

The airworthiness requirements in effect on the date of application for the change.

**J.10 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 standards were applied.

**J.11 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, design philosophy). Product-level change is defined at the aircraft, aircraft engine, or propeller level of change.

**J.12 Secondary change.**

A change that is part of a significant physical change that does not contribute materially to the level of safety. Guidance is contained in paragraph 3.10.1.4 of this GM.

**J.13 Significant change.**

A change to the type certificate to the extent that it changes one or more of the following, but not to the extent to be considered a substantial change: the general configuration, principles of construction, or the assumptions used for certification. The significance of the change is considered in the context of all previous relevant design changes and all related revisions to the applicable standards. Not all product-level changes are significant.

**J.14 Significant change to area.**

Not used in the context of MSTAR 21

**J.15 Substantial change.**

A change that is so extensive that a substantially complete investigation of compliance with the applicable certification basis is required, and consequently a new military type certificate is required pursuant to MSTAR 21.A.19.



**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 5**

**SUBPART E - SUPPLEMENTAL TYPE CERTIFICATES**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 6**

**SUBPART F – (RESERVED)**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 7**

**SUBPART G - PRODUCTION ORGANISATION APPROVAL**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 8**

**SUBPART H - CERTIFICATES OF AIRWORTHINESS AND RESTRICTED  
CERTIFICATES OF AIRWORTHINESS**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 9**

**SUBPART I – (RESERVED)**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 10**

**SUBPART J - DESIGN ORGANISATION APPROVAL**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 11**

**SUBPART K - PARTS AND APPLIANCES**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 12**

**SUBPART L – NOT APPLICABLE**



**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 13**

**SUBPART M - REPAIRS**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 14**

**SUBPART N – NOT APPLICABLE**

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 15**

**SUBPART O - TECHNICAL STANDARD ORDER AUTHORISATIONS**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 16**

**SUBPART P - PERMITS TO FLY**

To be inserted later.

**MSTAR 21- AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

**PART 3**

**CHAPTER 17**

**SUBPART Q - IDENTIFICATION OF PRODUCTS, PARTS AND APPLIANCES**

To be inserted later.

# **MALAYSIAN STATE TECHNICAL AIRWORTHINESS REGULATION**

## **MSTAR 21**

### **AIRCRAFT DESIGN, PRODUCTION AND CERTIFICATION**

#### **PART 4: LIST OF FORM**

##### **CHAPTER 1**


RESTRICTED

PU 2103



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA) c/o SUBANG AIRBASE  
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MSTAR Form 1

DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS					
1. Approving NMAA  DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS		2. <b>AUTHORISED RELEASE CERTIFICATE MSTAR FORM 1</b>		3. Form Tracking Number:	
4. Approved Organisation Name and Address:				5. Work Order/Contract/Invoice	
6. Item	7. Description	8. Part Number	9. Qty	10. Serial Number	11. Status/Work
12 Remarks					
13a. Certifies that the items identified above were manufactured in conformity to: <input type="checkbox"/> approved design data and are in a condition for safe operation <input type="checkbox"/> non-approved design data specified in Block 12			14a. <input type="checkbox"/> MSTAR 145.A.50 Release to Service <input type="checkbox"/> Other regulation specified in Block 12 Certification Statement Certifies that unless otherwise specified in Block 12, the work identified in Block 11 and described in Block 12, was accomplished in accordance with MSTAR 145 and in respect to that work the items are considered ready for release to service.		
13b. Authorised Signature		13c. Approval/Authorisation Number	14b. Authorised Signature <small>(Electronic signature on file)</small>		14c. Approval/Authorisation Number
13d. Name		13e. Date (dd/mmm/yyyy)	14d. Name		14e. Date (dd/mmm/yyyy)
<b>USER/INSTALLER RESPONSIBILITIES:</b> This Certificate does not automatically constitute authority to install. Where the User/Installer performs work in accordance with the regulations of an NMAA different than the NMAA specified in Block 1, it is essential that the user/installer ensures that their NMAA accepts items from the NMAA specified in Block 1. Statements in Block 14a do not constitute installation certification. In all cases aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.					

MSTAR Form 1 – V1.0



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MSTAR Form 1

## Authorised Release Certificate

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### Guidance

These guidelines are designed to assist you to complete the MSTAR Form 1 for MSTAR 21 and MSTAR 145 organisations. Attention is drawn to MSTAR 21 and MSTAR 145 which use the MSTAR Form 1 for production and maintenance purposes respectively. The Certificate referenced MSTAR Form 1 is called the Authorised Release Certificate.

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#### 1. Purpose and use

- 1.1. The primary purpose of the certificate is to declare the airworthiness of new aviation products, (excluding aircraft) parts and appliances or maintenance work undertaken on products (excluding aircraft), parts and appliances (hereafter referred to as item(s)).
  - 1.2. Correlation must be established between the certificate and the item(s). The originator must retain a certificate in a form that allows verification of the original data.
  - 1.3. For production purposes only - The certification may be applicable to more than one NMAA (or Authority), dependent on bilateral agreements of the relevant NMAA. The 'approved design data' mentioned in this certificate then means approved by the NMAA of the country under whose approval the certificate was issued. The Certificate is prepared and signed by the manufacturer. For production under MSTAR 21 Section A Subpart F it is presented for validation (by counter signature) by the Authority.
  - 1.4. The certificate is not a delivery or shipping note.
  - 1.5. NOT USED
  - 1.6. The certificate does not constitute approval to install the item on a particular aircraft, engine, or propeller but helps the end user determine its airworthiness approval status.
  - 1.7. A mixture of production released and maintenance released items is not permitted on the same certificate.
  - 1.8. A mixture of items certified in conformity with 'approved data' and to 'non-approved data' is not permitted on the same certificate.
- 

#### 2. General format

- 2.1. 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.
- 2.2. The certificate must be in 'landscape' format but the overall size may be significantly increased or decreased as long as the certificate remains recognisable and legible. If in doubt consult the NMAA.
- 2.3. The User/Installer responsibility statement can be placed on either side of the form.
- 2.4. All printing must be clear and legible to permit easy reading.
- 2.5. 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 and in accordance with the defined format. Pre-printed wording is permitted in accordance with the attached model but no other certification statements are permitted.
- 2.6. The certificate shall be in English, and if appropriate, in the official language(s) of the NMAA.





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MSTAR Form 1

- 2.7. The details to be entered on the certificate may be either machine/computer printed or handwritten using Block letters and must permit easy reading.
- 2.8. The use of abbreviations must be kept to a minimum, to aid clarity.
- 2.9. 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. Any use of the reverse side of the certificate must be referenced in the appropriate Block on the front side of the certificate.

#### NOTES

The original certificate shall accompany the items and correlation must be established between the certificate and the items. A copy of the certificate must be retained by the organisation that manufactured or maintained the item. Where the certificate format and data are entirely computer generated, subject to acceptance by the NMAA, it is permissible to retain the certificate format and data on a secure database.

Where a single certificate was used to release a number of items and those items are subsequently separated out from each other, such as through a parts distributor, then a copy of the original certificate must accompany such items and the original certificate must be retained by the organisation that received the batch of items. Failure to retain the original certificate could invalidate the release status of the items.

- 2.10 The Certificate that accompanies the item(s) may be attached to the item(s) by being placed in an envelope for durability.

### 3. Copies

- 3.1. There is no restriction in the number of copies of the Certificate sent to the customer or retained by the originator.

### 4. Error(s) on a certificate

- 4.1. If an end-user finds an error(s) on a certificate, they shall identify it/them in writing to the originator. The originator may issue a new certificate only if the error(s) can be verified and corrected.
- 4.2. The new certificate shall have a new tracking number, signature and date.
- 4.3. The request for a new Certificate may be honoured without re-verification of the item(s) condition. The new Certificate is not a statement of current condition and should refer to the previous certificate in Block 12 by the following statement:

'This Certificate corrects the error(s) in Block(s) [enter Block(s) corrected] of the Certificate [enter original tracking number] dated [enter original issuance date] and does not cover conformity/condition/release to service'.

- 4.4. Both Certificates should be retained according to the retention period associated with the first.

### 5. Completion of the certificate by the originator

Except as otherwise stated, there shall be an entry in all Blocks to make the document a valid Certificate.

#### Block 1—Approving NMAA

State the name and country of the NMAA under whose approval the certificate was issued.



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MSTAR Form 1

**Block 2—MSTAR Form 1 Header**

**AUTHORISED RELEASE CERTIFICATE**

MSTAR Form 1

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**Block 3—Form Tracking Number**

Enter the unique number established by the numbering system/procedure of the organisation identified in Block 4; this may include alphanumeric characters.

---

**Block 4—Approved Organisation Name and Address**

Enter the full name and address of the approved organisation (refer to MSTAR Form 55 for production organisations or MSTAR Form 3 for maintenance organisations) releasing the items covered by this certificate. Logos, etc, are permitted if the logo can be contained within the block.

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**Block 5—Work Order/Contract/Invoice**

To facilitate customer traceability of the item(s), enter the work order number, contract number, invoice number, or similar reference.

---

**Block 6—Item**

Enter line item numbers when there is more than one line item. This block permits easy cross referencing to the Remarks Block 12.

**NOTE**

This block is used to accurately reference a number of parts which may be legitimised by a single MSTAR Form 1. For example, a single MSTAR Form 1 has been generated to include 10 items with the same part number but different material batch numbers or serial numbers

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**Block 7—Description**

Enter the name or description of the item. Preference shall be given to the term used in the instructions for continuing airworthiness or maintenance data, eg Illustrated Parts Catalogue, Aircraft Maintenance Manual, Service Bulletin, Component Maintenance Manual.

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**Block 8—Part Number**

Enter the part number as it appears on the item or tag/packaging. In case of an engine or propeller the type designation may be used.

The part number as it appears on the item, usually defined in the design data; however, in the case of a kit of parts, media containing software or any other specific condition of supply may be defined in production data developed from design data. Information about the contents of the kit or media may be given in Block 12 or in a separate document cross-referenced from Block 12.

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### Block 9—Quantity

State the quantity of items contained in each line item.

---

### Block 10—Serial Number

If the item is required to be identified with a serial number, enter it here. If there is no serial number identified on the item, enter 'N/A' (Not Applicable).

---

### Block 11—Status/Work

The following describes the permissible entries for Block 11 for production or maintenance purposes. Enter only one of these terms – where more than one may be applicable, use the one that most accurately describes the majority of the work performed and/or the status of the article.

For **production** purposes, enter either 'PROTOTYPE' or 'NEW'.

Enter 'PROTOTYPE' for:

- (1) the production of a new item in conformity with non-approved design data;
- (2) re-certification by the organisation identified in Block 4 of the previous certificate after alteration or rectification work on an item, prior to entry into service, eg after incorporation of a design change, correction of a defect, inspection or test, or renewal of shelf-life. Details of the original release and the alteration or rectification work are to be entered in Block 12.

Enter 'NEW' for:

- (1) The production of a new item in conformity with the approved design data.
- (2) re-certification by the organisation identified in Block 4 of the previous certificate after alteration or rectification work on an item, prior to entry into service, eg after incorporation of a design change, correction of a defect, inspection or test, or renewal of shelf-life. Details of the original release and the alteration or rectification work are to be entered in Block 12.
- (3) re-certification by the organisation identified in Block 4 of the previous Certificate of items from 'prototype' (conformity to non-approved data) to 'new' (conformity to approved data and in a condition for safe operation), subsequent to approval of the applicable design data, provided that the design data has not changed. The following statement must be entered in Block 12:

RE-CERTIFICATION OF ITEMS FROM 'PROTOTYPE' TO 'NEW': THIS DOCUMENT CERTIFIES THE APPROVAL OF THE DESIGN DATA [INSERT MSTC/ STC NUMBER, REVISION LEVEL], DATED [INSERT DATE], TO WHICH THIS ITEM (THESE ITEMS) WAS (WERE) MANUFACTURED.

The box 'approved design data and are in a condition for safe operation' should be marked in Block 13a.

- (4) The examination of a previously released new item prior to entry into service in accordance with a specified standard or specification, (details of which and of the original release are to be entered in Block 12) or to establish airworthiness (an explanation of the basis of release and details of the original release are to be entered in Block 12).

For **maintenance** purposes, enter either:

- (1) **OVERHAULED.** Means a process that ensures the item is in complete conformity with all the applicable service tolerances specified in the (Malaysian State) Type Certificate holders, or equipment manufacturers instructions for continuing airworthiness, or in the data which is approved or accepted by the NMAA. The item will be at least disassembled, cleaned, inspected, repaired as necessary, reassembled and tested in accordance with the above specified data.



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- (2) **REPAIRED.** Rectification of defect(s) using an applicable standard (\*).
- (3) **INSPECTED/TESTED.** Examination, measurement, etc, in accordance with an applicable standard, (\*) eg visual inspection, functional testing, bench testing.
- (4) **MODIFIED.** Alteration of an item to conform to an applicable standard (\*).

(\* ) Applicable standard means a manufacturing/design/ maintenance/ quality standard, method, technique or practice approved by or acceptable to the NMAA. The applicable standard shall be described in Block 12.

### Block 12—Remarks

Describe the work identified in Block 11, either directly or by reference to supporting documentation, necessary for the user or installer to determine the airworthiness of item(s) in relation to the work being certified. If necessary, a separate sheet may be used and referenced from the main MSTAR Form 1. Each statement must clearly identify which item(s) in Block 6 it relates to. If there is no statement, state NONE.

For **production** purposes, examples of conditions which would necessitate statements in Block 12 are:

- (1) the justification for release to non-approved design data, eg pending (Malaysian State) Type Certificate, for test only, pending approved data, if applicable.
- (2) When the certificate is used for prototype purposes the following statement must be entered at the beginning of block 12:  
'NOT ELIGIBLE FOR INSTALLATION ON IN-SERVICE TYPE-CERTIFICATED AIRCRAFT'
- (3) For complete engines, a statement of compliance with the applicable emissions requirements currents at the date of manufacture of the engine.
- (4) For TSO articles, state the applicable TSO number.
- (5) Modification standard.
- (6) Compliance or non-compliance with airworthiness directives or Service Bulletins (or National Equivalent).
- (7) Details of repair work carried out, or reference to a document where this is stated.
- (8) Shelf-life data, manufacture date, cure date, etc.
- (9) Information needed to support shipment with shortages or re-assembly after delivery.
- (10) References to aid traceability, such as batch numbers.

For **maintenance** purposes, examples of information to be entered in Block 12 are:

- (1) Maintenance data used, including the revision status and reference. For all work performed and not limited to the entry made in Block 11. A statement such as 'in accordance with the Component Maintenance Manual (CMM)' is not acceptable. NDT methods with appropriate documentation used when relevant.
- (2) Compliance with airworthiness directives or service bulletins or national equivalent.
- (3) Repairs carried out.
- (4) Modifications carried out.
- (5) Replacement parts installed.
- (6) Life limited parts status.
- (7) Deviations from the customer work order.
- (8) Shelf-Life Limitations
- (9) Information needed to support shipment with shortages or re-assembly after delivery.
- (10) References to aid traceability, such as batch numbers.
- (11) etc



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#### NOTE

If printing the data from an electronic MSTAR Form 1, any appropriate data not fit for other blocks should be entered in this block.

#### Blocks 13a – 13e

Used for **production** release only:

##### Block 13a—Certification statement

Mark only one of the two boxes:

1. Mark the 'approved design data and are in a condition for safe operation' box if the item(s) was/were manufactured using approved design data and found to be in a condition for safe operation.
2. Mark the 'non-approved design data specified in Block 12' box if the item(s) was/were manufactured using applicable non-approved design data. Identify the data in Block 12, eg pending type-certificate, for test only, pending approved data.

Mixtures of items released against approved and non-approved design data are not permitted on the same certificate.

##### Block 13b—Authorised Signature

This space shall be completed with the signature of the authorised person. Only persons specifically authorised under the regulations of the NMAA are permitted to sign this block. To aid recognition, a unique number identifying the authorised person may be added.

##### Block 13c—Approval/authorisation Number

Enter the approval/authorisation number/reference. This number or reference is issued by the NMAA.

##### Block 13d—Name

Enter the name of the person signing Block 13b in a legible form.

##### Block 13e—Date (dd/mmm/yyyy)

Enter the date on which Block 13b is signed, the date must be in the format dd/mmm/yyyy (dd = 2-digit day, mmm = first 3 letters of the month, yyyy = 4 digit year).

#### NOTE

Blocks 13a to 13e Inclusive, **are not used for** maintenance release. For maintenance purposes, these blocks should be shaded, darkened, or otherwise marked to preclude their inadvertent or unauthorised use.

#### Blocks 14a – 14e

Used for **maintenance** release only:

##### Block 14a—Certification statement

Mark the appropriate box(es) indicating which regulations apply to the completed work. If the box "other regulations specified in Block 12" is marked, then the regulations of the other airworthiness authority(ies) must be identified in Block 12. At least one box must be marked, or both boxes may be marked, as appropriate.

For all maintenance carried out by maintenance organisations approved in accordance with MSTAR 145, the certification statement 'unless otherwise specified in Block 12' is intended to address the following cases:

- (1) Where the maintenance could not be completed.



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- (2) Where the maintenance deviated from the standard required by MSTAR 145.
- (3) Where the maintenance was carried out in accordance with a requirement other than that specified in MSTAR 145. In this case Block 12 shall specify the particular national regulation.

#### Block 14b—Authorised Signature

This space shall be completed with the signature of the authorised person. Only persons specifically authorised under the rules and policies of the NMAA are permitted to sign this block. To aid recognition, a unique number identifying the authorised person may be added.

#### NOTE

This signature can be computer printed subject to the NMAA being satisfied that only the signatory can direct the computer and that a signature is not possible on a blank computer-generated form.

#### Block 14c—Approval/Authorisation Number

The MSTAR145 Approved Maintenance Organisation Approval/Authorisation number given by the NMAA.

#### Block 14d—Name

Enter the name of the person signing Block 14b in a legible form.

#### Block 14e—Date

Enter the date on which Block 14b is signed, the date must be in the format dd = 2-digit day, mmm = 3 digit month, yyyy = 4 digit year.

#### NOTE

Blocks 14a to 14e Inclusive, **are not used for** production release. For production purposes, these blocks should be shaded, darkened, or otherwise marked to preclude their inadvertent or unauthorised use.

#### User/Installer responsibilities

Place the following statement on the certificate to notify end users that they are not relieved of their responsibilities concerning installation and use of any item accompanied by the form:

'THIS CERTIFICATE DOES NOT AUTOMATICALLY CONSTITUTE AUTHORITY TO INSTALL'.

'Where the user/installer performs work in accordance with regulations of an NMAA different than the NMAA specified in Block 1, it is essential that the user/installer ensures that their NMAA accepts items specified in Block 1'.

'Statements in Block 13a and Block 14a do not constitute installation certification. In all cases aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown'.



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MSTAR Form 1

## ACCEPTABLE MEANS OF COMPLIANCE

### AMC to MSTAR Form 1 – Authorised Release Certificate

Use of the MSTAR Form 1—Authorised Release Certificate for production or maintenance.

1. The following formats of an issued MSTAR Form 1 or equivalent certificate are acceptable:
  - A paper certificate bearing a signature (both originals and copies are accepted);
  - A paper certificate generated from an electronic system (printed from electronically stored data) when complying with paragraph 2;
  - An electronic MSTAR Form 1 or equivalent when complying with paragraph 2.
2. Electronic signature and electronic exchange of the MSTAR Form 1:
  - (a) Submission to the NMAA:
 

Any organisation intending to implement an electronic signature procedure to issue MSTAR Form 1 and/or to exchange electronically such data contained on the MSTAR Form 1, should document it and submit it to the NMAA as part of the documents attached to its Production Organisation Exposition (POE) or Maintenance Organisation Exposition (MOE).
  - (b) Characteristics of the electronic system generating the MSTAR Form 1.
 

The electronic system should:

    - guarantee secure access for each certifying staff;
    - ensure integrity and accuracy of the data certified by the signature on the form and be able to show evidence of the authenticity of the MSTAR Form 1 (recording and record keeping) with suitable security, safeguards and backups;
    - be active only at the location where the part is being released with an MSTAR Form 1;
    - not permit a blank form to be signed;
    - provide a high degree of assurance that the data has not been modified after signature (if a modification is necessary after issuance, eg re-certification of a part, a new form with a new number and reference to the initial issuance should be made);
    - provide for a 'personal' electronic signature, identifying the signatory. The signature should be generated only in presence of the signatory.

An electronic signature means data in electronic form which is attached to or logically associated with other electronic data and which serves as a method of authentication and should meet the following criteria:

    - it is uniquely linked to the signatory;
    - it is capable of identifying the signatory;
    - it is created using means that the signatory can maintain under his sole control.

This electronic signature should be an electronically generated value based on a cryptographic algorithm and appended to data in a way to enable the verification of the data source and integrity.

The electronic system should be based on a policy and management structure (confidentiality, integrity and availability), such as:

    - Administrators, signatories;
    - Scope of authorisation, rights;
    - Password and secure access, authentication, protections, confidentiality;



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- Track changes;
- Minimum blocks to be completed, completeness of information;
- Archives;
- etc.

The electronic system generating the MSTAR Form 1 may contain additional data such as:

- Manufacturer code;
- Customer identification code;
- Workshop report;
- Inspection results;
- etc.

(c) Characteristics of the MSTAR Form 1 generated from the electronic system

To facilitate understanding and acceptance of the MSTAR Form 1 released with an electronic signature, the following statement should be in Block 13b or 14b: 'Electronic Signature on File'.

In addition to this statement, it is accepted to print or display a signature in any form, such as a representation of the hand-written signature of the person signing, ie scanned signature, or a representation of their name.

When printing the electronic form, the MSTAR Form 1 should meet the general format as specified in MSTAR Forms. A watermark-type 'PRINTED FROM ELECTRONIC FILE' should be printed on the document.

When the electronic file contains a hyperlink to data required to determine the airworthiness of the item(s), the data associated to the hyperlink, when printed, should be in a legible format and be identified as a reference from the MSTAR Form 1.

Additional information not required by the MSTAR Form 1 completion instructions may be added to the printed copies of MSTAR Form 1, as long as the additional data does not prevent a person from filling out, issuing, printing, or reading any portion of the MSTAR Form 1. This additional data should be provided only in Block 12 unless it is necessary to include it in another block to clarify the content of that block.

(d) Electronic exchange of the electronic MSTAR Form 1.

The electronic exchange of the electronic MSTAR Form 1 should be accomplished on a voluntary basis. Both parties (issuer and receiver) should agree on electronic transfer of the MSTAR Form 1.

For that purpose, the exchange needs to include:

- all data of the MSTAR Form 1, including referenced data required by the MSTAR Form 1 completion instructions;
- all data required for authentication of the MSTAR Form 1.

In addition, the exchange may include:

- data necessary for the electronic format;
- additional data not required by the MSTAR Form 1 completion instructions, such as manufacturer code, customer identification code.

The system used for the exchange of the electronic MSTAR Form 1 should provide:

- A high level of digital security; the data should be protected, not altered or not corrupted;
- Traceability of data back to its source.





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Trading partners wishing to exchange MSTAR Form 1 electronically should do so in accordance with this Acceptable Means of Compliance. It is recommended that they use an established, common, industry method such as Air Transport Association (ATA) Spec 2000 Chapter 16.

The organisations are reminded that additional national and/or European requirements may need to be satisfied when operating the electronic exchange of the electronic MSTAR Form 1.

The receiver should be capable of regenerating the MSTAR Form 1 from the received data without alteration; if not, the system should revert back to the paper system.

When the receiver needs to print the electronic form, see paragraph 2c.

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MSTAR Form 4

## Acceptance of Nominated Management Personnel

### GUIDANCE

These guidelines are designed to assist you to complete the MSTAR Form 4 for the acceptance of nominated personnel under an approved exposition and the under Malaysian State Airworthiness Regulation (MSTAR).

### **IMPORTANT**

**It is the applicant's responsibility to apply for DGTA approval only if they have a requirement for the approval and can demonstrate compliance with all the relevant regulatory requirements.**

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the DGTA website and will assist with the application process.

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### Application Process

Completing this application form is the first step in the application process. Once received, DGTA will review your application including all supporting documentation provided.

Applicants are to complete this application form and submit to the DGTA.

This MSTAR Form 4 is the official DGTA form for the nomination and acceptance of key personnel. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application. One (1) MSTAR Form 4 form must be completed for **each** nominated position.

---

**Q1. Details of Management Personnel** - The applicant is to select **ONE** approval type

**Q2. Position** - The nominated person is required to select the position for which they require a Form 4 application. The "Additional Information" field should be completed for personnel applying for deputy or nominated positions. Other pertinent information can also be added in this field. Do not forget to enter the planned with effect date for the position.

**Q3. Nominated Person** - The nominated person must provide their full legal name. This is the name that would appear on, for example Malaysia identification card (IC), passport or birth certificate. The nominated person must provide their current business address and contact details.

**Q4. Organisation's Details** - The nominated person is required to provide the name of the legal entity with which they are associated.

**Q5. Qualifications** - The nominated person is required to provide details and supporting documentation of their qualifications relevant to the position for which they will hold within the organisation. Information on qualifications can be provided in a separate document (i.e. Curriculum Vitae) attached to this form. Examples of qualifications are: university degrees, professional training courses from verifiable sources and internal training courses. Please refer to the qualification requirement for the position applied for within the appropriate MSTAR, e.g. refer to MSTAR M.A.706 for Continuing Airworthiness Manager qualification requirements.

**Q6. Experience** - The nominated person is required to provide details and supporting documentation of their experience relevant to the position for which they will hold within the organisation. Additional information may be provided as an attachment to the application. Please refer to the experience requirement for the position applied for within the appropriate MSTAR, e.g.: refer to MSTAR M.A.706 for Continuing Airworthiness Manager experience requirements.

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DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

MSTAR Form 4

### **Post Holders Declaration**

By signing the declaration, the nominated person is indicating to DGTA that they have:

1. Read the guidelines;
2. Completed the application in full; and
3. Accepted the terms and conditions for processing the application. The application must be signed by the nominated person listed in item 3.

---

### **Privacy Policy**

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law.

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### **Form Submission**

The applicant is to ensure either the supporting MSTAR Form (eg. Form 2, 12, 51 or 82) for the change has been supplied iaw MSTAR requirements, if required or has obtained approval from their sponsoring approved MSTAR Organisation.

**NOTE:** If there is insufficient space in any of the fields, please attach additional information to this form.

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DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
 c/o SUBANG AIRBASE  
 40000 SHAH ALAM

MSTAR Form 4

## Acceptance of Nominated Management Personnel

### APPLICATION

<b>1. Details of Management Position required to be accepted as specified in:</b>	
MSTAR 145 <input type="checkbox"/>	MSTAR M <input type="checkbox"/> MSTAR 21 <input type="checkbox"/> MSTAR 147 <input type="checkbox"/>
<b>2. Position within the Organisation</b>	
<b>MSTAR 145</b> <input type="checkbox"/> RM <input type="checkbox"/> NDT Responsible Lvl 3 <input type="checkbox"/> QM	<b>MSTAR M</b> <input type="checkbox"/> CAM <input type="checkbox"/> QM <input type="checkbox"/> AwR Staff
<b>MSTAR 21J</b> <input type="checkbox"/> HDO <input type="checkbox"/> COA <input type="checkbox"/> CISM	<b>MSTAR 21G</b> <input type="checkbox"/> RM <input type="checkbox"/> QM
<b>MSTAR 147</b> <input type="checkbox"/> TM <input type="checkbox"/> QM	
<b>Additional Information</b>	
<b>Planned With Effect Date</b>	
<b>3. Business Contact Details:</b>	
3.1	Title/Name
	Address
	Work Phone
	Mobile
	Email
<b>4. Organisation</b>	
4.1	Name
<b>5. Qualifications relevant to the item (2) position:</b> <span style="float: right;">(Attach Supporting Documentation)</span>	



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
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MSTAR Form 4

<b>6. Work experience relevant to the item (2) position:</b>		(Attach Supporting Documentation)
<b>7. Post Holder Declaration</b>		
(To be completed by Applicant)		
<b>Declaration</b>		
<input type="checkbox"/> I declare that the information provided on this form is true and correct.	<input type="checkbox"/> I have obtained approval from the sponsoring approved MSTAR Organisation, as attached or,	
<input type="checkbox"/> I understand and accept that for DGTA to proceed with this application, I have supplied all supporting documentation to DGTA.	<input type="checkbox"/> I understand that for DGTA to proceed with this application, the supporting MSTAR Form for the change has been supplied in accordance with MSTAR requirements.	
Date	Name/Position	Signature:
<b>8. DGTA USE ONLY</b>		
8.1 Record Objective ID:		
8.3 Staff Assessment:		
I have assessed this application against the requirements of the MSTAR and recommend this application as		
<input type="checkbox"/> Accepted	<input type="checkbox"/> Accepted with Conditions	<input type="checkbox"/> Resubmit Required <input type="checkbox"/> Not Accepted
If Accepted; Planned With Effect Date:		
<b>Assessment Comments:</b>		
Date	Name/Position	Signature
8.4 DGTA Acceptance/Rejection		
<input type="checkbox"/> Accepted	<input type="checkbox"/> Accepted with Conditions	<input type="checkbox"/> Resubmit Required <input type="checkbox"/> Not Accepted
<b>Conditions (If Applicable)</b>		
Date	Name/Position	Signature


**Directorate General Technical Airworthiness**

MSTAR Form 15a

**Airworthiness Review Certificate (DGTA)**

<b>Airworthiness Review Certificate reference:</b>			
In accordance with Malaysian State Technical Airworthiness Regulation (MSTAR), DGTA hereby certifies that the following aircraft:			
<b>Aircraft Manufacturer:</b>			
<b>Manufacturer's Designation:</b>			
<b>Aircraft Registration:</b>			
<b>Aircraft Serial Number:</b>			
is considered airworthy at the time of the review.			
<b>Date of Issue:</b>		<b>Date of Expiry:</b>	
<b>Authorisation Number:</b>		<b>Signed:</b>	
<b>1st Extension:</b> The aircraft is considered to be airworthy at the time of the issue.			
<b>Date of Issue:</b>		<b>Date of Expiry:</b>	
<b>Authorisation Number:</b>		<b>Signed:</b>	
<b>Name of CAMO:</b>		<b>Approval Reference:</b>	
<b>2nd Extension:</b> The aircraft is considered to be airworthy at the time of the issue.			
<b>Date of Issue:</b>		<b>Date of Expiry:</b>	
<b>Authorisation Number:</b>		<b>Signed:</b>	
<b>Name of CAMO:</b>		<b>Approval Reference:</b>	



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

## Directorate General Technical Airworthiness Application for a Permit to Fly

MSTAR Form 21

### Guidance

#### IMPORTANT

**It is the applicant's responsibility to eliminate risk so far as is reasonably practicable, or if not practicable to do so, minimise risk so far as is reasonably practicable.**

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the [DGTA website](#) and will assist with the application process.

#### About this form and application process

#### Application Process

This form, in concert with MSTAR Form 18b - Application for the Approval of Flight Conditions, is used to summarise key outcomes of the seven-step risk management process undertaken in preparing the application. DGTA recommends the detail of the risk management activities are documented separately and referenced in the relevant sections of this form.

**Applicants are to complete and sign the application form and submit to the DGTA.**

#### MSTAR Form 21

This MSTAR Form 21 is the official DGTA form to apply for a Permit to Fly (PTF) under MSTAR 21 Subpart P. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application.

#### Withdrawal of Application

This application can be withdrawn in writing at any time.

#### Section 1 - Applicant

1. Insert details of the organisation applying for the PTF, in accordance with MSTAR 21.A.703. Use AOC number if issued.

#### Section 2 - Aircraft Owner / Operating Organisation

2. Insert details of the aircraft owner/operating organisation.

#### Section 3 - Aircraft Manufacturer / Type

3. Insert aircraft manufacturer and type, eg. British Aerospace / A27 Hawk Mk108/208.

**Application for a Permit to Fly****Section 4 - Manufacturer serial number/s or tail number/s**

4. State the tail number(s) or Manufacturer's Serial Number(s) of the subject aircraft. List all applicable aircraft tail numbers e.g. A34-001 through to A34-004. This information can be provided by reference to the associated Form 18b.

**Section 5 - Purpose of Flight**

5. This section summarises the **hazard and risk context IAW Step 1** of the seven-step risk management process. In establishing the hazard and risk context, there should be clear and concise statements on the desired outcome of the task, details on whether it is a new/existing or discretionary/non-discretionary task, and the task urgency. The specific flight(s) subject to this application must be inside the risk context of the approved flight conditions and support operation with the remaining risk characterised in the approved flight conditions.

**Section 6 - Duration**

6. Provide the expected target date for the first flight under the permit and details of the duration for which the permit is required. Duration can be expressed in either calendar period or flight hours.

**Section 7 - Configuration / Non-Compliance with Airworthiness Requirements**

7. This section must include a statement that the affected aircraft are in the configuration required by the approved flight conditions, and any other controls required (briefing, flying order etc.) to **eliminate the risk ALARP**, or if elimination is not reasonably practicable, **minimise the risk ALARP IAW Steps 3 and 4** of the seven-step risk management process, are in place.

**Section 8 - Flight Conditions**

8. Provide reference to either the approved Flight Conditions or an application for approval of Flight Conditions.

**Date, Name & Appointment and Signature**

9. By submitting this application, the signatory is confirming that:

- (a) The specific flight(s) subject to this application are inside the risk context of the approved flight conditions and support operation with the remaining risk characterised in the approved flight conditions.
- (b) The specific aircraft subject to this application meet the configuration required by the approved flight conditions including the implementation of all applicable conditions and restrictions in the approved flight conditions.
- (c) They are making the **decision to proceed** with the flight(s) under this PTF IAW **step 6** of the seven-step risk management process.
- (d) They are accepting the responsibility to **continuously monitor all risk controls for their effectiveness IAW step 7** of the seven-step risk management process.

**Form Submission**

Submit the application form to the DGTA





DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
 c/o SUBANG AIRBASE  
 40000 SHAH ALAM

**Directorate General Technical Airworthiness** MSTAR Form 21  
**Application for a Permit to Fly**

<b>Application</b>			
<b>1. Applicant</b>			
<b>Organisation</b>			
<b>Approval No.</b>			
<b>Application Reference No.</b> <Applicant to include a unique reference number for this application.>			
<b>2. Aircraft Owner / Operating Organisation</b>			
<b>3. Aircraft Manufacturer / Type</b>		<b>4. Manufacturer Serial Number/s</b> <Use annex A for a large number of aircraft, otherwise list the manufacturer serial numbers and tail numbers here.>	
<b>5. Purpose of Flight(s)</b>			
<b>6. Expected Target Date(s) for Flight(s) and Duration</b>			
<b>7. Aircraft Configuration / Non-compliance with Airworthiness Requirements as Relevant for the Permit to Fly</b> <i>The above aircraft for which a Permit to Fly is requested is defined in:</i>			
<b>8. Approval of Flight Conditions</b>			
<b>Date</b> DD-MMM-YY	<b>Name &amp; Appointment</b>	<b>Signature of Applicant</b>	

**Annex A**

**APPLICABLE MANUFACTURER SERIAL NUMBERS**

Manufacturer Serial Number	Tail Number	Date Added



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**Directorate General Technical Airworthiness**

MSTAR Form 25A

## **Application for Certificate Of Airworthiness**

### **Guidance**

These guidelines are designed to assist you to complete the MSTAR Form 25A – *Application for Certificate of Airworthiness* under Malaysian State Technical Airworthiness Regulation (MSTAR) 21 Subpart H.

#### **IMPORTANT**

**It is the applicant's responsibility to apply for DGTA approval only if they have a requirement for the approval and can demonstrate compliance with all the relevant regulatory requirements.**

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the [Directorate General Technical Airworthiness](#) (DGTA) website and will assist with the application process.

#### **About this form and application process**

##### **MSTAR Form 25A**

This MSTAR Form 25A is the official DGTA form to apply for a Certificate of Airworthiness under MSTAR 21 Subpart H. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application.

##### **Application Process**

Completing this application form is the first step in the application process. Once received, DGTA will review your application including all supporting documentation provided.

##### **Legacy CoA Transition**

As part of the transition from TAMMs to MSTARs, some aircraft have undergone a transition from a Legacy Certification Basis Description to a MSTAR compliant Type Certification Basis (TCB). Once the TCB has been completely transitioned and subsequently a MSTAR MSTC issued, the applicant can use the Legacy TAMM CoA as evidence for their application for a MSTAR CoA. The applicant is still required to complete the entire form.

**Applicants are to complete and sign the application form electronically and submit to the nominated DGTA email.**

**NOTE:** DGTA may not consider an application or cease to consider it further while the applicant has not complied with all MSTAR requirements.

#### **Withdrawal of Application**

This application can be withdrawn in writing at any time.

#### **Section 1 – Applicant's Reference**

**1.1** File reference within the applicant's file referencing system for record identification details.

#### **Section 2 – Applicant's Address and Contact Data**

**2.1** The applicant should be the State Aircraft Operator (SAO) who operates the aircraft. The Continuing Airworthiness Maintenance Organisation (CAMO) responsible for the tail may apply on behalf of the applicant (SAO).

**2.2** The applicant is to specify whether or not the CoA application is a by-product of the TCB transition and therefore the Legacy TAMM CoA is transitioning to a MSTAR CoA. Further information can be found above.

**Application for Certificate Of Airworthiness****Section 3 – Aircraft / Engine / Propeller / Rotor Details**

- 3.1 Registration number listed in the Australian Defence Register against the aircraft Serial No. for which this application for a Certificate of Airworthiness relates to.
- 3.2 State the Manufacturer (s) of the product / appliance in question.
- 3.3 State the Type & model of the product / appliance in question.
- 3.4 State the Serial No. of the product / appliance in question.
- 3.5 State the Hours of Operation and/or number of cycles of the product / appliance in question.

**Section 4 – Type Design & Other Information**

- 4.1 Provide details of the Malaysian State Type Certificate and associated Type Certification Data Sheet.
- 4.2 List all supplemental type certificates major modifications, & major repairs approved and installed on the aircraft since original type certification. Also list any deviations from the design that have been made during production / embodiment. Production deviations must be approved by an appropriate Design Organisation.
  - 4.2.1 Provide the Supplemental Type-Certificate (STC) / Repair / Modification / Production Deviation No.
  - 4.2.2 Provide the description of the STC / Repair / Modification / Production Deviation.
  - 4.2.3 Provide the installation status of the STC / Repair / Modification / Production Deviation.
  - 4.2.4 Provide/List details of any supplemental Instructions for Continuing Airworthiness (ICA) applicable to the tail including limitations as a result of the STC / Repair / Modification / Production Deviation. Provide any additional remarks if necessary to explain impact to airworthiness as a result.
- 4.3 List all applicable Airworthiness Directives (AD) and their compliance status.
  - 4.3.1 Provide the Airworthiness Directive No.
  - 4.3.2 Provide the description of the Airworthiness Directive.
  - 4.3.3 Provide the name of the Authority that issued the Airworthiness Directive.
  - 4.3.4 Provide a status on compliance with the requirements of the Airworthiness Directive and any comments that explains why an AD has not been complied with (if applicable).
- 4.4 Provide information on the aircraft Mass and Balance including a loading schedule.
- 4.5 Provide all applicable documentation that establishes conformity of the aircraft to its type data. Further guidance on what documentation to submit can be located within the application section of this form.  
**For used aircraft**, a Airworthiness Review Certificate or a statement from the authority where the aircraft was registered confirming the conformity of the aircraft against type design at the time of transfer is required in addition to historical records of production and modification. A Certificate of Release to Service is also mandatory to confirm that the aircraft is airworthy.
- 4.6 Provide details of all Instructions for Continuing Airworthiness applicable to the aircraft tail number.

**Section 5 – Applicant Declaration**

The Accountable Manager of the SAO or their authorised signatory should make the declaration under this section.

By signing the declaration, the applicant is indicating to DGTA that they:

1. have read the guidelines;
2. have completed the application in full;
3. declare the statements are true and correct; and
4. have accepted the terms and conditions for processing the application.

**Application for Certificate Of Airworthiness****Section 3 – Aircraft / Engine / Propeller / Rotor Details**

- 3.1 Registration number listed in the Australian Defence Register against the aircraft Serial No. for which this application for a Certificate of Airworthiness relates to.
- 3.2 State the Manufacturer (s) of the product / appliance in question.
- 3.3 State the Type & model of the product / appliance in question.
- 3.4 State the Serial No. of the product / appliance in question.
- 3.5 State the Hours of Operation and/or number of cycles of the product / appliance in question.

**Section 4 – Type Design & Other Information**

- 4.1 Provide details of the Malaysian State Type Certificate and associated Type Certification Data Sheet.
- 4.2 List all supplemental type certificates major modifications, & major repairs approved and installed on the aircraft since original type certification. Also list any deviations from the design that have been made during production / embodiment. Production deviations must be approved by an appropriate Design Organisation.
  - 4.2.1 Provide the Supplemental Type-Certificate (STC) / Repair / Modification / Production Deviation No.
  - 4.2.2 Provide the description of the STC / Repair / Modification / Production Deviation.
  - 4.2.3 Provide the installation status of the STC / Repair / Modification / Production Deviation.
  - 4.2.4 Provide/List details of any supplemental Instructions for Continuing Airworthiness (ICA) applicable to the tail including limitations as a result of the STC / Repair / Modification / Production Deviation. Provide any additional remarks if necessary to explain impact to airworthiness as a result.
- 4.3 List all applicable Airworthiness Directives (AD) and their compliance status.
  - 4.3.1 Provide the Airworthiness Directive No.
  - 4.3.2 Provide the description of the Airworthiness Directive.
  - 4.3.3 Provide the name of the Authority that issued the Airworthiness Directive.
  - 4.3.4 Provide a status on compliance with the requirements of the Airworthiness Directive and any comments that explains why an AD has not been complied with (if applicable).
- 4.4 Provide information on the aircraft Mass and Balance including a loading schedule.
- 4.5 Provide all applicable documentation that establishes conformity of the aircraft to its type data. Further guidance on what documentation to submit can be located within the application section of this form.  
**For used aircraft**, a Airworthiness Review Certificate or a statement from the authority where the aircraft was registered confirming the conformity of the aircraft against type design at the time of transfer is required in addition to historical records of production and modification. A Certificate of Release to Service is also mandatory to confirm that the aircraft is airworthy.
- 4.6 Provide details of all Instructions for Continuing Airworthiness applicable to the aircraft tail number.

**Section 5 – Applicant Declaration**

The Accountable Manager of the SAO or their authorised signatory should make the declaration under this section.

By signing the declaration, the applicant is indicating to DGTA that they:

1. have read the guidelines;
2. have completed the application in full;
3. declare the statements are true and correct; and
4. have accepted the terms and conditions for processing the application.

**Application for Certificate Of Airworthiness****Section 6 – DGTA Staff Only**

This section is not to be completed by the Applicant.

**Privacy Policy**

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law. DGTA will safeguard personal information however, please be aware that DGTA policy is to publish approvals on its website.

**Form Submission**

On completion, submit the application form by using the 'Submit Form' button in section 5.



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

Directorate General Technical Airworthiness

MSTAR Form 25A

## Application for Certificate Of Airworthiness

### Application

<b>1. Applicant's Reference</b>					
<b>1.1 Your Reference</b>					
<b>2. Applicant Address and Contact Data</b>					
<b>2.1 Applicant Data</b> ( <i>Details of SAO as shown on the certificate of registration</i> )					
<b>2.1.1 Name and Address</b>	Organisation Name				
	Street No and Name				
	Suburb		State		Post Code
	Country				
	<b>2.1.2 Contact Person</b>	Title and Full Name			
Position Title					
Phone					
Email					
<b>2.2 Is this CoA application a by-product of the TCB transition project?</b>			<input type="checkbox"/> Yes	<i>If Yes, provide reference to Legacy TAMM CoA</i>	
			<input type="checkbox"/> No		
<b>3. Aircraft / Engine / Propeller / Rotor / APU Details</b> ( <i>as noted on the aircraft data plate and the certificate of registration</i> )					
<b>3.1 Registration Mark:</b>					
	<b>3.2 Manufacturer</b>	<b>3.3 Type &amp; Model</b>	<b>3.4 Serial No(s)</b>	<b>3.5 Hours / Cycles</b>	
				Since New	Since Overhaul
<b>Aircraft</b>					
<b>Engines</b>			1.		
			2.		
			3.		
			4.		
<b>Propellers</b>			1.		
			2.		
			3.		
			4.		
<b>Main Rotor</b>					
<b>Tail Rotor</b>					





**Directorate General Technical Airworthiness**

MSTAR Form 25A

**Application for Certificate Of Airworthiness**

**4.5 Conformity documentation** (provide all applicable – follow the notes in the guidance section)

- Foreign / Export CoA: \_\_\_\_\_
- Form 52 Statement of Conformity: \_\_\_\_\_
- Form 53 Certificate of Release to Service: \_\_\_\_\_
- Airworthiness Review Certificate: \_\_\_\_\_
- AMO issued Certificate of Release to Service: \_\_\_\_\_
- Acceptance of Production Deviations by the commonwealth: \_\_\_\_\_
- Conformity statement from Authority of state of registry: \_\_\_\_\_
- Other: \_\_\_\_\_

**4.6 Manuals & Instructions for Continuing Airworthiness (ICA)**

- Approved Aircraft Flight Manual & Revision No: \_\_\_\_\_
- Approved Aircraft Maintenance Program & Revision No: \_\_\_\_\_
- Other \_\_\_\_\_

**5. Applicant Declaration**

I hereby declare that:

- All requirements of approved maintenance programme and applicable airworthiness directives have been complied with.
- The aircraft described above has been inspected and found airworthy in conformance with its approved type data.
- All information provided on this form is true and correct.
- I understand and accept that for DGTA to proceed with this application, I have supplied all supporting documentation to DGTA

Date	Name/Position	Signature

**6. DGTA USE ONLY**

6.1 Record Objective ID: \_\_\_\_\_

**6.2 Certificate of Airworthiness application approval:**

<input type="checkbox"/> Application Review & Processed. Checklist objective ID: _____	<input type="checkbox"/> Aircraft determined Airworthy	<input type="checkbox"/> Application Approved Form 25 objective ID: _____
<input type="checkbox"/> Application Requires Resubmit with additional information	<input type="checkbox"/> Application Not Approved	<input type="checkbox"/> Application Approved as part of TCB Transition Project

**6.3 Additional Comments:**

Date	Name/Position	Signature



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)

MSTAR Form 31

## Notification of Major Change / Major Repair Design

### Guidance

These guidelines are designed to assist organisations in the completion of a Malaysian State Technical Airworthiness Regulation (MSTAR) Form 31 to provide Notification of an Upcoming Major Change or Major Repair Design.

Acceptable Means of Compliance and further Guidance Material is available within the relevant Subparts of the MSTAR and on the DGTA webpage which may assist with the application process.

#### **About this form and application process**

This MSTAR Form 31 is the official DGTA application form to notify the Authority of an upcoming Major Change, a Supplemental Type Certificate (STC) or a Major Repair Design under MSTAR 21.A.97, MSTAR 21.A.115 or MSTAR 21.A.437(a) respectively. This form is the initial step in the application process and should be submitted with or before a Certification Programme Plan to gain in-principle agreement from the Authority.

#### **Withdrawal of Application**

An application can be withdrawn in writing at any time.

#### **Privacy Policy**

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law. DGTA will safeguard personal information however, please be aware that DGTA policy is to publish approved artefacts, ie STC and Type Certificate Data Sheets, on its website.

#### **Form Submission**

Applicants are to complete and sign the form electronically and submit to the DGTA Type Certification group mailbox via the 'Submit Form' button in Section 9.



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)

MSTAR Form 31

## Notification of Major Change / Major Repair Design

### Application

<b>1. Applicant Information</b> <i>(the organisation making the Declaration of Compliance to the TCB requirements)</i>				
<b>1.1 Your Reference</b>	<i>provide a unique identifier</i>			
<b>1.2 Name and Address</b>	Organisation Name			
	DOA No.			
	Street No and Name			
	Suburb		State	Post Code
	Country			
<b>1.3 Contact Person</b>				
	Title/Rank			
	Full Name			
	Position Title			
	Phone			
	Email			
<b>2. Type Certificate Holder Information</b>				
<b>2.1 Name and Address</b>	Organisation Name			
	Street No. and Name			
	Suburb		State	Post Code
<b>2.2 Contact Person</b>				
	Title/Rank			
	Full Name			
	Position Title			
	Phone			
	Email			
<b>3. Identification of Activity</b>				
Major Change	Major Repair Design	Includes amendments / supplements to approved parts of the Aircraft Flight Manual		
<b>3.1 Affected System Categories</b> <i>(select all that apply)</i>				
Aerial Delivery Equipment/Armament/Stores Avionics Cabin Safety Electrical Hydro-Mechanical		Propulsion System Software Structures Other (please specify)		



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
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MSTAR Form 31

## DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)

**Notification of Major Change / Major Repair Design****3.2 Amendments / Supplements to the approved parts of ICA** (select all that apply – includes limitations related to Repairs)

CMR (Certification Maintenance Requirement)  
CDCCL (Critical Design and Configuration Control  
Limitations)

AwL (Airworthiness Limitation)  
Other (please specify)  
Nil

**4. Product Identification**

<b>4.1 Applicability</b>	Type Certificate No.	
	Platform Name	
	Model(s)	
	Tail No(s) (if applicable)	
	Part No(s) (if applicable)	
	Serial No(s) (if applicable)	
<b>4.2 Prior Certification</b>	Approval Number Id	
	Issued By	
	Issued On	

**5. Description**

<b>5.1 Title</b> (limit 40 characters)	
<b>5.2 Purpose</b>	
<b>5.3 Affected Areas</b> (including manuals)	
<b>5.4 Re-Investigations</b>	
<b>5.5 Justification</b> (non MTC holder repairs only)	

**6. Certification Program**

<b>6.1 The Certification Program will be:</b>	
Provided with the Form 31a/31b	
A standalone Certification Program Plan	
<b>6.2 Schedule</b> (estimated)	



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**

MSTAR Form 31

**Notification of Major Change / Major Repair Design**

**7. MSTAR 21 demonstration of eligibility**

**This application is:**

Within the current approved scope of work of the applicant's DOA.

Undertaken by a non-DOA holder or outside the scope of the applicant's DOA on behalf of the holder of the Malaysian State Type Certificate, Restricted Malaysian State Type Certificate or Supplemental Type Certificate (as per MSTAR 21.A.2).

Name

DOA No.

Undertaken by an organisation other than the applicant for, or holder of, a certificate (as per MSTAR 21.A.2).

Name

DOA No.

Following an application for Design Organisation Approval (MSTAR Form 80) or Alternative Procedures to Design Organisation Approval (MSTAR Form 81).

Application Date

Project No.

Following an application for a change to the scope of work via MSTAR Form 81 or MSTAR Form 82.

Application Date

Project No.

Without DOA

**8. Applicant declarations**

I declare that the information provided on this form is true and correct.

Date

Name / Position

Signature

**9. Malaysian State Type Certificate holder**

**9.1 MSTC holder declaration** (to be completed by the identified MSTC holder)

Date

Name / Position

Signature



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
 c/o SUBANG AIRBASE  
 40000 SHAH ALAM

<b>DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)</b>	MSTAR Form 31
<b>Notification of Major Change / Major Repair Design</b>	

<b>10. DGTA USE ONLY</b>	Notification of receipt to Applicant	
<b>10.1 Record Objective ID:</b>		
<b>10.2 Major Change application:</b>		
Application Accepted	Application Requires Resubmit	Application NOT Accepted
<b>10.3 Additional Comments:</b>		
<b>Date</b>	<b>Name / Position</b>	<b>Signature</b>



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**

MSTAR Form 31A

## **Application for Approval of Major Change to Type Design**

### **Guidance**

These guidelines are designed to assist organisations in the completion of a Malaysian State Technical Airworthiness Regulation (MSTAR) Form 31A for Approval of Major Changes to Type Design under MSTAR 21 Subpart D (Changes to Type Certificates and Restricted Type Certificates) and MSTAR 21 Subpart E (Malaysian State Supplemental Type Certificates (MSSTC)).

Acceptable Means of Compliance and further Guidance Material is available within the relevant Subparts of the MSTAR and on the Directorate General Technical Airworthiness (DGTA) webpage which may assist with the application process.

#### **About this form and application process**

This MSTAR Form 31A is the official DGTA application form to obtain Approval of a Major Change to Type Design or Issue of an MSSTC under MSTAR 21.A.97 or MSTAR 21.A.115 respectively. This form is the final step in the application process and should be submitted in an application pack with the appropriate supporting evidence. In accordance with MSTAR 21.A.33(d) the DGTA may request additional information from the applicant to support approval of this application.

The output of approval of a Major Change will be determined by the DGTA and will either result in an amendment to the type certificate (as per MSTAR 21 Subpart D), or issue of an MSSTC (as per MSTAR 21 Subpart E).

**NOTE:** For repairs, MSTAR Form 31B must be used.

#### **Withdrawal of Application**

An application can be withdrawn in writing at any time.

#### **Privacy Policy**

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law. DGTA will safeguard personal information however, please be aware that DGTA policy is to publish approved artefacts, ie MSSTCs and Type Certificate Data Sheets, on its website.

#### **Form Submission**

Applicants are to complete and sign the form electronically and submit to the DGTA Type Certification group mailbox via the 'Submit Form' button.



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**

MSTAR Form 31A

## Application for Approval of Major Change to Type Design

### Application

<b>1. Applicant Information</b> <i>(the organisation making the Declaration of Compliance to the TCB requirements)</i>					
<b>1.1 Your Reference</b>	provide a unique identifier				
<b>1.2 Name and Address</b>	Organisation Name				
	DOA No.				
	Street No. and Name				
	Suburb		State		Post Code
	Country				
<b>1.3 Contact Person</b>					
	Title / Rank				
	Full Name				
	Position Title				
	Phone				
	Email				
<b>2. Type Certificate Holder Information</b>					
<b>2.1 Name and Address</b>	Organisation Name				
	Street No. and Name				
	Suburb		State		Post Code
<b>2.2 Contact Person</b>					
	Title / Rank				
	Full Name				
	Position Title				
	Phone				
	Email				
<b>3. Identification of Activity</b>					
Includes amendments / supplements to approved parts of the Aircraft Flight Manual					
<b>3.1 Affected System Categories</b> <i>(select all that apply)</i>					
Aerial Delivery Equipment/Armament/Stores Avionics Cabin Safety Electrical Hydro-Mechanical			Propulsion Systems Software Structures Other (please specify)		



**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)** MSTAR Form 31A  
**Application for Approval of Major Change to Type Design**

**3.2 Amendments / Supplements to the approved parts of ICA** *(select all that apply – includes limitations related to Repairs)*

CMR (Certification Maintenance Requirement) CDCCL (Critical Design and Configuration Control Limitations)	AwL (Airworthiness Limitation) Other (please specify) Nil
--	---

**4. Product Identification**

<b>4.1 Applicability</b>	Type Certificate No.	
	Platform Name	
	Model(s)	
	Tail No(s) <i>(if applicable)</i>	

**5. Design Details**

**5.1 Title** *(limit 40 characters)*

**5.2 Purpose**

**5.3 Certification Programme** *(comply with MSTAR 21.A.93(b))*

Previously submitted	<input type="checkbox"/> Submitted as part of this Application <i>(Certification programmes can be submitted as part of this application, without prior acceptance from the DGTA, where they are considered simple in accordance with the criteria in MSTAR GM 21.A.93(b))</i>
<b>Reference:</b> Approval Date:	<b>Reference:</b>

**5.4 Significance of Change** *(as detailed in MSTAR 21.A.101)*

**5.5 Scope of the Major Change**

**5.6 Re-investigations** *(as detailed in MSTAR 21.A.93(b)(2))*

**6. Issue of Approval** *(comply with MSTAR 21.A.97 / MSTAR 21.A.115)*

**6.1 Demonstration of Compliance** *(in accordance with MSTAR 21.A.97(b))*

**6.2 Type Certification Basis Tailoring (Certification Review Items (CRIs))**

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**

MSTAR Form 31A

**Application for Approval of Major Change to Type Design****6.3 Compatibility of Certified Design with ADF Intended Use** (CRE Assessment of the Major Change)

Details (or reference to document where this is addressed) if applicable.

**7. MSTAR 21 demonstration of eligibility****This application is:**

Within the current approved scope of work of the applicant's MDOA.

Undertaken by a non-DOA holder or outside the scope of the applicant's DOA on behalf of the holder of the Type Certificate, Restricted Type Certificate or Supplemental Type Certificate (as per MSTAR 21.A.2).

Company Name

DOA No.

Undertaken by an organisation other than the applicant for, or holder of, a certificate (as per DASR 21.A.2).

Company Name

DOA No.

Following an application for Design Organisation Approval (MSTAR Form 80) or Alternative Procedures to Design Organisation Approval (MSTAR Form 81).

Application Date

Project No. (if known)

Following an application for a change to the scope of work via MSTAR Form 81 or MSTAR Form 82.

Application Date

Project No. (if known)

Without DOA

**8. Applicant declarations**

**8.1 Declaration of Compliance** (select the applicable declaration. To be completed by the Head of Design / Authorised Representative or equivalent Representative of the Applicant Organisation)

The above declaration is made on the basis of (detail the basis on which the Declaration of Compliance has been made. May be a reference if this detail is contained in another document(s))

<b>Date</b>	<b>Name / Position</b>	<b>Signature</b>

<b>DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)</b>	MSTAR Form 31A
<b>Application for Approval of Major Change to Type Design</b>	

**8.2 Declaration of Completion** *(to be completed by the Authorised Representative of the Applicant Organisation, eg Chief of the Office of Airworthiness or Head of Design)*

I declare that the information provided on this form is true and correct.  
 I understand and accept the requirements for DGTA to proceed with this application and I have supplied all supporting documentation to DGTA.

<b>Date</b>	<b>Name / Position</b>	<b>Signature</b>

**9. Type Certificate holder**

**9.1 MSTC holder declaration** *(to be completed by the identified MSTC holder)*

<b>Date</b>	<b>Name / Position</b>	<b>Signature</b>

<b>DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)</b>	MSTAR Form 31A
<b>Application for Approval of Major Change to Type Design</b>	

<b>10. DGTA USE ONLY</b>		
<b>10.1 Record Objective ID:</b>		
<b>10.2 Major Change application:</b>		
Application Approved	Application Requires Resubmit	Application Not Approved
<b>10.3 Output Documentation:</b>	MSSTC Reference Id: TCDS update / Reference Id: Type Design Update (no product issued – Form 31A approval only) Other	
<b>10.4 Additional Comments:</b>		
<b>Date</b>	<b>Name / Position</b>	<b>Signature</b>



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**  
**Application for Approval of Major Repair Design**

MSTAR Form 31B

## Guidance

These guidelines are designed to assist organisations in the completion of a Malaysian State Technical Airworthiness Regulation (MSTAR) Form 31B for Approval of Major Repair Design under MSTAR 21 Subpart M (Repairs).

Acceptable Means of Compliance and further Guidance Material is available within the relevant Subparts of the MSTAR and on the DGTA webpage which may assist with the application process.

### About this form and application process

This MSTAR Form 31B is the official MSTAR application form to obtain Approval of a Major Repair Design under MSTAR 21.A.437(a). This form is the final step in the application process and should be submitted in an application pack with the appropriate supporting evidence. In accordance with MSTAR 21.A.33(d) the DGTA may request additional information from the applicant to support approval of this application.

Approval of this form (in its entirety) will constitute a DGTA Major Repair approval Instrument in accordance with MSTAR 21 Subpart M, MSTAR 21.A.437(a).

### Withdrawal of Application

An application can be withdrawn in writing at any time.

### Privacy Policy

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law. DGTA will safeguard personal information however, please be aware that DGTA policy is to publish approved artefacts, ie STCs and Type Certificate Data Sheets, on its website.

### Form Submission

Applicants are to complete and sign the form electronically and submit to the relevant AAER - TAR desk officer by email.

A list of desk officers is available in the [DGTA Directory](#). Applicants to request the relevant AAER - TAR Desk Officer's contact details from their point of contact at the relevant MAO.



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**  
**Application for Approval of Major Repair Design**

MSTAR Form 31B

## Application

<b>1. Applicant Information</b> <i>(the organisation making the Declaration of Compliance to the TCB requirements)</i>					
<b>1.1 Your Reference</b>	<i>provide a unique identifier</i>				
<b>1.2 Name and Address</b>	Organisation Name				
	DOA No.				
	Street No and Name				
	Suburb		State		Post Code
	Country				
<b>1.3 Contact Person</b>					
	Title / Rank				
	Full Name				
	Position Title				
	Phone				
	Email				
<b>2. Type Certificate Holder Information</b>					
<b>2.1 Name and Address</b>	Organisation Name				
	Street No and Name				
	Suburb		State		Post Code
<b>2.2 Contact Person</b>					
	Title / Rank				
	Full Name				
	Position Title				
	Phone				
	Email				
<b>3. Identification of Activity</b>					
Includes amendments / supplements to approved parts of the Aircraft Flight Manual					
<b>3.1 Affected System Categories</b> <i>(select all that apply)</i>					
Structures Propulsion Systems			Other (please specify)		
<b>3.2 Amendments / Supplements to the approved parts of ICA</b> <i>(select all that apply – includes limitations related to Repairs)</i>					
CMR (Certification Maintenance Requirement) CDCCL (Critical Design and Configuration Control Limitations)			AwL (Airworthiness Limitation) Other (please specify) Nil		

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**  
**Application for Approval of Major Repair Design**

MSTAR Form 31B

<b>4. Product Identification</b>	
<b>4.1 Applicability</b>	Type Certificate No.
	Platform Name
	Model(s)
	Tail No(s) <i>(if applicable)</i>
	Part No(s) <i>(if applicable)</i>
	Serial No(s) <i>(if applicable)</i>
<b>5. Design Details</b>	
<b>5.1 Title</b> <i>(limit 40 characters)</i>	
<b>5.2 Purpose</b>	
<b>5.3 Certification Programme</b>	
<b>Reference:</b>	Submitted as part of this Application <i>(For Major Repairs, Certification Programmes can be submitted as part of this application where they are deemed simple and meet the criteria detailed in AMC 21.A.97 and therefore have not received prior approval from the Authority. Refer to AMC 21.A.97 for further guidance.)</i>
<b>Reference:</b>	
	Previously submitted
<b>5.4 Damage description</b>	
<b>5.5 Reporting source</b>	
<b>5.6 Damaged Part No(s)</b> <i>(include source document/s)</i>	
<b>5.7 Affected areas</b> <i>(including manual references and location references – ie BL, FS, WL)</i>	
<b>5.8 Justification</b> <i>(cite here any substantiation data that will be provided with this submission)</i>	
<b>5.9 Compatibility of repair design with ADF configuration, role and environment</b>	
<b>5.10 Repair description</b>	

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**  
**Application for Approval of Major Repair Design**

MSTAR Form 31B

**6. MSTAR 21 demonstration of eligibility**
**This application is:**

Within the current approved scope of work of the applicant's DOA.

Undertaken by a non-DOA holder or outside the scope of the applicant's DOA on behalf of the holder of the Malaysian State Type Certificate, Restricted Malaysian State Type Certificate or Supplemental Type Certificate (as per MSTAR 21.A.2).

Name

DOA No.

Undertaken by an organisation other than the applicant for, or holder of, a certificate (as per MSTAR 21.A.2).

Name

DOA No.

Following an application for Design Organisation Approval (**MSTAR Form 80**) or Alternative Procedures to Design Organisation Approval (**MSTAR Form 81**).

Application Date

Project No.

Following an application for a change to the scope of work via **MSTAR Form 81** or **MSTAR Form 82**.

Application Date

Project No.

Without DOA

**7. Applicant declarations**

**7.1 Declaration of Compliance** (select the applicable declaration. To be completed by the Head of Design / Authorised Representative or equivalent Representative of the Applicant Organisation)

The above declaration is made on the basis of:

Date	Name / Position	Signature

**7.2 Declaration of Completion** (to be completed by the Authorised Representative of the Applicant Organisation, eg Chief of the Office of Airworthiness or Head of Design)

I declare that the information provided on this form is true and correct.

I understand and accept the requirements for DGTA to proceed with this application and I have supplied all supporting documentation to DGTA.

Date	Name / Position	Signature



<b>DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)</b> <b>Application for Approval of Major Repair Design</b>	MSTAR Form 31B
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**8. Malaysian State Type Certificate holder**

**8.1 MSTC holder declaration** *(to be completed by the identified MSTC holder)*

<b>Date</b>	<b>Name / Position</b>	<b>Signature</b>

**9. DGTA USE ONLY**

**9.1 Record Objective ID:**

**9.2 Major Repair Application:**

Application Approved	Application Requires Resubmit	Application NOT Approved
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**9.3 Additional Comments:**

<b>Date</b>	<b>Name / Position</b>	<b>Signature</b>



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**

MSTAR Form 32

## Application for Approval of Minor Change / Minor Repair Design

### Guidance

These guidelines are designed to assist you to complete the MSTAR Form 32 for Approval of Minor Change / Minor Repair Design under Malaysian State Technical Airworthiness Regulation (MSTAR) 21.A.93 or MSTAR 21.A.437(a) respectively.

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the DGTA website and will assist with the application process.

#### About this form and application process

##### **Application Process**

Completing this application form is the first step in the application process. Once received, DGTA will review your application including all supporting documentation provided.

**NOTE:** DGTA may not consider an application or cease to consider it further while the applicant has not complied with all MSTAR requirements.

##### **MSTAR Form 32**

This MSTAR Form 32 is the official DGTA form to apply for Approval of a Minor Change / Minor Repair Design under MSTAR 21.A.95 or MSTAR 21.A.437(a) respectively. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application.

#### Withdrawal of Application

An application can be withdrawn in writing at any time.

#### Privacy Policy

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law. DGTA will safeguard personal information however, please be aware that DGTA policy is to publish approvals on its website.

#### Required Information

**Minor Change to Type Design:** MSTAR 21.A.95 – The applicant must submit to the Authority the substantiation data for the change demonstrating that the change and areas affected by the change comply with the type-certification basis.

**Minor Repair Design:** MSTAR AMC 21.A.433(a) – The applicant should supply the Authority relevant substantiation data associated with the repair including damage identification and source, and repair drawings and/or instructions and scheme identifier.

#### Form Submission

Applicants are to complete and sign the application form electronically and submit via email to:

- **Minor Changes:** the relevant DGTA - AAER desk officer.
- **Minor Repairs:** the relevant DGTA - AAER desk officer.



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**

MSTAR Form 32

**Application for Approval of Minor Change / Minor Repair Design**

**Application**

<b>1. Applicant's Reference</b>					
<b>1.1 Your Reference</b>					
<b>2. Applicant Address and Contact Details</b>					
<b>2.1 Name and Address</b>					
	Organisation Name				
	Street No and Name				
	Suburb		State		Post Code
	Country				
<b>2.2 Contact Person</b>	Title/Rank				
	Full Name				
	Position Title				
	Phone				
	Email				
<b>3. Identification of Activity</b>					
<b>Category</b>	<b>Applicable products</b> <i>(list all)</i>			<b>Design disciplines required</b>	
<b>3.1</b> Type Certificate applicant or holder	NOT USED			NOT USED	
<b>3.2</b> Minor Change				Aerodynamics Structural Mechanical Propulsion Systems Electrical Software Armament Safety Systems	
<b>3.3</b> Minor Repair Design				Aerodynamics Structural Mechanical Propulsion Systems Electrical Software Armament Safety Systems	
Including changes to approved parts of the Flight Manual (FM)      Yes      No					

**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)**

MSTAR Form 32

**Application for Approval of Minor Change / Minor Repair Design**

<b>4. Product Identification</b>		
<b>4.1 Applicability</b>	Type Certificate Number	
	Type Certificate Holder	
	Type Name	
	Model(s)	
	Tail No(s) (if applicable)	
	Part No(s) (if applicable)	
	Serial No(s) (if applicable)	
<b>4.2 Type Certificate Baseline</b>		
<b>5. Original Approval (if applicable)</b>		
<b>5.1 MSTAR Approval MSTC</b>	Approval Number:	
	Issued by:	
	Issued on:	
<b>5.2 Third Country Approval / Project No: (prior relevant type certification)</b>	Approval Number:	
<b>6. Description</b>		
<b>6.1 Title</b>		
<b>6.2 Description</b>		
<b>6.3 Affected Areas (including manual references and location references – ie BL,FS, WL etc.)</b>		
<b>6.4 Re-Investigations (if applicable)</b>		

<b>DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)</b>	MSTAR Form 32
<b>Application for Approval of Minor Change / Minor Repair Design</b>	

<b>7. Applicant's declaration</b> <i>(to be completed by the Chief Executive or equivalent)</i>		
Declaration I declare that the information provided on this form is true and correct  I understand and accept that for DGTA to proceed with this application, I have supplied all supporting documentation to DGTA		
Date	Name / Position	Signature
<b>8. DGTA USE ONLY</b>		
<b>8.1 Record Objective ID:</b>		
<b>8.2 Design Organisation Approval application:</b>		
Application Approved	Application Requires Resubmit	Application NOT Approved
<b>8.3 Additional Comments:</b>		
Date	Name / Position	Signature



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

MSTAR Form 34

## Application for Technical Standard Order Authorisation

### Guidance

These guidelines are designed to assist you to complete the MSTAR Form 34 for approval as a Technical Standard Order (TSO) Authorisation under Malaysian State Technical Airworthiness Regulation (MSTAR) 21, Subpart O.

#### **IMPORTANT**

**It is the applicant's responsibility to apply for DGTA approval only if they have a requirement for the approval and can demonstrate compliance with all the relevant regulatory requirements.**

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the Directorate General Technical Airworthiness (DGTA) website and will assist with the application process.

#### **About this form and application process Application Process**

Completing this application form is the first step in the application process. Once received, DGTA will review your application including all supporting documentation provided.

**Applicants are to complete and sign of this application form and submit to the DGTA.**

**NOTE:** DGTA may not consider an application or cease to consider it further while the applicant has not complied with all MSTAR requirements.

#### **MSTAR Form 34**

This MSTAR Form 34 is the official DGTA form to apply for Technical Standard Order (TSO) Authorisation under MSTAR 21 Subpart O. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application.

#### **Withdrawal of Application**

An application can be withdrawn in writing at any time.

#### **Section 1-2: Applicant Information**

**Applicant's Reference.** Please provide a brief, unique identifier that will be used to refer to your application.

**Organisation Name.** Please fill in here exactly as you wish your organisation's name to appear on the Technical Standard Order (TSO) Authorisation certificate and Limitations.

**Organisation Address.** Enter your organisation's main physical address. If the TSO Authorisation certificate is to be delivered elsewhere (e.g. a PO Box), please indicate this in the postal address section below.

**Contact person and contact details.** Please provide an individual's name and contact details through which DGTA can direct all correspondence regarding the application and assessment process of the TSO.

#### **Section 3-7 – TSO Identification**

Please identify the applicable activity.

**Minor Changes.** Please complete the approval number and issue and issue date in case of Minor change to approved equipment. Describe briefly the Minor change to approved equipment if applicable.



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

MSTAR Form 34

**Product Identification.** Please enter the Type/Model name as it should appear on the TSO certificate. Provide a description for the Type/Model with Part Number(s).

**Certification Basis.** Please enter the TSO standard. Indicate whether the application includes deviations and make reference to the document explaining the compensating factors or the design features providing an equivalent level of safety or state "None" if the equipment is fully compliant with the requirements.

**Data Requirements.** Enter the POA number according to MSTAR 21 subpart G. Enter any additional information you think is necessary for your application for example providing MSTAR Form DDP (Declaration of Design and Performance).

**MSTAR 21 Demonstration of eligibility.** Please select one of the four options and indicate the date of application and the MSTAR reference DOA as applicable.

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### Privacy Policy

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law. DGTA will safeguard personal information however, please be aware that DGTA policy is to publish approvals on its website.

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### Form Submission

Submit the application to DGTA.

NOTE: If there is insufficient space in any of the fields, please attach additional information to this form.



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

MSTAR Form 34

## Application for Technical Standard Order Authorisation

### Application

<b>1. Applicant's Reference</b>					
<b>1.1 Your Reference</b>					
<b>2. Applicant Address and Contact Data</b>					
<b>2.1 Applicant Data</b>					
<b>2.1.1 Name and Address</b>	Organisation Name				
	Street No and Name				
	Suburb		State		Post Code
	Country				
<b>2.1.2 Contact Person</b>	Title/Rank				
	Full Name				
	Position Title				
	Phone				
	Email				
<b>2.1.3 Postal Address</b> <i>(if different from above)</i>	Street No and Name				
	Suburb		State		Post Code
	Country				
<b>3.0 Identification of Activity</b>					
<b>3.1 Application Type</b>	<input type="checkbox"/> Initial Approval of Equipment <input type="checkbox"/> Minor Change to approved equipment which requires a change of the TSO* (→ please complete 3.2 and 3.3)				
*Note: Minor Changes to approved equipment will be charged the applicable fee for administrative re-issuance.					
<b>3.2 Approval N°</b> <i>(Only complete in case of Minor change to approved equipment)</i>				Issued on: dd/mm/yyyy	
<b>3.3 Description of Minor Change</b> <i>(Only complete in case of Minor change to approved equipment)</i>					





DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

MSTAR Form 34

<b>4. Product Identification</b>			
<b>4.1 Type/ Model</b>			
<b>4.2 Description</b>			
<b>4.3 Part Number(s)</b>			
<b>5. Certification Basis</b>			
<b>5.1 TSO</b>			
<b>5.2 Deviations</b>		<input type="checkbox"/> None	<input type="checkbox"/> Deviations (→ please specify below)
<b>6. Data Requirements</b>			
<b>6.1 Demonstration for Capability for Production</b> (if applicable)			
<b>6.2 Remarks</b> (e.g. DDP in process)			
<b>7. MSTAR 21 demonstration of capability</b>			
I declare that this application is: <i>(select one of the four options)</i>			
<input type="checkbox"/>	Within the current approved scope of work of the applicant's DOA.		
<input type="checkbox"/>	Following an application for Military Design Organisation Approval (MSTAR Form 80) or Alternative Procedures to Design Organisation Approval (MSTAR Form 81).	Application Date	
		Project N°	
<input type="checkbox"/>	Following an application for a change to the scope of work via MSTAR Form 81 or MSTAR Form 82.	Application Date	
		Project N°	If Known
<input type="checkbox"/>	Inclusive of the design procedures required by <b>MSTAR 21.A.602B</b> .		
<b>8. Outline of Additional Data Requirements</b>			
<b>8.1 Submission Checklist</b>			
Please confirm that the following information is included as part of your application:			
<input type="checkbox"/>	All applicable procedures required by MSTAR 21.A.602B, DGTA Form DDP and data required by the TSO standard		
<input type="checkbox"/>	Compliance Checklist/Cross-Reference Matrix		
<b>Note:</b> Additional information about your design/production organisation may be sought at a later stage.			



DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS (DGTA)  
c/o SUBANG AIRBASE  
40000 SHAH ALAM

MSTAR Form 34

<b>9. Applicant's declaration</b> <i>(to be completed by the Chief Executive)</i>		
Declaration		
<input type="checkbox"/> I declare that the information provided on this form is correct and complete.		
<input type="checkbox"/> I understand and accept that for DGTA to proceed with this application, I have supplied all supporting documentation to DGTA.		
Date	Name/Position	Signature
<b>10. DGTA USE ONLY</b>		
<b>10.1 Record Objective ID</b>		
<b>10.2 Fast Track Reference</b>		
<b>10.3 Review of Technical Standard Order Authorisation</b>		
<input type="checkbox"/> Approved <input type="checkbox"/> Requires Resubmit <input type="checkbox"/> Not Approved	Comments	
Certificate Number		
<b>10.4 Terms of Approval Agreed</b>		
<input checked="" type="radio"/> Yes <input type="radio"/> No	Comments	
Date	Name/Position	Signature



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**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS**

MSTAR Form 50

## Application for Production Organisation Approval

### Guidance

These guidelines are designed to assist you to complete the MSTAR Form 50 for approval of a Production Organisation under Malaysian State Technical Airworthiness Regulation (MSTAR) 21, Subpart G.

#### **IMPORTANT**

**It is the applicant's responsibility to apply for DGTA approval only if they have a requirement for the approval and can demonstrate compliance with all the relevant regulatory requirements.**

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the DGTA website and will assist with the application process.

#### **About this form and application process**

##### **Application Process**

Completing this application form is the first step in the application process. Once received, DASA will review your application including all supporting documentation provided.

**Applicants are to complete and sign a PDF version of this application form electronically and by selecting the 'Submit Form' button in Section 7 of this application.**

**NOTE:** DGTA may not consider an application or cease to consider it further while the applicant has not complied with all DGTA requirements.

##### **MSTAR Form 50**

This MSTAR Form 50 is the official DGTA form to apply for approval of a Production Organisation under MSTAR 21, Subpart G. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application. Supporting documentation can be added to this Form. To add supporting documentation, select the "Add documents button" at the bottom of this application Form and follow the instructions.

#### **1.1 Your Reference:**

Please provide a **unique** internal reference to this application. This reference will be used as an identifier of your application in all communication by DGTA.

#### **2.1.1 Name and Location:**

Please enter the full **name and location** as it appears on the Business Registration or similar legal document stating name and seat (location of the headquarters) of the company. If applicable also enter the Trade Name, Doing-business-as and the Company registration number.

Please enter the address of the registered office as it appears on the Business Registration or similar legal document. In case the applicant is not a company but natural person, please enter the address at which you are registered.

First time applicants need to submit a copy of the company's **Business Registration** or similar legal document stating name and seat (location of the headquarters) of the company together with the application.

#### **2.1.2 Contact Person:**

The name and contact details of the person with whom DGTA should liaise with respect to matters pertaining to this

#### **3. Brief summary of proposed activities at the Block 2.1.1 addresses:**

This Block must include further details of the activities under the approval for the addresses indicated in Block 2.1.1.

**Section – 3.1 - General:** must include overall information. **Section 3.2 - Scope of approval:** must address the principles laid down in the GM MSTAR 21.A.151. **Section 3.3 - Nature of privileges:** must indicate the requested privileges as defined in MSTAR 21.A.163(b) to 21.A.163(e). For an application for renewal state 'NOT Applicable'.

**Application for Production Organisation Approval****4. Description of Organisation:**

This section 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 MSTAR 21.A.145(c)(2) must be included as far as possible, accompanied by the corresponding MSTAR Forms 4.

For an application for renewal state 'not applicable'

**5. Links/arrangements with design approval holder(s)/design organisation(s) where different from Block 1:**

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 section either directly or by reference to supporting documentation in relation to the requirements of MSTAR 21.A.133(b) and (c) and the AMC MSTAR 21.A.133(b) and (c).

**6. Approximate number of staff engaged or intended to be engaged in the activities:**

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 section either directly or by reference to supporting documentation in relation to the requirements of MSTAR 21.A.133(b) and (c) and the AMC MSTAR 21.A.133(b) and (c).

**Privacy Policy**

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law. DTA will safeguard personal information however, please be aware that DGTA policy is to publish approvals on its website.

**Form Submission**

Submit the electronic application to DGTA by email by selecting the 'Submit' button below section 7 of this application Form. **NOTE:** If there is insufficient space in any of the fields, please attach additional information to this form.



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**DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS**

MSTARForm 50

## Application for Production Organisation Approval

### Application

<b>1. Applicant's Reference</b>		
1.1 Your Reference:		
<b>2. Applicant Address and Contact Details</b>		
<b>2.1 Applicant Data</b>		
<b>2.1.1 Prime location for which approval is sought:</b> (If more than one facility is to be used, attach details of other facilities)	(Company) Name	
	Street / No	
	Post Code	
	City	
	Country	
<b>2.1.2 Contact Person:</b> (responsible for this application)	Title / Rank	
	Surname	
	First name	
	Job title	
	Phone	
	Email	
<b>3. Brief Summary of activities at the Block 2.1.1 address</b>		
<b>3.1 General:</b>		
<b>3.2 Scope of Approval:</b>		
<b>3.3 Nature of Privileges:</b>		

**Application for Production Organisation Approval**

**4. Description of Organisation**

--

**5. Links/arrangements with design approval holder(s)/design organisation(s) where different from Block 2:**

--

**6. Approximate number of staff engaged or intended to be engaged in the activities:**

--

**7. Applicant's declaration**

I declare that I have the legal capacity to submit this application to the DGTA and that all information provided in this application form is correct and complete.

Date	Title and Name	Accountable Manager Signature

**Important NOTE:** DGTA cannot accept applications without a signature. Please make sure that you sign the application.

<b>DIRECTORATE GENERAL TECHNICAL AIRWORTHINESS</b>	MSTAR Form 50
<b>Application for Production Organisation Approval</b>	

<b>8. DGTA USE ONLY</b>		
<b>8.1 Record Objective ID:</b>		
<b>8.2 Production Organisation Approval application:</b>		
<b>8.2.1 Application Approval</b>	<input type="checkbox"/> Application Approved	<input type="checkbox"/> Application Not Approved
<b>8.3 Output Documentation:</b>	<input type="checkbox"/> POE:	
	<input type="checkbox"/> Form 55:	
	<input type="checkbox"/> Other:	
<b>8.4 Additional Comments:</b>		
Date	Title and Name	Signature



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MSTAR Form 51

## Application for Significant Changes or Variation of Scope and Terms of MSTAR 21 Production Organisation Approval

### Guidance

These guidelines are designed to assist you to complete the MSTAR Form 51 –Application for significant changes or variation of scope and terms of MSTAR 21 Production Organisation Approval.

#### **IMPORTANT**

#### **About this form and application process**

##### **Name and address of the POA holder**

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, eg by a copy of the entry in the register of commerce.

##### **Approval reference number (if different)**

State the current approval reference number.

##### **Locations for which changes in the terms of approval are requested**

State the locations for which changes in the terms of approval are requested or state 'not applicable' if no change is to be anticipated here.

##### **Brief summary of proposed changes of the activities at the Block 3 addresses**

This Block should include further details for the variation of the scope of approval for the addresses indicated in Block 3. The Block 4(a) 'General' must include overall information for the change (including changes, eg in workforce, facilities, while the Block 4(b) 'Scope of approval' must address the change in the scope of work and products/ categories following the principles laid down in the MSTAR GM 21.A.151. The Block 4(c) 'Nature of privileges' must indicate a change in the privileges as defined in MSTAR 21.A.163 (b) to (d). State 'Not Applicable' if no change is anticipated here.

##### **Description of organisational changes**

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 MSTAR 21.A.145(c)(1) or a change in the nomination of the responsible managers in accordance with MSTAR 21.A.145(c)(2). A change in the nomination of responsible managers must be accompanied by the corresponding MSTAR Form 4. State 'Not Applicable' if no change is anticipated here.

##### **Position and name of the Accountable Manager or nominee:**

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 'Not Applicable' if no change is anticipated here. In case of an application for a change of the Accountable Manager the MSTAR Form 51 must be signed by the new nominee for this position. In all other cases the MSTAR Form 51 must be signed by the Accountable Manager.





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MSTAR Form 51

## Application for Significant Changes or Variation of Scope and Terms of MSTAR 21 Production Organisation Approval

### Application

<b>1. Name and address of production organisation approval holder:</b>		
<b>Name</b>		
<b>Address</b>		
<b>Email</b>		
<b>2. Approval reference number:</b>		
<b>Reference number</b>		
<b>3. Location(s) for which change in terms of approval are requested:</b>		
<b>Location 1</b>		
<b>Location 2</b>		
<b>4. Brief summary of proposed changes to the activities at Block 3 addresses:</b>		
<b>a) General</b>		
<b>b) Scope of approval</b>		
<b>c) Nature of privileges</b>		
<b>5. Description of organisational changes:</b>		
<b>6. Name and position of the Accountable Manager or nominee:</b>		
<b>Name</b>	<b>Position</b>	<b>Signature</b>



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MSTAR Form 52

### MSTAR Form 52 – Aircraft Statement of Conformity

AIRCRAFT STATEMENT OF CONFORMITY		
1. State of Manufacture	2. [participating Member State]	3. Statement Ref No:
4. Organisation		
5. Aircraft Type	6. Type Certificate Refs	
7. Aircraft Registration or Mark	8. Manufacturer's Identification No	
9. Engine/Propeller Details <sup>(1)</sup>		
10. Modifications and/or Service Bulletins (or national equivalents) <sup>(1)</sup>		
11. Airworthiness Directives (or national equivalents)		
12. Concessions <sup>(2)</sup>		
13. Exemptions, Waivers or Derogations <sup>(3)</sup>		
14. Remarks		
15. Certificate of Airworthiness		
16. Additional Requirements		
17. Statement of Conformity		
<p>It is hereby certified that this aircraft confirms fully to the Type Certificated design and to the items above in boxes 9, 10, 11, 12 and 13.</p> <p>The aircraft is in a condition for safe operation.</p> <p>The aircraft has been satisfactorily tested in flight.</p>		
18. Signed	19. Name	20. Date (dd/mm/yyyy)
21. Production Organisation Approval Reference		

(1) Delete as applicable

(2) Concession: Authorisation to use or release a product that does not conform to specified requirements. A concession is generally limited to the delivery of a product that has nonconforming characteristics within specified limits for an agreed time or quantity of that product.

(3) Exemptions, Waivers or Derogations: Authorisation to depart from the originally specified requirements of a product prior to realization. A deviation permit is generally given for a limited quantity of product or period of time, and for a specific use.



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MSTAR Form 52

## Instructions for the use of the Aircraft Statement of Conformity MSTAR Form 52

### 1. Purpose and scope

1.1. Use of the aircraft Statement of Conformity issued by a manufacturer producing under MSTAR 21 Section A Subpart F is described under MSTAR 21.A.130 and the corresponding Acceptable Means of Compliance.

1.2. The purpose of the aircraft Statement of Conformity (MSTAR Form 52) issued under MSTAR 21 Section A Subpart G is to enable the holder of an appropriate production organisation approval to exercise the privilege to obtain an individual aircraft certificate of airworthiness from the National Military Airworthiness Authority (NMAA) of the participating Member State of registry.

### 2. General

2.1. 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 unrecognizable. If in doubt consult the NMAA.

2.2. 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.

2.3. Completion may be either machine/computer printed or hand-written using block letters to permit easy reading. English, and where relevant one or more of the official language(s) of the issuing participating Member State, are acceptable.

2.4. A copy of the Statement and all referenced attachments are to be retained by the approved production organisation.

### 3. Completion of the Statement of Conformity by the originator

3.1. There should be an entry in all blocks to make the document a valid statement.

3.2. A Statement of Conformity may not be issued to the NMAA of the participating Member State of registry unless the design of the aircraft and its installed products are approved.

3.3. The information required in Blocks 9, 10, 11, 12, and 14 may be by reference to separate identified documents held on file by the production organisation, unless the NMAA agrees otherwise.

3.4. This Statement of Conformity is not intended to include those items of equipment that may be required to be fitted in order to satisfy 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 State of Manufacture

Enter name of the State of manufacture.



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#### Block 2 participating Member State

The NMAA under which authority the Statement of Conformity is issued.

#### Block 3 Statement Ref No

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 Organisation

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

#### Block 5 Aircraft Type

The aircraft type in full as defined in the Type Certificate and its associated data sheet.

#### Block 6 Type Certificate Refs

The Type Certificate reference numbers and issue for the subject aircraft.

#### Block 7 Aircraft Registration or Mark

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 NMAA of the participating Member State and, if applicable, by the NMAA of a third country.

#### Block 8 Manufacturer's Identification Number

The identification number assigned by the manufacturer for control and traceability and product support. This is sometimes referred to as a Manufacturers Serial Number or Constructors Number.

#### Block 9 Engine/Propeller Details

The full identification of the engine or propeller type(s) in full as defined in the relevant Type Certificate and its associated data sheet. Their manufacturer identification number and associated location should also be shown.

#### Block 10 Modifications and/or Service Bulletins (or national equivalents)

The identification of the approved design changes to the aircraft definition.

#### Block 11 Airworthiness Directives (or national equivalents)

A listing of all applicable Airworthiness Directives (or national equivalent) and a declaration of compliance, together with a description of the method of compliance on the subject individual aircraft including products and installed



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parts, appliances and equipment. Any future compliance requirement time should be shown.

#### Block 12 Concessions

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

#### Block 13 Exemptions, Waivers or Derogations

Only agreed exemptions, waivers or derogations may be included here and should be marked 'Not Used' if there are no exemptions, waivers or derogations.

#### 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 Certificate of Airworthiness

Enter 'Certificate of Airworthiness', or 'Restricted Certificate of Airworthiness', or for the Certificate of Airworthiness requested.

#### Block 16 Additional Requirements

Additional requirements such as those notified by an importing country should be noted in this block.

#### Block 17 Statement of conformity

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 POA holder. 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 defined under the control of the quality system, as established by MSTAR 21.A.139 in particular MSTAR 21.A.139(b)(1)(vi), to ensure that the aircraft conforms with 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 POA holder.

#### Block 18 Signed

The Statement of Conformity may be signed by the person authorised to do so by the production approval holder in accordance with MSTAR 21.A.145(d). A rubber stamp signature should not be used.

#### Block 19 Name

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



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Block 20 Date

The date the Statement of Conformity is signed should be given.

Block 21 Production Organisation Approval Reference the NMAA approval reference should be quoted.





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MSTAR Form 55

**MSTAR Form 55 – Production Organisation Approval Certificate**

[participating Member State]

**PRODUCTION ORGANISATION APPROVAL CERTIFICATE**

Reference: [participating Member State Code].21G.XXXX

Pursuant to national regulation and subject to the conditions specified below, the NMAA hereby certifies

[COMPANY NAME AND ADDRESS]

as a production organisation in compliance with MSTAR 21, Section A, Subpart G, approved to produce products, parts and appliances listed in the attached approval schedule and issue related certificates using the above references.

CONDITIONS:

1. This approval is limited to that specified in the enclosed terms of approval, and
2. This approval requires compliance with the procedures specified in the approved production organisation exposition, and
3. This approval is valid whilst the approved production organisation remains in compliance with MSTAR 21.
4. Subject to compliance with the foregoing conditions, this approval shall remain valid for an unlimited duration unless the approval has previously been surrendered, superseded, suspended or revoked.

Date of original issue:

Date of this revision:

Revision No:

Signed: .....

For the NMAA:





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MSTAR Form 55

[participating Member State]	<b>Terms of Approval</b>	TA: [participating Member State Code].21G.XXXX
<p>This document is part of Production Organisation Approval Number [participating Member State Code].21G.XXXX issued to:</p> <p>Company name:</p>		
Section 1. <b>SCOPE OF WORK:</b>		
PRODUCTION OF	PRODUCTS/CATEGORIES	
For details and limitations refer to the Production Organisation Exposition, Section xxx		
Section 2. <b>LOCATIONS:</b>		
Section 3. <b>PRIVILEGES:</b>		
<p>The Production Organisation is entitled to exercise, within its Terms of Approval and in accordance with the procedures of its Production Organisation Exposition, the privileges set forth in MSTAR 21.A.163. Subject to the following:</p> <p><i>[keep only applicable text]</i></p> <p>Prior to approval of the design of the product an MSTAR Form 1 may be issued only for conformity purposes.</p> <p>A Statement of Conformity may not be issued for a non-approved aircraft</p> <p>Maintenance may be performed, until compliance with maintenance regulations is required, in accordance with the Production Organisation Exposition Section xxx</p> <p>Permits to Fly may be issued in accordance with the Production Organisation Exposition Section yyy</p>		
Date of original issue:	Signed:	
Date of this revision:		
Revision No.:	For NMAA	



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MSTAR Form 80

## Guidance of Application for Design Organisation Approval (DOA)

These guidelines are designed to assist you to complete the MSTAR Form 80 for approval as a Design Organisation under Malaysian State Airworthiness Regulation (MSTAR) 21, Subpart J.

### **IMPORTANT**

**It is the applicant's responsibility to apply for MSTAR 21, Subpart J if they already have a formal instrument and can demonstrate compliance with all the relevant regulatory requirements.**

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the DGTA website and will assist with the application process.

---

### **Application Process**

Completing this application form is the first step in the application process. Once received, DGTA will review your application including all supporting documentation provided.

Applicants are to complete this application form and submit to the DGTA.

This MSTAR Form 80 is the official DGTA form to apply for approval as a Design Organisation (DOA) under MSTAR 21 Subpart J. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application.

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### **Withdrawal of Application**

An application can be withdrawn in writing at any time.

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### **Section 1-2: Applicant Information**

**Applicant's Reference.** Please provide a brief, unique identifier that will be used to refer to your application.

**Organisation Name.** Please fill in here exactly as you wish your organisation's name to appear on the Design Organisation Approval (DOA) certificate and Terms of Approval (ToA).

**Organisation Address.** Your organisation's main physical address. If the DOA certificate is to be delivered elsewhere, please indicate this in the postal address section below.

**Contact person and contact details.** Please provide an individual's name and contact details through which DGTA can direct all correspondence regarding the application and assessment process of the DOA.

**Reason for application.** Please provide a brief explanation as to why a DOA is sought.



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MSTAR Form 80

### **Section 3-5 – Proposed Terms of Approval**

**Scope of design work.** Please provide details of the categories of design work to be carried out, the platform upon which it will be conducted and the design disciplines required. If approved, this information will form a large part of the Terms of Approval (ToA) for the DOA. The numbering in brackets refers to the equivalent Category for Scope of Design used by the European Aviation Safety Agency (EASA) on their Form 80 and is retained for reference.

**Privileges.** Please tick all privileges being sought as part of the application. Further information regarding privileges can be found at MSTAR 21.A.263.

**Limitations.** Please list any limitations to the scope of design work sought in Section 3.

---

### **Section 7-8 – Additional Information**

**Other Information.** Please list details of any other information relevant to this application.

**Other Approvals held from NAAs or NMAAs.** Please provide details of all organisational approvals held under MSTAR, another National Military Airworthiness Authority (NMAA) or National (civil) Airworthiness Authority (NAA).

**Submission Checklist.** Please ensure that all the listed forms and documents are submitted as part of this application. A compliance checklist is a cross reference matrix that provides references as to how the organisation claims compliance against all of the applicable MSTAR 21 requirements given the requested Terms of Approval.

**MSTAR Form 4 Holder Applications.** Please ensure that all MSTAR Form 4 Holder applications related to this organisational approval accompany this application.

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### **Privacy Policy**

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law.

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MSTAR Form 80

## Application for Design Organisation Approval (DOA)

<b>1. Applicant's Reference</b>		
<b>1.1 Your Reference</b>		
<b>2. Applicant Address and Contact Data</b>		
<b>2.1 Applicant Data</b>		
<b>2.1.1 Name and Address</b>		
<b>2.1.2 Contact Person</b>	Title/Rank	
	Full Name	
	Position Title	
	Phone	
	Email	
<b>2.1.3 Postal Address</b> <i>(if different from above)</i>		
<b>2.2 Reason for Application</b>		
<b>3. Scope of design work (tick all that apply)</b>		
Category	Applicable products <i>(list all)</i>	Design disciplines required
<b>3.1</b> <input type="checkbox"/> (1A/1B/1C) Type Certificate applicant or holder	Not Used	Not Used
<b>3.2</b> <input type="checkbox"/> (2A/B) Major Changes/STC		<input type="checkbox"/> Aerodynamics <input type="checkbox"/> Electrical <input type="checkbox"/> Structural <input type="checkbox"/> Software <input type="checkbox"/> Mechanical <input type="checkbox"/> Armament <input type="checkbox"/> Avionics <input type="checkbox"/> System Safety
<b>3.3</b> <input type="checkbox"/> (2A/B) Major Repair Design		<input type="checkbox"/> Aerodynamics <input type="checkbox"/> Electrical <input type="checkbox"/> Structural <input type="checkbox"/> Software <input type="checkbox"/> Mechanical <input type="checkbox"/> Armament <input type="checkbox"/> Avionics <input type="checkbox"/> System Safety
<b>3.3</b> <input type="checkbox"/> (3A/B) Minor Changes		<input type="checkbox"/> Aerodynamics <input type="checkbox"/> Electrical <input type="checkbox"/> Structural <input type="checkbox"/> Software <input type="checkbox"/> Mechanical <input type="checkbox"/> Armament <input type="checkbox"/> Avionics <input type="checkbox"/> System Safety



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<b>3.4 <input type="checkbox"/> (3A/B)</b> Minor Repair Design		<input type="checkbox"/> Aerodynamics <input type="checkbox"/> Structural <input type="checkbox"/> Mechanical <input type="checkbox"/> Avionics	<input type="checkbox"/> Electrical <input type="checkbox"/> Software <input type="checkbox"/> Armament <input type="checkbox"/> System Safety
<b>3.5 <input type="checkbox"/> (1B/1C)</b> TSO Authorisation (for APU only)		N/A	

#### 4. Privileges *(tick all that apply)*

The holder of a design organisation approval shall be entitled, within its terms of approval and under the relevant procedures of the design assurance system to:

- |                          |   |
|--------------------------|---|
| <input type="checkbox"/> | 1. Classify changes to type design and repairs as 'major' or 'minor'.   |
| <input type="checkbox"/> | 2. Approve minor changes to type design and minor repairs.  |
| <input type="checkbox"/> | 3. Issue information or instructions containing the following statement: 'The technical content of this document is approved under the authority of DOA reference MYS.DGTA.21J.[XXXX]'.   |
| <input type="checkbox"/> | 4. Approve documentary changes to the aircraft flight manual and supplements, and issue such changes containing the following statement: 'Revision number: YY to AFM (or supplement) reference: (ZZ), is approved under the authority of MDOA reference MYS.DGTA.21J.[XXXX]'. |
| <input type="checkbox"/> | 5. Approve the design of major repairs to products for which it holds the supplemental type-certificate or fulfils the obligations of the Malaysian State Type Certificate (MSTC) holder on behalf of the Authority.  |

#### 5. Limitations

#### 6. Other Information

#### 7. Other Approvals held from NAAs or NMAAs

#### 8. Outline of Additional Data Requirements

##### 8.1 Submission Checklist

Please confirm that the following information is included as part of your application:

- |                          |   |
|--------------------------|---|
| <input type="checkbox"/> | Design Organisation Exposition (DOE)                |
| <input type="checkbox"/> | All relevant plans/procedures referenced in the DOE |
| <input type="checkbox"/> | Compliance Checklist/Cross-Reference Matrix         |

##### 8.2 MSTAR Form 4 Holder Applications

Please confirm that this application is accompanied by related MSTAR Form 4 Holder applications?

- |                          |                                  |
|--------------------------|----------------------------------|
| <input type="checkbox"/> | Head of Design Organisation      |
| <input type="checkbox"/> | Chief of Office of Airworthiness |



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<input type="checkbox"/> Chief of Independent System Monitoring		
<i>Note: Additional information about your design organisation may be sought at a later stage.</i>		
<b>9. Applicant's declaration (to be completed by the Chief Executive)</b>		
Declaration		
<input type="checkbox"/> I declare that the information provided on this form is correct and complete.		
<input type="checkbox"/> I understand and accept that for DGTA to proceed with this application, I have supplied all supporting documentation to DGTA.		
Date	Name/Position	Signature
<b>10. DGTA USE ONLY</b>		
<b>10.1 Review Application of Design Organisation Approval</b>		
<input type="checkbox"/> Approved	Comments	
<input type="checkbox"/> Requires Resubmit		
<input type="checkbox"/> Not Approved		
<b>10.2 Terms of Approval Agreed</b>		
<input type="checkbox"/> Yes	Comments	
<input type="checkbox"/> No		
Date	Name/Position	Signature



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## Guidance of Application for Significant Changes to Design Organisation Approval

These guidelines are designed to assist you to complete the MSTAR Form 82 for approval as a Design Organisation under Malaysian State Airworthiness Regulation (MSTAR) 21, Subpart J.

### **IMPORTANT**

**It is the applicant's responsibility to apply for MSTAR 21, Subpart J if they already have a formal instrument and can demonstrate compliance with all the relevant regulatory requirements.**

Please carefully read this document and any relevant Acceptable Means of Compliance or Guidance Material issued by DGTA. This information is available on the DGTA website and will assist with the application process.

### **Application Process**

Completing this application form is the first step in the application process. Once received, DGTA will review your application including all supporting documentation provided.

Applicants are to complete this application form and submit to the DGTA.

This MSTAR Form 82 is the official DGTA form to apply for approval of significant change to a Design Organisation (DOA) under MSTAR 21 Subpart J. This form is considered part of an application pack and should be submitted with the appropriate evidence to support the application.

**Section 1: Your Reference** - This reference will be used as an identifier of your application in all communication by DGTA.

**Section 2: SAO/Company Name and Contact Person** - Please enter your DGTA Applicant Number. This number follows the pattern MSTAR.21JXXX and can be found on any application acceptance letter received for previous applications.

Please enter the full name of the company as it appears on the Business Registration or similar legal document stating name and seat (location of the headquarters) of the company.

Please enter the address of the registered office as it appears on the Business Registration or similar legal document.

**Section 2.1: Contact Person** - The name and contact details specified in this section are those of the person responsible for the application.

**Section 2.2 & 2.3: Contact Person & Forwarding Address** - The name and address specified in this section is where DGTA will send the original certificate/approval.

**Section 3: Changes to the organisation** - Add description of changes to the organisation (See GM 21A.247). In case of name/address changes or change of ownership, please provide a copy of your company's business registration together with the application.

**Section 3.1: Changes to the scope** - Describe, for each kind of product, the exact nature of new design activities planned to be added under DOA (e.g. "minor changes to large aeroplanes related to installation of avionics equipment"; "STC and minor changes to large and small rotorcraft related to cabin interiors"...).

**Section 3.2: Changes to the list of products** - Indicate new product(s) to be added.

**Section 3.3: Changes to the limitations** - Indicate changes in limitations.



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**Section 3.4: Changes to the number of staff** - The number of staff should be calculated as follows, for all sites involved in design and certification activities under the approval:

<b>All staff involved in:</b>	<b>In addition, for Design subcontractors, the following staff should be counted:</b>
<ul style="list-style-type: none"> <li>• Managing the design organisation</li> <li>• Drawing, calculating, testing, simulating</li> <li>• Producing and verifying compliance documentation</li> <li>• Performing airworthiness office tasks</li> <li>• System monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>• All staff involved in producing compliance documents</li> <li>• All staff involved in verifying compliance documents</li> <li>• All staff involved in airworthiness office tasks</li> <li>• All staff involved in system monitoring.</li> </ul>
<b>Staff not working full time should be counted, with appropriate ratio.</b>	

**Section 4: Other information** - Add information on schedule for Type Certificate, STC or other design approval.

#### **Privacy Policy**

DGTA requires the provision of information as listed in this form. All such information received will be treated as confidential and will not be disclosed to any third parties unless that disclosure is required or authorised by law.





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## Application of Significant Changes to Design Organisation Approval (DOA)

<b>1. Your Reference</b>		
<b>2. Name and Address</b> (SAO/Company)	Applicant DOA Number	
	SAO/Company Name	
	Address	
<b>2.1 Contact Person</b> (Responsible for this application)	Title	<input type="checkbox"/> Mr <input type="checkbox"/> Ms
	Name	
	First name	
	Job title	
	Phone/Fax	
	Email	
<b>2.2 Forwarding Address</b> (may be left blank, if same as 2) (for sending original documents)	SAO/Company Name	
	Address	
<b>2.3. Contact Person</b> (may be left blank, if same as 2.1)	Title	<input type="checkbox"/> Mr <input type="checkbox"/> Ms
	Name	
	First name	
	Job title	
	Phone/Fax	
	Email	



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3. Identification of significant change(s)	
<b>3.1 Changes to the organisation</b> (Ref. MSTAR 21.A.247 and GM 21.A.247)	<input type="checkbox"/> No <input type="checkbox"/> Yes (please specify changes below)
	<input type="checkbox"/> Change of ownership <input type="checkbox"/> Change of name and/or address <input type="checkbox"/> Other: please specify
<b>3.2 Changes to the scope</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes (please specify the new activities to be added to the DOA scope below)
<b>3.3 Changes to the list of products</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes (please specify the new product(s) below)
<b>3.4 Changes to the limitations</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes (please specify changes below)
<b>3.5 Changes to the privileges</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes (please specify new privileges below)
<b>3.6. Changes to the number of staff</b> (please consult the completion instructions on how to count the number of staff)	<input type="checkbox"/> No <input type="checkbox"/> Yes (please specify the new total number of staff below)
<b>4. Other Information</b>	
<b>5. Outline of additional data requirements</b>	
In case of name change or new address, a copy of the Business Registration or similar legal document stating name and address of the company must be provided.	
<b>Additional information about this significant change to your design organisation will be requested at a second stage.</b>	



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<b>6. Applicant's declaration</b>		
I declare that I have the legal capacity to submit this application to the DASA and that all information provided in this application form is correct and complete.		
Date	Name/Title	Signature
<b>7. DGTA USE ONLY</b>		
<b>7.1 Record Objective ID:</b>		
<b>7.2 Major Change application:</b>		
<input type="checkbox"/> Application Approved	<input type="checkbox"/> Application Requires Resubmit	<input type="checkbox"/> Application Not Approved
<b>7.3 Output Documentation:</b>	<input type="checkbox"/> DOE: <Reference Id> <input type="checkbox"/> Form 83: <Reference Id> <input type="checkbox"/> Improved DAS procedures <input type="checkbox"/> Other	
<b>7.4 Additional Comments:</b>		
Date	Name/Position	Signature



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MSTAR Form DDP

**MSTAR Form DDP – 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., TSO 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 TSO and any deviations thereof.
9. A statement of the level of compliance with the TSO 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 TSO.

- a) Environmental Qualification
  - i. Temperature and Altitude
  - ii. Temperature Variation
  - iii. Humidity
  - iv. Operational Shocks and Crash Safety
  - v. Vibration
  - vi. Explosion Proofness
  - vii. Waterproofness
  - viii. Fluids Susceptibility
  - ix. Sand and Dust
  - x. Fungus Resistance
  - xi. Salt Spray
  - xii. Magnetic Effect
  - xiii. Power Input
  - xiv. Voltage Spike
  - xv. Audio Frequency Conducted Susceptibility – Power Inputs



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- xvi. Induced Signal Susceptibility
- xvii. Radio Frequency Susceptibility (Radiated and Conducted)
- xviii. Emission of Radio Frequency Energy
- xix. Lightning Induced Transient Susceptibility
- xx. Lightning Direct Effects
- xxi. Icing
- xxii. Electrostatic Discharge
- xxiii. Fire, Flammability

(NOTE: The manufacturer should list environmental categories for each of the sections of the issue of EUROCAE ED-14/RTCA DO-160 or military equivalent standard that was used to qualify the article.)

- b) For radio transmitters the transmitting frequency band, maximum transmitting power, and emission designator.
- c) Working and ultimate pressure loads.
- d) Time rating (e.g., continuous, intermittent) or duty cycle.
- e) Limits of accuracy of measuring instruments.
- f) 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 or military equivalent standard).

10. A statement of criticality of software or "None" if not applicable.

(NOTE: Software levels are those defined in the current issue of EUROCAE ED-12C/RTCA document DO-178C.)

11. A statement of design assurance level for complex hardware or a statement indicating whether complex hardware is embedded or not in the product.

(NOTE: Complex hardware design assurance levels are those defined in the applicable issue of EUROCAE ED-80/RTCA document DO-254.)

12. 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)

Note: the MSTAR Form DDP is intended to be a Declaration of Design and Performance for TSO requirements only. It is not configured for use for other purposes where a DDP may be required.