MALAYSIAN STATE AIRWORTHINESS AUTHORITY

MALAYSIAN STATE TECHNICAL AIRWORTHINESS MANUAL

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS
INTERIM
VOLUME 6

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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** The incorporation of the amendment is to be done by authorised persons only.

MALAYSIAN STATE TECHNICAL AIRWORTHINESS REGULATIONS

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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	Europen Military Airworthiness Certification Criteria

EMAD	Europen Military Airworthiness Document
EMAD R	Europen 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
MTOE*	Maintenance Training Organisation Exposition
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

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GLOSSARY

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.

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 AuthorityCertificate (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/o r 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 a r e 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 responsiblefor 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 Organisation Exposition*

A controlled quality document containing the details of an organisation's training management system. The MTOE 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 includethe 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 MSAA 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 evidenceto 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 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 1 **CHAPTER 1**

TECHNICAL REQUIREMENT

SUBPART A - GENERAL

147. A.05 Scope

(a) This section establishes the requirements to be met by an Organisation seeking approval as an Aircraft Maintenance Training Organisation (AMTO) to conduct training and examination.

(b) The approval of level and scope establishes the bounds of the training services which an Aircraft Maintenance Training Organisation (AMTO) may provide:

1. Level. Levels are usually defined on training categories into five distinct tiers; basic training, basic examination standards, type/task training, engineering specialist training and engineering management training.

2. Scope. Scope refers to a field of study encompassing structure, engine, aeromechanical and avionics in aeronautical engineering, specific modularisation basic subject, military-specific systems, specific task, specific engineering specialization, human factors, and airworthiness legislation.

147. A.10 General

GM

(a) A training organisation or part of an organisation registered as a legal entity may engage in any stage of the maintenance training if that organisation is holding an AMTO certification issued by the TAA.

(b) The Directorate General Technical Airworthiness (DGTA) act as TAA may suspend, revoke, limit or vary the AMTO certification, where DGTA has identified a safety issue or has clear evidence that the organisation has contravened any provision of technical airworthiness requirement or regulations stipulated in MSTAR 147.

AMC

147. A.15 Application

AMC

(a) An application for certification of approvals or to change existing approvals shall be made in the application form, MSTAR Form 12.

AMC

(b) If the DGTA is satisfied that the applicant has fulfilled the requirements in MSTAR 147, the DGTA may issue a certificate of approval, MSTAR Form 11.

AMC

(c) An application for an approval or change to approval shall include the following information:

1. Sponsor letter from MAO or provide a legally binding formal instrument document from SAO.

GM

2. Registered name and address of the applicant.

3. The address of the organisation requiring the approval or change to the approval.

4. Intended scope and level of approval or change to the level and scope of approval.

5. Name and signature of the Accountable Manager (AM).

6. Date of application.

7. Draft of the Maintenance Training Organisation Exposition (MTOE).

8. Training Curriculum.

(i) For SAO - Approved Training Curriculum.

(ii) For Commercial - Draft Training Curriculum.

9. Additional documents in support of its application when requested by DGTA.

(d) DGTA may, at any time, conduct airworthiness regulatory oversight to determine compliance with any provision of technical airworthiness requirement or regulations stipulated in MSTAR 147.

(e) For training activity which required on a short term or temporary basis, application for AMTO certification is not necessary. Temporary Training Authorisation (TTA) may be provided by MAO as approval to conduct the training.

AMC

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 1 **CHAPTER 2**

SUBPART B - ORGANISATIONAL REQUIREMENTS

147. A.100 Facility requirements

(a) The size and structure of facilities shall ensure protection from the prevailing weather elements and proper operation of all planned training and examination on any day.

AMC

(b) Fully enclosed appropriate accommodation separate from other facilities shall be provided for the instruction of theory and the conduct of knowledge examinations.

AMC

1. The maximum number of students undergoing knowledge training during any training session shall not exceed a level conducive to an effective learning environment.

2. The size of accommodation for examination purposes shall be such that no student can read the paperwork or computer screen of any other student from his/her position during examinations.

(c) The facilities environment prescribed in point (b). shall be maintained such that students can concentrate on their studies or examination as appropriate, without undue distraction or discomfort.

(d) In the case of a basic training course, basic training workshops and/or maintenance facilities separate from training classrooms shall be provided for practical instruction appropriate to the planned training course. If, however, the organisation is unable to provide such facilities, arrangements may be made with another organisation to provide such workshops and/or maintenance facilities, in which case a written agreement shall be made with such organisation specifying the conditions of access and use thereof. The DGTA shall require access to any such contracted organisation and the written agreement shall specify this access.

AMC

(e) In the case of an aircraft type/task training course, access shall be provided to appropriate facilities containing examples of aircraft type as specified in paragraph 147.A.115.(d).

AMC

(f) The maximum number of students undergoing practical training during any training course shall not exceed 15 per supervisor or assessor.

AMC

(g) Office accommodation shall be provided for instructors, knowledge examiners and practical assessors of a standard to ensure that they can prepare for their duties without undue distraction or discomfort.

AMC

(h) Secure storage facilities shall be provided for examination papers and training records. The storage environment shall be such that documents remain in good

condition for the retention period as specified in paragraph 147.A.125. The storage facilities and office accommodation may be combined, subject to adequate security.

AMC GM

(i) A library shall be provided containing all technical material appropriate to the scope and level of training undertaken.

147. A.105 Personnel requirements

AMC

(a) The organisation shall appoint an Accountable Manager who has corporate authority for ensuring that all training commitments can be financed and carried out to the standard required by this MSTAR 147.

AMC

(b) A person or group of persons who have an academic degree in engineering discipline or hold a state aircraft maintenance license with experience exercising certification privileges, whose responsibilities include ensuring that the maintenance training organisation complies with the requirements of this MSTAR, will be nominated. Such person(s) must be responsible to the Accountable Manager. The senior person or one person from the group of persons may also be the Accountable Manager subject to meeting the requirements for the Accountable Manager as defined in point (a).

AMC

(c) The organisation shall contract/appoint sufficient staff to plan/perform knowledge and practical training, conduct knowledge examinations and practical assessments under the approval qualification, training, and experience criteria.

AMC

(d) By derogation to point (c)., when another organisation is used to provide practical training and assessments, other organisation's staff may be nominated to carry out practical training and assessments.

(e) Any person may carry out any combination of the roles of instructor, examiner and assessor, subject to compliance with point (f).

(f) The experience and qualifications of instructors, knowledge examiners and practical assessors shall be established under criteria published or procedure and to a standard agreed by the DGTA.

AMC GM

(g) The appropriate qualifications, training and experiences related to the aviation, aircraft, aeronautical product, aircraft-related equipment of the person or group of persons defined in point (b). shall be specified in the Maintenance Training Organisation Exposition (MTOE) for the acceptance of such staff.

GM

(h) Instructors, knowledge examiners and practical assessor shall undergo updating training for 40 hours in every 24 months (based on appointment date) relevant to current technology, practical skills, human factors, and the latest training techniques appropriate to the knowledge being trained or examined. This includes competence and proficiencies in their respective specializations at all times by engaging in maintenance activities and/or attending refresher training for a period of not less than 15 hours per year.

AMC GM

(i) The Instructor Indices value for instructor mustering/specialization should not exceed 1.0 and shall stipulate and be defined in the curriculum.

(j) The instructional hours for a class session are 6.0 hours per day (Monday - Thursday), 4.0 hours per day (Friday) and 5 days per week. Total theoretical instructional hours should not exceed 28 hours period time in a week and shall be stipulated in the curriculum.

(k) Any appointed instructors from respective specialization or/and trade shall have the experience exercising aircraft maintenance licence privilege, or holding a degree in engineering tertiary education, or have the experience exercising aircraft maintenance inspector/supervisor privilege. Appointed instructors that do not meet the minimum requirements of instructor qualification as defined in point (f)., shall be always supervised by a qualified instructor.

(l) The maintenance training organisation shall establish and maintain a system to assess and appoint a person or group of personnel in every structure key function as defined in point (b).

(m) The maintenance training organisation shall document its organisational structure in the MTOE. The description of the organisational structure shall contain:

1. The title(s) of management position.

2. The title of a supervisory position.

3. An organisational chart showing associated chains of management and training responsibility of the functional groups.

147. A.110 Records of instructors, examiners, and assessors AMC GM

(a) The organisation shall maintain a record of all instructors, knowledge examiners and practical assessors for a minimum period of five (5) years after termination of their employment or assignment within the AMTO. Logbooks should be made available to instructors, examiners and assessors. These records shall reflect the experience and qualification, training history and any subsequent training undertaken.

(b) Terms of reference shall be drawn up for all instructors, knowledge examiners and practical assessors.

147. A.115 Instructional equipment

(a) Each classroom shall have appropriate presentation equipment of a standard that ensures students can easily read presentation text/drawings/diagrams and figures from any position in the classroom. Presentation equipment shall include representative synthetic training devices to assist students in their understanding of the subject matter where such devices are considered beneficial for such purposes.

GM

(b) The basic training workshops and/or maintenance facilities as specified in paragraph 147.A.100.(d), must have all tools and equipment necessary to perform the approved scope of training.

(c) The basic training workshops and/or maintenance facilities as specified in paragraph 147.A.100.(d), must have an appropriate selection of aircraft, engines, aircraft parts and avionics equipment.

AMC

(d) The aircraft type training organisation as specified in paragraph 147.A.100.(e), must have access to the appropriate aircraft type. Synthetic training devices may be used when such synthetic training devices ensure adequate training standards.

AMC

(e) There shall be enough instructional equipment to maintain a maximum trainee to training aid ratio of eight to one (8:1).

147. A.120 Maintenance training material

(a) Maintenance training course material shall be provided to the student and cover as applicable:

AMC

1. The basic knowledge syllabus specified in MSTAR 66 for the relevant aircraft maintenance licence category or subcategory and,

2. The type training course curriculum content required by MSTAR 66 for the relevant aircraft type and aircraft maintenance licence category or subcategory.

(b) Students shall have access to examples of maintenance documentation and technical information of the library as specified in paragraph 147.A.100.(i).

147. A.125 Records of students

The organisation shall keep all student training, examination, and assessment records for at least five (5) years following completion of the particular student's course.

AMC

147. A.130 Training procedures and quality system

(a) The organisation shall establish procedures acceptable to the DGTA to ensure proper training standards and compliance with all relevant requirements in this MSTAR.

AMC

(b) An outlining of the procedures to ensure proper training standards are met and comply with the MSTAR 66 requirements. The organisation shall establish a Quality Management System (QMS) including:

AMC GM

1. An independent Internal Quality Audit (IQA) function to monitor training standards, the integrity of knowledge examinations and practical assessments, compliance with and adequacy of the procedures, and

2. A feedback system of audit findings to the person(s) and ultimately to the Accountable Manager referred to in paragraph 147.A.105.(a), to ensure, as necessary, to undertake appropriate corrective and preventive action including an investigation to find the root cause of the non-conformity.

(c) The organisation shall carry out a quality Management Review Meeting (MRM) at least once a year.

AMC

(d) The organisation shall provide a set of the Training Instruction Manual (TIM) acceptable to the DGTA to clearly define the training procedure, training process and management in ensuring meets the training standards and compliance with all relevant requirements in this MSTAR 147.

AMC

(e) The organisation shall establish and promote safety policies and procedures by setting out in the TIM and ensure compliance with Occupational Health and Safety (OHS) requirements.

(f) The organisation shall ensure that all personnel are made aware of the procedures in MTOE and TIM, and adopt them in the daily business of training.

147. A.135 Examinations and assessment

AMC GM

(a) Theoretical examination and practical assessment of students shall be conducted by a qualified examiner.

(b) The examination staff shall ensure the security of all questions.

AMC

(c) Knowledge examination papers must have three (3) sets of examination papers containing at least 30% different questions for each set taken from a question bank.

GM

(d) Any student found during a knowledge examination to be cheating or in possession of material on the examination subject other than the examination papers and associated authorised documentation shall be disqualified from taking the examination and may not take any examination for at least three (3) months after the date of the incident. The DGTA shall be informed of any such incident together with the details of any enquiry within one calendar month.

(e) Any examiner found during a knowledge examination to be providing question answers to any student being examined shall be disqualified from acting as an examiner and the examination declared void. The DGTA must be informed of any such occurrence within one calendar month.

147. A.140 Maintenance Training Organisation Exposition (MTOE)

AMC

(a) The organisation shall provide a Maintenance Training Organisation Exposition (MTOE) previously referred as “Maintenance Training Management Plan (MTMP)” for use by the organisation describing the organisation and its procedures and containing the following information:

1. A statement signed by the accountable manager confirming that the maintenance training organisation's MTOE and any associated manuals define the maintenance training organisation's compliance with this MSTAR and shall be always complied with.

2. The title(s) and name(s) of the person(s) nominated in accordance with paragraph 147.A.105.(b).

3. The duties and responsibilities of the person(s) specified in point (a).2, including matters on which they may deal directly with the DGTA on behalf of the maintenance training organisation.

4. A maintenance training organisation chart showing associated chains of responsibility of the person(s) specified in point (a).2.

5. A list of the training instructors, knowledge examiners and practical assessors.

6. A general description of the training and examination facilities located at each address specified in the maintenance training organisation's approval certificate, and if appropriate any other location, as required by paragraph 147.A.145.(b).

7. A list of the maintenance training courses which form the extent of the approval.

8. The MTOE amendment procedure.

9. The maintenance training organisation's procedures, as required by paragraph 147.A.130.(a).

10. The maintenance training organisation's control procedure, as required by 147.A.145.(c), when authorised to conduct training, examination, and assessments in locations different from those specified in paragraph 147.A.145.(b).

11. A list of the locations according to paragraph 147.A.145.(b).

12. A list of organisations, if appropriate, as specified in paragraph 147.A.145.(d).

(b) The MTOE and any subsequent amendments shall be approved by the DGTA.

(c) Notwithstanding point (b), minor amendments to the MTOE may be approved through the MTOE procedure (hereinafter called indirect approval).

GM

147. A.145 Privileges of the maintenance training organisation

(a) The maintenance training organisation may carry out the following as permitted by the maintenance training organisation MTOE:

1. Basic training courses to the MSTAR 66 syllabus, or part thereof.

AMC

2. Aircraft type/task training courses under MSTAR 66.

3. Task training, engineering specialist training or engineering management training under a recognised training specification standard.

4. The examination of students who attended the basic or aircraft type training course at the maintenance training organisation.

5. The examination of students who did not attend the basic training course at the maintenance training organisation provided that:

(i) The examination is conducted at one of the locations identified in the approval certificate, or

(ii) If performed at locations not identified in the approval certificate, as permitted by points (b) and (c), either:

a. The examination is provided through a DGTA question bank; or

b. In the absence of a DGTA question bank, the Training Manager selects the questions set for the examination.

6. The issue of certification under Chapter 3 and 4 to Part 4 to MSTAR 147 following successful completion of the approved basic or aircraft type training courses and examinations specified in points (a).1, (a).2, (a).3, and (a).4, as applicable.

AMC

(b) Training, knowledge examinations and practical assessments may only be carried out at the locations identified in the approval certificate and/or at any location specified in the maintenance training organisation MTOE.

(c) By derogation to point (b), the maintenance training organisation may only conduct training, knowledge examinations and practical assessments in locations different from point (b). at subcontractor locations with the control procedure established in the MTOE. Such locations need not be listed in the MTOE.

(d) Training Support Network (TSN).

AMC **GM**

1. Aircraft Maintenance Training Organisation may subcontract the conduct of basic training, type training and related examinations to selected subcontractors that are DGTA AMTO certified or have NAA certification recognized by DGTA. An approved maintenance training organisation shall establish procedures under the control of the quality system.

2. By derogation from point 1., the subcontracting of basic theoretical training and examination is limited to MSTAR 66, Appendix I, Modules 1, 2, 3, 4, 5, 6, 8, 9 and 10.

3. Subcontracting on practical and assessment of basic training is limited to MSTAR 66, AMC to Appendix I, and Practical Experience Tasks.

GM

4. The subcontracting of type training and examination is limited to the power plant and avionics systems.

5. The Aircraft Maintenance Training Organisation may engage external organisations to provide organisational requirements as specified in paragraphs 147.A.100 and 147.A.105 and/or to conduct a portion of the training. The maintenance training organisation shall establish procedures in the MTOE outlining the processes as follow:

(i) Assessment of capacity and capabilities of external organisations to support training.

(ii) Mechanism of an external organisation to provide training resources, educational references, data, and documentation.

(iii) Quality assurance and technical integrity requirement for accepting training performed by the external organisation.

(iv) Details of the scope and level of training to be delivered by the selected organisation.

(e) An organisation may not be approved to conduct examinations unless approved to conduct the corresponding training.

(f) By derogation from point (e)., an organisation approved to provide basic training or type training may also be approved to provide type-examination in the cases where type training is not required.

AMC

(g) A maintenance training organisation may only be permitted to deliver maintenance training, examinations, and practical assessments under an approved curriculum by respective SAO.

AMC **GM**

(h) A maintenance training organisation may be approved to deliver specialist training or engineering management training when there is a statement of compliance with the equivalent standard that can be found specified in the curriculum.

AMC

(i) A maintenance training organisation may be approved to deliver distance learning and virtual classroom instruction after permitted by an exemption granted by the DGTA.

AMC

147. A.150 Changes to the maintenance training organisation

AMC

(a) The maintenance training organisation shall notify the DGTA of any proposed changes to the organisation that affect the approval before any such change takes place, to enable the DGTA to determine continued compliance with this MSTAR and to amend, if necessary, the maintenance training organisation approval certificate.

(b) The DGTA may prescribe the conditions under which the maintenance training organisation may operate during such changes unless the DGTA determines that the maintenance training organisation approval must be suspended.

(c) Failure to inform the DGTA of such changes may result in suspension or revocation of the maintenance training organisation approval certificate backdated to the actual date of the changes.

147. A.155 Continued validity

(a) Approval shall be issued for valid up to three (3) years or until the contract to which it relates, expires, or is suspended, revoked, surrendered, or superseded whichever occurred first.

(b) An approval certificate and accompanying LMTA shall remain in force and valid subject to:

1. The organisation remaining in compliance with this MSTAR 147, by the provisions related to the handling of findings under paragraph 147.A.160; and

2. The DGTA being granted access to the organisation to determine continued compliance with this MSTAR 147; and

AMC

3. The certificate not being surrendered or revoked.

(c) The validity of an AMTO certification shall be re-assessed by a process and at a frequency determined by DGTA.

(d) Upon surrender or revocation, the approval shall be returned to the DGTA.

147. A.160 Findings

(a) Corrective Action Request (CAR) Categories are:

1. **Level 1**: A Major CAR finding which one or more of the following:

(i) Any significant non-compliance with the examination process which would invalidate the examination(s),

(ii) Failure to give the DGTA access to the organisation's facilities during normal operating hours after two written requests,

(iii) The lack of an accountable manager,

(iv) A significant non-compliance with the training process.

2. **Level 2**: A Minor CAR finding which any non-compliance with the training process other than level 1 findings.

(b) After receipt of notification of findings under paragraph 147.A.160, the holder of the maintenance training organisation approval shall be able to determine the root cause, analyse for an improvement or correction plan, and demonstrate corrective action to the satisfaction of the DGTA within a period agreed with the following authority.

AMC

1. For non-compliance, the AMTO is required to take corrective action within fourteen (14) calendar days for Level 1, and sixty (60) calendar days for Level 2.

2. The permissible extension for the CAR(s) is 3 months for Level 1 and 6 months for Level 2 respectively. The consideration for extension shall be given gradually up to the maximum allowable days and subject to discretion by the authority.

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 1 **CHAPTER 3**

SUBPART C - APPROVED BASIC TRAINING COURSE

147. A.200 The approved basic training course

(a) The approved basic training course shall consist of knowledge training, knowledge examination, practical training, and a practical assessment.

(b) The knowledge training element shall cover the subject matter for a category or subcategory aircraft maintenance licence as specified in MSTAR 66.

AMC

(c) The knowledge examination element shall cover a representative cross-section of subject matter from point (b), training element.

(d) The practical training element shall cover the practical use of common tooling/equipment, the disassembly/assembly of a representative selection of aircraft parts and the participation in representative maintenance activities being carried out relevant to the MSTAR 66 complete module. The elements of practical training selected for basic practical training shall be extracted from the list of tasks contained in paragraph 5 to AMC to Appendix I to MSTAR 66. Basic Skills and Experience Practical Logbooks as in Appendix XIV to MSTAR 66 must be provided to students.

AMC

(e) Where identified elements of practical experience cannot be completed in a training session, the outstanding balance may be completed while undertaking an on-the-job training program or performing maintenance tasks under supervision.

(f) The practical assessment element shall cover the practical training and determine whether the student is competent using tools and equipment and working under maintenance manuals.

AMC

(g) The duration of basic training courses shall comply with Appendix I to MSTAR 147.

AMC

(h) The duration of conversion courses between (sub) categories shall be determined through an assessment of the basic training syllabus and the related practical training needs.

AMC

147. A.205 Basic knowledge examinations

AMC

Basic knowledge examinations shall:

(a) Be complied with the standard defined in MSTAR 66.

(b) Be conducted without the use of training notes.

(c) Cover a representative cross-section of subjects from the module of training completed defined under MSTAR 66.

147. A.210 Basic practical assessment

(a) Basic practical assessments shall be carried out during the basic maintenance training course by the nominated practical assessors after each visiting period to the practical workshops/maintenance facility.

AMC

(b) The student shall achieve an assessed pass to paragraph 147.A.200.(f).

AMC

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 1 **CHAPTER 4**

SUBPART D - AIRCRAFT TYPE/TASK TRAINING

147. A.300 Aircraft type/task training

AMC

A maintenance training organisation shall be approved to carry out MSTAR 66 aircraft type and/or task training subject to compliance with the standard specified in paragraph 66.A.45.

147. A.305 Aircraft type examinations and task assessments

A maintenance training organisation approved under paragraph 147.A.300 to conduct aircraft type training shall conduct the aircraft type examinations or aircraft task assessments specified in MSTAR 66 subject to compliance with the aircraft type and/or task standard specified in 66.A.45 of MSTAR 66.

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 1 **CHAPTER 5**

SUBPART E - ENGINEERING SPECIALIST AND ENGINEERING MANAGEMENT TRAINING (MY)

147. A.400 Training Specification Standards (MY)

A maintenance training organisation shall be approved to carry out a engineering specialists training or engineering management training subject to compliance with recognised training specification standards specified in the MTOE.

147. A.405 Training examinations and assessments (MY)

A maintenance training organisation approved under paragraph 147.A.400 to conduct a engineering specialists training or engineering management training shall conduct the training examinations or assessments specified in training curriculum subject to compliance with the training specification standards.

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 2 **CHAPTER 1**

ACCEPTABLE MEANS COMPLIANCE / GUIDANCE MATERIAL (AMC/GM)

SUBPART A - GENERAL

GM 147.A.10 General

Such an organisation may conduct business from more than one address and may hold more than one MSTAR approval.

AMC 147.A.10 (b) General (MY)

DGTA has the authority to terminate AMTO certification based on:

1. Reasonable grounds in the case of compromised training standards.

2. Findings of non-compliant with any requirements in MSTAR 147.

3. Delay in closing Corrective Action Request (CAR) within the approved time frame as defined in paragraph 147.A.160 (b).

AMC 147.A.15 Application

Detail explanation refer to AMC 147.A.15 (a) and AMC 147.A.15 (b).

AMC 147.A.15 (a) Application (MY)

The application form should contain the information required in the MSTAR Form 12.

AMC 147.A.15 (b) Application (MY)

1. The application information should contain the scope and level required as agreed by MAO specified in the sponsor letter or a legally binding formal instrument document.

2. Upon receiving the application form and support documents from prospective applicants, DGTA shall conduct a thorough assessment on the following items:

   (a) Review the maintenance training organisation exposition.

   (b) Review curriculum.

   (c) Verify the organisation's compliance with the requirement of MSTAR 147.

   (d) Accuracy of information in the documents.

   (e) Training processes and controls fulfilled requirements stipulated in paragraph 147.A.140.

(f) Training standard and compliance fulfilled requirements stipulated in paragraph 147.A.130 (a).

(g) Onsite inspection on the availability of training facilities and equipment, competent personnel, and records.

(h) Compliance assessment on applicant's capability as an AMTO.

(i) Confirmation of statement in the sponsor letter or a legally binding formal instrument document that details the approval of scope and level sealed in contract with the Federal Government of Malaysia.

3. The audit should be conducted based on checking the facility for compliance, interviewing personnel and sampling any relevant training course for its conduct and standard.

4. The audit report should be made on a MSTAR Form 22.

5. If the unavailability of any items in point 2., to demonstrated technical competency on applicant but sufficient fulfilment of the application requirement and DGTA satisfied, the DGTA shall provide a Provisional Approval certification with valid for a maximum duration of twelve (12) months accompanying Letter of Maintenance Training Authority (LMTA) to eligible the applicant to perform maintenance training and examination before award AMTO certification approval.

6. When the applicant fulfils the application information requirements and DGTA satisfied that the organisation who holds a provisional certificate of approval has demonstrated technical competency in conducted maintenance training and assessment, DGTA shall formally certify the applicant as an AMTO through the issuance of an AMTO certificate approval and accompanying LMTA.

7. Incomplete fulfilment application information required will be a basis for rejection of the AMTO approval. Such rejection shall be documented and disclosed to the applicant.

GM 147. A.15 (c) (1) Application (MY)

1. Any commercial organisation seeking the AMTO certification must be able to convince DGTA that the organisation is required to be certified as an AMTO to provide training services. This is usually achieved by entering into a contract with the Federal Government of Malaysia (GOM) to provide training services or aircraft maintenance services.

2. In this case, the AMTO certification shall be terminated when the contract platform with GOM is revoked or not renewed or when the contract as a commercial support network organisation is terminated.

3. For a commercial organisation holding an Organisation Certificate Approval from DGTA seeking the AMTO certification for their own or for any subcontractor being part of a commercial support network organisation must be able to submit strong justification. An application shall be supported by MAO sponsor letter or a legally binding formal instrument document to convince DGTA that the organisation or subcontractor is eligible for AMTO certification.

4. A legally binding formal instrument document may be in terms of a written directive, contract, Letter of Agreement, Purchase Order, minute of meeting, or other correspondence that details the scope and level of maintenance training for AMTO certification from the DGTA.

5. The sponsor letter from MAO shall be provided together with the application form by a commercial organisation that seeking the AMTO certification in the following circumstances:

(a) Initial application of AMTO certification without any maintenance or training services agreement contract with GOM.

(b) Renewal of maintenance or training services agreement contract with GOM containing a new scope and level of services which affected on initial approval of AMTO or AMO certification limitations.

(c) Intention to add in new scope and level of approved AMTO certificate.

AMC 147.A.15 (e) Application (MY)

1. There will be occasions when training activity is required on a short term or temporary basis, for example to meet a short-term surge of trainees, incorporate one-off preparatory training for potential personnel going abroad, or provide ad-hoc training services over a short period of time. In such cases it may not be cost-effective for an organisation to fulfil a complete AMTO certification. Typically, the training activity would be conducted before the certification process could be completed.

2. MAO is allowed to provide specific TTA to an organisation to conduct training for a defined period not exceeding 3 months. Where the MAO grants TTA, that organisation will be responsible for the technical integrity and outcomes of the training.

3. No regulatory provision has been made for consecutive grants of TTA to the same organisation for the same scope of work as this situation is outside the spirit of the regulation. Should a requirement for training services to be provided over a time greater than 3 months become apparent, the MAO is expected to develop an acceptable solution with DGTA in the first instance.

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 2 **CHAPTER 2**

SUBPART B - ORGANISATIONAL REQUIREMENTS

AMC 147. A.100 (a) Facility requirements (MY)

1. The maintenance training organisation shall ensure the infrastructure is certified fitness/approved for use and protection from the prevailing weather elements and proper operation of all planned training and examination on any particular day. Suitable facilities must be provided to ensure proper working space arrangements for various training aids.

2. The training facilities shall provide a conducive learning environment. In the conduct of training the following guideline shall apply:

(a) The environment must be comfortable.

(b) Lighting must be adequate for practical and theory lessons.

(c) Noise levels must be kept at a minimum.

(d) The work area must be aesthetically pleasing.

(e) Work area spacing must be adequate.

(f) Work areas must be reasonably clean.

(g) Training aids must be adequate.

(h) Visual media must be visible.

(i) Audio media must be satisfactorily audible.

AMC 147. A.100 (b) Facility requirements

Fully enclosed individual classrooms shall be provided for the theory lessons and examinations. In the conduct of training the following guideline shall apply:

1. For theory lessons, the maximum number of students shall not exceed 28 per classroom. An enclosed classroom in a controlled environment suitable for theory lessons shall be provided such that students can concentrate on their studies or examination as appropriate, without undue distraction or discomfort. The amount of “ideal” space for each adult in a classroom range from a low of 1.4 m^2 to a high of 6.7 m^2. The size of classrooms is affected by:

(a) The number of trainees in a class.

(b) Size of the trainee in the workstation.

(c) Classroom configuration.

(d) Size of aisles.

(e) Use of media.

2. The room/halls to conduct examinations/assessments shall be sufficiently spaced to minimise the probability of cheating/misconduct among trainees.

AMC 147. A.100 (d) Facility requirements

1. Individual workshop(s) and/or maintenance facilities (excluding training classroom) shall be provided for basic course practical training.

2. Engagement with any third-party organisation(s) may be made if the training organisation is unable to provide such facilities. A written agreement shall be made with the third-party organisation(s) specifying the conditions of access and the use thereof. The right to access such third-party organisation(s) by DGTA (for regulatory enforcement purposes) shall be specified in a written agreement between the training organisation and the third-party organisation(s).

AMC 147. A.100 (e) Facility requirements (MY)

For aircraft type training modules, trainees shall be provided with access to appropriate facilities containing actual aircraft models relevant to the scope of training.

AMC 147. A.100 (f) Facility requirements (MY)

1. For the practical training, the maximum number of trainees shall not exceed 15 per instructor/assessor. In addition, the AMTO shall provide these requirements as follows:

(a) Suitable area for application of finishing materials, including paint spraying.

(b) Suitable areas equipped with wash tanks and degreasing equipment with air pressure or other adequate cleaning equipment.

(c) Suitable facilities for running engines. Suitable area with adequate equipment, including benches, tables, and test equipment, to disassemble, service and inspect.

(d) Ignition, electrical equipment, and appliances.

(e) Carburettors and fuel systems.

(f) Hydraulic and vacuum systems for aircraft, aircraft engines and system appliances.

(g) Suitable space with adequate equipment, including tables, benches, stands, and jacks, for disassembling, inspecting, and rigging aircraft.

(h) Suitable space with the adequate equipment for disassembling, inspecting, assembling, troubleshooting, and timing engines.

AMC 147. A.100 (g) Facility requirements (MY)

Office accommodation complying with appropriate occupational safety and health standards shall be provided for instructors, examiners, and assessor's conducive teaching/instructional environment.

AMC 147. A.100 (h) Facility requirements (MY)

1. Secured storage facilities shall be provided for examination papers, answer sheets, questions analysis and training records.

2. The storage environment shall be such that documents remain in good condition for the 5 years retention period. For SAO, it is advisable to retain the records until Run out Date (ROD) of the trainee.

3. The storage facilities and office accommodation may be combined, subject to adequate security access control.

AMC 147.A.100 (i) Facility requirements

1. For approved basic maintenance training courses this means holding and ensuring reasonable access to copies of all MSTARs and any Malaysian State Airworthiness publications, examples of typical aircraft maintenance manuals and service bulletins, Airworthiness Directives, aircraft and component records, release documentation, procedures manuals and aircraft maintenance programmes.

2. Except for all MSTARs and any Malaysian State Airworthiness publications, the remainder of the documentation should represent typical examples for both large and small aircraft and cover both aeroplanes and helicopters as appropriate. Avionic documentation should cover a representative range of available equipment. All documentation should be reviewed and updated regularly.

3. AMTO must provide a suitable technical reference depository. The technical reference depository shall provide appropriate facilities for study and reference. It shall isolate from high noise levels. The technical references shall be related to aircraft type(s) operated by the SAO. The technical depository shall include (but not limited to) the following:

(a) A library shall be manned by trained personnel.

(b) A library containing all current technical reference materials, electronic media and journals related to the scope and level of training undertaken.

(c) The publications shall include basic modules of aircraft type, engineering specialisation and engineering management training such as:

(i) Aircraft, engine, propeller, Type Certificate Data Sheets (TCDS) and/or specifications.

(ii) Airworthiness Directives (AD).

(iii) Supplemental Type Certificates (STC).

(iv) Related Maintenance Manuals (MM).

(v) Instruction to Continuing of Airworthiness (ICA) document.

(vi) Technical Airworthiness Advisory Circular (TAAC).

(vii) Other instructional materials, such as textbooks on basic physics, math, hydraulics, and engines.

(viii) Service Bulletins, Release Documents, Service Publication, aircraft and/or component records

GM 147.A.100 (i) Facility requirements

Where the organisation has an existing library of regulations, manuals and documentation required by another MSTAR, it is not necessary to duplicate such a facility subject to student access being under controlled supervision.

AMC 147.A.105 Personnel requirements

As explained in AMC 147.A.105 (b).

AMC 147.A.105 (a) Personnel requirements (MY)

The Accountable Manager (AM) has the responsibility to ensure that all training resources are allocated, and the training services are carried out within the scope and level defined in the AMTO certificate. The AM shall:

1. Ensure that all necessary resources are available to accomplish training commitments to support the organisation approval.

2. Establish and promote safety and quality policy specified in MTOE; and

3. Demonstrate a basic understanding of this Regulation.

AMC 147.A.105 (b) Personnel requirements

1. The maintenance training organisation shall structure key training managerial functions and other functional groupings that are responsible to AM on its daily operation. Typical key functions include the following:

(a) **Training Manager**. A person shall be nominated to lead and manage the training management team and responsible for all training functions on a day-to-day basis.

(b) **Quality Manager**. A person shall be appointed to set up, monitor and review a training quality system. Training quality issues of training standards, compliance matters and propose actionable preventive actions shall be made known to the AM.

(c) **Examination/Assessment**. A person shall be appointed to oversee the design of question papers, standards of examinations and invigilation.

(d) **Academic and Curriculum**. A person shall be appointed to oversee the curriculum design, training media, lesson plan, instructor guides and evaluate the effectiveness of basic, aircraft type, engineering specialist and engineering management training.

(e) **Instructional**. The maintenance training organisation shall employ or contract sufficient qualified staff to plan, manage and carry out the theoretical and practical training, and to conduct theoretical examinations and practical assessments under the approved curriculum.

(f) **Safety Officer**. A person shall be appointed to establish, promote, monitor, and review safety policies in maintenance training organisations and to ensure compliance with Occupational Health and Safety (OHS) requirements.

2. The maintenance training organisation shall establish and maintain a system to assess and appoint a person or group of personnel in every structure key function as defined in point 1., whose responsibilities include ensuring that the maintenance training organisation complies with this MSTAR. Except for basic training approval organisations, designated persons or groups of persons holding a minimum Category B aircraft maintenance license from any competent authority are permitted. Such person(s) shall ultimately be responsible to the AM and comply with the following:

(a) The person(s) nominated shall represent the training management structure of the maintenance training organisation and be responsible for all functions specified in this MSTAR.

(b) The person(s) nominated shall be able to demonstrate relevant knowledge, background and satisfactory experience related to aircraft or component maintenance and demonstrate a working knowledge of this MSTAR.

(c) Procedures shall make clear who deputises for any person in the case of lengthy absence of the said person.

3. Except for the Accountable Manager, a MSTAR Form 4 should be completed by the Training Manager or Quality Manager for each person nominated to hold a position required by 147.A.105 (b) upon he/she certify in personnel assessment processes. An example of a MSTAR Form 4 is included in MSTAR 147.

4. The larger maintenance training organisation (an organisation with the capacity to provide training for 50 students or more) should appoint a Training Manager with the responsibility of managing the training organisation on a day-to-day basis. Such a person could also be the Accountable Manager. In addition, the organisation should appoint a Quality Manager with the responsibility of managing the quality system as specified in paragraph 147.A.130 (b) and an Examination Manager with the responsibility of managing the relevant MSTAR 147 Subpart C or Subpart D examination system. Such person(s) may also be an instructor and/or examiner.

5. The smaller maintenance training organisation (an organisation with the capacity to provide training for less than 50 students), a combination of the position stated in point 1, is permissible, except for position quality it should be stand-alone and independent. DGTA shall verify and be satisfied that all functions can be properly carried out in combination and the maintenance training organisation demonstrated all functions are controlled through a documented process and properly carried out.

AMC 147.A.105 (c) Personnel requirements

The maintenance training organisation should have a nucleus of permanently employed staff to undertake the minimum amount of maintenance training proposed

but may contract, on a part-time basis, instructors for subjects which are only taught on an occasional basis.

AMC 147.A.105 (f) Personnel requirements

1. Any person currently accepted by the DGTA under the Internal Maintenance Authority (IMA) qualification prescribed in PU 2103 Technical Airworthiness Management Manual (TAMM), before MSTAR 147 coming into force, may continue to be accepted under 147.A.105 (f).

2. Paragraph 3 of Appendix VIII to MSTAR 66 provides criteria to establish the qualification of assessors.

3. The qualification, training and experience of instructors, examiners and assessors shall be established by the standards acceptable to the DGTA and must be appropriated to course(s) being taught or examined.

GM 147.A.105 (f) Personnel requirements

It is recommended that potential instructors be trained in instructional techniques.

GM 147.A.105 (g) Personnel requirements

Examiners should demonstrate a clear understanding of the examination standard required by MSTAR 66 and have a responsible attitude to the conduct of examinations such that the highest integrity is ensured.

AMC 147.A.105 (h) Personnel requirements

Updating training should normally be 40 hours duration (every 24 months) but may be adjusted to the scope of training of the organisation and particular instructor/examiner. The required training is divided into:

1. 15 hours/12 months - engaging in maintenance activities and/or attending refresher training in their respective specializations.

2. 5 hours/12 months - others training as explained in 147.A.105 (h).

GM 147.A.105 (h) Personnel requirements

1. Records should show for each instructor/examiner when the updating training was scheduled and when it took place.

2. The updating training may be subdivided during the 24 months into more than one element and may include such activities as attendance at relevant lectures and symposiums.

AMC 147. A.110 Records of instructors, examiners, and assessors

1. The following minimum information relevant to the scope of activity should be kept on record in respect of each instructor, knowledge examiner and practical assessor:

(a) Name

(b) Date of Birth

(c) Personnel Number

(d) Experience

(e) Qualifications

(f) Training history

(g) Subsequent Training

(h) Scope of activity

(i) Starting date of employment/contract

(j) If appropriate - ending date of employment/contract.

2. The record may be kept in any format but should be under the control of the organisation's quality system.

3. 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 become accessible to unauthorised persons.

4. The DGTA is a TAA when investigating the records system for initial and continued approval or when the DGTA has cause to doubt the competence of a particular person.

GM 147.A.110 Records of instructors, examiners and assessors

Instructors, knowledge examiners and practical assessors should be provided with a copy of their terms of reference.

GM 147.A.115 (a) Instructional equipment

1. Synthetic training devices are working models of a particular system or component and include computer simulations.

2. A synthetic training device is considered beneficial for complex systems and fault diagnostic purposes.

AMC 147.A.115 (c) Instructional equipment

1. An appropriate selection of aircraft parts means appropriate to the particular subject module or submodule of MSTAR 66 being instructed. For example, the turbine engine module should require the provision of sufficient parts from different types of turbine engines to show what such parts look like, what the critical areas are from a maintenance viewpoint and to enable disassembly/assembly exercises to be completed.

2. Appropriate aircraft, engines, aircraft parts and avionics equipment mean appropriate with the particular subject module or submodule of MSTAR 66 being instructed. For example, category B2 avionic training should require amongst other equipment, access to at least one type of installed autopilot and flight director system

such that maintenance and system functioning can be observed and therefore more fully understood by the student in the working environment.

AMC 147.A.115 (d) Instructional equipment

'Access' may be interpreted to mean, in conjunction with the facilities requirement of 147.A.100 (d), that there may be an agreement with a maintenance organisation approved under MSTAR 145 to access such parts, etc.

AMC 147.A.120 (a) Maintenance training material

Training course notes, diagrams and any other instructional material should be accurate. Where an amendment service is not provided, a written warning to this effect should be given.

AMC 147. A.125 Records of students

The trainee records shall include (but not limited to):

1. Trainee application documents.

2. Trainee academic/vocational qualification, professional certification or prior experience resume.

3. Trainee exemption records.

4. Trainee training certification issued references number.

AMC 147.A.130 (a) Training procedures and quality system (MY)

1. This guidance material provides some clarifications for the incorporation of new training methods and training technologies in the procedures for aircraft maintenance training.

2. The classic training method is a teacher lecturing the pupils in a classroom. Commonly the training tools are a blackboard and training manuals. New technologies make it possible to develop new training methods and use other training tools, e.g., multimedia-based training and virtual reality. A combination of several training methods/tools is recommended to increase the overall effectiveness of the training.

3. Simulation cannot be eligible as a sole training or assessment tool for basic hand skills such as wiring, drilling, filing, wire locking, riveting, bonding or any other skill where competence may only be achievable by performing a hands-on activity.

4. Three tables are provided to illustrate the possibilities for the use of different training methods and tools:

(a) Table 1: Training tools.

(b) Table 2: Training methods.

(c) Table 3: Combination of training methods and tools and their use.

5. Table 1 lists existing training tools that may be selected for basic training.

	Training tools	Description
1	Slideshow presentation	A structured presentation of slides.
2	Manuals	Comprehensive and controlled publication of a particular topic.
3	Computer (desktop PC, laptop, etc.)	An electronic processing device that can hold and display information in various media.
4	Mobile devices (such as, but not limited to, tablet, smartphones, etc.)	A mobile electronic processing device that can hold and display information in various media.
5	Videos	Electronic media for broadcasting moving visual images.
6	MSTD - Maintenance simulation training device	A training device that is intended to be used in maintenance training, examination, and/or assessment for a component, system or entire aircraft. The MSTD may consist of hardware and software elements.
7	Mock-up	A scaled or full-size replica of a component, system or entire aircraft that preserves (i.e., is a replica of) the geometrical, operational or functional characteristics of the real component, system or entire aircraft for which maintenance training is delivered with the use of such a replica.
8	Virtual reality	A computer-generated three-dimensional (3D) environment which can be explored and possibly interacted with.
9	MTD - Maintenance training device	A maintenance training device is any training device other than an MSTD used for maintenance training and/or examination and/or assessment. It may include mock-ups.
10	Real aircraft	A suitable aircraft whose condition allows teaching a selection of maintenance tasks that are representative of the particular aircraft or the aircraft category. 'Suitable' means an aircraft of the type of licence (sub)category (if the licence (sub)category aircraft is outfitted with the same equipment subject to the particular lesson module(s) and is sufficiently similar so that the lesson objective(s) can be satisfactorily accomplished) for type training, or an aircraft representative of the licence (sub)category for basic training, and excludes 'virtual aircraft'. 'Condition' means that the aircraft is equipped with its main components and that the systems can be activated/operated when this is required by the learning objectives.
11	Aircraft component	A suitable aircraft component used to teach specific maintenance tasks of the wing. This may include but is not limited to tasks such as borescope inspections, minor repairs, testing, or the assembly/disassembly of sub-components. 'Suitable' means that the condition of the component should fit the learning objectives of the tasks and, when appropriate, may feature existing defects or damages.
12	Augmented reality	An enhancement (modification, enrichment, alteration or manipulation) of one's current perception of reality elements of a physical, real-world environment following user's inputs picked up by sensors transferred to rapid streaming computer images. By contrast, virtual reality replaces the real world with a simulated one.
13	Embedded training	A maintenance training function that is originally integrated into the aircraft component's design (i.e., a centralised fault display system).
14	Classroom	A physical, appropriate location where learning takes place.
15	Virtual classroom	A simulated, not physical, location where synchronous learning takes place.
16	Virtual aircraft	A simulated, not physical, aircraft that may be used in theoretical training, practical training, examination or assessment.
Note: Synthetic training devices (STDs) is a generic term used for systems using hardware and/or software, simulating the behaviour of one or more aircraft systems or a complete aircraft, such as maintenance simulation training devices (MSTDs), maintenance training devices (MTDs) and flight simulation training devices (FSTDs).		

Table 1: Training tools

6. Table 2 lists existing training methods that may be selected for basic training.

Training method	Description	Instructor-centred (1)	Student-centred (2)	Blended training (3)
Assisted learning (mentoring)	Assisted learning or mentorship represents an ongoing, close relationship of dialogue and learning between an experienced/ knowledgeable instructor and a less experienced/ knowledgeable student to develop the experience/ knowledge of students.	x	x	x
Computer-based training (CBT)	CBT is an interactive means of structured training using a computer to deliver content. (Note: Not to be confused with competency-based training that also uses the acronym 'CBT')	x	x	x
Demonstration	A method of teaching by example rather than explanation.	x		x
Distance learning asynchronous	Distance learning reflects training situations in which instructors and students are physically separated. It is asynchronous if the teacher and the students do not interact at the same time.		x	x
Distance learning synchronous	Distance learning reflects training situations in which instructors and students are physically separated. It is synchronous if the teacher and the students interact at the same time (real-time).	x		x
e-learning	Training via a network or electronic means, with or without the support of instructors (e-tutors).	x	x	x
Lecturing (instructor-led/face to face)	The practice of face-to-face delivery of training and learning material between an instructor and students, either individuals or groups.	x		x
Mobile learning (M-learning)	Any sort of learning that happens when the student is not at a fixed, predetermined location, using mobile technologies.	x	x	x
Multimedia-based training (4)	Any combined use of different training media.	x	x	x
Simulation	Any type of training that uses a simulator imitating a real-world process or system.	x	x	x
Web-based training (WBT)	Generic term for training or instruction delivered over the internet or an intranet using a web browser.	x	x	x

Note: The purpose of this table is to provide a short definition for each associated training method and to relate each method to the focus of the learning. It is not meant to comprehensively explore and identify the capabilities of each training method herein included.

(1) 'Instructor-centred' means that the instructor is responsible for teaching the student.

(2) 'Student-centred' means that the student is responsible for the learning progress.

(3) 'Blended training' includes different instructional methods and tools, different delivery methods, different scheduling (synchronous/asynchronous) or different levels of guidance. Blended training allows the integration of a range of learning opportunities.

(4) 'Multimedia-based training' by definition uses various media to achieve its objective, thus, none of the single media listed is per se a complete solution for training.

Table 2: Training methods

7. Table 3 presents the combination of training methods and tools that may be taken into account for theoretical and practical training.

8. The table is intended to support potential delivery methods. Additional training methods and further use of those methods could be acceptable to the DGTA when demonstrated as supporting learning objectives.

Training method	Training tools	Theoretical elements			Practical elements	OJT	Learning objectives		
See Table 2	See Table 1	Level 1	Level 2	Level 3			Know-ledge	Skills	Attitude
instructor-led /face to face)	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16	x	x	x	x	x only type	x	x	x only type
Assisted learning (mentoring)	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	x	x	x	x	x only type	x	x	x only type
e-learning	1, 2, 3, 4, 5, 8, 12, 14, 15, 16	x	x	x (1)	x (1)	x	x	x (1)	x (1)
Computer-based training	1, 2, 3, 4, 5, 8, 12, 14, 15, 16	x	x	x	x (1)		x only type	x (1)	x (1)
Multimedia-based training	1, 2, 3, 4, 5, 8, 12, 13, 14, 15, 16	x	x	x	x (1)		x only type	x (1)	x (1)
Web-based training (WBT)	1, 2, 3, 4, 5, 8, 12, 14, 15, 16	x	x	x (1)	x (1)		x only type	x (1) only type	x (1)
M-learning	1, 2, 3, 4, 5, 12, 15, 16	x	x	x (1)	x (1)		x (1) type un-limited	x (1)	x (1)
Distance learning synchronous	1, 2, 3, 4, 5, 8, 15, 16	x	x	x (1)	x (1)		x (1)	x (1)	x (1)
Distance learning asynchronous	1, 2, 3, 4, 5, 8, 16	x	x	x (1)			type un-limited	x (1)	only type
Demonstration	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	x	x	x (1)	x	x (1) only type	x	x	x (1) only type
Simulation	1, 3, 4, 6, 7, 8, 9, 10, 12, 14, 15(1), 16	x	x	x (1)	x		x	x	x only type
This table relates a given training method to a list of acceptable training tools (code), oriented to deliver the theoretical elements, practical elements or on-the-job training associated with their specific learning objectives.									
(1) Limited suitability. It means that the respective training method may be used but with limited results, thus requiring the support of a complimentary training method to fulfil the learning objectives. NOTE: Instructor (human) involvement should be considered in Basic Knowledge Modules 9A/9B.									

Table 3: Combination of training methods and tools and their use

AMC 147.A.130 (b) Training procedures and quality system

1. The independent audit procedure should ensure that all aspects of MSTAR 147 compliance should be checked at least once every 12 months and may be carried out as one complete single exercise or subdivided over 12 months by a scheduled plan.

2. In a small maintenance training organisation, the independent audit function may be contracted to another maintenance training organisation approved under MSTAR 147 or a competent person acceptable to the DGTA. Where the small training organisation chooses to contract the audit function it is conditional on the audit being carried out twice every 12 months with one such audit being unannounced.

3. Where the maintenance training organisation is also approved to another Part requiring a quality system, then such quality systems may be combined.

4. When training or examination is carried out under the subcontract control system:

(a) A pre-audit procedure should be established whereby the MSTAR 147 Aircraft Maintenance Training Organisation should audit a prospective subcontractor to determine whether the services of the sub-contractor meet the intent of MSTAR 147.

(b) A renewal audit of the subcontractor should be performed at least once every 12 months to ensure continuous compliance with the MSTAR 147 standard.

(c) The subcontractor control procedure should record audits of the sub-contractor and have a corrective action follow-up plan.

5. The independence of the audit system should be established by always ensuring that audits are carried out by personnel not responsible for the function or procedure being checked.

GM 147.A.130 (b) Training procedures and quality system

1. The primary objective of the quality system is to enable the training organisation to satisfy itself that it can deliver properly trained students and that the organisation remains in compliance with MSTAR 147.

2. The independent audit is a process of routine sample checks of all aspects of the training organisation’s ability to carry out all training and examinations to the required standards. It represents an overview of the complete training system and does not replace the need for instructors to ensure that they carry out training to the required standard.

3. A report should be raised each time an audit is carried out describing what was checked and any resulting findings. The report should be sent to the affected department(s) for rectification action giving target rectification dates. Possible rectification dates may be discussed with the affected department(s) before the quality department confirms such dates on the report. The affected department(s) should rectify any findings and inform the quality department of such rectification.

4. A large training organisation (an organisation with the capacity to provide training for 50 students or more) should have a dedicated quality audit group whose sole function is to conduct audits, raise finding reports and follow up to ensure that findings are being rectified. For the small training organisation (an organisation with the capacity to provide training for less than 50 students) it is acceptable to use competent personnel from one section/department not responsible for the function or procedure to check the section/department that is responsible subject to the overall planning and implementation being under the control of the quality manager.

5. The management control and follow up system should not be contracted to outside persons. The principal function is to ensure that all findings resulting from the independent audit are corrected promptly and to enable the accountable manager to remain properly informed of the state of compliance. Apart from rectification of findings, the Accountable Manager should hold routine meetings to check progress on rectification except that in the large training organisation such meetings may be delegated on a day-to-day basis to the quality manager as long as the accountable manager meets at least once per year with the senior staff involved to review the overall performance.

AMC 147. A.130 (c) Training procedures and quality system (MY)

The following elements, but not limited to, shall be taken as input for the review:

1. Results of audits.

2. Customer feedback.

3. Effectiveness/shortcomings of the training program, including financial support and additional staff to meet foreseen training program.

4. Examinations and assessments.

5. Trainee achievements and support.

6. Follow-up actions from previous management reviews.

7. Changes that could affect the Quality Management System (as part of the AMTO).

8. Recommendations for improvement.

9. The finding of audit analysis root caused classified under following categories:

(a) Organisation.

(b) People.

(c) Procedure.

AMC 147. A.130 (d) Training procedures and quality system (MY)

1. AMTO shall establish a set of training procedures in the Training Instruction Manual (TIM) encapsulating;

(a) Scope of training authorised under the organisation’s certification.

(b) Contents of the training programmes offered including the courseware and equipment to be used.

(c) The organisation’s quality assurance system.

(d) The organisation’s facilities.

(e) The name, duties and qualification of the person designated.

(f) Duties and qualification of the personnel responsible for planning, performing and/or supervising the training.

(g) Procedures for establishing and maintaining the competency of the instructional personnel.

(h) Methods used to document and retain training records.

(i) Any work instructions, procedures or work processes of training management.

(j) Procedures used to manage the competency of personnel involved in any training, management and/or quality audits by a procedure and to a standard agreed by the Authority.

2. As a minimum guideline, the TIM sample template specified in Appendix II, MSTAR 147 shall be applied.

3. AMTO shall review this set of training instructions annually, and all amendments to the training and procedures manual shall be furnished promptly to all organisations or persons to whom the manual has been issued.

AMC 147. A.135 Examinations and Assessment

1. The theoretical examination and/or practical assessment conducted on students shall comply with the training assessment defined in Appendix III, MSTAR 147.

2. Examinations may be computer- or hard-copy-based or a combination of both.

3. The actual questions to be used in a particular examination should be determined by the examiners.

4. The assessment aims to identify individuals' achievement of defined outcomes, rather than relating their performance to that of other learners. Assessment may conduct in several ways, employing different instruments, depending on the competencies or learning outcomes that need to be assessed.

5. Assessors and examiners are to ensure that the most suitable method and the instrument are employed when assessing competence. In practice, several items of evidence need to be collected to confirm competency. Where the assessment of all aspects of competence is required, assessment is to be conducted in a practical setting that is similar to the workplace.

6. Theoretical knowledge examination questions must be controlled by AMTO.

GM 147.A.135 Examinations and Assessment

The DGTA will determine when or if the disqualified examiner may be reinstated.

AMC 147.A.135(b) Examinations and Assessment

As explained in 147.A.135 (b).

GM 147.A.135(c) Examinations and Assessment

As explained in 147.A.135 (c).

AMC 147. A.140 Maintenance training organisation exposition (MTOE)

1. A recommended format of the Maintenance Training Organisation Exposition (MTOE) is included in Appendix IV, MSTAR 147.

2. When the maintenance training organisation is approved by any other Part which also requires an exposition, the exposition required by the other Part may form the basis of the maintenance training organisation exposition in a combined document, as long as the other exposition contains the information required by 147.A.140 and a cross-reference index is included based upon Appendix IV, MSTAR 147.

3. When training or examination is carried out under the subcontract control system the maintenance training organisation exposition should contain a specific procedure on the control of sub-contractors as per Appendix IV, MSTAR 147 item 2.8 plus a list of sub-contractors as required by 147.A.140 (a) (12) and detailed in Appendix IV, MSTAR 147 item 2.8.2.

4. The DGTA may approve a delegated exposition approval system for all changes other than those affecting the approval.

GM 147.A.140(c) Maintenance Training Organisation Exposition (MTOE)

As explained in 147.A.140.

AMC 147.A.145 (a)(1) Privileges of the maintenance training organisation (MY)

Maintenance training organisations are allowed to conduct basic training courses according to the MSTAR 66 syllabus or part thereof as authorized in MTOE maintenance training organisations to any person sponsored by SAO or approved organisations recognized by DGTA.

AMC 147.A.145 (a)(6) Privileges of the maintenance training organisation (MY)

1. On the successful completion of approved training, the AMTO may issue the certificate of recognition to the qualified student.

2. An approved course certificate shall include the following information:

(a) Serial Number of the certificate.

(b) Name and approval number of the maintenance training organisation.

(c) Name of the course and course reference number.

(d) Module and Category passed.

(e) Name and MyKad number of the student.

(f) Signature of the Training Manager as the authorised person issuing the certificate.

3. Type training certificates may be used for recognition of completion of either the theoretical element or both the theoretical and practical elements by deleting as appropriate.

4. The training certificate must identify if the course is a complete course or a reduced course based upon the applicant previous experience or credit recognition.

AMC 147.A.145 (d) Privileges of the maintenance training organisation

1. When training or examination is carried out under the sub-contract control system it means that for the duration of such training or examination, the MSTAR 147 approval has been temporarily extended to include the sub-contractor. It, therefore, follows that those parts of the subcontractor's facilities, personnel and procedures involved with the MSTAR 147 Aircraft Maintenance Training Organisation's students should meet requirements of MSTAR 147 for the duration of that training or examination and it remains the MSTAR 147 organisation's responsibility to ensure such requirements are satisfied.

2. The maintenance training organisation approved under MSTAR 147 is not required to have complete facilities and personnel for training that it needs to sub-contract but it should have its expertise to determine that the sub-contractor meets the MSTAR 147 standards. Particular attention should be given to ensuring that the training that is delivered also meets the requirements of MSTAR 66 and the aircraft technologies are appropriate.

3. The contract between the maintenance training organisation approved under MSTAR 147 and the sub-contractor should contain:

(a) A provision for the DGTA to have right of access to the sub-contractor;

(b) A provision for the sub-contractor to inform the MSTAR 147 Aircraft Maintenance Training Organisation of any change that may affect its MSTAR 147 approval before any such change takes place.

GM 147.A.145 (d) Privileges of the maintenance training organisation

1. The pre-audit procedure should focus on establishing compliance with the training and examination standards set out in MSTAR 147 and MSTAR 66.

2. The fundamental reason for allowing a maintenance training organisation approved under MSTAR 147 to sub-contract certain basic theoretical training courses is to permit the approval of maintenance training organisations, which may not have the capacity to conduct training courses on all MSTAR 66 modules.

3. The reason for allowing the subcontracting of training modules 1 to 6 and 8 to 10 only is, that most of the related subjects can generally also be taught by training organisations not specialised in aircraft maintenance and the practical training element as specified in 147.A.200 does not apply to them. On the contrary, training modules 7 and 11 to 17 are specific to aircraft maintenance and include the practical training element as specified in 147.A.200. The intent of the 'limited subcontracting' option as specified in 147.A.145 is to grant MSTAR 147 approvals only to those organisations having themselves at least the capacity to teach on aircraft maintenance specific matters.

GM 147.A.145 (d) (3) Privileges of the maintenance training organisation

In the case of type training and examination, the reason for allowing only subcontracting to powerplant and avionics systems is that the related subjects can generally also be imparted by certain organisations specialised in these domains such as the Type Certificate Holder of the powerplant or the OEMs of these avionics systems. In such a case, the type training course should make clear how the interfaces with the airframe are addressed and by whom (the subcontracted organisation or the MSTAR 147 organisation itself).

AMC 147.A.145 (f) Privileges of the maintenance training organisation

1. When an organisation approved to provide basic knowledge training or type training is also approved to provide type-examination in the cases where type training is not required, appropriate procedures in the MTOE should be developed and approved, including:

(a) The development and the conduct of the type-examination.

(b) The qualification of the examiners and their currency.

2. In particular, emphasis should be put when such an examination is not regularly conducted or when the examiners are not normally involved in aircraft or activities with technology corresponding to the aircraft type subject to examination. An example would be the case of an organisation providing basic knowledge training only for the B1.1 license. This organisation should justify how they run type examinations for single piston-engine helicopters in the case of a B1.4 licence.

AMC 147. A.145 (g) Privileges of the maintenance training organisation (MY)

1. Any training courses shall be delivered according to the curriculum approved by respective MAO. Applicants shall design and draft the training curriculum according to the intended scope and level of training by curriculum format defined in Appendix V MSTAR 147 and fulfils the requirements stated in MSTAR 66.

2. For AMTO SAO, the applicant shall submit the proposed curriculum to MAO for verification and approval. MAO may delegate the verification process to the respective unit within their organisation. This requirement applied for both initial application and continuing renewal (when approved curriculum validity expired as explained in Paragraph 4.

3. For AMTO Commercial, curriculum verification and approval shall be carried out by DGTA. Conditions below applied:

(a) Initial application: If planned for entering a contract with the Federal Government of Malaysia (GOM) to provide training services.

(b) Continuing Renewal: when approved curriculum validity expired as explained in Paragraph 4.

4. The approved curriculum validity is as follows:

(a) For courses where the duration is a year or less, the validity period is two (2) years from the date the curriculum is approved.

(b) For courses where the duration is more than one (1) year, the validity period is the duration of the course plus one (1) year (and rounded up to the nearest year). (Example: for courses duration of 1 year and 3 months, the validity period will be 3 years, and for courses duration of 3 years validity period is 4 years).

(c) For AMTO SAO, the MAO has the authority to extend the validity of curriculum; however, each extension shall not exceed a period of more than two (2) years.

(d) For AMTO Commercial, the DGTA has the authority to extend the validity of curriculum; however, each extension shall not exceed a period of more than two (2) years.

GM 147. A.145 (g) Privileges of the maintenance training organisation (MY)

1. The curriculum is the authorized management plan of a course. It contains training strategies, objectives, resource requirements, and a range of authoritative course management information. The curriculum should develop by the training development authority. The focus of curriculum development is to provide a structured set of learning activities that allow the progressive development of skills, attitudes and knowledge that leads to the achievement of competency. The curriculum should develop from the Course Training Outcome (CTO) which relate to competency requirements for support staff and certifying staff.

2. The essential features of curricula are that they must:

(a) Be based on training outcomes objectives, expressed through CTO, which specify what a graduate will be able to do by the conclusion of training.

(b) Comprise statements of the knowledge, skills and attitudes that graduates must develop to achieve the specified competency standard.

(c) Specify the assessment process, the criteria for which successful performance is to be demonstrated and conditions under which assessment is to be made.

3. The guideline of curricula as outlined in Appendix VI, MSTAR 147, consist of six sections with their table of the content page. The titles of the six sections are:

(a) Section 1 - Training Specification.

(b) Section 2 - Course Management Information.

(c) Section 3 - Course Resource Requirements.

(d) Section 4 - Modules of Training.

(e) Section 5 - Assessment Plans.

(f) Section 6 - Instructor Guides.

AMC 147. A.145 (h) Privileges of the maintenance training organisation (MY)

1. A maintenance training organisation shall specify the duration and contents of the course in the training curriculum. The minimum requirements, for training course duration and course contents as stipulated in equivalent standards, must be adhered to.

2. A maintenance training organisation shall conduct the theoretical examination and practical assessment. The minimum requirements for training examination and assessment as stipulated in the equivalent standard must adhere.

AMC 147. A.145 (i) Privileges of the maintenance training organisation (MY)

1. There are situations where traditional training delivery systems face-to-face class training are unable to be conducted due to the unavailability of approved training organisations within the country or regional state or due to pandemics. A maintenance training organisation may be approved to deliver distance learning and virtual classroom instruction as authorised.

2. Nonetheless, online teaching requires careful thinking about how students and teachers are equipped for the change and serious consideration about whether the teaching style is still effective when taken out from the classroom and transposed to or mixed with technological devices. Moreover, inequalities are exacerbated when it comes to access to technology and digital devices, as many students may lack the connections and devices to learn remotely. The Aircraft Maintenance Training Organisation shall ensure training facilities requirements related to virtual classrooms and distance learning are consistently available and interoperable.

3. The Aircraft Maintenance Training Organisation shall establish a procedure in the MTOE for conducting theoretical parts of the training according to the approved curriculum in a virtual classroom and distance learning with considered requirements on practical training parts where appropriate and feasible.

4. The Aircraft Maintenance Training Organisation shall provide the instructor guideline of virtual classrooms and distance learning in TIM. Distance learning and virtual classroom instruction guidelines as defined in Appendix VI, MSTAR 147 shall adhere.

5. A reasonable balance between the different training methods should always be ensured so that the student achieves the level of proficiency necessary for the safe performance of all related duties and responsibilities. As an example, during maintenance training, numerous training elements are usually taught through a combination of theory and practice. The Aircraft Maintenance Training Organisation shall develop and conduct suitable methods of assessment to measure the knowledge and performance level of students to comply the approved training curriculum assessment standard requirements.

6. To maintain high-quality standards of training, hands-on practical training shall be conducted as per the approved training curriculum. A programme of structured On Job Training (OJT) shall be prepared to satisfy the practical training requirement.

7. When deciding to allow distance learning, if applicable, or virtual classroom instruction, the Aircraft Maintenance Training Organisation shall perform a risk assessment that, as a minimum, carefully evaluates whether:

(a) Students and theoretical knowledge instructors will have access to appropriate equipment to support remote learning/instruction or the shift from face-to-face to virtual classroom training;

(b) The teaching style remains effective in achieving the training objectives;

(c) The remote environment can reach each training objective.

8. The Aircraft Maintenance Training Organisation shall create a positive learning environment, engaging students and encouraging active participation to achieve the learning objective and have elicited a feedback system for students.

AMC 147. A.150 Changes to the maintenance training organisation (MY)

1. The maintenance training organisation shall comply with all the requirements of this MSTAR. Each AMTO shall:

(a) Advise DGTA on any changes to the basis of its certification to DGTA within seven (7) working days from the date of change and seek written approval for that change.

(b) Upon verification and subsequent approval by DGTA, the change to AMTO certification shall be updated in the MTOE.

(c) Failure to advise DGTA of such changes may result in suspension or revocation of the AMTO certificate.

2. In exceptional cases, the SAO or commercial organisation may request exemption either deviation (before the occurrence of non-compliance) or waiver (after the occurrence of non-compliance) for one or more of the clauses or certain aspects of the regulatory requirement. Any exemption granted can be temporary or permanent. Any request is to be fully justified and dealt with on a case-to-case basis through further discussions with DGTA. Applications and approval processes for exemptions must be properly documented and the authority to approve/reject exemption shall be exercised by the Director-General of DGTA.

3. AMTO shall not operate in any manner in violation of this MSTAR unless permitted under a written exemption by DGTA. Each AMTO shall:

(a) Submit a written request for exemption to DGTA when the AMTO is unable to meet any of the clauses.

(b) Operate by the terms and conditions specified under the approved exemption.

(c) Maintain a permanent record of all exemptions either requested or approved.

(d) Notify DGTA in writing within seven (7) working days when any of the exemptions are no longer applicable.

AMC 147.A.155(b)2 Continued validity of approval

In addition to being granted access to the AMTO to determine continued compliance, the DGTA should also be granted access to any organisation carrying out training (and,

if applicable, examination) on behalf of the AMTO under the 'subcontract control system' as specified at AMC 147.A.145 (d).

AMC 147. A.160 (b) Findings (MY)

1. Failure to complete the rectification of any level 1 finding within fourteen (14) calendar days of written notification shall entail revocation, suspension or limitation by the DGTA, of the maintenance training organisation approval in whole or in part.

2. An action shall be taken by the DGTA to revoke, limit or suspend in whole or part the approval in case of failure to comply within the time scale granted by the DGTA in the case of a level 2 finding.

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 2 **CHAPTER 3**

SUB PART C - APPROVED BASIC TRAINING COURSE

AMC 147.A.200 (b) The approved basic training course

Each licence category or subcategory basic training course may be subdivided into modules or sub-modules of knowledge and maybe intermixed with the practical training elements subject to the required time elements of 147.A.200 (f) and (g) being satisfied.

AMC 147.A.200 (d) The approved basic training course

1. Where the maintenance training organisation approved under MSTAR 147 contracts the practical training element either totally or in part to another organisation by 147.A.100 (d), the organisation in question should ensure that the practical training elements are properly carried out.

2. At least 30% of the practical training element should be carried out in an actual maintenance working environment.

3. The Basic Practical Training Worksheet as defined in Appendix VIII, MSTAR 147 shall be prepared and implemented by a qualified practical instructor for the practical training element selected for the basic practical training.

4. Where identified elements of practical experience cannot be completed in a training session, the outstanding balance may be completed while undertaking an on-the-job training program or performing maintenance tasks under supervision

AMC 147.A.200 (f) The approved basic training course

As explained in 147.A.200 (f).

AMC 147.A.200 (g) The approved basic training course

1. To follow pedagogical and human factors principles, the maximum number of training hours per day for the theoretical training should not be more than 6 hours. A training hour means 60 minutes of tuition excluding any breaks, examination, revision, preparation and aircraft visit. In exceptional cases, the DGTA may allow deviation from this standard when it is properly justified that the proposed number of hours follows pedagogical and human factors principles. These principles are especially important in those cases where:

   (a) Theoretical and practical training is performed at the same time;

   (b) Training and normal maintenance duty/apprenticeship are performed at the same time.

2. The minimum participation time for the trainee to meet the objectives of the course should not be less than 90 % of the tuition hours. Additional training may be provided by the training organisation to meet the minimum participation time. If the minimum participation defined for the course is not met, a certificate of recognition should not be issued.

AMC 147.A.200 (h) The approved basic training course (MY)

Typical conversion durations are given below:

1. The approved basic training course to qualify for conversion from holding a MSTAR 66 aircraft maintenance licence in subcategory A1 to subcategory B1.1 or B2 should not be less than 1600 hours and for conversion from holding a MSTAR 66 aircraft maintenance licence in subcategory A1 to subcategory B1.1 combined with B2 should not be less than 2200 hours. The course should include between 60% and 70% knowledge training.

2. The approved basic training course to qualify for conversion from holding a MSTAR 66 aircraft maintenance licence in subcategory B1.1 to B2 or category B2 to B1.1 should not be less than 600 hours and should include between 80% and 85% knowledge training.

3. The approved basic training course to qualify for conversion from holding a MSTAR 66 aircraft maintenance licence in subcategory B1.2 to subcategory B1.1 should not be less than 400 hours and should include between 50% and 60% knowledge training.

4. The approved basic training course to qualify for conversion from holding a MSTAR 66 aircraft maintenance licence in one subcategory A to another subcategory A should not be less than 70 hours and should include between 30% and 40% knowledge training.

AMC 147. A.205 Basic knowledge examinations

The DGTA may accept that the maintenance training organisation approved under MSTAR 147 conduct the examination of students who did not attend an approved basic course at the organisation in question.

AMC 147.A.210 (a) Basic practical assessment

Where the maintenance training organisation approved under MSTAR 147 contracts the practical training element either totally or in part to another organisation under 147.A.100 (d) and chooses to nominate practical assessors from the other organisation, the organisation in question should ensure that the basic practical assessments are carried out.

AMC 147.A.210 (b) Basic practical assessment

1. An assessed pass for each student should be granted when the practical assessor is satisfied that the student meets the criteria of 147.A.200 (f). This means that the student has demonstrated the capability to use relevant tools/equipment/test equipment as specified by the tool/equipment/test equipment manufacturer and the use of maintenance manuals in that the student can carry out the required inspection/testing without missing any defects, can readily identify the location of components and is capable of correct removal/fitment/adjustment of such components. The student is only required to carry out enough inspection / testing and component removal / fitment / adjustments to prove capability. The student should also show an appreciation of the need to ensure clean working conditions and the observance of safety precautions for the student and the product. In addition, the student should demonstrate a responsible attitude to flight safety and the airworthiness of the aircraft.

2. Appendix VIII, MSTAR 66 provides criteria for the competence assessment performed by the designated assessors (and their qualifications).

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 2 **CHAPTER 4**

SUB PART D - AIRCRAFT TYPE/TASK TRAINING

AMC 147. A.300 Aircraft type/task training

Aircraft type training may be subdivided into the refresher and/or airframe and/or powerplant and/or avionics/electrical systems type training courses. A maintenance training organisation approved under MSTAR 147 may be approved to conduct refresher type training only, airframe type training only, powerplant type training only, avionics/electrical systems type training only or any combination thereof.

1. Refresher type training course means a type training course for the continued validity of an aircraft maintenance license defined under 66.A.40 (f) containing theoretical knowledge of Level 1 training with not less than 30 total hours specific to the ATA Specification Chapter and examination.

2. Airframe type training course means a type training course including all relevant aircraft structure and electrical and mechanical systems excluding the powerplant.

3. Powerplant type training course means a type training course on the bare engine, including the build-up to a quick engine change unit.

4. The interface of the engine/airframe systems should be addressed by either airframe or powerplant type training. In some cases, such as for general aviation, it may be more appropriate to cover the interface during the airframe course due to the large variety of aircraft that can have the same engine type installed.

5. Avionics/electrical systems type training course means type training on avionics and electrical systems covered by but not necessarily limited to ATA (Air Transport Association) chapters 22, 23, 24, 25, 27, 31, 33, 34, 42, 44, 45, 46, 73 and 77 or equivalent.

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 3 **CHAPTER 1**

APPENDICES

Appendix I to 147. A.200

BASIC TRAINING COURSE DURATION

The minimum duration of a complete basic training course shall be as follows:

Basic Course	Duration (in hours)	Theoretical Training Ratio (in %)
A1	800	30 - 35
A2	650	30 - 35
A3	800	30 - 35
A4	800	30 - 35
B1.1	2 400	50 - 60
B1.2	2 000	50 - 60
B1.3	2 400	50 - 60
B1.4	2 400	50 - 60
B2	2 400	50 - 60
B4	2 400	50 - 60
Bridging	800	30 - 35

Appendix II to AMC 147. A.130(d)

TRAINING INSTRUCTION MANUAL

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Appendix IV - List of Training Aids

Appendix III to AMC 147. A.135

TRAINING ASSESSMENT

1. The production of overall plans on how assessment is to be conducted for each curriculum module is a key task of the Aircraft Maintenance Training Organisation developer. The plan shall provide a summary of the knowledge, attitude and performance assessment requirements for each training level. Where Authority training standards and syllabus as defined in MSTAR 66 shall be included in courses, detail of the applicable training package assessment guidelines and qualification outcomes must be included in the module assessment plan in the curriculum.

2. The factors that should be considered in selecting an assessment method to relate to the relevance key abilities associated with competency as follows:

a. **Theoretical**. Theoretical examination to identify underpinning knowledge and its relationship to overall competency. A module theoretical examination instrument should contain the test items to be completed by the student with cross-reference to applicable learning outcomes and assessment criteria. The method of scoring items, cut-off points and an indication of the criticality of the items to the assessment of the overall competence is to be included.

b. **Practical**. Practical assessment to identify on performance application of component skills to overall competency. A module of practical assessment instruments should contain a description of the assessment instructions to be followed, the assessment checklist and guidance regarding minimum acceptable performance. The checklist must also detail the competency/learning outcome, its associated assessment criteria, a list of steps to be followed and note any key points to be observed. Standards criteria of references against which the student's performance will be judged are to be provided.

c. **Attitudes**. Attitudinal aspects associated with competency. Attitude assessment focuses on confirming the occurrence of observable general or particular forms of behaviour. The assessor should be able to make inferences from the learner's observable behaviour and make judgements on their attitudes and values reflected by these behaviours. Attitudes should be measured or assessed at the same time that learners are being assessed performing work-related tasks. Attitude and performance assessment instruments should conduct collectively. Attitude assessments should use an awarding grades system such as Satisfactory or Not Yet Satisfactory; ratings on a scale from A to E; or a scored system from one to ten.

3. In the CBTA System, summative and formative assessment are two methods that can be used individually or in combination to gather and assist the judicial process. The type of assessment employed depends on the purpose of the assessment to evaluate knowledge and performance of a student's learning during the training session.

a. **Summative Assessment.** The assessment process used to evaluate student learning, skill acquisition, and academic achievement at the end or conclusion of a defined instructional lesson either chapter, module, or training session. The purpose of the assessment is to check that a student has fulfilled all the competency requirements for the aim of the courses. The tests, assignments, or projects are used to determine whether students have learned what they were expected to learn to what degree students have learned the material they have been taught. This assessment must be primarily directed toward the testing of actual task performance and not task

knowledge. Assessment on underpinning knowledge may be conducted only when required to check the essential degree of knowledge to task performance.

b. **Formative Assessment**. The assessment process used to conduct in-process assessments of student comprehension, learning needs, and academic progress during a lesson. The purpose of assessment is to collect detailed information that can be used to improve instruction and student learning while it's happening. The questions that instructors pose either in oral or writing quizzes to individual students and groups of students during the learning process to determine what specific concepts or skills they may be having trouble with. The term `formative' refers to the function of this assessment type in assisting students `form' the knowledge, skills and attitudes that will eventually be required to demonstrate competence. Formative assessment is usually administered through the Progress Test. Progress tests should be administered for all off-job courses longer than five days duration. The results must not be used in isolation to determine the competence of final student grades. However, they may be used by unit management when considering cases of student failure to progress in training.

4. The theory and practical training session assessment shall be conducted to students on every training module to determine the instructional objectives that have been achieved. The assessment test shall comply with the following criteria's:

a. **Multiple Choice Objective Question (MCOQ)**. The examination question booklets, which consist of instructions, are provided to candidates together with answer sheets. Each question comprises an introductory statement and three alternative answers designated (A), (B) and (C) printed below the statement. Each set of examination papers should encompass the minimum number of questions required by every subject must design.

b. **Subjective / Essay Paper**. This test paper comprises several questions which cover basic principles and practical features appropriate to systems and/or components. Questions in the main section will relate to the maintenance and inspection aspects, condition assessment, functional checking, trouble-shooting procedures and maintenance and certification.

c. **Practical Assessment**. The assessment of the practical project/assignment/performance will be carried out based on the instructor guide checklist/worksheet and using the practical assessment checklist based on the approved training curriculum.

5. **Theoretical - Knowledge Examination**. The summative assessment method shall be applied after the conclusion of the Course Level session. The knowledge examination paper should have three (3) sets of examination question papers containing a minimum of 30% different questions for each set.

a. Formula to identify the number of questions required by modules as follow:

(1) Number of questions required by module = W

(2) Module duration hours = Y

(3) Total training duration hours = Z

(4) Number of questions for one set examination paper = X

(5) Formula: W = (Y/Z) * X

b. Formula to identify the number of questions required by training session each module as follow:

(1) Number of questions required by training session = A

(2) Training session duration hours = B

(3) Total module duration hours = Y

(4) Number of questions required by module = W

(5) Formula: A = (B/Y) * W

c. The total score of the knowledge examination is 100%. One set knowledge examination paper shall contain sixty-eight (68) questions and should be designed as per the following defined format:

(1) **Part A**. Containing 60% marks of answer all sixty (60) questions encompassing of Multiple-Choice Objective Questions (MCOQ), fill in the blank and State True or False.

(2) **Part B**. Containing 20% marks of answer all four (4) Short Subjective Questions.

(3) **Part C**. Containing 20% marks of answer two (2) selection Subjective Questions No 1 or No 2, and No 3 or No 4.

d. The total examination time for one session is based on the total number of questions. The average time answering one question as follows:

(1) MCOQ is based upon a nominal average of 75 seconds per question.

(2) Short Answer Subjective Questions is 15 minutes per question.

(3) Selection Subjective Questions is 30 minutes per question.

e. If knowledge examination is applied, at the end of the course only 50% of total marks will bring forward for the total marking. Unless, if the knowledge assessment as defined in point 6 is not applied, it will carry 100% of the total marks.

6. **Theoretical - Knowledge Assessment**. The summative assessment method may apply after the conclusion of a training module, and/or a combination of training modules within the respective Course Level session. Occasion assessment may conduct on individual and/or syndicate containing a maximum of three students:

a. The knowledge assessment is allowed to be conducted to students at the middle of the Course Level session after a particular training session of the module is completed. Assessment is conducted in terms of quiz tests or/and assignments or projects grouping presentations.

b. The design of the knowledge assessment paper should not be less than two (2) Parts of the question format as defined in point 5 (c) containing 64 questions. The

test paper shall consist of either Part A and Part B, or Part A and Part C. Any examination paper Part B or Part C selected, shall contain 40% marks.

c. The number of questions for knowledge assessment shall be at least 1 question per hour of instruction. The number of questions for each training session and level shall be proportionate to:

(1) The effective training hours spent teaching at that training session and course level,

(2) The learning objectives as given by the training needs analysis.

d. Question paper on Part A and B is the conduct of closed book type. Only paper Part C is approved to conduct an open book type in case of examining a candidate's ability to interpret technical documents.

e. If assignments or projects grouping presentation is selected, the question paper should contain either Part B or Part C.

f. In each module phase, the knowledge assessment is not the final theoretical examination result, and the students are not allowed to fail any knowledge assessment phase of the module.

g. In the end, of course, only 50% of the total marks will bring forward for the total marking. Unless, if the knowledge examination as defined in point 5 is not applied, it will carry 100% of total marks.

7. **Practical - Performance Assessment**

(a) The performance assessment will be based on the application of theoretical knowledge taught during the theory and practices phase.

(b) The assessment activities consist of oral and on job practical execution.

(c) Assessment criteria cover compliance with safety, correct references, in the sequence of steps, accuracy and performance.

(d) Practical assessment time for one session is based on the critical level of task maintenance or depth of inspection. The minimum duration to complete one task practical assessment is 60 minutes.

8. **Attitudinal Assessment** - An attitude student shall be assessed throughout the entire practical performance assessment time. The student’s a choice to display as follow:

(a) Continuing airworthiness.

(b) Safety awareness.

(c) Correct tool control and correct reference.

(d) Confidence level.

9. **Cut-off Points.** For competency assessment, a cut-off points or standard is applied to specify the minimum level of performance considered acceptable to confer competence. A

candidate is required to pass all kinds of assessment sessions given. A cut-off points for passing marks on every assessment method is 75 per cent.

10. **Re-sit Examination**. Anyone who fails a subject or module exam on the first attempt, is allowed to Re-sit the Examination one more time. Candidates are not allowed to fail any subject or module exams twice throughout the course. If a candidate fails on the “Re-sit Examination”, he/she must repeat the training and pass the failed subject or Module.

11. **Grades.** The primary purpose of competency-based assessment is to indicate an outcome achievement. The recognition of merit or grading beyond Competent (C) or Not Yet Competent (NYC) shall include as part of the assessment system. For grading C or NYC, the codes that should be used are Distinction (D), Credit (C), and Pass (P).

Appendix IV to AMC 147. A.140

MAINTENANCE TRAINING ORGANISATION EXPOSITION (MTOE)

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2.4 Personnel Requirement

2.4.1 Organisational Chart

2.4.2 Key Function and Appointments within an AMTO

2.4.3 Duties and Responsibilities of Management Personnel

Accountable Manager, Training Manager, Quality Manager, Examination Manager, Training & Support Manager, Academic and Curriculum Manager, Instructor, Examiner and Practical Assessor.

Example:

a. Accountable Manager

(1) Position (Xxxxxxxxx - Designation)

(2) Immediate Superior

(3) Main Responsibilities

(4) Specific Function

2.5 Facilities Requirement

2.5.1 Main Office

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2.5.3 Procedure Regarding Training Facilities

2.6 General Description of Facilities at Approved Address

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2.6.3 Training Aids.

2.6.4 Academic Facilities and Resources.

2.6.5 Library and Learning Resources.

2.7 List of Approved Course

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2.7.2 The courses conducted are based on SAO or MAO Approved Training Curriculum (Curriculum Approval Reference).

2.8 Training Support Network (TSN)

2.8.1 Procedure Regarding TSN

Manager, Examination Manager, Training and Support Manager, Academic and Curriculum Manager, Instructor, Examiner and Practical Assessor

Appendix V - List of Exemption

Appendix VI - Floor Plan

Appendix V to AMC 147. A.145(g)

CURRICULUM FORMAT

Introduction

1. The curriculum is the authorized management plan of a course. It contains training strategies, objectives, resource requirements, and a range of authoritative course management information. The curriculum should develop by the training development authority. The focus of curriculum development is to provide a structured set of learning activities that allow the progressive development of skills, attitudes and knowledge that leads to the achievement of competency. The curriculum should develop from the Course Training Outcome (CTO) which relate to competency requirements for support staff, maintenance supervisor and aviation engineer.

2. The essential features of curricula are that they must:

   a. Be based on training outcomes objectives, expressed through CTO, which specify what a graduate will be able to do by the conclusion of training.

   b. Comprise statements of the knowledge, skills and attitudes that graduates must develop to achieve the specified competency standard.

   c. Specify the assessment process, the criteria which successful performance is to be demonstrated and conditions under which assessment is to be made.

3. The curricula consist of six sections with its own table of content page:

   a. Section 1 - Training Specification.

   b. Section 2 - Course Management Information.

   c. Section 3 - Course Resource Requirements.

   d. Section 4 - Modules of Training.

   e. Section 5 - Assessment Plans.

   f. Section 6 - Instructor Guides.

Curriculum Contents

1. **Section 1**

   a. **Training Specification**. The training specification is the master document for a course of training contained in Section 1 of the curriculum. This document is the authority to conduct training and contain course management details and required training outcomes, expressed as Course Training Outcomes (CTOs). Cross-references of curriculum modules against both CTO and Technical Airworthiness Requirement are also included in the section. Cross-referencing is usually completed during the development of the course to ensure content validity of the curriculum objectives and assist in subsequent National Aviation Authority (NAA) accreditation. The Section 1 training specification is divided into two (2) Parts as follows:

(1) **Part 1 - Management Information**. The information outlines the heading and their associated purposes that are included in Part 1:

(a) **Title.** The title of the training program reflects the content and type of training.

(b) **Abbreviation, Course Code and Effective Date.** The abbreviation and course code comprises alphabetical and numeric components, respectively. The alphabetical component (or course abbreviation) is used for documenting course details in training schedules and training related documentation. It may also be used to determine whether a member has completed a course of training. The MSTAR-145 Human Resource Department can use the code to search for individual training preferences or for annotating particular job posts with related training requirements or competency assessments. The numeric component can also be used as a curriculum identifier (or number) when referencing curriculum packages. Additionally, the effective date of the training specification, located under the course code, indicates the earliest date that will be accepted for reporting the course. The course code is allocated by the training management office.

(c) **Course Security Classification.** This field states the highest classification of the course material used for instructional purposes. This field does not represent the security classification of the training specification which is usually unclassified. If the training specification contains classified material, then privacy markings are applied under the Malaysian Armed Forces Staff Manual - Volume 1 Service Writing (Provisional) - PPB MAL 100.

(d) **Level of Course, Mastering/Specialization and Eligibility.** The eligibility criteria specify the prerequisite qualifications, mustering/specialization and rank required of candidates, and whether or not the training is available to members of other Services. Details in the eligibility field may be referred to as orders or instructions. The level, of course, is expressed as Basic Knowledge Training Course of Level, Aircraft Type Training Course of Level, Specialist, Specific Task or Engineering Management.

(e) **Travel & Subsistence and Course Fees.** (If applicable) The appointments with funding for the provision of Travel & Subsistence (T&S) and funding the program are listed in these fields. These appointments are recommended by the working group convened to conduct a training requirements analysis and approved by the Training Design Authority.

(f) **Training Authorities.** The various training authorities responsible for aspects of training are as follows:

i. **Course Panelling Authority.** Responsible for selecting and placing personnel on the course.

ii. **Training Analysis Authority.** Responsible for approving the constituent workplace competencies and/or related Occupational specifications.

iii. **Training Design Authority.** Responsible for approving the training specification.

iv. **Training Development Authority.** Responsible for developing training and approving the curriculum.

v. **Conduct of Training Authority.** Responsible for conducting training and assessing students undertaking that training. The Conduct of Training Authority is also responsible for assessing Recognition of Prior Learning (RPL) applications.

vi. **External Training Evaluation Authority.** Responsible for externally evaluating (also referred to as validating) training. The External Evaluation Authority is also responsible for reviewing the training specification as a result of external evaluation results.

(g) **Method of Application.** This field details the method by which a member can apply for the training program.

(h) **Course Aim.** The course aim describes the intended outcome of the training and must be taken into account when developing training.

(i) **Course Description.** The course description provides a brief overview of the content of the program and may include the method of delivery. This field is to be used when describing the program on the Certificate of Training and Statement of Attainment.

(j) **Location of Training.** The site or sites at which the training is conducted is entered in the Location of Training field.

(k) **Duration.** The length of training or duration, of course, is expressed in decimal fractions of working weeks (example: 10 weeks and two days is expressed as 10.4 weeks). For training programs that are conducted outside normal working hours, duration factors are to be stated in the Additional Information field of the training specification. The length of training is initially estimated by the working group convened to conduct a training requirements analysis and confirmed or revised during the development of training.

(l) **Maximum and Minimum Strength.** The strength of a course is expressed in terms of the maximum and the minimum number of participants for which the training is designed. Maximum and minimum numbers are important for training that relies on a certain number of participants for the training to be effective, for example, syndicate and group work.

(m) **Related Training.** (If applicable) Related training may be a listing of associated training programs that together, form a suite of training. The identification of related training on the training specification ensures that, where appropriate, a training program is considered as part of suite training rather than a separate entity. Entries in this field may be referenced to other documentation, for example, Occupational Specifications or Technical Instructions.

(n) **Additional Information.** Details of training that is not addressed in any of the other fields on the training specification, and which may have an impact on training delivery or particular assessment strategies, contain information that training is conducted outside normal working hours, or that there is a requirement for course participants to live-in for the duration of course.

(o) **Accreditation.** Details of training accreditation associated with the course are entered in this field. Information regarding the accreditation agency through which accreditation has been achieved and qualification/part qualification entitlements associated with the course are to be included.

(p) **Authority for Issue.** A training specification is annotated with an authority for the issue which denotes the file reference under which the training specification is released to the Development and Conduct Authorities. Amended training specifications are released under a new authority for issue file reference.

(q) **Date Last Reviewed.** The date when the accuracy and validity of the training specification were last reviewed is entered in this field. The date is amended when an external evaluation of the corresponding course initiates no change to the actual contents of the training specification. If an external evaluation initiates amendment to the contents of the training specification, then a new training specification will be issued with an updated authority for the issue. Consequently, upon the initial issue of training specification, the field is normally 'blank' and the date of review is the same as the date annotated under the authority for issue file reference.

(2) **Part 2 - Course Training Outcome (CTO)**. These CTOs are derived using elements or tasks selected from the Occupational Specification or constituent workplace standard. The training specification also includes specification of training levels to be achieved, guidance regarding delivery and assessment strategies. The provision of an approved training specification is the precursor to the development of a curriculum and training courseware.

(a) **Course Training Outcome (CTO).** A CTO is an outcome statement, expressed as a training objective, which the course participant is required to achieve to graduate from a course. A CTO is always stated in performance terms and is usually ascribed a Training Level (TL).

(b) **Training Level.** A Training Level (TL) indicates the minimum standard to which a CTO must be performed by the conclusion of training. The TL ascribed to a CTO must not exceed the corresponding Workplace Proficiency Level applied to the applicable competency unit/element in the Occupational Specification or constituent workplace competencies for a particular rank or group. Attitude statements are not ascribed to TL. The definitions of training levels codes ascribed to course training outcomes are interpreted as follows:

Training Level	Level of Performance	Supervision Required	After Completing Course, The Trainee Can:
4	Expert	Minimum	Carry out the task quickly; can tell or show others how to do the task; cope with difficult and unusual problems; could apply skill and associated knowledge to new situations; can apply the skill to novel or unique contexts or environments. The graduate has performed the tasks many times in training.
3	Skilled	Normal	Cope with common problems; apply skill and associated knowledge to new situations with moderate confidence; can perform tasks in familiar contexts or the environment. The graduate has performed the tasks several times in training.
2	Trained	Close	Perform the task (actual or simulated); is aware of common problems; could apply skill and associated knowledge to new situations, with limited confidence; can perform tasks in a specific instructional context or environment. The graduate has performed the task at least once in training.
1	Prepared	Constant	Prepared some component skills for the task; has task knowledge; can interpret and determine appropriate responses; can build cue response chains. The graduate has not performed the complete task in training.

2. **Section 2**

a. **Course Management Information.** Section 2 of the curriculum contains comprehensive information required for the efficient and standardized management of courses or training programs. The following information outlines the heading and their associated purposes that are included in Section 2:

(1) **Course Description**. A brief statement of the overall aim of the course as a whole, with emphasis on course outcomes, must be provided. The overall length, location(s) of training, the relationship of the course to AMO employment and outline of course design strategy are included.

(2) **Training Modules**. A list of training modules is listed, showing abbreviations and hours of instructions for each module. Training Modules cover all theoretical and practical elements for basic knowledge training, type rating training and engineering management training.

(3) **Non-Instructional Hours.** A list of non-instructional activities applicable to all participants of a course is given, with hour allocation. Non-instructional activities are those for which instructor attendance is not required and therefore not included in the calculation of instructor indices. The types of activities included within this heading course administration, course opening/closing, course orientation and psychological services. A sub-total of the hours associated with non-instructional activities must be included.

(4) **Hour Summary**. A summary of the hours for training modules and non-instructional activities is included under this heading. The training specification course length and the factors which contribute to its derivation from the course total hours are also included. To express the length in weeks, as required for training specification, it is necessary to take into consideration the adopted course instructional strategy. An instructional training hour means 60 minutes of tuition excluding for students to take rest breaks, move to a new training area (according to the timetable) and/or conduct some personal administration, examination, revision, preparation and/or aircraft visit. Maximum 28 hours training courses is chosen as the length for an instructional week. In these cases, the course length is calculated simply by dividing the total hours (instructional and non-instructional) by 28. There are many instances, however, when the instructional week can be derived by dividing the total course hours by the number of hours in the instructional week (for constant instructional weeks) or by plotting the course on a weekly program.

(5) **The sequence of Instruction**. A network diagram depicting the dependencies training session of modules between each other is provided at Annex A to Section 2 of the curriculum. The diagram will assist instructors and programmers in sequence the module for optimum learning effect.

(6) **Training Program**. Weekly training is provided at Annex B to Section 2 of the curriculum.

(7) **Special Instructions.** Any information peculiar to the unit conducting the training should be included. Information that can be included under this heading is background data for any special assessment requirements or procedures, outlines of unique instructional strategies, explanations detailing the needs for particular resources, or particular course restriction/limitation on structure and conduct.

(8) **Assessment Procedures**. Special assessment requirements, sequences, procedures or the number of questions required by the training session in every module must be detailed under this heading. The training assessment defined in Appendix III shall be adhered to.

(9) **Action Verbs**. Action Verbs used in the curriculum are to be listed and defined as Annex C to Section 2. Examples of each action verb must also be provided.

(10) **Course Awards**. Any awards or prizes made upon graduation from the course or training program are listed. A brief explanation of the purpose and criteria upon which the award is made can also be included.

(11) **Graduation Status**. The effects, if any, that completion of the course has on a member's service employment, pay, incentive allowance or promotion are included under this heading.

(12) **Civil Recognition**. Civil recognition, if any, according to course graduates by National Aviation Authority accredited training providers, licensing bodies, trade recognition agencies, and so on, is included under this heading.

(13) **Course Reporting**. Course reporting procedures and suspension policy/procedures.

(14) **Glossary of Terms**. Acronyms, abbreviations and specialized terms used in the curriculum should be defined at Annex D to Section 2 of the curriculum.

3. **Section 3**

a. **Resource Requirements**. The curriculum is the authority for the acquisition of resources required to support the conduct of the training. The availability of these resources based on qualification, training and experience must be confirmed before the curriculum can be approved. Section 3 must contain details of workforce, financial, equipment and publication resources required to conduct training. The following information outlines the heading used in Section 3:

(1) **Instructor Requirements**. Details of instructor requirements for the theoretical and practical modules are provided in Section 3 of the respective curriculum. Information should be detailed as follows:

(a) A table summarizing the Instructor Hours for each module, by Instructor Mustering/Specialization is included.

(b) A table summarizing the instructor Hours and Instructor Indices for the course as a whole (theoretical and practical components) by Instructor Mustering/Specialization.

(2) **Instructor Indices**. Instructor Indices is a value of the ratio between total instructor hours and 880 total working hours a year by Instructor Mustering/Specialization (Total Instructor Hours/880 Hours). The value of the Instructor Index shall be lesser than 1.0.

(3) **Physical Resource Requirements**. A summary of the Training Support Equipment (TSE) specified for each module is to provide in Section 3 of the curriculum. This includes all references and publications, visiting instructors, specialist support, and visits required for course conduct. If available, the full course recovery amount per student for the course should be included. The cost associated with specific modules should be included. The training managers of the AMTO responsible for administering the training can be consulted to provide assistance and guidance in the development of course costing.

4. **Section 4**

a. **Training Modules**. Section 4 contains the training modules for the course. These training modules include all theoretical and practical training. Non-ATA Specification Chapter training modules should be developed and included where instructor indices must be derived for course activities that are part of core engineer/technician training, for example, Human Factor, Safety or Airworthiness Regulation training specification. If instructor indices are not required, the course

activities should be included under the non-instructional hours heading described in subparagraph 2 a. (3). Section 4 does not include modules covering non-instructional activities; these are summarized in Section 2. The following information outlines the heading that is used to describe training modules:

(1) **Titles**. The titles given to the modules are listed.

(2) **Duration**. The nominal duration of the module, expressed in hours, is detailed. A breakdown of the course or training program hours by delivery strategy for example On-Job, Off-Job, Distance Learning, etc. should be included.

(3) **Module Code**. Where National Aviation Authority curricula/modules are utilized within AMTO course of training, details of National Aviation Authority module and discipline (that is, the employment stream identifier) codes are listed. Additionally, for AMTO course modules that have been National Aviation Authority registered, the corresponding details of the National Aviation Authority module and discipline codes need to be listed. If National Aviation Authority registration is not applicable, then a character identifier is included to assist course programming and referencing in other training documentation.

(4) **Module purpose**. The overall outcomes the module is designed to achieve in terms of the skills and knowledge that participants will be able to demonstrate on completion of the modules is stated. Normally, this statement will correspond with a CTO or group of CTOs listed in the training specification.

(5) **Prerequisites and/or Co-requisites**. Prerequisites for entry to the training module and modules that must be undertaken concurrently are listed under this leading.

(6) **Relationship to National Standards**. A link to any National Aviation Authority standards, training/knowledge level and/or National Aviation Authority training modules is outlined under this heading. The module code (detailed in subparagraph 4 a. (3)) acts as an identifier for referencing purposes whereas this heading is designed to provide an overt link and cross-reference to the workplace standards or competency and any associated National Aviation Authority training modules.

(7) **Content Summary**. A listing of the titles of the learning outcomes or a dot-point summary of the content and underpinning knowledge relevant to the achievement of the learning outcomes is provided.

(8) **Delivery Strategy**. Where appropriate, the recommended delivery strategy for the training module is detailed. This may include a recommended sequence with other training modules or how learning outcomes can be combined between the modules.

(9) **Resource Requirements**. A listing of the human and physical resource requirement specific to the module is provided. Permanent/invitation instructor, examiner and assessor qualifications, training and experience should also be listed.

(10) **OH&S Requirements**. Details of any Occupational Health and Safety (OH&S) guidelines and procedures applicable to the module must be stated under this heading.

(11) **Assessment Method**. The Assessment Method specifies the method(s) used to obtain evidence regarding the achievement of the required learning outcome/assessment criteria. The assessment methods are documented as a single statement for each group of assessment criteria. Details of how the module outcomes will be assessed, including any on-job assessment, and which learning outcomes may be grouped for assessment purposes are indicated.

(12) **Assessment Conditions**. Details of the conditions under which on-job and off-job assessment will take place are provided.

(13) **References**. A listing of documentation specific to this module is included.

(14) **Learning outcomes**. A list of learning outcomes numbered sequentially within each module and expressed as objective statements are provided. Reference to the module code identifier should also include. Normally, these learning outcomes will directly correspond to the CTO listed in the training specification.

(15) **Assessment Criteria**. The Assessment Criteria objective statements are numbered sequentially within each learning outcome.

(16) **Conditions.** The conditions under which learning assessment will take place are generalized for each group of assessment criteria and documented in a single statement. The essential facilities and range of variables (conditions/contexts) of learning associated with the related competencies should be included.

(17) **Instructor Requirements**. A tabular listing of instructor/student ratios, duration (in hours) instructor hours and the mustering/specialization of the instructor(s) for each learning outcome within a module is provided at the end of each training module. This information is summarized for the course in Section 3 of the curriculum and is the basis for calculating ground instructor establishments. Where instructor/student ratios vary within the assessment criteria for learning outcome, the tabular listing should be broken down to assessment criteria level. The determination of instructor/student ratios as outlined in paragraph 4 b.

b. **Instructor/Student Ratio.** The instructor/student ratio is used to specify both the number of instructors to be employed and the instructional approach to be used in delivering instruction for a learning outcome. For example, the ratio (1)2(1/6) for a class of 12 students would indicate the need for 2 instructors to deliver the learning outcome in 1 session, where the student class is split into groups of 6 and taught using a 1 to 6 instructor/student ratio. Similarly, (1)1(1/18) for a class of 18 students would indicate the need for 1 instructor to teach the whole class of 18 students in one session. If the insufficient number of instructors, the ratio (2)1(1/6) for a class of 12 students would indicate the need for 2 sessions to deliver the learning outcome by 1 instructor, where the student class is split into groups of 6 and taught using a 1 to 6 instructor/student ratio. The maximum number of students in the class (course strength), which will influence the derivation of the ratio, is specified in the approved training specification. The formula to define instructor/student ratio and to calculate the value of instructor hours are as follow:

(1) Instructor/Student Ratio = (A) B (C / D)

(2) Instructor Hours = (E) (A) B

Symbol	Description
A -	The number of sessions needs to be taught to the whole student.
B -	The number of instructors needs to teach the whole student.
C -	One (1) Instructor to teach a group student.
D -	The number of students per group (whole class or split into groups).
E -	Value of training session duration (period) hours

Example:

If the value of:

A -	The number of sessions needs to be taught to the whole student.	=	1 x session (split class)
		=	2 x session (whole class)
B -	The number of instructors needs to teach the whole student.	=	2 x instructor (split class)
		=	1 x instructor (whole class)
C -	One (1) Instructor to teach a group student.	=	1 x instructor
D -	The number of students per group (whole class or split into groups).	=	28 x students (split class)
		=	56 x students (whole class)
E -	Value of training session duration (period) hours.	=	3 x duration hours
	The maximum allowable number of students for the theory session	=	28 x students per classroom

The value of:

(1) Instructor/Student Ratio : (A) B (C / D)

(a) Split Class : (1) 2 (1 / 28)

(b) Whole Class : (2) 1 (1 / 28)

(2) Instructor Hours : (E) (A) B

(a) Split Class : 3 * (1) 2 = 6 hours (2 x instructors)

(b) Whole Class : 3 * (2) 1 = 6 hours (1 x instructor)

c. **Theoretical Hours and Practical Elements**. Breakdown of the training hours and practical elements by a training session in every module to comply with training standard requirements as per outlining in MSTAR 66.

d. **The number of questions required by the training session**. Define the minimum number of questions for each training session of the module to comply with basic knowledge requirement, basic examination standard or type rating and examination standard requirement as per outlining in MSTAR 66.

5. **Section 5**

a. **Assessment Plans.** Section 5 of the curriculum contains the assessment plans for the course or training program. The assessment plans provide documented processes necessary for collecting and interpreting evidence to make judgments on the nature and extent of trainee progress or achievement toward the learning outcome. Clear and comprehensive identification of an individual's achievement of these learning outcomes is essential in a criterion-referenced environment under the principles of competency-based assessment.

b. The assessment plan must specify:

(1) Theoretical, practical and attitude assessments to the applicable learning outcomes and associated assessment criteria.

(2) References used to support the assessment standard.

(3) Assessment conditions.

(4) Assessment method.

(5) The cut-off point, score or standard; and

(6) Scoring instructions

6. **Section 6**

a. **Instructor Guide.** Section 6 of the curriculum contains the Instructor Guide (IG) for the associated training modules. The IG ensures the Learning Outcomes and Assessment Criteria determined during the development of the course are conveyed to the student. The IG is a key component of training delivery, and well prepared and effective IG enhances the consistency and quality of training.

b. The function of the IG is to provide the instructor with sufficient information in the form of lesson objectives, key points, strategies and advice on appropriate instructional methods necessary to meet the module outcomes. Using this information, instructors should be able to prepare and formulate lesson plans for use in the classroom or training environment. Using the IG as the primary source of information for the preparation of lesson plans ensures the standardisation of lesson content and level over several course serials or sessions.

c. Additionally, the CTO and Learning Outcomes can be effectively achieved by the original course design methodology. The IG is an essential component of the instructional package and must be available to the instructor before training commences.

d. IG can also be used, by instructors, to obtain information on the knowledge that a group of trainees are expected to have as a result of a previous training course or courses. Continuity of instruction is therefore ensured and duplication avoided. Failure to carry out this check may result in duplication of training. The following information outlines the instructor guide format and content:

(1) **Learning Outcome Face Sheet.** Each learning outcome covered by the IG is to be preceded by a Learning Outcome Face Sheet. The purpose of this page is to provide a summary of resources required and indicate the CTO from which the learning outcomes are derived.

(2) **Left Hand Page.** The left-hand page details the learning outcome and assessment criteria, serial numbers, resources and references.

(3) **Right Hand Page.** The right-hand page contains, from an instructional point of view, the most important information. It contains the minimum amount of material, in the form of key points, that the instructor is required to present and the instructional method that the training developer believes to be the best way to present the key points.

Appendix VI to GM 147. A.145(g)

CURRICULA GUIDELINES

Copy No: …….

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F/A-18D

AIRCRAFT TYPE TRAINING

CURRICULUM

GENERAL FAMILIARIZATION TRAINING

Curriculum Control No	:	FA18D-ATT-CL01
Curriculum Approval Date	:	15 Aug 2015
Curriculum Approval References	:	MAWILUD 1/A4/KEJ(AM)/500/3/5
AMTO Certificate Number	:	AMTO 01/2016
AMTO Certification Validity Date	:	23 Mac 2016

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PREFACE

1. This aircraft rating training curriculum is emphasis what the trainee should become and understands. It aims not only at increasing general knowledge but also at developing analytical thinking, improved attitudes, understanding and the mustering of skill on their aircraft type or trade and also competence to do the job as support staff or certifying staff.

2. Based on the competency-based training, instructors are performed an appropriate analysis to identify skill and knowledge levels to be delivered to trainees is sufficient and efficient to execute respective tasks. This analysis will determine whether they met the training objective and whether they have the competency to apply the skill effectively.

3. The curriculum is developed according to the approved training scope and level in the Letter of Maintenance Training Authority (LMTA). The training modules are designed corresponding with RMAF technical training standard and Airworthiness Training Standards requirement under the following directive:

a. PU 9108 - Manual of Training Policy and Procedure.

b. PU 2207 - Arahan Latihan Kejuruteraan.

c. PU 2206 - Arahan Kerjaya dan Spesifikasi Kerja.

d. State Technical Airworthiness Policy (STAP).

e. Malaysian State Technical Airworthiness Regulations - Part 147 (MSTAR 147).

f. Malaysian State Technical Airworthiness Regulations - Part 66 (MSTAR 66).

4. To ensure the curriculum is relevant and up to date with the latest in procedure and technology, proposals and recommendations from all concerned are welcome. Any inquiry or proposals for this curriculum shall be channelled to:

F/A-18D Aircraft System School
No 18 Squadron
Pangkalan Udara Butterworth
12990 BUTTERWORTH
Phone No: 04-3136263

06 August 2019

Accountable Manager

SECTION ONE

TRAINING SPECIFICATION

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Title **Page No.**

TRAINING SPECIFICATION

PART 1 - MANAGEMENT INFORMATION

Title:	General Familiarization Training
Abbreviation:	GFT
Course Code:	CL01-GFT-FA18D
Effective Date:	Sep 2019
Course Security Classification:	Unclassified
Level of Course:	Course Level 1 of Aircraft Type Training
Trade/Specialization:	Aeromechanical or Avionic Technician
Travel & Subsistence:	To Be Announced
Course Fees:	To Be Announced
Course Panelling Authority:	MAWILUD 1
Method of Application:	New engineering officers, technicians and mechanics that are posted as new members are automatically qualified. Meanwhile, non-member needs to submit an application letter to the SAO office and copy it to F/A-18D Aircraft System School.
Training Analysis Authority:	Senior Maintenance Manager
Training Design Authority:	DGTA
Training Development Authority:	MAWILUD 1
Conduct of Training Authority:	Training Manager
External Training Evaluation Authority:	AMTO Certification by Director General Technical Airworthiness (DGTA)
Course Aim:	To provide preparation or refresher training among technical personnel with knowledge of the aircraft general overview, system configuration and basic system description before proceeding on Course Level 2 - Service and Ground Handling Training; or recertification of competency; or renewal of SAML.

Course Description:

1. The course provides theory and practical instruction covering safety precaution, human factors, technical publication, aircraft general overview, system configuration, basic system description, basic system overview of controls, indicators and principal components function & location of the group airframe systems, airframe structure, propeller, helicopter, power plant and military-specific systems as outlined in the Systems Description Section of the Aircraft Maintenance Manual and/or Instructions for Continuing Airworthiness.

2. The course is divided into eight (8) modules as follows:

a. Module 01: Aircraft Maintenance and Management.

b. Module 02: Human Factors.

c. Module 03: Aircraft General.

d. Module 04: Airframe System.

e. Module 05: Airframe Structure.

f. Module 06: Propellers.

g. Module 07: Engine.

h. Module 08: Helicopter.

i. Module 09: Military-Specific Systems.

Eligibility

Engineering or technical personnel who have passed tertiary education in a technical discipline, aviation maintenance training or basic knowledge training.

Location of Training:

F/A-18D Aircraft System School
Pangkalan Udara Butterworth
12990 BUTTERWORTH

Duration:

56.0 Hours

Maximum Strength:

28

Minimum Strength:

02

Related Training:

Course Level 1 - General Familiarization Training is a prerequisite for Course Level 2 - Service and Ground Handling and Course Level 3 - Line and Base Maintenance Training.

Additional Information:	Course Level 1 - General Familiarization Training certificate will be awarded to course participants on completion of the course and passed the examination. Excluding the refresher training, no competency certification can be awarded upon graduation.
Accreditation:	Completed Aircraft Type Training package as define under 66.A.45(b) may apply for SAML Category B to DGTA.
Authority for Issue:	F/A-18D Aircraft System School is authorized to issue certification under 147.A.45(a)(6).
Date Last Reviewed:	Aug 2019
Date Next Review:	Sep 2021 (Every 2 years)

PART 2 - COURSE TRAINING OUTCOMES

On completion of the course, the graduate is to be able to achieve the following:

		Training Level
1	Identify safety precautions related to the airframe, its systems and power plant during maintenance activities.	2
2	Identify special tooling and test equipment used with the aircraft.	1
3	Identify aircraft manuals, maintenance practices important to the airframe, its systems and power plant.	2
4	Define the general aircraft overview, role and characteristics.	1
5	Define F/A-18D aircraft ATA Specification Chapter system description, general layout, characteristics, major component location and basic normal functioning of each major component.	1

Attitude Statement:

6 The course participants are to choose to display:

a. A positive approach towards excellent maintenance practice culture and commitment to the requirement for continuing airworthiness.

b. The graduate is to perform good maintenance practice and maintain a high standard of safety awareness on the maintenance work process.

c. Knowledge of correct tool control and correct reference.

d. Have confidence in carrying out all jobs.

CROSS-REFERENCE OF TRAINING SPECIFICATION CTOs TO TRAINING SESSIONS

1. MODULE 01 - AIRCRAFT MAINTENANCE AND MANAGEMENT

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
1.	Maintenance Safety Management.	√	√	√	√	√
2.	Tools and Equipment Management.	√	√	√	√	√
3.	Petroleum, Oil & Lubricates Management.	√	√	√	√	√
4.	Maintenance Reference, Manual and Documentation.	√	√	√	√	√
5.	Summative Knowledge Assessment 1 (SKA 1)	√	√	√	√	√

2. MODULE 02 - HUMAN FACTORS

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
1.	Human Factor in Aircraft Maintenance and Inspection.	√	√	√	√	√
2.	Summative Knowledge Assessment 2 (SKA 2)					

3. MODULE 03 - AIRCRAFT GENERAL

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
1.	Aircraft General Overview.	√	√	√	√	√
2.	Aircraft Role and Function.	√	√	√	√	√
3.	Aircraft Characteristics and Specification.	√	√	√	√	√
4.	Summative Knowledge Assessment 2 (SKA 3)	√	√	√	√	√

4. MODULE 04 - AIRFRAME SYSTEM

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
1.	21 Air Conditioning	√	√	√	√	√
2.	21A Air Supply	√	√	√	√	√
3.	21B Pressurisation	√	√	√	√	√
4.	21C Safety and Warning Devices	√	√	√	√	√
5.	22 Auto flight					
6.	23 Communications					
7.	24 Electrical Power					
8.	25 Equipment and Furnishings					
9.	25A Electronic Equipment including emergency equipment					
10.	26 Fire Protection					
11.	27 Flight Controls					

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
12.	27A Sys. Operation: Electrical/ Fly-by-Wire					
13.	28 Fuel Systems					
14.	29 Hydraulic Power					
15.	Summative Knowledge Assessment 3 (SKA 4)					

5. MODULE 05 - AIRFRAME STRUCTURE

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
1.	51 Standard practices and structures (damage classification, assessment and repair)					
2.	53 Fuselage					
3.	54 Nacelles/ Pylons					
4.	Summative Knowledge Assessment 4 (SKA 5)					

6. MODULE 06 - PROPELLER

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
1.	60A Standard Practices - Propeller					
2.	61 Propellers/ Propulsion					
3.	61A Propeller Construction					
4.	Summative Knowledge Assessment 5 (SKA 6)					

7. MODULE 07 – ENGINE

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	2	3	4	5
1.	70 Standard Practices – Engines,					
2.	70A constructional arrangement and operation (Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals, Lubrication Systems).					
3.	70B Engine Performance					
4.	Summative Knowledge Assessment 2 (SKA 7)					

8. MODULE 08 - HELICOPTER

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	**2**	**3**	**4**	**5**
1.	18 Vibration and Noise Analysis (Blade tracking)					
2.	60 Standard Practices Rotor					
3.	62 Rotors					
4.	Summative Knowledge Assessment 7 (SKA 8)					

9. MODULE 09 - MILITARY SPECIFIC SYSTEMS

TRAINING SESSION		COURSE TRAINING OUTCOMES				
		1	**2**	**3**	**4**	**5**
1.	92 Radar					
2.	93 Surveillance					
3.	94 Weapon System					
4.	Summative Knowledge Assessment 8 (SKA 9)					

TRAINING LEVELS ASCRIBED COURSE TRAINING OUTCOMES

The definitions of training levels codes ascribed to course training outcomes are interpreted as follows:

Training Level	Level of Performance	Supervision Required	After Completing Course, The Trainee Can:
4	Expert	Minimum	Carry out the task quickly; can tell or show others how to do the task; cope with difficult and unusual problems; could apply skill and associated knowledge to new situations; can apply the skill to novel or unique contexts or environments. The graduate has performed the tasks many times in training.
3	Skilled	Normal	Cope with common problems; apply skill and associated knowledge to new situations with moderate confidence; can perform tasks in familiar contexts or the environment. The graduate has performed the tasks several times in training.
2	Trained	Close	Perform the task (actual or simulated); is aware of common problems; could apply skill and associated knowledge to new situations, with limited confidence; can perform tasks in a specific instructional context or environment. The graduate has performed the task at least once in training.
1	Prepared	Constant	Prepared some component skills for the task; has task knowledge; can interpret and determine appropriate responses; can build cue response chains. The graduate has not performed the complete task in training.

SECTION TWO

COURSE MANAGEMENT INFORMATION

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COURSE MANAGEMENT INFORMATION

2.1 COURSE DESCRIPTION

2.1.1 **Aircraft Type Training Objective** - The main objective of aircraft type training conducted by F/A-18D System School as AMTO is to graduate Aeromechanical and Avionic Technician with competency to carry out F/A-18D aircraft maintenance activities. The combination of the three (3) knowledge level aircraft systems are being taught before he/she is certified as Maintenance Inspector Supervisor, Authorized Tradesperson or Non-Technical Personnel.

2.1.2 **Course Aim** - General Familiarization Training aims to prepare technical personnel with knowledge level 1 of the aircraft general overview, system configuration and basic system description before proceeding on the next level of aircraft type training. This course also for refresher training to SAML holders who had less than 6 months of maintenance experience in the preceding 2 years period prior qualified to renew his/her licence or a refresher for recertification on Authorisation Certification.

2.1.3 **Course Location** - The course is conducted at F/A-18D System School RMAF Butterworth or any other suitable establishments.

2.1.4 **Course Design Strategy** - The course module training instruction covering the ATA Specification Chapter Group and non-ATA Specification Chapter Group encompassing F/A-18D Aircraft Maintenance and Management in the RMAF context. The course is designed to develop individual skills and will be exposed to the actual working environment throughout the course. The course consists of theoretical training and examination and except for the refresher, practical training and assessment.

2.1.5 **Entrant Qualification** - Engineer or Technical personnel who have passed tertiary education in a technical discipline, Aviation Maintenance Training or Basic Knowledge Training.

2.2 TRAINING MODULE

2.2.1 The contents of training consist of theoretical instructional and practical elements. The course contents covered on syllabus non-ATA Chapter and ATA Chapter specification group system. Detailed information on theoretical instruction hours and practical elements percentage are defined in Section 4. The training is divided into eight (8) modules as follows:

a. Module 01: Aircraft Maintenance and Management.
b. Module 02: Human Factors.
c. Module 03: Aircraft General.
d. Module 04: Airframe System.
e. Module 05: Airframe Structure.
f. Module 06: Propellers.

g. Module 07: Engine.
h. Module 08: Helicopter.
i. Module 09: Military Specific Systems

2.3 TRAINING INSTRUCTIONAL HOURS

2.3.1 The instructional hours for General Familiarization Training have been designed into two (2) categories of training sessions which is the non-ATA Specification Chapter and the ATA Specification Chapter System.

2.3.2 Allocation for theoretical training instructional hours are as follows:

No	Activity	Hours
a.	ATA Specification Chapter	34.0
b.	Non-ATA Specification Chapter	12.0
Total		46.0

2.3.3 The theory assessment session allocation hours are as follows:

No	Activity	Hours
a.	Knowledge Assessment	2.0
b.	Knowledge Examination	1.5
Total		3.5

2.3.4 Practical session and practical assessment for General Familiarization Training has been designed on ATA Specification Chapter Group System specific on main components location and function.

2.3.5 Practical training instructional and practical assessment session hours are as follows:

No	Activity	Hours
a.	Practical Training Session	3.0
b.	Performance Assessment	1.5
Total		4.5

2.4 NON-INSTRUCTIONAL HOURS

2.4.1 Following are the estimated Non-Instructional Hours required in conducting General Familiarization Training:

No	Activity	Hour
a.	Pre-Course Administration: Incoming Processing and Course Opening	1.0
b.	Post Course Administration: Critique Course and Course Closing	1.0
	Total	2.0

2.5 HOURS SUMMARY

2.5.1 This course is conducted based on **28** working hours per week, 5 days a week. The total of **56.0** hours equates to a course length of **2** weeks. The course will start on Monday and will finish in 2 weeks on Friday. Training hours are based on **6** hours per day for Monday

to Thursday and **4** hours for Friday. The maximum training instructional hours covered each week is not more than **28** hours period time.

2.5.2 The summary of hours required to conduct General Familiarization Training comprising nine (9) training modules are as follows:

No	Activity	Hours
a.	Theoretical Training Sessions ATA Chap	34.0
b.	Theoretical Training Sessions Non-ATA Chap	12.0
c.	Knowledge Examination & Assessment	3.5
d.	Practical Training Session	3.0
e.	Performance Assessment	1.5
f.	Non-Instructional Hours	2.0
Total		**56.0**

2.5.3 The summary of practical element percentage to conduct General Familiarization Training comprising eight (8) training modules are as follows:

No	Activity	Practical
a.	Total Number of Practical Task	29.0
b.	Percentage of Practical Elements	15.0%

2.6 SEQUENCE OF INSTRUCTION

2.6.1 The sequence of instruction has been determined in Annex A on how the F/A-18D System School is recognized as AMTO conducting the General Familiarization Training for Aircraft Type Training Course Level 1.

2.7 TRAINING PROGRAM

2.7.1 The training program details on each module that to be followed accordingly are as stated in Annex B to this section.

2.8 RECOGNITION OF PRIOR LEARNING

2.8.1 Engineer or technical personnel who have passed tertiary education in aviation technical discipline, aviation maintenance training, skilled worker technical training or basic knowledge training.

2.9 SPECIAL INSTRUCTIONS

2.9.1 Special instructions are as follows:

a. **Delivery.** F/A-18D System School Training Manager may authorize variations in the delivery of the course to accommodate the needs of specific client units. However, full coverage of course CTO's will comply.

b. **Staffing.** For normal classroom instruction, the instructor/student ratio is [1]1(1/28). During practical sessions, the instructor/student ratio is [2]2(1/7). Instructors are required to be in the workshop all the time of the session.

c. **Conduct of Training.** The course is to be conducted according to:

(1) Aircraft Flight Manual.

(2) Aircraft Maintenance Manual.

(3) Interactive Electronic Technical Publication.

(4) Training Handout Book.

(5) Engineering Procedure Manual.

2.10 ASSESSMENT PROCEDURES

2.10.1 The assessment is conducted under the Assessment Plan stipulated in Section 5. All Learning Outcomes are assessed in the following manner:

a. **Theoretical - Knowledge Examination**

(1) The knowledge examination to be conducted after the training instructional lesson.

(2) If knowledge examination is applied, at the end of the course only 50% of total marks will bring forward for the total marking. Unless, if the knowledge assessment is not applied, it will carry 100% of the total marks.

(3) The knowledge examination will have three (3) sets of question papers containing a minimum of 30% different questions for each set. Each set examination paper shall contain sixty-eight (68) questions and should be designed as per the following defined format:

(a) Part A containing 60% marks of answer all sixty (60) questions encompassing Multiple-Choice Objective Questions (MCOQ) fill in the blank and State True or False.

(b) Part B containing 20% marks of answer all four (4) Short Subjective Questions.

(c) Part C containing 20% marks of answer two (2) selection Subjective Questions No 1 or No 2, **and** Subjective Questions No 3 or No 4.

(4) The number of questions required by modules as stipulated in Section 4 and the nominal average time answering one question as follows:

(a) Part A is 75 seconds per question.

(b) Part B is 15 minutes per question.

(c) Part C is 30 minutes per question.

b. **Theoretical - Knowledge Assessment**

(1) The knowledge assessment may apply more than one time to a student on the selection of training modules or with the combination of training modules. Knowledge assessment is conducted in terms of quiz paper or/and grouping presentation.

(2) The quiz paper format consists of two (2) parts of the question either Part A and Part B, or Part A and Part C containing 64 questions. Any quiz paper containing Part B or Part C carry 40% marks. If a grouping presentation is selected, the question paper should contain either Part B or Part C.

(3) The quiz paper Part A and B is conducted of closed book type. Only paper Part C is approved to conduct an open book type in case of examining a candidate's ability to interpret technical documents.

(4) If knowledge assessment is applied, at the end of the course only 50% of total marks will bring forward for the total marking. Unless, if the knowledge examination is not applied, it will carry 100% of the total marks.

c. **Practical - Performance Assessment**

(1) The performance assessment will be held at the end of the selected modules phase as defined in Section 5.

(2) The assessment will be based on the application of theoretical knowledge taught during the theory and practices phase.

(3) The assessment activities consist of oral and on job practical execution.

(4) Assessment criteria cover compliance with safety, correct references, in the sequence of steps, accuracy and performance.

d. **Attitudinal Assessment** - Throughout the course, the student’s a choice to display as follow:

(1) Continuing airworthiness.

(2) Safety awareness.

(3) Correct tool control and correct reference.

(4) Confidence level.

2.10.2 A candidate, who fails on the assessment procedure first attempt, is allowed a “Re-sit Examination”. A candidate is not allowed to fail any modules assessment twice throughout the course. Whatever marks obtained by the candidate who passed a “Re-sit Examination” will be considered as 75%. (e.g. An actual score of 95% will be equated as 75%). If a candidate fails on the “Re-sit Examination”, he/she must repeat the training and pass the failed subject or Module.

2.10.3 The total score of each assessment procedure is 100% and a passing mark is 75% shall be achieved to qualified award training certification. The student who failed will be suspended from the course and resulted as **NOT YET QUALIFIED**.

2.10.4 End of module phase knowledge examination and/or knowledge assessment cannot be used as part of the final examination unless they contain the correct number of questions required as defined in paragraph 2.10.1 a (3).

2.11 ACTION VERBS

2.11.1 Definitions and examples of action verbs in this curriculum are provided in Annex C to this section.

2.12 COURSE AWARDS

2.12.1 There are no awards or prizes applicable to the course

2.13 GRADUATION STATUS

2.13.1 Re-certification can be considered for refresher participants.

2.14 CIVIL RECOGNITION

2.14.1 EASA Part 66 Type Training Level 1

2.15 COURSE REPORTING

2.15.1 Senior Maintenance Manager.

2.16 GLOSSARY OF TERMS

2.16.1 The glossary of terms is provided in Annex D.

2.17 GRADING SYSTEM

2.17.1 The basis of grading is as follows:

Percentage Obtained	Grades	Classification
85 - 100	A	Excellent
80 - 84	B	Good
75 - 79	C	Satisfactory
74 and below	D	Fail

2.18 AWARD OF CERTIFICATION

2.18.1 A certificate will be awarded to trainees who have passed both theory and practical assessment by achieving the following result:

(1) At least 75% each for the Theory Assessment, and Practical Assessment.

2.19 SUSPENSION AND TERMINATION OF COURSE

2.19.1 Candidates must pass Course Level 1 to be eligible to continue on the next Course Level of Aircraft Type Training.

2.19.2 Anyone candidate who fails the re-sit examination will be interviewed by TM and required to repeat the training and pass failed subject or Modules.

2.19.3 Anyone candidate who fails to achieve 75% and above of total average assessment passing marks will be suspended and status not yet competent. He/she require to repeat the training and passes all subject or Modules.

2.20 CURRICULUM AMENDMENT

2.20.1 Proposals for the amendments to this curriculum shall be submitted to MAWILUD 1 for verification and MTU-Kejuruteraan for endorsement. All amendments made shall comply with MSTAR 147 and Training Instruction Manual.

2.21 ADDITIONAL INFORMATION

2.21.1 The format of this curriculum is developed under MSTAR 147. Meanwhile, the standard of training contents is designed and complied with MSTAR 66.

ANNEXES:

A. The sequence of Instruction.
B. Training Program.
C. Action Verbs.
D. Glossary of terms.

SECTION THREE

COURSE RESOURCES REQUIREMENTS

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HUMAN RESOURCE REQUIREMENTS

1. **General**

a. The F/A-18D aircraft General Familiarization Training (GFT) is designed to provide Course Level 1 aircraft type training for technical personnel that requires instructors and lecturers that are qualified and trained. To ensure effectiveness in delivering during the Theory and Practical Phase, a minimum ratio of 1 to 28 students is to be maintained. Details are as follows:

(1) **Course Coordinator:** 1 x minimum rank of Captain as the Course Coordinator (CC). The appointed personnel should preferably have attended the Basic Training Course (BTC) or Senior Trainer Course (STC).

(2) **The number of Training Staff:** The minimum of rank Sgt and above for instructor in house.

b. Instructors must adhere strictly to the curriculum learning outcomes and assessment criteria. All presentations and handouts must be checked and approved by the Course Coordinator to maintain their standard. All instructors must possess basic qualifications as follows:

(1) Minimum Qualification: Basic Training Course (BTC) or equivalent.

(2) Experience Required: Recognized experience in F/A-18D Aircraft Type Training and other related subject.

(3) Mustering or Specialization: Shall have 2 years' experience exercising aircraft maintenance licence, or holding a degree in engineering tertiary education, or have the experience exercising aircraft maintenance inspector/supervisor.

c. The F/A-18D aircraft General Familiarization Training (GFT) is divided into eight (8) modules. The length of each phase varies accordingly due to its LOs and are as follows:

(1)	Module 01: Aircraft Maintenance and Management.	Hours
(2)	Module 02: Aircraft General.	Hours
(3)	Module 03: Airframe System.	Hours
(4)	Module 04: Airframe Structure.	Hours
(5)	Module 05: Propeller.	Hours
(6)	Module 06: Engine.	Hours

(7) Module 07: Helicopter. Hours

(8) Module 08: Military Specific Systems. Hours

Total **Hours**

2. **Summary of Instructor Hours per Training Session by Mustering/Specialization**

a. **Theoretical Phase**. In reference to Section 4 of this Curriculum, Summary of Instructor Hours per Training Session by Mustering / Specialization during Theory Phase is as per the table below:

Module	Duration Hours	Mustering / Specialization	Instructor Hours
Module 01: Aircraft Maintenance and Management.	1.0	a. Airworthiness Regulation	0.50
		b. Safety Regulation	0.25
		c. Human Factor.	0.25
Module 02: Human Factors			
Module 03: Aircraft General.			
Module 04: Airframe System.			
Module 05: Airframe Structure.			
Module 06: Propeller.			
Module 07: Engine.			
Module 08: Helicopter.			
Module 09: Military Specific Systems.			
Total			

b. **Practical Phase**. In reference to Section 4of this Curriculum, Summary of Instructor Hours per Training Session by Mustering / Specialization during Practical Phase is as per the table below:

Module	Duration Hours	Mustering / Specialization	Instructor Hours
Module 01: Aircraft Maintenance and Management.	0.75	a. SAML-Supervisor	0.25
		b. SAML-Category B1	0.25
		c. SAML-Category B2	0.25
Module 02: Human Factors			
Module 03: Aircraft General.			
Module 04: Airframe System.			
Module 05: Airframe Structure.			
Module 06: Propeller.			
Module 07: Engine.			
Module 08: Helicopter.			
Module 09: Military Specific Systems.			
Total			

3. **Total Instructor Hours and Indices Summary by Mustering/Specialization**

a. Total Instructor Hours and Indices Summary by Mustering / Specialization in Section 4 as the table below:

Mustering/Specialization	Total Instructor Hours	Instructor Index	Min Instructor
SAML-Category B1	950	1.08	2
SAML-Category B2	850	0.97	1
SAML-Category B2 (Limitation Armament)	12	0.01	1
Airworthiness Regulation	1	0.001	1
Safety Regulation	2	0.002	1
Human Factor	1	0.001	1
Total			

Note:

a. Non-Instructional hours were excluded in the calculation of Instructor Indices as no instructors were required during these tasks.
b. 31.4 weeks per year x 28 hours per week equal to 880 hours.
c. **Instructor Index calculation: Total Instructor Hours/880**.
d. If, Instructor Index < 1.0 is good, > 1.0 is bad**.**
e. Meaning that the minimum instructor is 1 instructor for < 880 total instructor hours.

PHYSICAL RESOURCE REQUIREMENTS

1. **Guest Lecturers**

S/N	Mustering/ Specialization	Total Instructor Hours	Tuition Fee Per Hour	Total Cost
1.	Quality Assurance			
2.	Aeromechanical			
3.	Avionic			

2. **Outsources Training**

S/N	Description	Total Instruction Hours	Cost Fee Per Hour	Total Cost
1.	Theoretical Training			
2.	Practical Training			
3.	Training Support Network			
4.	Side Visit			

3. **Training Equipment**

a. **Non-Consumable Items**

S/N	Description	Quantity	Price Per Unit	Total Cost
1.	Student Chairs (Classroom)	10		
2.	Student Desks (Classroom)	10		
3.	Projector Screen	1		
4.	Tools	1 Set		

b. **Consumable Items**

S/N	Description	Quantity	Price Per Unit	Total Cost
1.	Photostat Paper A4 80g	10 Reams		
2.	Certificate	10 Pcs		
3.	Rag	25 Pcs		

REFERENCES AND PUBLICATIONS

1. **Commercial Text Books (References)**

ITEM	TITLE

2. **Publications (Loan to each student)**

ITEM	TITLE

COURSE COSTS

a. Full Recovery Cost per Student RM
b. Equipment Maintenance per Course RM
c. Guest Lecturer RM

SECTION FOUR

TRAINING MODULES

TABLE OF CONTENTS

Title **Page No.**

MODULES 01: AIRCRAFT MAINTENANCE AND MANAGEMENT

Module Title	:	Aircraft Maintenance and Management
Module Code	:	AMM
Duration	:	8 hours
Module Purpose	:	To provide technical personnel with knowledge of workplace safety management, asset management and maintenance practices before allowing performed maintenance activities.
Pre-Requisites	:	Tertiary education in a technical discipline, Aviation Maintenance Training or Basic Knowledge Training.
Relationship to National Standards	:	Europe Military Airworthiness Requirement
Contents Summary	:	This module will cover on following training session/assessments: 1. Maintenance Safety Management. 2. Tools and Equipment Management. 3. Petroleum, Oil & Lubricates Management. 4. Maintenance Reference, Manual and Documentation.
Delivery Strategy	:	Delivery of this module instruction designed to develop competent personnel towards continuing airworthiness will be: 1. Theoretical: Face-to-face. 2. Practical: Demonstrate and perform.
Resource Requirements	:	1. **Human**; Qualified Instructor. 2. **Physica**l; Standard Classroom and equipment as required as stated in Section 3.
OH&S Requirements	:	During conducting practical training modules shall comply with any Occupational Health and Safety

(OH&S) guidelines and procedures applicable to the training session.

Assessment Conditions :

1. **Knowledge Examination** and **Knowledge Assessment** are to take place in a standard classroom or other suitable training environments.

2. **Performance Assessment** is to take place on Line or Base maintenance workplace or suitable practical environment.

Assessment Methods :

Assessment will be conducted as defined in Section 2 of this curriculum:

1. **Theory - Knowledge Examination**. A Summative Knowledge Assessment will be conducted using a written examination at the end of this course.

2. **Theory - Knowledge Assessment**. Summative Knowledge Assessment will be conducted at the end of this module which is incorporated within the training session.

3. **Practical - Performance Assessment**. Summative Performance Assessment will be conducted using the Practical Assessment Checklist Form as defined in Section 5 at the end of this course.

4. **Attitude Assessment**. The Attitude Statement will be assessed throughout the entire practical performance assessment time.

References :

Approved technical information data and foreign source data used in the training session as follows:

1. AMM
2. CMM
3. WDM

LEARNING OUTCOMES : Upon satisfactory completion of this module, the participant will be able to:

Learning Outcomes 01	:	Define maintenance safety management.
Assessment Criteria	:	1.1 Define the work environment floor plan and emergency evacuation procedure. 1.2 Define workplace hazards and safety precautions. 1.3 Define the aircraft danger zone area and safety precautions. 1.4 Define the type of danger on aircraft. 1.5 Define the cockpit safety precaution. 1.6 Define maintenance safety management.
Learning Outcomes 02	:	Describe the tools and equipment management.
Assessment Criteria	:	2.1 Describe the Tools & Equipment Management. 2.2 Describe the procedure of Tool Control and FOD. 2.3 Describe the loose article check 2.4 Describe the Illustrated Tool and Equipment Manual. 2.5 Describe the tools and equipment management.
Learning Outcomes 03	:	Explain the petroleum, oil & lubricates management
Assessment Criteria	:	3.1 Explain the P.O.L Management & Control Procedure. 3.2 Explain the type of P.O.L. 3.3 Explain the petroleum, oil & lubricates management.
Learning Outcomes 04	:	Describe the maintenance reference, manual and documentation.
Assessment Criteria	:	4.1 Describe the Maintenance Manual. 4.2 Describe a Component Manual. 4.3 Describe a Wiring Diagram Manual. 4.4 Describe an Illustrated Part Catalogue. 4.5 Describe on Structure Repair Manual. 4.6 Describe on Minimum Equipment List. 4.7 Describe an Aircraft Log Book. 4.8 Describe the maintenance reference, manual and documentation.

INSTRUCTOR REQUIREMENTS

MODULES 01: AIRCRAFT MAINTENANCE AND MANAGEMENT (THEORETICAL)

Training Session	Learning Outcome	Instructor / Student Ratio	Duration (Period)	Instructor Hours	Mustering / Specialization
1. Maintenance Safety Management.	LO 01 AC 1.1-1.6	(1)1/ (1:10)	2 hours	2 hours	Qualified Instructor
2. Tools and Equipment Management	LO 02 AC 2.1-2.5	(1)1/ (1:10)	2 hours	2 hours	Qualified Instructor
3. Petroleum, Oil & Lubricates Management	LO 03 AC 3.1-3.4	(1)1/ (1:10)	1 hour	1 hour	Qualified Instructor
4. Maintenance Reference, Manual and Documentation	LO 04 AC 4.1-4.8	(1)1/ (1:10)	3 hours	3 hours	Qualified Instructor
Total			**8 Hours**	**8 Hours**	

Note:

1. The formula to define instructor/student ratio required by a training session in every module as per outline in MSTAR 147.
2. The maximum number of students allowed is 28 students per room.

MODULES 01: AIRCRAFT MAINTENANCE AND MANAGEMENT (PRACTICAL)

Training Session	Learning Outcome	Instructor / Student Ratio	Duration (Period)	Instructor Hours	Mustering / Specialization
1. Maintenance Safety Management.	LO 01 AC 1.1-1.6	(1)1/ (1:10)	0.5 Hours	0.5 Hours	Qualified Instructor
2. Tools and Equipment Management.	LO 02 AC 2.1-2.5	(1)1/ (1:10)	0.5 Hours	0.5 Hours	Qualified Instructor
3. Petroleum, Oil & Lubricates Management.	LO 03 AC 3.1-3.4	(1)1/ (1:10)	0.5 Hours	0.5 Hours	Qualified Instructor
4. Maintenance Reference, Manual and Documentation	LO 04 AC 4.1-4.8	(1)1/ (1:10)	0.5 Hours	0.5 Hours	Qualified Instructor
Total			**2 Hours**	**2 Hours**	

Note:

1. The formula to define instructor/student ratio required by a training session in every module as per outline in MSTAR 147.
2. The maximum number of students allowable is 15 students per instructor/assessor.
3. An allowable maximum ratio of the trainee to training aid is eight to one (8:1).

MODULES 01: AIRCRAFT MAINTENANCE AND MANAGEMENT
PRACTICAL HOURS AND ELEMENTS

Chapters	Practical Elements											B1 / B2 - Number of Practical Element	Practical Hours
	B1/ B2	Aeromechanical (B1)					Avionics (B2)						
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS		
1. Maintenance Safety Management.	x/x	x					x					2/2	1.50
2. Tools and Equipment Management	x/x	x					x					2/2	1.50
3. Petroleum, Oil & Lubricates Management	x/x											1/1	0.50
4. Maintenance Reference, Manual and Documentation	x/x			x	x	x			x	x	x	4/4	3.50
Total	**4/4**	**2**		**1**	**1**	**1**	**2**		**1**	**1**	**1**	**9/9**	**7.0**

Note:

1. Practical under this training session shall be conducted together with related subjects from any modules training. The objective is to give a familiarization and integrate one training session with another related training session.

2. The categories of practical elements as follows:

a.	LOC	(L)	: Location	-	15 minutes.
b.	FOT	(F)	: Functional/Operational Test	-	60 minutes.
c.	SGH	(S)	: Service and Ground Handling	-	60 minutes.
d.	R/I	(R)	: Removal/ Installation	-	60 minutes.
e.	MEL	(M)	: Minimum Equipment List	-	60 minutes.
f.	TS	(T)	: Troubleshooting	-	60 minutes.

MODULES 01: AIRCRAFT MAINTENANCE AND MANAGEMENT
NUMBER OF QUESTIONS REQUIRED BY TRAINING SESSION

No.	Training Session	Training Session Duration Hours	No of Question	Part A	Part B	Part C
1	Maintenance Safety Management.	2	2	1	-	1
2	Tools and Equipment Management	2	2	1	1	-
3	Petroleum, Oil & Lubricates Management	1	1	1	-	-
4	Maintenance Reference, Manual and Documentation	3	4	2	1	1
	Total	**8**	**9**	**5**	**2**	**2**

Note:

1. The formula to identify the number of questions required by every training session in the module as per outline in MSTAR 147.

2. Assessment procedure as defined in Section 2:

   a. **Knowledge Examination**: The examination paper consists of 68 Questions divided into Part A (60 questions, 60%), Part B (4 questions, 20%) and Part C (4 questions, 20%).

   b. **Knowledge Assessment**: Quiz paper consist of Part A (60 questions, 60%) & Part B (4 questions, 40%) or Part A (60 questions, 60%) & Part C (4 questions, 40%).

   c. **Knowledge Assessment**: In terms of assignments or projects grouping presentation in selected, question paper encompassing Part B or Part C.

THEORETICAL INSTRUCTIONAL HOURS AND PRACTICAL ELEMENTS

Module Training Session	Theoretical Hours (B1 & B2)	Aircraft Configuration Item Practical Elements											B1 / B2 - Practical Elements
		B1 / B2	Practical Requirement for Aeromechanical (B1)					Practical Requirement for Avionics (B2)					
		LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS	
Module 1: Aircraft Maintenance and Management													
1. Maintenance Safety Management.	2	x/x	x					x					2/2
2. Tools and Equipment Management	2	x/x	x					x					2/2
3. Petroleum, Oil & Lubricates Management	1	x/x											1/1
4. Maintenance Reference, Manual and Documentation	3	x/x			x	x	x			x	x	x	4/4
Module 2: Aircraft General													
Module 3: Aircraft System													
Total	**8**	**4/4**	**65**					**65**					**9/9**
Percentage Practical Element			**(9) / (4+65) * (100) = 13.04%**					**(9) / (4+65) * (100) = 13.04%**					

Note:

1. Contents of practical training at least 50% of the crossed items in the table practical elements stipulated in Table 2 to Appendix III to MSTAR 66 excluding location-related practical training, which are relevant to the particular aircraft configuration item (CI), shall be completed as part of the practical training package for aircraft type training.

SECTION FIVE

ASSESSMENT PLANS

TABLE OF CONTENTS

THEORY ASSESSMENT PLANS SUMMARY

Theory Assessment:

The summative Assessment (SA) method is applying for theory assessment after the conclusion of a training module or combination of training modules within Course Level 1 training session, and the conclusion of a training Course Level session. Theory assessment aims to evaluate the underpinning knowledge selected from the Learning Outcomes and Assessment Criteria listed in Section 4 of this curriculum.

There are **eight (8) Knowledge Assessments** and **one (1) Knowledge Examination** are planned throughout this course.

Theory Assessments are prepared and conducted by AMTO Standard & Examination (S&E) Cell under MSTAR 147.

Assessment Conditions:

The examination paper Part A and Part B shall be conducted of closed book type.

Only examination paper Part C is authorized to conduct an open book type in case of examining the candidate's ability to interpret technical documents.

Assessment Method:

A written Examination paper in the form of MCOQ, fill in the blank, True/False and Short/Long Essay questions as defined in Section 2 of this curriculum.

Scoring Instructions:

Instructors will monitor students during the assessment and marking the answer sheet based on the standard marking scheme.

The total score of this assessment is 100%. The passing mark for the average total score is 75% must be achieved.

Knowledge Examination will carry 50% weightage towards the overall theory assessment.

Knowledge Assessment will be assessed for individual or/and grouping presentations carry 50% weightage towards the overall theory assessment.

Cut Off Point:	75% of marks must be achieved to meet a pass for each assessment. A candidate, who fails the theory assessment on the first attempt, is allowed a “Re-sit Examination”. A candidate is not allowed to fail any theory assessment twice throughout the course. If the candidate failed a “Re-sit Examination”, his/her require to repeat the training and passes failed Module. Only 75% will be given to the student even though the re-assessment is above 75%.
Reference:	Refer Section 4 - References in each module. MSTAR 147. MTOE.

PRACTICAL ASSESSMENT PLANS SUMMARY

Practical Assessment:

The summative Assessment (SA) method is applying for practical assessment after the conclusion of a training Course Level session. The practical assessment aims to evaluate the underpinning performance skill selected from the Learning Outcomes and Assessment Criteria listed in Section 4 of this curriculum.

There is **one (1) Performance Assessment** (PA) conducted throughout this course.

Performance Assessments are conducted by AMTO Standard & Examination (S&E) Cell under MSTAR 147.

Assessment Conditions:

The PA for task location shall be conducted of closed book type. Only PA other than task location is authorized to conduct an open book to evaluate candidates in the ability to interpret technical documents.

Assessment Method:

Performed task accordance to practical assessment checklist form provided in this Section.

The Attitude Statement will be assessed throughout the entire practical session course. Following criteria display on students are observed and assessed:

(1) Continuing airworthiness.
(2) Safety awareness.
(3) Correct tool control and correct reference.
(4) Confidence level.

Scoring Instructions:

Instructors will monitor students during the assessment and marking the answer sheet based on the standard marking scheme. The total score of this assessment is 100%. Performance Assessment (PA) will carry 100% weightage towards the overall practical assessment.

Cut Off Point:

75% of marks must be achieved to meet a pass for PA.

A candidate, who fails the PA first attempt, is allowed a “Re-sit Examination”.

A candidate is not allowed to fail any practical assessment twice throughout the course. If the candidate failed a “Re-sit Examination”, he/she must repeat the training and pass failed Module.

Only 75% will be given to the student if the reassessment is above 75%.

Reference:

Refer Section 4 - References in each module.
MSTAR 147.
MTOE.

ASSESSMENT - INSTRUCTOR REQUIREMENTS

Training Session	Assessment Criteria	Instructor/ Student Ration	Duration (Hours)	Instructor Hours	Mustering/ Specialisation
Formative Knowledge Assessment 1 (FKA 1)	LO 1.0 - 5.0 AC 1.1 - 5.2	[1] 1 (1/28)	0.25	0.25	Qualified Instructor
Formative Knowledge Assessment 2 (FKA 2)	LO 1.0 - 3.0 AC 1.1 - 3.10	[1] 1 (1/28)	0.25	0.25	
Formative Knowledge Assessment 3 (FKA 3)	LO 1.0 - 3.0 AC 1.1 - 3.6	[1] 1 (1/28)	0.25	0.25	
Formative Knowledge Assessment 4 (FKA 4)	LO 1.0 - 3.0 AC 1.1 - 3.4	[1] 1 (1/28)	0.25	0.25	
Summative Knowledge Assessment (SKA)	M1 - M4	[1] 2 (1/14)	2.0	2.0	Qualified Assessor
Summative Performance Assessment (SPA)	M1 - M4	[2] 2 (1/7)	1.0	2.0	Qualified Practical Assessor
Total			**4.0**	**5.0**	

KNOWLEDGE ASSESSMENT

Assessment Method:	Knowledge Assessment is designed to assess students' understanding of all necessary underpinning knowledge at the end of each module which is incorporated within the training session. Students will be assessed individually at the end of each module which is incorporated within the training session. The Knowledge Assessment is in terms of quizzes or group presentations. The number of questions is based on each module stipulated in Section 4.
Assessment Conditions:	The examination on paper Part A and Part B shall be conducted of closed book type. Only paper Part C is authorized to conduct an open book type in case of examining the candidate's ability to interpret technical documents.
Attitude Assessment:	The Attitude Statement will be assessed throughout the entire course.
Cut Off Point:	75% of marks must be achieved to meet a PASS for this assessment. A candidate, who fails a subject or module assessment on the first attempt, is allowed a "Re-sit Examination". A candidate is not allowed to fail any modules assessment twice throughout the course. If the candidate failed a "Re-sit Examination", he/she must repeat the training and pass failed Module.
Criticality:	This assessment targets underpinning knowledge required by the students.
Scoring Instructions:	Instructors will monitor students during the assessment and marking the answer sheet based on the standard marking scheme.
Reference:	Refer Section 4 - References in each module. MSTAR 147. MTOE.

KNOWLEDGE EXAMINATION

Assessment Method:	Knowledge Examination is designed to assess students' understanding in all necessary underpinning knowledge associated with Module 1 to Module 8 thought in this course. Students will be assessed in a written examination that compromises MCOQ, Fill in the Blank, True or False and Short/Long Essay questions. Knowledge Examination will be assessed individually at the end of the course.
Assessment Conditions:	The examination on paper Part A and Part B shall be conducted of closed book type. Only paper Part C is authorized to conduct an open book type in case of examining the candidate's ability to interpret technical documents.
Attitude Assessment:	The Attitude Statement will be assessed throughout the entire course.
Cut Off Point:	75% of marks must be achieved to meet a PASS for this assessment. A candidate, who fails a Knowledge Examination on the first attempt, is allowed a "Re-sit Examination". A candidate is not allowed to fail on Knowledge Examination twice throughout the course. If the candidate failed a "Re-sit Examination", she/he will not be considered for training certification.
Criticality:	This assessment targets underpinning knowledge required by the students.
Scoring Instructions:	Instructors will monitor students during the assessment and marking the answer sheet based on the standard marking scheme.
Reference:	Refer Section 4 - References in each module. MSTAR 147. MTOE.

PERFORMANCE ASSESSMENT

Assessment Method:

Performance Assessment (PA) is designed to assess students' understanding of all necessary underpinning skill performance associated with Module 1 to Module 8 thought in this course.

Students will be assessed under the practical assessment checklist in Section 5 corresponding with the Practical Instructor Guide in Section 6.

PA will be assessed individually at the end of the course.

Assessment Conditions:

The PA for task location shall be conducted of closed book type. Only PA other than task location is authorized to conduct an open book to evaluate candidates in the ability to interpret technical documents.

Attitude Assessment:

The Attitude Statement will be assessed throughout the entire course. Following criteria display on students are observed and assessed:

(1) Continuing airworthiness.
(2) Safety awareness.
(3) Correct tool control and correct reference.
(4) Confidence level.

Any attitudinal breach will be dealt with the AMTO Training Standing Instructions.

Cut Off Point:

75% of marks must be achieved to meet a PASS for this assessment.

A candidate, who fails on the PA first attempt, is allowed a "Re-sit Examination".

A candidate is not allowed to fail on the PA twice throughout the course. If the candidate failed a "Re-sit Examination", she/he will not be considered for training certification.

Criticality:

This assessment targets underpinning knowledge required by the students.

Scoring Instructions:

Instructors will monitor students during the assessment and marking the answer sheet based on the standard marking scheme.

Reference:

Refer to Section 4 - References in each module.
Refer to Section 6 - References in each practical instruction.
MSTAR 147.

ASSESSMENTS INSTRUMENT

General Familiarization Training Section 5

Copy No: …….

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F/A-18D

AIRCRAFT TYPE TRAINING

GENERAL FAMILIARIZATION TRAINING

ASSESSMENT PLANS

THEORY AND PERFORMANCE ASSESSMENTS

There are ten (10) assessment requirements for the modules Course Level 1:

1. Knowledge Assessment 1: Aircraft Maintenance and Management
2. Knowledge Assessment 2: Human Factors
3. Knowledge Assessment 3: Aircraft General
4. Knowledge Assessment 4: Airframe System
5. Knowledge Assessment 5: Airframe Structure
6. Knowledge Assessment 6: Propeller
7. Knowledge Assessment 7: Engine
8. Knowledge Assessment 8: Helicopter
9. Knowledge Assessment 9: Military Specific Systems
10. Knowledge Examination 1: Course Level 1 Aircraft Type Training Examination
11. Performance Assessment 1: Components Location & Function

General Familiarization Training **Section 5**

COVER SHEET

ASSESSMENT MASTER

KNOWLEDGE EXAMINATION

COURSE LEVEL 1 AIRCRAFT TYPE TRAINING EXAMINATION

GENERAL FAMILIARIZATION TRAINING

NOTE

This cover sheet is not to be duplicated

KNOWLEDGE EXAMINATION

COURSE LEVEL 1 AIRCRAFT TYPE TRAINING EXAMINATION
GENERAL FAMILIARIZATION TRAINING

INSTRUCTION TO CANDIDATE

1. There is three (3) Part of the questions paper consisting of 68 questions.

2. Candidate required to sit and answer Questions Paper 1 and Paper 2.

3. **Paper 1: Answer ALL questions within 1 hour and 25 minutes**

   a. **Part A**. Containing **60%** marks of answer all sixty (60) questions encompassing Multiple-Choice Objective Questions (MCOQ), fill in the blank and State True or False. The time per question is 75 seconds.

4. **Paper 2: Answer ALL Parts question within 2 hours**

   a. **Part B**. Containing **20%** marks of **answer all** four (4) Short Subjective Questions. The time per question is 15 minutes.

   b. **Part C**. Containing **20%** marks of **answer two (2)** Selection Subjective Questions No 1 or No 2, **and** No 3 or No 4. The time per question is 30 minutes.

5. The total score of this assessment is 100% and passing marks is 75%.

6. Questions must be written on the **ANSWER SHEET** provided. **DO NOT WRITE ANYTHING ON THE QUESTION PAPER**.

7. Copying and discussing are **STRICTLY PROHIBITED**. Anyone caught will be expelled from the exam and considered as **FAILED**.

8. Please write down your particulars in the provided column on the front page.

9. Please sign if you understood and agreed to adhere to the written instructions as above.

Rank/Name/Service No:			
Signature:		Date:	

For Assessor Use Only			
Score Mark:		Passed / Failed	
Rank/Name/Service No:			
Signature:		Date:	

General Familiarization Training **Section 5**

COVER SHEET

ASSESSMENT MASTER

GENERAL FAMILIARIZATION TRAINING

KNOWLEDGE ASSESSMENT NO. 2

MODULE 02: AIRCRAFT GENERAL

NOTE

This cover sheet is not to be duplicated

General Familiarization Training **Section 5**

KNOWLEDGE ASSESSMENT NO. 2

MODULE 02: AIRCRAFT GENERAL

INSTRUCTION TO CANDIDATE

1. There is two (2) Parts of the question paper consisting of **4** questions.

2. The candidate must answer **ALL** questions **within 20 minutes**.

3. **Part A**. Containing **60%** marks of **answer all** three (3) questions encompassing Multiple-Choice Objective Questions (MCOQ), fill in the blank and State True or False. The time per question is 75 seconds.

4. **Part B**. Containing **40%** marks of **answer all** one (1) Short Subjective Questions. The time per question is 15 minutes.

5. The total score of this assessment is 100% and passing marks is 75%.

6. Questions must be written on the **ANSWER SHEET** provided. **DO NOT WRITE ANYTHING ON THE QUESTION PAPER**.

7. Copying and discussing are **STRICTLY PROHIBITED**. Anyone caught will be expelled from the exam and considered as **FAILED**.

8. Please write down your particulars in the provided column in the front of this question.

9. Please sign if you understood and agreed to adhere to the written instructions as above.

Rank/Name/Service No:			
Signature:		Date:	

For Assessor Use Only			
Score Mark:		Passed / Failed	
Rank/Name/Service No:			
Signature:		Date:	

KNOWLEDGE ASSESSMENT NO. 2

MODULE 02: AIRCRAFT GENERAL

LO 2 - AC 1.1

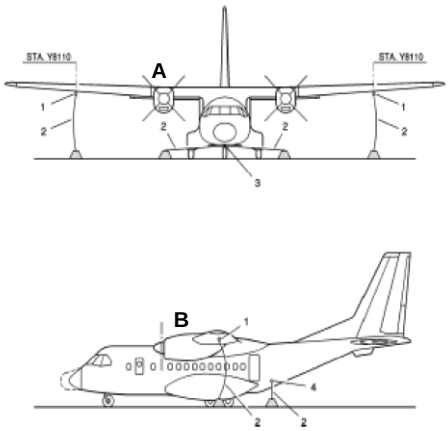
Q.1 Select the major component of aircraft.

a. Engine
b. Wheel Hub
c. Landing Gear

Answer: A

LO 2 - AC 1.2

Q.2 Label the following component A and component B of aircraft from the list provided:



a. Component A is Propeller and component B is Engine
b. Component A is Blade and component B is Cowling
c. Component A is Nose Landing Gear and component B is HF Antenna

Answer: A

LO 2 - AC 1.3

Q.3 Before leaving your aircraft cockpit you are to turn off the electrical power and release the flight control gust lock. (True / False)

Answer: False

General Familiarization Training **Section 5**

COVER SHEET

ASSESSMENT MASTER

GENERAL FAMILIARIZATION TRAINING

PERFORMANCE ASSESSMENT NO. 1

COMPONENTS LOCATION & FUNCTION

NOTE

This cover sheet is not to be duplicated

PERFORMANCE ASSESSMENT NO 1

COMPONENT LOCATION & FUNCTION

ASSESSMENT INSTRUCTIONS

When conducting the assessment, the practical assessor is required to do the following:

1. An assessor is to check the student competency i.a.w. the checklist.

   a. Place a tick any point in the '**Assessment Point**' column of the checklist to indicate that the student performance at the sub-task, or

   b. Each tick on '**Assessment Point**' will contribute a respective mark to the total marks scored for the completed tasks.

   c. Place a '**N/A**' in the remark column of the checklist to indicate that the assessment criteria at the sub-task are not to be assessed.

   d. Place a tick in the '**COMPETENT'** box **or 'NOT YET COMPETENT**' box of the Assessment Outcome to indicate the student performance assessment grading.

2. Written comments are mandatory for any sub-task that is '**Not Satisfactory**' on performance assessment with assessment indicated as '**Very Poor**' or '**Poor**'.

3. The critical task is marked with an asterisk (*****) and student performance must be '**satisfactory**'. If '**Not Satisfactory**' is acquired, the student is considered to fail the practical assessment.

4. The students are to be debriefed on any sub-tasks for which they are '**Not Satisfactory**' and appropriate remedial action must be carried out.

5. Students who scored 75% and above are considered a pass. 74% and below is considered a failure, students need to redo the task.

6. Please write down candidate particulars in the provided column in the front of this checklist.

7. Please brief the candidate prior and after to assess and ask the candidate to put in the signature if she/he is understood and agreed to the comments and the assessment outcome.

General Familiarization Training **Section 5**

PERFORMANCE ASSESSMENT CHECKLIST
(ASSESSOR ONLY)

Maintenance Task: Component Location & Function / Inspection / Component Change / Testing / Troubleshooting & Rectification / Ground Handling

Number of Assessment: _____

Assessor's Name: _____

No, Rank, Name of Candidate: _____
(Use attachment if more than one student)

Trade: _____

Course: _____

Location: _____Date: _____ Start Time: _____ End Time: _____

IND	ASSESSMENT CRITERIA	ASSESSMENT POINT					REMARKS
		0	1	2	3	4	
ELEMENT 1: PRE-MAINTENANCE PREPARATION							
1.1	Ensure the technical manual available.						
1.2	Ensure using the correct technical manual.						
1.3	Ensure using the correct tool and equipment as required.						
1.4	Ensure the **Consumable items** and **non-consumable items** sufficient						
ELEMENT 2: KNOWLEDGE							
2.1	Organize Pre-Maintenance Process						
2.2	Identify Manual/Publication/Check List						
2.3	State on Main Component						
2.4	Identify on Main Component Location						
2.5	Describe on Main Component Function						
2.6	Identify Tools and Equipment						
2.7	Describe on type of maintenance / servicing / inspection / ground handling as stipulated in ICA						
2.8	Describe inspection / servicing / cleaning / on the component as per Technical Manual						
2.9	Describe functional check/test on the system						
2.10	Describe safety precautions during maintenance						
ELEMENT 3: SKILL							
3.1	Perform functional check/test on the system						
3.2	Perform inspection/ servicing/ cleaning / ground handling						
3.3	Identified on physical criteria and condition						
3.4	Recognized abnormal condition						
3.5	Accurate and correct references used						
3.6	Accurate and correct in performing maintenance						
3.7	Accurate and correct in engineering practice						

3.8	Correct of material or component used						
3.9	Correct measurement and judgement on limitation						
3.10	Correct maintenance documentation and records						
3.11	Perform working sequence as per Technical Manual						
3.12	Perform using the correct tool and equipment						
ELEMENT 4: ATTITUDE							
4.1	To know the knowledge, skills and positive attitude towards work						
4.2	Focusing on practical learning processes						
4.3	A bilateral relationship with the instructor						
4.4	Show curiosity						
4.5	Ability to work in a team and willing to help and collaborate with colleagues						
4.6	The ability to guide and lead subordinates well						
4.7	Diligent, dedicated, and committed						
4.8	Is responsible for all personal and subordinate behaviour						
4.9	Can be trusted and trusted to perform the tasks that have been assigned						
4.10	Always obeys and enforces the law						
4.11	Displayed a commitment to the RMAF Core Values						
4.12	Displayed a positive approach toward SNCO/NCO Technician Duties						
4.13	Choose to respect a person as individual						
ELEMENT 5: SAFETY							
5.1	Choose to adhere to the Safety Precautions and Procedures						
5.2	Positive attitude towards Safety Environment as per OSH policy						
5.3	Ensuring in performing Loose Article Check/ Inspection						
5.4	Confident level and precaution measure alert						

Note:

a. Please cross-out whichever is not applicable
b. Assessment points definition:

0 - Very Poor (VP)	1 - Poor (P)	2 - Satisfactory (S)	3 - Good (G)	4 - Excellent (E)

GRADING CODE

Score Point Marks	Grade
More than 90%	Distinction (D)
80 - 89 %	Credit (C)
75 - 79 %	Pass (P)
Below 75 %	Fail (F)

Assessment Result:

Total Marks: **Score Point Marks:** **Grade Code:**

Comments by Practical Assessor:

_____
_____
_____
_____

Assessment Outcome: **COMPETENT** ☐ **NOT YET COMPETENT** ☐

Sight and Sign:

Student:	_____ (Name)	_____ (Signature)	_____ (Date)
Practical Assessor:	_____ (Name)	_____ (Signature)	_____ (Date)

Comments by Verification Officer:

_____
_____
_____
_____

Verified by:	_____ (Name)	_____ (Signature)	_____ (Date)

ASSESSMENT GUIDE

GENERAL

1. **Assessor Qualifications:** The assessor must be approved as a Senior Course Assessor by the TM under MTOE and Training-related Standing Instructions.

2. **Assessment Appeal Procedures:** Procedures related to appealing the results of this assessment, are detailed in MTOE, TIM and Training-related Standing Instructions.

3. **Reassessment Conditions/Procedures:** Conditions and procedures relating to re-sitting this assessment are detailed in MTOE, TIM and Training-related Standing Instructions.

4. **Recording Action:** Results of this assessment are to be recorded under MTOE, TIM and Training-related Standing Instructions.

5. **External Audit Procedures:** Audit procedures for this assessment are detailed in MTOE, TIM and Training-related Standing Instructions.

6. **Conduct of the Assessment:** The following guide is generic and is to be used for both Formative and Summative Knowledge/Performance Assessments. The conduct servicing/inspection of assessment is to be carried out as follows:

    a. Assessor Guide - Knowledge Assessment.

    b. Assessor Guide - Knowledge Examination.

    c. Assessor Guide - Performance Assessment.

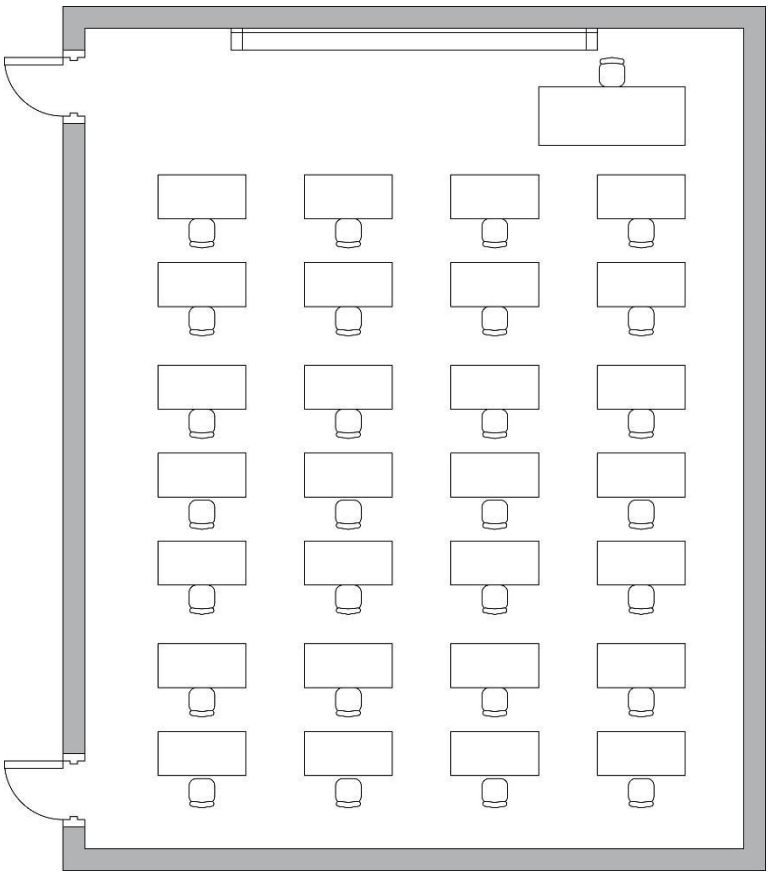
ASSESSOR GUIDE - KNOWLEDGE ASSESSMENT

STEP	ASSESSOR	STUDENT
1.	Manage the timing of selected training sessions accordingly to cater for the assessment.	
2.	Set up classrooms with all assessment materials. Ensure only allowable references and equipment on the student's table.	
3.	Brief student from the Knowledge Assessment Briefs.	
4.	Monitor the student progress IAW related assessment instructions. Provide guidance and feedback where necessary.	Manage time and complete the assessment. Use only allowable references.
5.	Collect all the questionnaires and answer sheets. Briefly review the assessment.	Give feedback toward the Knowledge Assessment procedures.
6.	Evaluate the answer sheet based on the standard answer scheme.	
7.	Enter assessment outcomes and provide any relevant comments on Knowledge Assessment.	
8.	Brief result of Knowledge Assessment to the student.	The student is encouraged to appeal.
9.	Identify any remedial action required.	
10.	Monitor student progress IAW remedial action as required in step 9 (if required).	
11.	Debrief student on remedial action (if required).	

ASSESSOR GUIDE - KNOWLEDGE EXAMINATION

STEP	ASSESSOR	STUDENT
1.	Review lessons that will be assessed during the tutorial.	
2.	Set up classrooms with all assessment materials. Ensure only allowable references and equipment on the student's table.	
3.	Brief student from the Knowledge Examination Briefs.	
4.	Monitor the student progress IAW related assessment instructions. Provide guidance and feedback where necessary.	Manage time and complete the assessment. Use only allowable references.
5.	Collect all the questionnaires and answer sheets.	Give feedback toward the Knowledge Examination procedures.
6.	Evaluate the answer sheet based on the standard answer scheme.	
7.	Conduct Knowledge Examination review with students.	Students are encouraged to appeal.
8.	Enter assessment outcomes and provide any relevant comments on Knowledge Examination.	
9.	Identify any remedial action required.	
10.	Monitor student progress IAW remedial action as required at step 9 (if required).	
11.	Debrief student on remedial action (if required).	
12.	Analyse and review the questionnaire.	

Knowledge Assessment Examination Hall Layout



ASSESSOR GUIDE - PERFORMANCE ASSESSMENT

STEP	ASSESSOR	STUDENT
1.	Review lessons that will be assessed during practical instruction.	
2.	Set up a practical workplace with all assessment materials. Ensure only allowable references and equipment available.	
3.	Brief student from the Performance Assessment Briefs.	
4.	Monitor the student progress IAW related assessment instructions. Provide guidance and feedback where necessary.	Manage time and complete the assessment. Use only allowable references.
5.	Evaluate the answer sheet based on the standard answer scheme.	
6.	Conduct Performance Assessment review with students.	Students are encouraged to appeal.
8.	Enter assessment outcome and provide any relevant comments on Performance Assessment.	
9.	Identify any remedial action required.	
10.	Monitor student progress IAW remedial action as required at step 9 (if required).	
11.	Debrief student on remedial action (if required).	
12.	Analyse and review the questionnaire.	

SECTION SIX

INSTRUCTOR GUIDES

TABLE OF CONTENTS

LEARNING OUTCOMES FACE SHEET

COURSE: General Familiarization Training **(1)** **MODULE**: 01 **(2)**

DATE RAISED/AMENDED: Nov 2015 **(3)** **AUTHOR**: Curriculum Manager **(4)**

COURSE TRAINING OUTCOMES AND TRAINING LEVEL: **(5)**

CTO 1 : Identify safety precautions related to the airframe, its systems and power plant during maintenance activities.

TL : 2

LEARNING OUTCOME(S): (6)

LO 1 Able to define maintenance safety management.

AC 1 Define the work environment floor plan and emergency evacuation procedure.
AC 2 Define workplace hazards and safety precautions.
AC 3 Define the aircraft danger zone area and safety precautions.
AC 4 Define the type of danger on aircraft.
AC 5 Define maintenance safety management.

REFERENCE(S): (7)

1. (MF) A1-F18 Technical Manual
2. Instructors Guide - US Navy

RESOURCE(S): (8)

1. Simulated Aircraft Maintenance Trainer - Avionic, Armament & FCS - US Navy
2. Naval Aviation Maintenance Trainer - Landing Gear & ECS - US Navy

Notes:

1. Curriculum title: obtained from the Training Specification.
2. Module title and abbreviation: obtained from the curriculum (section 4)
3. Date IG has written or date that contents of the topic were last amended.
4. Rank, name and appointment of the member(s) who developed the IG.

5. Training Specification CTO and TL from which the curriculum learning outcome(s) at (6) were derived
6. Learning outcome(s) and its Assessment Criteria(s), including serial number(s).
7. References that were used as a source of the topic material and student texts, if required.
8. Resources available to the instructor for the presentation of the learning outcome(s).

LEFT HAND PAGE

MODULE (1)	LEARNING OUTCOME (2)	ASSESSMENT CRITERIA (3)	RESOURCES REFERENCES (4)
1. Aircraft Maintenance and Management.	1. Able to define maintenance safety management.	1.1 Define the work environment floor plan and emergency evacuation procedure. 1.2 Define workplace hazards and safety precautions. 1.3 Define the aircraft danger zone area and safety precautions. 1.4 Define the type of danger on aircraft. 1.5 Define the cockpit safety precaution. 1.6 Define the maintenance safety management	1. (MF)A1-F18 Technical Manuals 2. BIMS -Boeing Integrated Maintenance Servicing
	2. Able to describe the tools and equipment management.	2.1 Describe the Tools & Equipment Management. 2.2 Describe the procedure of Tool Control and FOD. 2.3 Describe the loose article check. 2.4 Describe the Illustrated Tool and Equipment Manual. 2.5 Describe the tools and equipment management.	1. MMP - Maintenance Management Plan

	3. Able to explain petroleum, oil & lubricates management.	3.1 Explain the P.O.L Management & Control Procedure. 3.2 Explain the type of P.O.L. 3.3 Explain the P.O.L characteristic and hazard category. 3.4 Explain the petroleum, oil & lubricates management.	
	4. Able to describe the maintenance reference, manual and documentation.	4.1 Describe the Maintenance Manual. 4.2 Describe a Component Manual. 4.3 Describe a Wiring Diagram Manual. 4.4 Describe an Illustrated Part Catalogue. 4.5 Describe on Structure Repair Manual. 4.6 Describe on Minimum Equipment List. 4.7 Describe an Aircraft Log Book. 4.8 Describe the maintenance reference, manual and documentation.	

Notes:

1. From learning outcome face sheets.
2. From learning outcome face sheets.
3. From the curriculum module.
4. References used to develop IG, sources of information for the development of lesson plans, student texts, handouts and training guides.

RIGHT HAND PAGE

KEY POINTS AND INSTRUCTIONAL METHODS	HOURS (3)
Key Point 1: Define the work environment floor plan and emergency evacuation procedure (1) **Introduction** Workplace housekeeping and physical arrangements are among the activities that need to be considered in ensuring workers safety and health. A workplace that is neat and orderly can contribute to improvements in an organisation's productivity. In contrast, a workplace that is messy and not in order may cause accidents and illness that consequently affect productivity. a. Hangar b. Shelter	0.25
Key Point 2: Define workplace hazards and safety precautions. Among workplace conditions that may cause accidents or diseases are: a. Slippery floors oily, wet, dusty etc. b. Hand tools/ materials/electricity cables in pathways. c. Disorderly physical arrangements of machinery d. Narrow working space Among the types of accidents that frequently occur due to unsafe workplace conditions are: a. Falling or stumbling over materials or tools b. Falling or skidding due to slippery floor c. Collision with machinery in pathways d. Tripping over tools/cable/wire in pathways	0.25
Key Point 3: Define the aircraft danger zone area and safety precautions.	0.25
Key Point 4: Define the type of danger on aircraft.	0.25
Key Point 5: Define the cockpit safety precaution.	0.25

Instructional Method: (2) Instructor with PPT Slide and a side visit to: Explain on approved facilities building and shop floor plan layout. Walking briefly on side visit training session	
	1.25

Notes:

1. List of words or phrases which indicate the minimum amount of ‘must know’ or ‘must know’ information as directed by the lesson objective. Key points must correspond with the curriculum objective on the left-hand page to which they refer.

2. Brief description of the method and activities which best utilizes the resources available. May include, for example, advice on when to administer assessments and perform practical work. May also contain notes which alert the instructor to tasks that require planning. For example, visits, guest lecturers and use of facilities.

3. Time (hours) for completion of curriculum objectives.

LEARNING OUTCOMES FACE SHEET

COURSE: General Familiarization Training **MODULE**: 05

DATE RAISED/AMENDED: Nov 2015 **AUTHOR**: Maj Azie TUDM (379700)

COURSE TRAINING OUTCOMES AND TRAINING LEVEL:

CTO 5 : Define F/A-18D aircraft ATA Specification Chapter system description, general layout, characteristics, major component location and basic normal functioning of each major component.

TL : 2

LEARNING OUTCOME(S):

LO 1 Able to define overview of Chap 21 Air conditioning System.

AC 1 Explain system introduction and general layout.
AC 2 Explain on System Description.
AC 3 State on Major components.
AC 4 Explain the major component function.
AC 5 Point on Major component location
AC 6 Define overview of Chap 21 Air conditioning System.

REFERENCE(S):

1. (MF) A1-F18 Technical Manual
2. Instructors Guide - US Navy

RESOURCE(S):

1. Simulated Aircraft Maintenance Trainer - Avionic, Armament & FCS - US Navy
2. Naval Aviation Maintenance Trainer - Landing Gear & ECS - US Navy

LEFT HAND PAGE

MODULE (1)	LEARNING OUTCOME (2)	ASSESSMENT CRITERIA (3)	RESOURCES / REFERENCES (4)
5. Airframe System	1. Able to define overview of Chap 21 Air conditioning System.	1.1 Explain on system introduction and general layout. 1.2 Explain on System Description. 1.3 State on Major components. 1.4 Explain the major component function. 1.5 Points on Major component location. 1.6 Define overview of Chap 21 Air conditioning System	1. (MF)A1-F18 Technical Manuals 2. BIMS -Boeing Integrated Maintenance Servicing. 3. AMM 4. WDM 5. AFM **6. Practical Checklist Form** **7. Performance Assessment Form Checklist**
	2. Able to define overview of Chap 23 Communications System.	2.1 Explain on system introduction and general layout. 2.2 Explain on System Description. 2.3 State on Major components. 2.4 Explain the major component function. 2.5 Points on Major component location.	1. AMM **2. Practical Checklist Form** **3. Performance Assessment Form Checklist**

		2.6 Define overview of Chap 23 Communications System	

Notes:

1. From learning outcome face sheets.
2. From learning outcome face sheets.
3. From the curriculum module.
4. References used to develop IG, sources of information for the development of lesson plans, student texts, handouts and training guides.

RIGHT HAND PAGE

KEY POINTS AND INSTRUCTIONAL METHODS	HOURS (3)
Key Point 1: Explain on system introduction and general layout. **(1)** **Introduction** **Key Point 2:** Explain on System Description. **Key Point 3:** State on Major components. **Key Point 4:** Explain on major component function. **Key Point 5:** Point on Major component location **(Actual Practical)** **Instructional Method:** **(2)** Instructor with PPT Slide and a side visit to: a. Performed practical elements on actual aircraft environment using Practical Checklist Form. b. Conduct Performance Assessment using Performance Assessment Form as per outline in Section 5.	0.25 0.5 0.25 0.5 1.0
	2.5

Notes:

1. List of words or phrases which indicate the minimum amount of ‘must know’ or ‘must know’ information as directed by the lesson objective. Key points must correspond with the curriculum objective on the left-hand page to which they refer.

2. Brief description of the method and activities which best utilizes the resources available. May include, for example, advice on when to administer assessments and perform practical work. May also contain notes which alert the instructor to tasks that require planning. For example, visits, guest lecturers and use of facilities.

3. Time (hours) for completion of curriculum objectives.

General Familiarization Training **Section 6**

Form 01

PRACTICAL CHECKLIST
(INSTRUCTOR ONLY)

Maintenance Task: Component Location & Function / Inspection / Component Change / Testing / Troubleshooting & Rectification / Ground Handling

Instructor Particular: _____
Course Series: _____ Module: _____
Training Session: _____ Training Duration: _____

IND	ASSESSMENT CRITERIA	BRIEF POINT
ELEMENT 1: PREPARE THE TRAINING AIDS / TOOLS		
1.1	Ensure the technical manual available.	
1.2	Ensure using the correct technical manual.	
1.3	Ensure using the correct tool and equipment as required.	
1.4	Ensure the **Consumable items** and **non-consumable items** sufficient	
ELEMENT 2: KNOWLEDGE		
2.1	Organize Pre-Maintenance Process	
2.2	Identify Manual/Publication/Checklist	
2.3	State on Main Component	
2.4	Identify on Main Component Location	
2.5	Describe on Main Component Function	
2.6	Identify Tools and Equipment	
2.7	Describe on type of maintenance/servicing / inspection/ground handling as stipulated in ICA	
2.8	Describe inspection/ servicing/ cleaning/ on the component as per Technical Manual	
2.9	Describe functional check/test on the system	
2.10	Describe safety precautions during maintenance	
ELEMENT 3: SKILL		
3.1	Perform functional check/test on the system	Practical Worksheet No:
3.2	Perform inspection/ servicing/ cleaning / ground handling	Practical Worksheet No:
3.3	Identified on physical criteria and condition	Practical Worksheet No:
3.4	Recognized abnormal condition	Practical Worksheet No:
3.5	Accurate and correct references used	Practical Worksheet No:
3.6	Accurate and correct in performing maintenance	Practical Worksheet No:
3.7	Accurate and correct in engineering practice	Practical Worksheet No:
3.8	Correct of material or component used	Practical Worksheet No:
3.9	Correct measurement and judgement on limitation	Practical Worksheet No:

3.10	Correct maintenance documentation and records	Practical Worksheet No:
3.11	Perform working sequence as per Technical Manual	Practical Worksheet No:
3.12	Perform using the correct tool and equipment	Practical Worksheet No:
ELEMENT 4: ATTITUDE		
4.1	To know the knowledge, skills and positive attitude towards work	
4.2	Focusing on practical learning processes	
4.3	A bilateral relationship with the instructor	
4.4	Show curiosity	
4.5	Ability to work in a team and willing to help and collaborate with colleagues	
4.6	The ability to guide and lead subordinates well	
4.7	Diligent, dedicated, and committed	
4.8	Is responsible for all personal and subordinate behaviour	
4.9	Can be trusted and trusted to perform the tasks that have been assigned	
4.10	Always obeys and enforces the law	
4.11	Displayed a commitment to the RMAF Core Values	
4.12	Displayed a positive approach toward SNCO/ NCO Technician Duties	
4.13	Choose to respect a person as individual	
ELEMENT 5: SAFETY		
5.1	Choose to adhere to the Safety Precautions and Procedures	
5.2	Positive attitude towards Safety Environment as per OSH policy	
5.3	Ensuring in performing Loose Article Check/ Inspection	
5.4	Confident level and precaution measure alert	

Comment:

_____

Instructor's Signature: _____ Date: _____

Number of Trainee: _____

Attended List:

_____

_____

_____

_____

Appendix VII to AMC 147. A.145(i)

DISTANCE LEARNING AND VIRTUAL CLASSROOM

1. Introduction

a. There are occurrences, where required technical knowledge under face-to-face classroom instruction training is unable to be conducted due to no approved training providers in the country or any regional state, or pandemics impact, or other obstacles.

b. As an option to training requirements, the need to shift theoretical knowledge instruction footprint to a remote/virtual environment to enable continuity of the planned training. Nonetheless, to maintain high-quality standards of training, hands-on practical training shall be considered and feasible.

c. There are two aspects of remote/virtual environment applicable to training that require careful consideration:

(1) Distance learning;

(2) Substitute (or complement) face-to-face classroom instruction by virtual classroom instruction.

d. MSTAR 147 recognizes distance learning and virtual classrooms (VC) instruction through video conferencing, in real-time, as a means of compliance to the amount of time spent in an actual classroom.

e. This guideline provides recommendations to approved maintenance training organisations wishing to implement distance learning and virtual classroom instruction for theoretical while maintaining an acceptable level of training effectiveness and knowledge transfer under the approved curriculum.

2. Definition

a. **A virtual classroom** means a virtual environment, not a physical, location where synchronous learning takes place.

b. **Computer-based training (CBT)** means any interactive means of structured training using a computer to deliver content. It needs to be complemented with close assistance by an instructor.

c. **Distance learning asynchronous** means training situations in which instructors and students are physically separated. The teacher and the students do not interact at the same time. In pilot training, it is applicable only in modular courses.

d. **Distance learning synchronous** means training situations in which instructors and students are physically separated. It is synchronous if the teacher and the students interact at the same time (real-time).

e. **E-learning** means training via a network or electronic means, with or without the support of instructors (e-tutors).

f. **Mobile learning (M-learning)** means any sort of learning that happens when the student is not at a fixed, predetermined location, using mobile technologies.

g. **Web-based training (WBT)** means a generic term for training or instruction delivered over the internet or an intranet using a web browser.

3. **Distance learning**

a. Any Aircraft Maintenance Training Organisation introducing distance learning, due consideration should be given to students' evaluation. For this reason, after finishing the distance-learning course, the Aircraft Maintenance Training Organisation should have an evaluation meeting with the students at the training centre.

b. MSTAR 66 for type training, Multimedia Based Training (MBT) methods may be used to satisfy the theoretical training element either in the classroom or in a virtual controlled environment subject to the acceptance of the DGTA approving the training course.

c. During distance learning, academic progress needs to be more closely monitored. This can be done by additional (online) tests. For most courses, the examination may not be accepted online and should be done at a later stage. A short refresher training may be desirable.

d. Distance learning requires additional attention during internal audits.

4. **Virtual Classroom Instruction**

a. The face-to-face classroom instruction delivered by an instructor may be replaced by virtual classroom instruction, such as videoconferencing if an acceptable level of communication and interaction is ensured with appropriate equipment and tools. The virtual classroom instruction should provide real-time instructor-led learning where students can interact, communicate, view and discuss presentations. The Aircraft Maintenance Training Organisation should also guarantee that students make satisfactory academic progress and maintain reliable records for the completion of training.

b. There are no requirements for IT infrastructure addressing personal data protection and security, change management, continuity, integrity, audits, user authentication privileges, logging of overall integrated system activity, etc.

5. **Guidance on distance learning and virtual classroom instruction**

a. Ensuring the quality of training when classroom instruction is delivered by distance learning and virtual classroom instruction.

(1) Perform a risk assessment to evaluate whether within an acceptable minimum level:

(a) Students and theoretical knowledge instructors will have access to appropriate equipment to support remote learning/instruction or the shift from face-to-face to virtual classroom training;

(b) The teaching style remains effective in achieving the training objectives;

(c) The remote environment can reach each training objective.

(2) Provided virtual classroom (VC) facilities for instructional delivery by an instructor to a student with an acceptable level of communication with appropriate training media equipment.

(3) Appropriate training equipment shall be available to deliver VC in real-time via an online platform.

(4) Students make satisfactory academic progress under the supervision of competent instructors. The training instructional and assessment records for the completion of training shall be maintained.

b. Identify traditional training delivery system can have virtual equivalents during training instructional, such as:

(1) A classroom can be physical or virtual;

(2) Tutorials can also be e-tutorials;

(3) Computer-Based Training can also be available online outside of the training provider's material;

(4) Demonstrations, including those supported by demonstration equipment where virtual reality technology can be applied;

(5) Exercises carried out as groups or individuals and based on practical training planning, communications, presentations, and projects may be online in a small virtual classroom;

(6) The directed study including workbook exercises or assignments is excellent for online Learning Management System use;

(7) In aviation industry field trips, aerodrome or aircraft visits, the instructor can present from the industry field, whilst students can have an online session (e.g., using Open Broadcaster Software) with the possibility of asking questions;

(8) Distance learning both methods synchronous and asynchronous are already in common use;

(9) E-learning;

(10) Mobile learning (M-learning);

(11) Web-based learning.

c. The Aircraft Maintenance Training Organisation should reflect the agreed approach with a (temporary) update of the training manual. To shift from the face-to-face class to the virtual class is a transformation/ variation that must be managed according to the change management procedure described in the MTOE or TIM of an Aircraft Maintenance Training Organisation itself.

d. Whether the change from the physical classroom to the virtual one is a major change, requiring the prior approval of the DGTA or not, depends on the change management procedure of MTOE and its approval by the DGTA.

e. Depending on the process in place, the Aircraft Maintenance Training Organisation may need to request approval from DGTA to deviate from its MTOE. Temporary changes to the MTOE or stand-alone procedure may be agreed upon by the DGTA.

6. **Guidance on virtual classroom instruction - level of communication**

a. An acceptable level of communication should meet all the following criteria:

(1) Live interactive instructor-led sessions in an online learning environment within a shared online space;

(2) Maintain continuously an active and simultaneously exchange between instructor and student(s): dynamic and two-way flow of communication without delay;

(3) Able to share relevant training material as specified for the appropriate lesson, unit or course in the training manual;

(4) Maintain a “video and audio” interactive communication by taking into account non-verbal communication cues (tone of voice, facial expression);

(5) Establish a policy for the use of virtual classroom instructions such as “raise your hand, question, …”

(6) Monitor what the instructor’s screen displays;

(7) Ensure that students have tools to present learning content in different formats, as well as to implement collaborative and individual activities.

(8) The instructor should have the particularly important role of the moderator who guides the learning process and supports group activities and discussions.

b. Virtual classroom instruction requires the students and the instructor to interact equally - active participation, collaborative work, and communication are encouraged in this type of classroom.

c. The instructor creates opportunities for both independent learning and learning from one another, and guides the students in developing and practising video conferencing the skills they need.

d. Doing this at the student’s own pace, as far as practicable, would enhance student-centred training. This increases the motivation level of the students as well as their interest in the learning activities.

7. **Guidance on virtual classroom instruction - appropriate equipment and tools**

a. The equipment/tools needed for the virtual classroom instruction should ensure an acceptable level of communication without technical interruption during the virtual classroom instruction.

b. The equipment should ensure the student’s identification (visual when needed) and a continuous assessment of the level of communication with all students.

c. The equipment should permit the instructor to achieve the same training objectives and quality of instruction compared to instruction within face-to-face classroom instruction as defined by the training provider.

d. Generally, smartphones are not considered adequate for presenting video and images, although they may be very effective for attending a lecture.

8. **Guidance on virtual classroom instruction - instructor**

a. The Aircraft Maintenance Training Organisation should ensure that the instructor delivering virtual classroom instruction:

(1) Has received appropriate training covering at least learning style, teaching method associated to virtual classroom instruction, such as videoconferencing, and familiarisation to the used virtual classroom instruction system,

(2) Demonstrates his ability to manage time, training media and equipment and tool to ensure that the training objectives are met,

(3) Performs any necessary assessment of the student(s) including proper identification of the assessed student.

b. Throughout the virtual classroom instruction, the students should be encouraged by the instructor to participate at regular intervals. This can be achieved by a variety of activities such as brainstorming, small group discussion, collaborative and individual tasks, Q&A sessions, etc.

9. **Guidance on virtual classroom instruction - student**

a. Creating a positive learning environment, engaging students and encouraging active participation helps students achieve the learning objective.

b. During the virtual classroom instruction, there should be opportunities for frequent interaction between student and instructor, student and other students, and student and content.

c. Instruction in a synchronous virtual classroom can only be successful with the active participation and engagement of the students to create a positive learning environment and helps the students achieve the expected outcomes.

10. **Guidance on virtual classroom instruction - acceptable level of academic effectiveness**

a. **The maximum number of students and training times**.

(1) The maximum number of students should be established considering the capability of the tool to maintain an acceptable level of communication and it should be adapted to the training objectives. Ideally, it should avoid exceeding a maximum number of 12 students.

(2) Training design should take into account that students may find virtual classroom training more tiring than traditional classroom training and the daily training hours may therefore need to be reduced.

(3) A break of reasonable time should be planned for every hour of virtual classroom instruction.

b. **Attendance records**

The instructor delivering the virtual classroom instruction should be responsible for the attendance records of the students by ensuring the students are in the virtual classroom instruction with the appropriate level of communication during all the virtual classroom instruction.

c. **Interruption of connection, loss of communication**

(1) Interruption of connection and loss of communication amongst individual participants can happen during a virtual classroom session.

(2) The training provider should develop a policy on the progress of such a session, repetition of instructed training elements and re-involvement of participants affected by the temporary loss of connection.

(3) Non-attendance should be managed under the “non-attendance” policy as in face-to-face classroom instruction.

d. **Examinations/Evaluations**

When examination or evaluation is necessary for a virtual classroom, identification of students should be assured. Oral exams or remote forms could be used, provided the system used is the same for all students.

11. **Training system feedback loop**

a. The Aircraft Maintenance Training Organisation should ensure that:

(1) The participants report strengths and weaknesses of the training system (training environment, training programme, assessment/evaluation) and suggest improvements;

(2) The instructor keeps effective time management;

(3) Discussions among classmates are facilitated;

(4) A feedback system for students is elicited.

12. **Oversight by DGTA**

a. DGTAs should have access to the virtual classrooms and sample the training.

b. Intensified oversight is recommended in particular in the initial phase.

Appendix VIII to AMC 147.A.200(d)

BASIC TRAINING PRACTICAL WORKSHEET

	PRACTICAL WORKSHEET	**Task Card No: 00X** Rev No : XXX Issue Date : XXXX

a. Practical Session Information:

Practical Task	Basic Skill Task		
Module	2.0 Maintenance Practices		M 07
Index No	2.11	**Category**	B1 B2
Task / Competence	Use a range of hand tools and power tools to achieve a dimensional accuracy of ±0.010 in/0.25 mm.	**Location**	Workshop - Sheetmetal
Training Session	7.3 Tools	**Knowledge Level**	3
Learning Outcome	LO 02 Define on use of tools		
Assessment Criteria	7.3.1 Demonstrate and performed the common hand tool types: a. Tool X b. Tool Y	**Duration (Hours)**	6
Course Training Outcome	Upon completion of Level 3 training, the student will be able to: Apply his knowledge in a practical manner using the manufacturer's instructions		
Mastering	Practical Instructor SAML B1 or equivalent		
Reference	Hand Tool Handbook / Manual dated XXXX Power Tool Handbook / Manual dated XXXX		

b. Task Objective:

The trainee must able to:

1. Use a steel rule properly
2. State the safe margin and requirement when cutting using hacksaw.
3. Explain how to use the files effectively
4. Perform check for flatness, square and angular dimension.
5. Use a Vernier calliper and perform reading.

c. Basic Skill Applied:

1. Task Index No xx
2. Task Index No xy

d. Workshop/Hangar Equipment:

1. Work bench with bench vise
2. Ground Power Unit

e. Aircraft/Engine/Role Equipment:

1. CN 235 with CT7-9C Turboprop engine
2. Galley

f. Common Tools/Special Equipment:

1. Personal Protective Equipment (PPE)
2. Steel rule

g. Materials Required:

1. Metal block
2. Protective pads for the jaws of the bench vise

h. General Instructions

1. Debrief on Work Safety - refer to Task Index No xx.
2. Instructor will demonstrate and explain the task step by step before the trainee performing the particular task.

i. Perform Task

STEP	PROCEDURE	PRACTICAL INSTRUCTOR REMARKS
1	Preparation: Prepare work bench for the task.	
2	**Instruction:** a. Perform the task using a steel rule provided. b. Position the metal block on the surface plate. c. Measure the dimension using the steel rule. d. Record the dimensions: _____ inch. **Question:** When using a steel rule, why we should avoid using end of the scale? **Answer:**	
3	**Instruction:** Using the fitter square, torch light and surface plate: a. Put the metal block on the surface plate. b. Using the fitter square and torch light to check the flatness of the metal block. c. Ensure no gap is present between the metal block and fitter square. d. Continue filing if the gap is visible. **Question:** What are the ways to check for flatness? **Answer:**	
4	Clean up and return all the tools to its place / location.	

j. Date and Practical Instructor Name

Date	**:**
Instructor Name	**:**
Signature	**:**

MSTAR 147 - AIRCRAFT MAINTENANCE TRAINING ORGANISATIONS

PART 4 **CHAPTER 1**

LIST OF FORMS

MSTAR FORM 11

a. AMTO Certificate Approval

MALAYSIAN STATE AIRWORTHINESS AUTHORITY

AIRCRAFT MAINTENANCE TRAINING ORGANISATION APPROVAL CERTIFICATE

Reference Number: DGTA.MSTAR 147. XXXX

Subject to the condition specified below, the DGTA hereby certifies:

COMPANY NAME AND ADDRESS

As a maintenance training organisation in compliance with Section A of MSTAR 147 to provide training and conduct examinations listed in the approval Letter of Maintenance Training Authority attached and to issue related certificates of recognition to students using the above references.

CONDITIONS:

1. This approval is limited to what is specified in the scope and level of the aircraft Maintenance Training Organisation Exposition (MTOE) as referred to in Section A of MSTAR 147; and

2. This approval requires compliance with the procedures specified in the approved Maintenance Training Management Plan; and

3. This approval requires compliance with the approved training curriculum; and

4. This approval requires compliance with the terms and conditions set out in the certification agreement; and

5. This approval is valid whilst the aircraft maintenance training organisation remains in compliance with MSTAR 147; and

6. Subject to compliance with the foregoing conditions, this approval shall remain valid for three (3) years duration from the date of effective unless the approval has previously been surrendered, superseded, suspended or revoked.

Date of Issue:

For the State Airworthiness Authority:

Page 1 of 2

APPROVAL SCHEDULE
Reference Number: DGTA.MSTAR 147. XXXX

Organisation:
COMPANY NAME AND ADDRESS

LEVEL	SCOPE
Basic Training	• Aeromechanical (B1.1 & B1.3) • Avionics (B2)
Basic Examination Standard	
Type/Task Training	• Aeromechanical (B1) & Avionic (B2) – Aircraft xxx • Aeromechanical (B1.3) - Aircraft xxx • Avionics (B2) - Aircraft xxx

1. This Approval Schedule is limited to those training and examinations specified in the scope and level of the approved Maintenance Training Organisation Exposition (MTOE).

   a. MTOE Reference :
   b. Date of Original Issue :
   c. Date of Last Revision Approved :
   d. Revision No. :

2. Subject to compliance with the foregoing conditions, this approval shall remain valid for three (3) year duration from the date of effective unless the approval has previously been surrendered, superseded, suspended or revoked.

   a. Date of First Issue :
   b. Revision No. :
   c. Date of Effective :
   d. Date of Expiry :

Date of Issue:

For the State Airworthiness Authority:

b. Provisional Certificate Approval

MALAYSIAN STATE AIRWORTHINESS AUTHORITY

PROVISIONAL APPROVAL CERTIFICATE
Reference Number: DGTA.MSTAR 147. PXXXX

Subject to the condition specified below, the DGTA hereby certifies:

COMPANY NAME AND ADDRESS

As a maintenance training organisation in compliance with Section A of MSTAR 147 to provide training and conduct examinations listed in the approval schedule attached and to issue related certificates of recognition to students using the above references.

CONDITIONS:

1. This provisional approval is limited to what is specified in the scope and level of the aircraft Maintenance Training Organisation Exposition (MTOE) as referred to in Section A of MSTAR 147; and

2. This approval requires compliance with the procedures specified in the approved Maintenance Training Management Plan; and

3. This approval requires compliance with the approved training curriculum; and

4. This approval requires compliance with the terms and conditions set out in the certification agreement; and

5. This approval is valid whilst the aircraft maintenance training organisation remains in compliance with MSTAR 147; and

6. Subject to compliance with the foregoing conditions, this approval shall remain valid for one (1) year duration from the date of effective unless the approval has previously been surrendered, superseded, suspended or revoked.

Date of Issue:

For the State Airworthiness Authority:

Page 1 of 2

PROVISIONAL APPROVAL SCHEDULE
Reference Number: DGTA.MSTAR 147. PXXXX

Organisation:
COMPANY NAME AND ADDRESS

LEVEL	SCOPE
Basic Training	• Aeromechanical (B1.1 & B1.3) • Avionics (B2)
Basic Examination Standard	
Type/Task Training	• Aeromechanical (B1) & Avionic (B2) – Aircraft xxx • Aeromechanical (B1.3) - Aircraft xxx • Avionics (B2) - Aircraft xxx

1. This Provisional Approval Schedule is limited to those training and examinations specified in the scope and level of the approved Maintenance Training Organisation Exposition (MTOE).

   a. MTOE Reference :
   b. Date of Original Issue :
   c. Date of Last Revision Approved :
   d. Revision No. :

2. Subject to compliance with the foregoing conditions, this approval shall remain valid for one (1) year duration from the date of effective unless the approval has previously been surrendered, superseded, suspended or revoked.

   a. Date of First Issue :
   b. Revision No. :
   c. Date of Effective :
   d. Date of Expiry :

Date of Issue:

For the State Airworthiness Authority:

Notes:

1. The following fields on page 2 at paragraph 1 ‘Approval Schedule’ of the maintenance training organisation approval certificate, and on page 2 at paragraph 1 ‘Provisional Approval Schedule’ of the provisional approval certificate should be completed as follows:

   - **Date of Original Issue**: It refers to the date of the original issue of the Maintenance Training Management Plan.

   - **Date of Last Revision Approved**: It refers to the date of the last revision of the maintenance training organisation exposition affecting the content of the certificate. Changes to the Maintenance Training Management Plan which do not affect the content of the certificate do not require for reissue of the certificate.

   - **Revision No**: It refers to Revision No. of the last revision of the Maintenance Training Management Plan affecting the content of the certificate. Changes to the Maintenance Training Management Plan which do not affect the content of the certificate do not require for reissue of the certificate.

2. The following fields on page 2 at paragraph 2 ‘Approval Schedule’ of the maintenance training organisation approval certificate, and on page 2 at paragraph 2 ‘Provisional Approval Schedule’ of the provisional approval certificate should be completed as follows:

   - **Date of First Issue**: It refers to the date of the first issue of the ‘Approval Schedule’ of the maintenance training organisation approval certificate, and the ‘Provisional Approval Schedule’ of the provisional approval certificate.

   - **Revision No**: It refers to the revision No. of the last revision on the approved scope and level defined in MTOE, and contents of the certificate.

   - **Date of Effective**: It refers to the effective date of the certificate approved by the Certificate Committee.

MSTAR FORM 12

MSTAR FORM 12 - APPLICATION FOR MSTAR 147 INITIAL / CHANGE OF APPROVAL

Registered Nama & Address of Applicant:

Trading Name (if different):

Tel No: ……..…… Fax No: …… E-Mail: ……

Scope and Level of MSTAR 147 Approval Relevant to This Initial */ Change of * Application

Scope of Training:

Level of Training:

Training Standard:

Provide reference on the formal instrument document and name of state aircraft operators:

* Cross out whichever is not applicable

Name & Position of Accountable Manager: Signature of Accountable Manager: Date of Application:	Space for official use

MSTAR FORM 148

CERTIFICATE OF RECOGNITION
Certificate Number:

The certificate of recognition is issued to:

[NAME]

[NRIC Number]

By:

[AMTO NAME AND ADDRESS]

Reference Number:

A maintenance training organisation approved to provide training and conduct examinations within its approved scope and level under MSTAR 147.

This certificate confirms that the above-named person either successfully passed the approved basic training course and/or the basic examination stated below in compliance with MSTAR 66 for the time being in force.

BASIC TRAINING COURSE or/and BASIC EXAMINATION

LIST OF MSTAR 66 MODULES/DATE OF EXAMINATION PASSED

Date:
.....

Signed:
.....

For: [AMTO NAME]

MSTAR Form 148

Notes:

1. The basic training certificate template shall be used for recognition of completion of either the basic training or the basic examination, or both the basic training and basic examinations. Some examples of cases where a MSTAR Form 148 could be issued are the following:

a. After successful completion of a full basic course in one licence (sub) category including successful completion of the examinations of all the corresponding modules.

b. After successful completion of a full basic course in one licence (sub) category without performing examinations. The examinations may be performed at a different MSTAR 147 organisation (this organisation will issue the corresponding Certificate of Recognition for those examinations) or at the DGTA.

c. After successful completion of all module examinations corresponding to a licence (sub) category.

d. After successful completion of certain modules/submodules/subjects. It must be noted that ‘successful completion of a course (without the module examinations) means successful completion of the theoretical and practical training including the corresponding practical assessment.

2. The training certificate shall identify each module examination by date passed together with the corresponding version of Appendix I to MSTAR 66.

MSTAR FORM 149

Page 1 of 1

CERTIFICATE OF RECOGNITION
Certificate Number:

The certificate of recognition is issued to:

[NAME]

[NRIC Number]

By:

[AMTO NAME AND ADDRESS]

Reference Number:

A maintenance training organisation approved to provide training and conduct examinations within its approved scope and level under MSTAR 147.

This certificate confirms that the above-named person either successfully passed the theoretical and/or the practical elements of the approved type training course stated below and the related examinations in compliance with MSTAR 66 for the time being in force.

[AIRCRAFT TYPE TRAINING COURSE]

[START and END DATES]

[SPECIFY THEORETICAL ELEMENTS AND/OR PRACTICAL ELEMENTS]

or

[AIRCRAFT TYPE EXAMINATION]

[END DATE]

Date: .....

Signed: .....

For: [AMTO NAME]

MSTAR Form 149

Notes:

1. The type training certificate template shall be used for recognition of completion of either the theoretical elements or the practical elements, or both the theoretical and practical elements of the type rating training course.

2. The certificate shall indicate the airframe/engine combination for which the training was imparted.

3. The appropriate references shall be deleted as applicable and the course type box shall detail whether only the theoretical elements or the practical elements were covered or whether theoretical and practical elements were covered.

4. The training certificate shall identify if the course is a complete course or a partial course (such as an airframe or power plant or avionic/electrical course) or a different course based upon the applicant previous experience, for instance, CN235 (VIP) course for CN235 (Military) technicians.

5. The DGTA Certificate of Recognition for Category B type Training/Examination shall be issued after completion of a full package of course level including successful completion of the theoretical elements, knowledge examinations/assessments, practical elements and performance assessments of all the corresponding modules.

MSTAR Form 4

MSTAR Form 4 - Nomination of Management Personnel

Details of Management Personnel required to be accepted as specified in 147.A.105

1. Name:

2. Position:

3. Qualifications relevant to the item (2) position:

4. Training relevant to the item (2) position:

5. Work experience relevant to the item (2) position:

Signature: ……. Date: …….

On completion, please send this form under confidential cover to the DGTA.

DGTA use only

Name and signature of authorised DGTA staff member accepting this person:

Signature: ……. Date: …….

Name: ……. Office: …….

MSTAR FORM 22

Directorate General Technical Airworthiness

MSTAR FORM 22 - MSTAR 147 APPROVAL RECOMMENDATION REPORT

Part 1: General

Name of organisation:

Approval reference:

Requested approval rating/
Form 11 dated*:

Other approvals held (if app.)

Address of facility audited:

Audit period: From: To:

Date(s) of audit(s):

Audit reference(s):

Persons interviewed:

DGTA Auditor: Signature(s):

DGTA Lead Auditor: Signature(s):

Date of MSTAR Form 22 Part 1 completion:

*Delete where applicable

Part 2: MSTAR 147 Compliance Audit Review						
The five columns may be labelled and used as necessary to record the approved training/examinations, facility, including subcontractor's, reviewed. Against each column used of the following MSTAR 147 sub-paragraphs please cross (X) the box if not satisfied with compliance and specify that subparagraph. State audit reference finding in Part 4, noncompliance or enter N/A where an item is not applicable, or N/R when applicable but not reviewed.						
Para	Subject	Sub Para				
147.A.100	Facility requirements	☐	☐	☐	☐	☐
147.A.105	Personnel requirements	☐	☐	☐	☐	☐
147.A.110	Records of instructors, examiners and assessors	☐	☐	☐	☐	☐
147.A.115	Instructional equipment	☐	☐	☐	☐	☐
147.A.120	Maintenance training material	☐	☐	☐	☐	☐
147.A.125	Records	☐	☐	☐	☐	☐
147.A.130	Training procedures and quality system	☐	☐	☐	☐	☐
147.A.135	Examinations	☐	☐	☐	☐	☐
147.A.140	MTOE	☐	☐	☐	☐	☐
147.A.145	Privileges of the maintenance training organisation	☐	☐	☐	☐	☐
147.A.150	Changes to the maintenance training organisation	☐	☐	☐	☐	☐
147.A.155	Continued validity	☐	☐	☐	☐	☐
147.A.160	Findings	☐	☐	☐	☐	☐
147.A.200	Approved basic training course	☐	☐	☐	☐	☐
147.A.205	Basic knowledge examinations	☐	☐	☐	☐	☐
147.A.210	Basic practical assessment	☐	☐	☐	☐	☐
147.A.300	Aircraft type/task training	☐	☐	☐	☐	☐
147.A.305	Aircraft type examinations and task assessments	☐	☐	☐	☐	☐
147.A.400	Training Specification Standards	☐	☐	☐	☐	☐
147.A.405	Training examinations and assessments	☐	☐	☐	☐	☐
DGTA Auditor(s):		Signature(s):				
DGTA Lead Auditor:		Signature(s):				
Date of Part 2 completion:						

Part 3: Compliance with MSTAR 147 Maintenance Training Organisation Exposition (MTOE)

Please either tick (√) the box if satisfied with compliance, or cross (X) if not satisfied with compliance and specify the reference on the Part 4 finding, or enter N/A where an item is not applicable, or N/R when applicable but not reviewed.

PART 1		GENERAL
1.1		Background of Organisation
1.2		Purpose of MTOE
1.3		Management of this MTOE
1.4		Condition of Use
1.5		List of Abbreviations Used
1.6		Definitions
1.7		Scope and Level of Approved Training
1.8		Training Description
1.9		Award and Retention of AMTO Certification
1.10		Changes to AMTO Certification
1.11		Duration of AMTO Certification
1.12		Termination of AMTO Certification
1.13		Exemptions, Deviation and Waivers
1.14		Training, Examination & Certification Policy Statement
1.15		Occupational Safety & Health Policy Statement
PART 2		ORGANISATION MANAGEMENT
2.1		Organisational Detail
2.2		AMTO Facilities Addresses
2.3		Corporate Commitment by the Accountable Manager
2.4		Personnel Requirement
2.4.1		Organisational Chart
2.4.2		Key Function and Appointments within an AMTO
2.4.3		Duties and Responsibilities of Management Personnel
2.5		Facilities Requirement
2.5.1		Main Office
2.5.2		List of approved alternative Facility Address
2.5.3		Procedure Regarding Training Facilities
2.6		General Description of Facilities at Approved Address

2.6.1		General Description
2.6.2		Floor plan
2.6.3		Training Aids
2.6.4		Academic Facilities and Resources
2.6.5		Library and Learning Resources
2.7		List of Approved Course
2.7.1		The courses approved by SAO or MAO is listed in MTOE
2.7.2		The courses conducted are based on SAO or MAO Approved Training Curriculum
2.8		Training Support Network (TSN)
2.8.1		Procedure Regarding TSN
2.8.2		List of Sub Contractors and Support Network
2.8.3		List of Outsourced Training
2.8.4		List the Training Service of TSN
2.9		Notification Procedure Regarding Changes to Organisation
2.10		MTOE Amendment Procedure
PART 3		TRAINING AND EXAMINATION MANAGEMENT
3.1		Purpose
3.1.1		References
3.1.2		Responsibilities
3.2		Training Description
3.2.1		Training Program
3.2.2		Prerequisite
3.2.3		Basic Training Description
3.2.4		Type Training
3.3		Policy - Training Standard
3.3.1		Training Instructor and Assessor Standard
3.3.2		Basic Training Instructional Standard
3.3.3		Aircraft Type Training Instructional Standard
3.3.4		Training Assessment Standard
3.3.5		Training and Assessment Records
3.4		Policy - Examination Standard
3.4.1		Examination Question Paper Standard
3.4.2		Examination Marking Standard Records

3.5		Training and Instruction Procedure
3.5.1		Training Instruction Manual
3.5.2		Training Curriculum

PART 4 QUALITY MANAGEMENT SYSTEM

4.1		Purpose
4.2		Scope
4.3		Responsibilities
4.4		Internal Quality Audit Procedure and Process
4.4.1		Audit Team
4.4.2		Audit Checklist
4.4.3		Audit Report
4.5		Corrective Action Request (CAR) Analysis Procedure and Process
4.6		Management Review Meeting (MRM) Procedure and Process

PART 5 APPENDICES

5.1		List of Approved Courses
5.2		Training Sequence Chart
5.3		Compliance Matrix
5.4		Selection Criteria for Accountable Manager, Training Manager, Quality Manager, Examination Manager, Training and Support Manager, Academic and Curriculum Manager, Instructor, Examiner and Practical Assessor
5.5		List of Exemption
5.6		Floor Plan

MTOE reference: MTOE amendment:

DGTA desktop auditor: Signature(s):

DGTA Lead Auditor: Signature(s):

Date of MSTAR Form 22 Part 3 completion:

Part 4: Findings regarding MSTAR 147 compliance status

Each CAR Major (level 1) and Minor (level 2) findings should be recorded whether it has been rectified or not and should be identified by a simple cross-reference to the Part 2 requirement. All non-rectified findings should be copied in writing to the organisation for the necessary corrective action.

Part 2 or 3 ref.	Audit reference(s): Findings	CAR Category / Level	Corrective Action Request		
			Date Due	Date Closed	Reference

Part 5: MSTAR 147 approval or continued approval or change recommendation
Name of organisation: Approval reference: Audit reference(s): Applicable MSTAR 147 amendment status: The following MSTAR 147 scope of approval is recommended for this organisation: Sope of Training: Level of Training: Or, it is recommended that the MSTAR 147 scope of approval specified in MSTAR Form 11 referenced ..... be continued. Name of recommending DGTA Lead Auditor: Signature of recommending DGTA Lead Auditor: DGTA control office: Date of recommendation: MSTAR Form 22 review (quality check): Date:
Part 6: MSTAR 147 Board of State Technical Airworthiness
Board of State Technical Airworthiness reference: Approval: Provisional / Full certification Approval reference: The following MSTAR 147 scope and level of approval or continued approval for this organisation: Scope of Training: Level of Training: Date of Effective: Date of Expiry: Remarks: