

COMMITTEE REPORT ON
AME APPRENTICESHIP TRAINING PROGRAM

Background:

Ministry of Civil Aviation aims to address the skill gap by streamlining the practical training of the Aircraft Maintenance engineers passing out from the AME training schools through an integrated Apprenticeship program for AMEs in Civil Aviation Sector.

In view of the above a technical committee was formed by MoCA under the chairmanship of Sh. K.P. Srivastava, DDG and members from the airlines. The terms of reference of the committee were::

- i) To draft the selection criteria for candidates to be selected as apprentices
- ii) To draft the standard training modules to be covered during the one year Apprenticeship program.
- iii) To decide on the amount of stipend payable to the apprentices

The Technical committee held its two meetings on 11.05.17, 24.05.17 and 26.05.2017 at DGCA HQ to decide on the above terms of reference. During the meetings, the subject issues were discussed in detail and following guidelines were framed:

i) Selection Criteria

The candidates who have passed 3 year AME training course from DGCA approved AME training schools and minimum passed DGCA paper 1 and 2 or equivalent shall be eligible for the AME Apprenticeship program.

The eligible candidates shall be required to register on NATS website. CAR 145 Aircraft Maintenance Organisations conducting Apprenticeship training Program shall select the candidates from the NATS website.

The feasibility for conducting the joint entrance examination by Central examination Organisation (CEO) DGCA was explored. CEO is currently engaged in CAR 66 modular examinations which are being conducted for the first time in India and hence is not in position to undertake any additional examination. Therefore, in order to avoid any delay to the launch of AME Apprenticeship training program, JEE is not feasible at this stage.

ii) Syllabus

Standard Training Modules Syllabus for Fixed Wing and Helicopters has been prepared after detailed discussions with the stake holders and attached as Appendix 'A' and 'B' respectively.

iii) Stipend

Establishments shall pay stipend to apprentices during the period of apprenticeship training at a rate not less than the prescribed minimum rate as per Government of India guidelines i.e. 3542 per month for "Technician Apprentices". Employers are however free to pay stipends higher than these minimum rates.

Overview of Apprenticeship Training Program:

This committee proposes to provide one year of apprenticeship training programme which will consist of both classroom training and field training.

Classroom training intends to cover the knowledge requirement in certain areas which are considered as prerequisites for the apprentices to work in maintenance environment like :

Air Legislation and its applications relevant to maintenance organisations, use of maintenance documentation, Ramp and Personal Safety, Standard Maintenance Practices, Human Factors, Safety Management System, Organisation Maintenance capability and Scope of approval, Fleet aircraft and their system overview, Aircraft Servicing procedures and precautions, etc.

The Work Environment/ Field training will be a guided programme under the supervision of permanent staff in the areas of:

Use of general tools and Special tools, use of personal safety equipment and items, Maintenance precautions, Understanding of Ramp Markings and arrangements, Aircraft receiving and dispatching procedures, Aircraft inspection and servicing, use of aircraft auxiliary power supply equipment like GPU, A/C cart, Hydraulic Cart etc., Aircraft component locations, Identification, removal and installation procedures, Aircraft Cleaning, Aircraft Interior inspection and maintenance etc.

On Job Training (OJT) will be imparted by experience staff functioning in Line and Base Maintenance Departments.


Industry Issues to be addressed:

- 1) As the apprenticeship training is to be conducted inside airport operational area, hence all apprentices are required to be issued Airport Entry Pass by BCAS. Currently BCAS only issues AEP to bonafide employees of the organisations.
MoCA to instruct BCAS for issue of AEP to apprentices.
- 2) Indemnity: Apprentices will be required to insure themselves at the start of the apprentice program and organisations to be indemnified.

- 3) Meeting was held with Sh. D.K. Paliwal, DEA, Ministry of HRD on date 16.05.17 and attended by the following ;
- Sh. Amit Awasthi, AWO
 - Sh. Laksh Dhingra, IndiGo
 - Sh. Jitin Gulati, Vistara

During the meeting it was observed that NATS website is required to be modified to enable AME candidates to enrol / register themselves for the AME Apprenticeship Program so that CAR 145 Aircraft Maintenance Organisations conducting Apprenticeship training Program shall be able select the candidates from the NATS website.

MoCA may request MoHRD for necessary action in this regard.


(Sh. Subodh Sumbh)
Member


(Sh. Anil kumar)
Member


(Sh. Rajan Raman)
Member



(Sh. Laksh Dhingra)
Member


(Sh. Jitin Gulati)
Member


(Sh. S K Jain)
Member


(Sh. Vinod Shukla)
Member


(Sh. A S Kaushal)
Member


(Sh. K P Srivastava)
Chairperson
29/5/2017

Appendix-A

**AME Apprenticeship Training
Guidelines
(Fixed Wing)**

CONTENTS

APPRENTICE TRAINING PROGRAM SYLLABUS

| Chapter | Description | Page No. |
|----------------|---------------------------------|-----------------|
| 1 | Preamble | 3 |
| 2 | Apprenticeship Training Process | 4 |
| 3 | Trainee Details | 5 |
| 4 | Training Syllabus | 6-15 |
| 5 | Assessment Sheet | 16 |
| 6 | Sample Log Book | 17 |

Chapter 1: Preamble

- 1.1 This document has been prepared to comply with the On Job Training requirements i.e structured Apprenticeship program to comply with Govt. of India initiative on skill development.
- 1.2 The document covers the various areas/ departments of an aviation maintenance organization about which an Aircraft Maintenance Engineer is expected to have reasonable knowledge to work in an airline organization. This booklet should serve as a compact and portable reference document, which would reflect the completion of the candidate's apprenticeship training.
- 1.3 The tasks has been identified for B1 & B2 categories. However, this is generic guideline. The AMO may vary it during customization for their applicable aircraft.
- 1.4 Maintenance tasks which are considered as A/B1/B2/B3 are:
- a. Maintenance tasks performed on aircraft structure, power plant and mechanical and electrical systems.
 - b. Work on avionics systems requiring **only** simple tests to prove their serviceability and **not** requiring troubleshooting.
 - c. Maintenance tasks which are considered as B2 are:
 - d. Maintenance tasks performed on avionic and electrical systems
 - e. Electrical and avionics tasks within power plant and mechanical systems, requiring **only** simple tests to prove their serviceability.

Chapter 2: Apprenticeship Training Process

- 2.1 The objective of this training to gain the required competence and experience in performing safe maintenance.
- 2.2 It should be conducted at and under the control of a maintenance organization appropriately approved for the maintenance of the particular aircraft type.
- 2.3 The candidate participated in the task should be able to:
- 2.4 Be aware of the safety aspects during aircraft maintenance Read and understand maintenance manual instructions
 - a. Use tools and equipment as required in maintenance manual instructions
 - b. Use and have knowledge of various material, both raw and consumable, and standard parts
 - c. Use his knowledge in a practical manner and use manufacturer instructions
 - d. Interpret results from various sources and measurements and apply corrective action where appropriate
 - e. Demonstrate knowledge of good maintenance standards and human factor limitation.

Completion of the booklet

All entries in this booklet shall be made in ink. It should be signed by the trainee and the designated representative of the organization. Any correction, shall be done in manner by striking with a single line, such that deleted entry remains legible.

Chapter 3: Trainee Details

| Trainee Details | |
|--|--|
| Name in Full: | |
| Personal Address: | |
| Details of DGCA papers /Modules passed | |
| AME/BAMEL Licence No. (If available): | |
| Name of Organisation & Address: | |
| Signature: | |

Chapter 4: Training Syllabus

4.1 The following are the topics of knowledge and skill coverage proposed for personnel who will be coming under AME Apprenticeship Program for development in typical Schedule Operator.

| SN | TOPICS | DURATION IN DAYS | REMARKS |
|-----|--|---------------------|---------|
| 1. | Review of international and Indian Air Legislation structure and applicable legislation for scheduled airlines | 1 | |
| 2. | Ramp and personal safety | 1 | |
| 3. | Standard practices and aircraft marshalling , headset procedures , Aircraft documentation | 2 | |
| 4. | Safety management system/ EHS/MSDS | 1/2 | |
| 5. | Human factors and Good Maintenance Practices in aircraft maintenance | 1 | |
| 6. | Electrical wiring interconnection system | 1/2 | |
| 7. | Fuel tank safety | 1/2 | |
| 8. | Type aircraft system familiarisation , inspection and servicing | 3 | |
| 9. | Workshop Practices & Tools | 2 | |
| 10. | Special tools & Equipment procedures | 1 | |
| 11. | Engine Monitoring and Ground Operations | 1 | |
| 12. | Concept of Special Operations such as EDTO , Auto Land , RVSM, etc. | 1 | |
| 13. | Aviation Security Training | 1/2 | |

Total

15 days

4.2 Aircraft Specific: - Proposed duration 11 months

Below mentioned ATA & areas to be covered during Apprentice program covering the system in following area:

1. ATA 07 Lifting and Shoring precautions and practices
2. ATA 08 Leveling and Weighing procedures
3. ATA 09 Towing and Taxi procedures
4. ATA 10 Parking, Mooring, Storage and Return to Service procedures
5. ATA 11 Placards and Markings identification and importance
6. ATA 20 Standard Practices - Airframe
7. ATA 21 Air Conditioning and Pressurization system
8. ATA 22 Auto Flight
9. ATA 23 Communications
10. ATA 24 Electrical Power
11. ATA 25 Equipment/Furnishings
12. ATA 26 Fire Protection and extinguishing
13. ATA 27 Flight Controls
14. ATA 28 Fuel
15. ATA 29 Hydraulic Power
16. ATA 30 Ice And Rain Protection including ATA 12 Cold Weather Maintenance
17. ATA 31 Indicating / Recording System
18. ATA 32 Landing Gear
19. ATA 33 Lights
20. ATA 34 Navigation
21. ATA 35 Oxygen
22. ATA 36 Pneumatic
23. ATA 38 Water/Waste
24. ATA 45 Central Diagnostic System
25. ATA 47 Nitrogen Generation System
26. ATA 49 Airborne Auxiliary Power
27. ATA 51 Standard Practices and Structures – General
28. ATA 52 Doors
29. ATA 53 Fuselage introduction
30. ATA 54 Nacelles/Pylons
31. ATA 55 Stabilizers
32. ATA 56 Windows
33. ATA 57 Wings structure
34. ATA 61 Propeller
35. ATA 71 Power Plant introduction and component highlight
36. ATA 72 Engine
37. ATA 73 Engine - Fuel And Control
38. ATA 74 Ignition
39. ATA 77 Engine Indicating system
40. ATA 78 Exhaust/ Thrust Reverser

- 41. ATA 79 Oil
- 42. ATA 80 Starting

| ATA | SYSTEM/SUBJECT |
|-------------------|---|
| 00 | Technical Documentation & MEL/CDL including de-activation only of sub-system and aircraft components as permitted by the approved MEL <ol style="list-style-type: none"> 1. Organization AMP, Inspection Schedules, FRB, CDLB and Work Orders 2. MEL and its Parts 3. CDL 4. Introduction to De-activation of different components/sub-components as per MEL 5. Any task recommended by DGCA |
| 00 | MCC Functioning <ol style="list-style-type: none"> 1. Introduction to MCC 2. Function 3. Technical Delay Handling 4. Technical Support 5. Control of Repeated Defects |
| 00 thru' 12 | A/C General <ol style="list-style-type: none"> 1. Aircraft Dimensions 2. Structure Breakdown & Zoning 3. Cockpit Panels/ Pushbutton Philosophy 4. Servicing Points such as opening & re-fitment of quick access inspection panels 5. Replace Placards & Markings |
| 20 | Standard Practices – Airframe <ol style="list-style-type: none"> 1. Personal Protective Equipment's 2. Ramp Hazards 3. Foreign Object Debris 4. Marshalling 5. Anti-collision Beacon 6. Dangerous Areas Around Engines 7. Placement of Chocks 8. Placement of Safety Cones 9. Alignment of Vehicles/ Equipment's 10. Speed Restrictions <p>Safety practices and Safety equipment-</p> <ol style="list-style-type: none"> 1. Use of safety jackets, gloves, safety shoes, Ear Protection 2. Use of warning notices, circuit breaker clips in the cockpit. |

| ATA | SYSTEM/SUBJECT |
|-----|---|
| | <ol style="list-style-type: none"> 3. Safety when handling fuel, hydraulic, deicing and other cleaning fluids 4. Safety related to ESDS components and practices. 5. Safety pins/safety sleeves for landing gears, doors etc. 6. Wheel Charging with Nitrogen precautions 7. Safe handling of oxygen system related tools and equipment 8. Safety while working around radar equipment (radiation) 9. CDCCL items (SFAR 88) 10. Safety related to Inerting system (ATA 47)- Fuel tank safety, 11. Safety precautions during Engine Run Up (Idle/high power) <p>Standard Practices :- Ground Equipment Familiarization</p> <ol style="list-style-type: none"> 1. Familiarization, safety precautions and use of Ground Power Unit 2. Familiarization, safety precautions and use of Ground Hydraulic cart (pressurization unit) 3. Familiarization, safety precautions and use of Ground Air-conditioning unit/duct 4. Familiarization, safety precautions and use of Ground pneumatic Cart /duct 5. Use of different types of trestles. <p>Standard Practices :- General Tools / Special Tools Familiarization</p> <ol style="list-style-type: none"> 1. Familiarization of each tool content of General tool kit (set Spanners/ Combination spanners/ Off set Ring spanners/ Ring Ratchet/ Deep sockets/ shallow sockets/universal joint drives/expander/ reducer/universal drive sockets/ crowfoot spanners/ ratchet/ drive breaker bar/ drive extensions/ speed handle/ Diagonal cutters/ nose pliers/twisters/ vice grip pliers/ soft jaw monkey plier/screw drivers (plain, Philips, heavy duty)// mallets/ feeler gauge/hacksaw/ strap wrench/ bottle key / Allen keys/magnifying glass/nose grip plier/ needle files etc.) 2. Uses of Dial Gauge/ Push pull gauge/ Micrometer/ Vernier Caliper etc. 3. Familiarization on use of Torque adapter / Torque wrench, Setting Torque value on dial type and sleeve type torque wrench. <p>Standard Practices :- Aircraft Servicing / Equipment Familiarization</p> <ol style="list-style-type: none"> 1. Familiarization on use Nitrogen HP Regulator / LP Regulation, Bottle Key and hose./ TP Gauge. 2. IDG Rig / Hydraulic servicing unit/ Engine Oil Charging unit./ Fuel Drain Tool |

| ATA | SYSTEM/SUBJECT |
|-----|--|
| | <ol style="list-style-type: none"> 3. Wheel Change tool (MLG , NLG Adapter / Thread protector / Wheel Change Dolly etc) 4. Brake Change tools (Brake Tool Adapter / Axle Protector/ Brake fan tool /driving adapter for Tachometer etc.). 5. Use of various types of Grease Gun (Hand Grease Gun / Power Grease Gun/Pressure Grease unit /Grease Rig) and respective adapter / nozzle kit. 6. Use of TR Cowl / Core cowl opening Pump. 7. Windshield Removal tool kit /Suction Kit for window removal Installation./ Special tool for sliding window 8. Familiarization on use of Nose wheel / Main wheel Jacks, Aircraft Jacks / jacking Adapters etc. 9. MLG & MLG Door Locking Sleeve, Cargo Door safety locking Sleeve/ NLG & NLG Door Locking pin 10. Familiarization on use of Tensiometer for cable tension measurement 11. Familiarization on Compressor wash/ ECO wash unit. 12. Familiarization and practical use of Bleed tester kit. 13. Familiarization on use of Borescope Kit (flexi scope / rigid boro kit), adapter etc. 14. Flight control Rig pin kit / Flap Zero locking tool/ spoiler maintenance key etc. <p>Standard Practices :- Aircraft Avionics Equipment Familiarization</p> <ol style="list-style-type: none"> 1. Familiarization on use of each tool content of General Avionics tool kit, Electrician service tool kit. 2. Familiarization on use of Digital Multimeter / milliohm meter 3. Familiarization on use of Manual Insulation tester (megger) / insulation and continuity tester/ bonding tester. 4. Familiarization on use of Crimping tool splice/ terminal lugs , Crimping tool ferrule/ crimping tool Turrets/ Crimping too (12 positioner and Go No Go Gauge) 5. Familiarization on use of splicing tool kit, wire Insertors /extractors etc. 6. Familiarization on use of Pitot Flushing tool 7. Familiarization on use of Pitot Static Leak tester 8. Familiarization on use of Air Data Test kit / Air data accessory kit 9. Familiarization on use of DMC Kit. |

| ATA | SYSTEM/SUBJECT |
|-----|--|
| 21 | Air Conditioning <ol style="list-style-type: none"> 1. Overview 2. PACK Presentation 3. Zone Temperature Regulation 4. Control & Indication 5. Component Location 6. Avionics Ventilation 7. Pressurization 8. LAV/Galley Ventilation 9. Maintenance/Test Facilities & Servicing |
| 22 | Auto Flight <ol style="list-style-type: none"> 1. Introduction 2. Flight Management/Flight Guidance 3. Auto Pilot/Flight Director 4. Auto Thrust 5. Flight Augmentation 6. Maintenance/Test Facilities & Servicing |
| 23 | Communications <ol style="list-style-type: none"> 1. Introduction 2. Cabin/In-flight/Service Interphone 3. Radio Communication 4. Onboard Communication 5. SSFDR 6. CIDS 7. Component Location 8. Maintenance/Test Facilities & Servicing |
| 24 | Electrical Power including operational check of AC EMERGENCY GENERATION (CMR) <ol style="list-style-type: none"> 1. Introduction 2. Normal/Abnormal/Emergency/Battery Only Configuration 3. Control & Indication 4. Component Location 5. Maintenance/Test Facilities & Servicing including replacement of aircraft batteries |
| 25 | Equipment & Furnishings including emergency equipment replacement and passenger/crew seat replacement task <ol style="list-style-type: none"> 1. General 2. Cockpit/Cabin Crew Seats & their replacement including seat belts & harnesses. 3. LAV/Galleys 4. Cabin Panel Layout 5. PAX/Emergency Doors & Escape Slide 6. Cargo Compartment 7. Emergency Equipment & their replacement |

| ATA | SYSTEM/SUBJECT |
|-----|--|
| | 8. Servicing: Replacement of ovens, boilers, beverage makers. |
| 26 | Fire Protection <ol style="list-style-type: none"> 1. Introduction 2. Engine/APU Fire Protection 3. Avionics Smoke 4. Cargo/Lavatory Smoke 5. Cabin Fire 6. Maintenance/Test Facilities & Servicing |
| 27 | Flight Controls <ol style="list-style-type: none"> 1. Introduction 2. Flight Control Surfaces 3. Cockpit Controls & Indication 4. Fly By Wire/Flight Control Laws 5. Mechanical Backup 6. Component Location 7. Maintenance/Test Facilities & Servicing |
| 28 | Fuel System <ol style="list-style-type: none"> 1. Introduction 2. Controls & Indication 3. Component Location 4. Refueling/Defueling 5. Maintenance/Test Facilities & Servicing 6. Fuel Tank Safety (CDCCL) |
| 29 | Hydraulic Power including Hydraulic fluid upliftment task <ol style="list-style-type: none"> 1. Introduction 2. Controls & Indication 3. Component Location 4. Maintenance/Test Facilities & Servicing |
| 30 | Ice & Rain Protection including wiper blade change task <ol style="list-style-type: none"> 1. Introduction 2. Controls & Indication 3. Component Location 4. Maintenance/Test Facilities & Servicing including replacement of windscreen wiper blades & static wicks, inspection for & removal of de-icing/anti-icing fluid residues |
| 31 | Indicating/Recording including cleanliness check of DU Screens (ECAM, PFD & ND) <ol style="list-style-type: none"> 1. Introduction to EIS (EFIS/ECAM) 2. Recording (DFDR/AIDS/CFDIU) 3. Component Location 4. Maintenance/Test Facilities & Servicing |

| ATA | SYSTEM/SUBJECT |
|-----|--|
| 32 | Landing Gear including Wheel/Brake Change task <ol style="list-style-type: none"> 1. Introduction 2. L/G , L/G Doors & Wheels 3. L/G Extension & Retraction 4. Brake/Steering 5. Control & Indication 6. Component Location 7. Maintenance/Test Facilities & Servicing : replacement of wheel assemblies & brake units |
| 33 | Lights including internal and external lights, filaments replacement task and Operational check of Cabin Emergency Light <ol style="list-style-type: none"> 1. Introduction 2. Cockpit/Cabin/Cargo/Service Compartment/Exterior/Emergency Lights 3. Component Location 4. Maintenance/Test Facilities & Servicing including replacement of internal, external lights, filaments & flash tubes. |
| 34 | Navigation <ol style="list-style-type: none"> 1. Introduction 2. Component Location 3. Dependent/Independent Position Determining System 4. Maintenance/Test Facilities & Servicing |
| 35 | Oxygen including Portable Oxygen Bottles replacement task <ol style="list-style-type: none"> 1. Introduction 2. Cockpit Crew/ Cabin/Portable Oxygen System 3. Control & Indication 4. Maintenance/Test Facilities & Servicing |
| 36 | Pneumatic <ol style="list-style-type: none"> 1. Introduction 2. Engine/APU Bleed 3. Leak Detection 4. Component Location 5. Control & Indication 6. Maintenance/Test Facilities & Servicing |
| 38 | Water/Waste including toilet system components replacement task <ol style="list-style-type: none"> 1. Introduction 2. Potable/Waste Water System 3. Vacuum Toilet System 4. Service Panels 5. Component Location 6. Maintenance/Test Facilities & Servicing including replacement of toilet system components excluding gate valves. |
| 46 | Information Systems <ol style="list-style-type: none"> 1. Introduction |

| ATA | SYSTEM/SUBJECT |
|-------------------|---|
| | <ol style="list-style-type: none"> 2. Architecture/Panels/Component Location 3. Maintenance/Test Facilities & Servicing |
| 47 | Inert Gas System <ol style="list-style-type: none"> 1. Introduction 2. Component Location 3. Maintenance/Test Facilities & Servicing |
| 49 | APU <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. ECB/Interfaces 4. Maintenance/Test Facilities & Servicing including replacement of APU batteries. |
| 51 thru' 57 | A/C Structure/Door/Fuselage/Pylons/Windows/Wings <ol style="list-style-type: none"> 1. PAX & Cargo Doors 2. L/G Doors 3. Fuselage 4. Pylon 5. THS/Elevator 6. Vertical Stabilizer/Rudder 7. Cockpit/Cabin Windows 8. Wings 9. Composite Application 10. Servicing including simple repairs & replacement of internal compartment doors & placards, overhead storage compartment doors & cabin refurbishing items, removal/installation of external doors fitted with quick release attachments. |
| 71/72 | Power Plant/Engine <ol style="list-style-type: none"> 1. Introduction & Description |
| 71/72 | <ol style="list-style-type: none"> 2. Component Location 3. Maintenance/Test Facilities & Servicing |
| 73 | Engine Fuel & Control <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. Maintenance/Test Facilities & Servicing |
| 74 | Engine Ignition/Starting <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. Maintenance/Test Facilities & Servicing |
| 75 | Engine Air <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. Maintenance/Test Facilities & Servicing |

| ATA | SYSTEM/SUBJECT |
|-----|--|
| 76 | Engine Controls <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. Maintenance/Test Facilities & Servicing |
| 77 | Engine Indicating <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. Maintenance/Test Facilities & Servicing |
| 78 | Engine Exhaust <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. Maintenance/Test Facilities & Servicing |
| 79 | Engine Oil <ol style="list-style-type: none"> 1. Introduction & Description 2. Component Location 3. Maintenance/Test Facilities & Servicing |

Chapter 5: Assessment Sheet

| S. N | Task description | Area | Max marks | Obtained Marks | Remarks |
|------|------------------------|---|------------|----------------|---------|
| | Behavioral, Airmanship | The trainee scans the environment before starting the task and during the task performance to ensure safety of aircraft and personnel. Communication linked to the task performance within the team members is clear and relevant | 5 | | |
| | Safety minded | The trainee adheres to the Safety Warnings and Cautions as mentioned in the Aircraft Maintenance Manual. | 10 | | |
| | Technical skills | The trainee identifies and uses the appropriate tools and equipment (including special tools) | 10 | | |
| | Technical skills | Performance of Two selected core task (B1/ B2) proficiently. | | | |
| | | 1. | 30 | | |
| | | 2. | 30 | | |
| | Documentation | Use of Aircraft Documentation and completion of records | 15 | | |
| | | Total | 100 | | |

Result: (Tick as applicable)

| | | |
|------|------|------------------------------|
| PASS | FAIL | Name & Signature of Assessor |
|------|------|------------------------------|

Chapter 6 : Sample Log Book

STRUCTURED ON JOB TRAINING LOGBOOK

FORM NO.
 ISSUE -, REV., DATED

NAME OF TRAINEE - _____

| ATA | ATA CHAPTER | REFERENCES | ON A/C | COMPETENCY ASSESSED | | | | | | | | INITIALS OF TRAINEE | INITIALS OF INSTRUCTOR/ASSESSOR | TRAINING/ASSESSMENT DATE |
|-----|--------------------------------|------------|--------|-------------------------------|------------------------|--------------------|-------------------------|----------------------------|------------------|-----------------------------|--------------------|---------------------|---------------------------------|--------------------------|
| | | | | JOB CARD/WORK ORDER/TECH. LOG | DOCUMENTATION HANDLING | A/C FINAL CLOSE UP | ENVIRONMENTAL AWARENESS | PERFORM MAINTENANCE ACTION | AIRCRAFT REPORTS | USING REPORTS & INDICATIONS | SYSTEM INTEGRATION | | | |
| 05 | Time Limits/Maintenance Checks | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Caution: For all work on aircraft and components all relevant safety precautions must be observed.

Appendix-B

AME Apprenticeship Training Guidelines (Helicopters)

CONTENTS

| Chapter | Description | Page No. |
|----------------|---------------------------------|-----------------|
| 1 | Preamble | 3 |
| 2 | Apprenticeship Training Process | 4 |
| 3 | Trainee Details | 5 |
| 4 | Training Syllabus | 6-13 |
| 5 | Assessment Sheet | 14-15 |
| 6 | Sample Log Book | 16 |

CHAPTER 1

Preamble

1. This document has been prepared to comply with the On Job Training requirements i.e structured Apprenticeship program to comply with Govt. of India initiative on skill development.
2. The document covers the various areas/ departments of an aviation maintenance organization about which an Aircraft Maintenance Engineer is expected to have reasonable knowledge to work in an airline organization. This booklet should serve as a compact and portable reference document, which would reflect the completion of the candidate's apprenticeship training.
3. The tasks has been identified for B1 & B2 categories. However, this is generic guideline. The AMO may vary it during customization for their applicable aircraft.
4. Maintenance tasks which are considered as A/B1/B2/ are:
 1. Maintenance tasks performed on aircraft structure, power plant and mechanical and electrical systems.
 2. Work on avionics systems requiring **only** simple tests to prove their serviceability and **not** requiring troubleshooting.

CHAPTER 2

Apprenticeship Training Process

The objective of this training to gain the required competence and experience in performing safe maintenance.

It should be conducted at and under the control of a maintenance organization appropriately approved for the maintenance of the particular aircraft type.

The candidate participated in the task should be able to:

- Be aware of the safety aspects during aircraft maintenance
- Read and understand maintenance manual instructions
- Use tools and equipment as required in maintenance manual
- Have knowledge of various material, both raw and consumable, and standard parts
- Use his knowledge in a practical manner to apply manufacturer instructions
- Interpret results from various sources /measurements and learn corrective action where appropriate
- Demonstrate knowledge of good maintenance standards and human factor limitation.

Completion of the logbook

All entries in the logbook shall be made in ink. It should be signed by the trainee and the designated representative of the organization. Any correction, shall be done in manner by striking with a single line, such that deleted entry remains legible.

CHAPTER 3

Trainee Details

| Trainee Details | |
|---------------------------------------|--|
| Name in Full: | |
| Personal Address: | |
| Details of DGCA papers/Modules passed | |
| AME/BAMEL Licence No. (If available): | |
| Name of Organisation & Address: | |
| Signature: | |

CHAPTER 4

TRAINING SYLLABUS

4.1 The following are the topics of knowledge and skill coverage proposed for personnel who will be coming under AME Apprenticeship Program for development in typical Helicopter Operator / MRO organization.

| SN | TOPICS | DURATION IN DAYS | REMARKS |
|-----|---|---------------------|---------|
| 1. | Review of Indian Air Legislation structure and applicable legislation for Helicopter operator / MRO | 1 | |
| 2. | Ramp and personal safety | 1/2 | |
| 3. | Standard practices and aircraft marshalling , , Aircraft documentation | 2 | |
| 4. | Safety management system/ Environment Health & Safety | 1 | |
| 5. | Human factors in aircraft maintenance | 1/2 | |
| 6. | Type aircraft system familiarisation , inspection and servicing | 2 | |
| 7. | Workshop Practices & Tools | 1/2 | |
| 8. | Special tools & Equipment procedures | 1/2 | |
| 9. | Good Maintenance Practices | 1.5 | |
| 10. | Aviation Security Training | 1/2 | |

Total

10 days

4.2 Aircraft Specific: - Proposed duration 12 months

Below mentioned ATA & areas to be covered during Apprentice program covering the system in following area:

1. ATA 07 Lifting and Shoring precautions and practices
2. ATA 08 Leveling and Weighing procedures
3. ATA 09 Towing and Taxi procedures
4. ATA 10 Parking, Mooring, Storage and Return to Service procedures
5. ATA 11 Placards and Markings identification and importance
6. ATA 20 Standard Practices - Airframe
7. ATA 21 Air Conditioning and Pressurization system
8. ATA 22 Auto Flight
9. ATA 23 Communications
10. ATA 24 Electrical Power
11. ATA 25 Equipment/Furnishings
12. ATA 26 Fire Protection and extinguishing
13. ATA 28 Fuel
14. ATA 29 Hydraulic Power
15. ATA 30 Ice And Rain Protection including ATA 12 Cold Weather Maintenance
16. ATA 31 Indicating / Recording System
17. ATA 32 Landing Gear
18. ATA 33 Lights
19. ATA 34 Navigation
20. ATA 52 Doors
21. ATA 53 Fuselage
22. ATA 55 Stabilizer
23. ATA 56 Windows and windshield
24. ATA 60 General Mechanics System
25. ATA 62 Main Rotor
26. ATA 63 Main Rotor Drive
27. ATA 64 Tail Rotor
28. ATA 65 Tail Rotor Drive
29. ATA 67 Rotor Flight Controls
30. ATA 71 Power Plant
31. ATA 73 Engine fuel control system
32. ATA 76 Engine controls
33. ATA 77 Engine Indicating system
34. ATA 79 Engine Oil
35. ATA 80 Starting
36. ATA 88 Electrical Harness

| ATA | SYSTEM / SUBJECT |
|-------------|---|
| 00 | Technical Documentation & MEL including de-activation only of sub-system and aircraft components as permitted by the approved MEL <ol style="list-style-type: none"> 1. Organization AMP, Inspection Schedules, FRB, and Work Orders 2. MEL and its Parts 3. Introduction to De-activation of different components/sub-components as per MEL 4. Any task recommended by DGCA |
| 00 thru' 12 | A/C General <ol style="list-style-type: none"> 1. Aircraft Dimensions 2. Structure Breakdown & Zoning 3. Cockpit Panels/ Pushbutton Philosophy 4. Servicing Points such as opening & re-fitment of quick access inspection panels 5. Replace Placards & Markings |
| 20 | Standard Practices – Airframe <ol style="list-style-type: none"> 1. Personal Protective Equipment's 2. Ramp Hazards 3. Foreign Object Debris 4. Marshalling 5. Anti-collision Beacon 6. Dangerous Areas Around Engines 7. Placement of Chocks 8. Placement of Safety Cones 9. Alignment of Vehicles/ Equipment's 10. Speed Restrictions <p>Safety practices and Safety equipment-</p> <ol style="list-style-type: none"> 1. Use of safety jackets, gloves, safety shoes, Ear Protection 2. Use of warning notices, circuit breaker clips in the cockpit. 3. Safety when handling fuel, hydraulic, deicing and other cleaning fluids 4. Safety related to ESDS components and practices. 5. Safety pins/safety sleeves for landing gears, doors etc. 6. Wheel Charging with Nitrogen precautions 7. Safety while working around radar equipment (radiation) 8. MEL items 9. Safety precautions during Engine Run Up (Idle/high power) |

Standard Practices :- Ground Equipment Familiarization

1. Familiarization, safety precautions and use of Ground Power Unit
2. Familiarization, safety precautions and use of Ground Hydraulic cart (pressurization unit)
3. Use of different types of trestles.

Standard Practices :- General Tools / Special Tools Familiarization

1. Familiarization of each tool content of General tool kit
(set Spanners/ Combination spanners/ Off set Ring spanners/ Ring Ratchet/ Deep sockets/ shallow sockets/universal joint drives/expander/ reducer/universal drive sockets/ crowfoot spanners/ ratchet/ drive breaker bar/ drive extensions/ speed handle/ Diagonal cutters/ nose pliers/twisters/ vice grip pliers/ soft jaw monkey plier/screw drivers (plain, Philips, heavy duty)/ mallets/ feeler gauge/hacksaw/ strap wrench/ bottle key / Allen keys/magnifying glass/nose grip plier/ needle files etc.)
2. Uses of Dial Gauge/ Push pull gauge/ Micrometer/ Vernier Caliper etc.
3. Familiarization on use of Torque adapter / Torque wrench, Setting Torque value on dial type and sleeve type torque wrench.

Standard Practices :- Aircraft Servicing / Equipment Familiarization

1. Familiarization on use Nitrogen HP Regulator / LP Regulation, Bottle Key and hose./ TP Gauge.
2. / Hydraulic servicing unit./ Fuel Drain Tool
3. Wheel Change tool (MLG , NLG Adapter / Thread protector / etc)
4. Brake Change tools (Brake Tool Adapter / Axle Protector/ Brake fan tool /driving adapter for Tachometer etc.).
5. Use of various types of Grease Gun (Hand Grease Gun /) and respective adapter / nozzle kit.
6. Familiarization on use of Nose wheel / Main wheel Jacks, Aircraft Jacks / jacking Adapters etc.
7. Familiarization on Compressor wash unit.
8. Familiarization on use of Borescope Kit (flexi scope / rigid boro kit), adapter etc.
9. Flight control Rig pin kit.

Standard Practices :- Aircraft Avionics Equipment Familiarization

1. Familiarization on use of each tool content of General Avionics tool kit, Electrician service tool kit.
2. Familiarization on use of Digital Multimeter / milliohm meter
3. Familiarization on use of Manual Insulation tester (megger) / insulation and continuity tester/ bonding tester.

| | |
|-----------|---|
| | <ol style="list-style-type: none"> 4. Familiarization on use of Crimping tool splice/ terminal lugs , Crimping tool ferrule/ crimping tool Turrets/ Crimping too (12 positioner and Go No Go Gauge) 5. Familiarization on use of splicing tool kit, wire Insertors /extractors etc. 6. Familiarization on use of Pitot Static Leak tester 7. Familiarization on use of Air Data Test kit / Air data accessory kit 8. Familiarization on use of DMC Kit. |
| 21 | <p>Air Conditioning</p> <ol style="list-style-type: none"> 1. Overview 2. Control & Indication 3. Component Location 4. Avionics Ventilation 5. Maintenance & Servicing |
| 22 | <p>Auto Flight</p> <ol style="list-style-type: none"> 1. Introduction 2. Auto Pilot system 3. Auto Pilot component locations 4. Maintenance & Servicing |
| 23 | <p>Communications</p> <ol style="list-style-type: none"> 1. Introduction 2. Intercom 3. Radio Communication 4. FDR 5. Component Location 6. Maintenance & servicing |
| 24 | <p>Electrical Power</p> <ol style="list-style-type: none"> 1. Introduction 2. Normal/Emergency - Battery 3. Control & Indication 4. Component Location 5. Maintenance including replacement of aircraft batteries |
| 25 | <p>Equipment & Furnishings</p> <ol style="list-style-type: none"> 1. General 2. Cockpit/Cabin Crew Seats & their replacement including seat belts & harnesses. 3. Cargo Compartment |
| 26 | <p>Fire Protection</p> <ol style="list-style-type: none"> 1. Introduction 2. Engine Fire Protection 3. Cabin Fire Extinguisher |

| | |
|----------------|--|
| 28 | <p>Fuel System</p> <ol style="list-style-type: none"> 1. Introduction 2. Controls & Indication 3. Component Location 4. Refueling/Defueling 5. Maintenance |
| 29 | <p>Hydraulic Power including Hydraulic fluid upliftment task</p> <ol style="list-style-type: none"> 1. Introduction 2. Controls & Indication 3. Component Location 4. Maintenance & Servicing |
| 32 | <p>Landing Gear including Wheel/Brake Change task</p> <ol style="list-style-type: none"> 1. Introduction 2. L/G , L/G Doors & Wheels 3. L/G Extension & Retraction 4. Brake 5. Control & Indication 6. Component Location 7. Maintenance & Servicing |
| 33 | <p>Lights including internal and external lights</p> <ol style="list-style-type: none"> 1. Introduction 2. Cockpit/Cabin/Cargo/Service Compartment/Exterior 3. Component Location 4. Maintenance & Servicing including replacement of internal, external lights, filaments. |
| 34 | <p>Navigation</p> <ol style="list-style-type: none"> 1. Introduction 2. Component Location 3. Maintenance & Servicing |
| 51 thru' 57 | <p>A/C Structure/Door/Fuselage/Windows</p> <ol style="list-style-type: none"> 1. PAX & Cargo Doors 2. L/G Doors 3. Fuselage 4. Stabilizer 5. Cockpit/Cabin Windows 6. Servicing including simple repairs & replacement of internal compartment doors & placards, removal/installation of external doors fitted with quick release attachments. |

| | |
|------------------------|---|
| 60 thru' 67 | Main Rotor, Main Rotor Drive, Tail Rotor, Tail Rotor Drive, Rotor Flight Controls 1. Introduction 2. Component Location 3. Maintenance & Servicing |
| 71 | Power Plant/Engine 1.Introduction & Description 2.Component Location 3.Maintenance |
| 73 | Engine Fuel & Control 1. Introduction & Description 2. Component Location 3. Maintenance |
| 76 | Engine Controls 1. Introduction & Description 2. Component Location 3. Maintenance |
| 77 | Engine Indicating 1. Introduction & Description 2. Component Location 3. Maintenance |
| 79 | Engine Oil 1. Introduction & Description 2. Component Location 3. Maintenance |
| 80 | Starting system 1. Introduction & Description 2. Component Location 3. Maintenance |

4.3 LEARNING TOPICS

| DEPARTMENT | LEARNING TOPICS | DURATION |
|---|---|----------|
| CAMO | Familiarization with MOE | 2 months |
| | Updating airframe and engine hours | |
| | Service Life Limited items | |
| | Tracking of component hours - TSN, TSO, TBO, Cycles | |
| | Forecasting periodic inspection | |
| | Call outs for inspection, compliance of ASB, AD, SB | |
| | Airworthiness review & certification | |
| | Usage of CAMO software | |
| | Use and updating of Technical documentation | |
| QUALITY | Incoming inspection | 2 months |
| | Stage inspection during maintenance activity | |
| | Failure analysis, MTBF | |
| | Preparation of inspection schedules | |
| | Internal audits | |
| | Audit of sub-contractors | |
| | Usage of log cards, tags, CA Form 1, EASA Form 1, FAA 8130-3 | |
| | Human factors | |
| SMS | | |
| LINE MAINTENANCE | Reading of task cards and performing the activities | 4 months |
| | Usage of appropriate tools, GSE, GHE | |
| | Tools counting and calibration status | |
| | FOD and prevention | |
| | Usage of consumable materials to clean Helicopter and parts | |
| | External inspection before release | |
| | Usage of blanks and removal before flight | |
| | Daily inspection, BITE test and preparation for flight | |
| | Oil and Hydraulic, Wheel & Brake systems maintenance | |
| | Refuelling and precautions to be taken | |
| | Procedure to be followed while refuelling from barrels | |
| | Embarking and dis-embarking of passengers - safety to be observed | |
| | Baggage loading & C.G. for weight and balance | |
| | Maintenance ground run procedure | |
| | Trouble shooting and simple rectification | |
| | After last flight inspection and Turn around servicing | |
| | Towing and positioning of Helicopter - safety to be observed | |
| | Preparation of helipad before arrival | |
| Usage of fire extinguisher | | |
| Following tasks subject to availability of suitably configured helicopters: | | |

| | | |
|-------------------------|---|----------|
| | - Removal and installation of Helicopter Emergency Medical Service (HEMS) simple internal medical equipment | |
| | - Removal and installation of external cargo provisions (i.e., external hook, mirrors) other than the hoist | |
| | - Removal and installation of quick release external cameras and search lights | |
| | - Removal and installation of emergency float bags, not including the bottles | |
| | - Removal and installation of external doors fitted with quick release attachments | |
| | - Removal and installation of snow pads/skid wear shoes/slump protection pads | |
| | Log book entries | |
| BASE MAINTENANCE | Defuelling, disposal of ATF | 3 months |
| | Inspection of Helicopter as per schedule | |
| | Safe operation of hangar facilities like overhead crane, compressed air, etc. | |
| | Removal of assemblies and installation procedure | |
| | Retrofitment SB, STC | |
| | Compliance of AD, ASB | |
| STORES | Tools calibration process to be followed | 1 month |
| | Tool inventory records | |
| | Bonded Stores documentation - Release notes, Certificate of Conformity | |
| | Batch no., shelf-life, cold store requirements | |
| | Quarantine stores procedure | |
| | Identification of spurious parts, disposal of rejected items | |

CHAPTER 5

Assessment Sheet

| | Task description | Area | Maximum marks | Obtained Marks | Remarks |
|--|------------------------|--|---------------|----------------|---------|
| | Behavioral, Airmanship | The trainee scans the environment before starting the task and during the task performance to ensure safety of aircraft and personnel. Communication linked to the task performance within the team members is clear and relevant | 5 | | |
| | Safety minded | The trainee adheres to the Safety Warnings and Cautions as mentioned in the Aircraft Maintenance Manual. | 10 | | |
| | Technical skills | The trainee identifies and uses the appropriate tools and equipment (including special tools) | 10 | | |

| | | | | |
|--|------------------|--|-----|--|
| | Technical skills | Performance of Two selected core task (B1/ B2) proficiently. | | |
| | | 1. | 30 | |
| | | 2. | 30 | |
| | Documentation | Use of Aircraft Documentation and completion of records | 15 | |
| | | Total | 100 | |

Result: (Tick as applicable)

| | | |
|------|------|------------------------------|
| PASS | FAIL | Name & Signature of Assessor |
|------|------|------------------------------|

Chapter 6 : Sample Log Book

STRUCTURED ON JOB TRAINING LOGBOOK

FORM NO.
 ISSUE -, REV-....., DATED-.....

NAME OF TRAINEE- _____

| ATA | ATA CHAPTER | REFERENCES | ON A/C | COMPETENCY ASSESSED | | | | | | | INITIALS OF TRAINEE | INITIALS OF INSTRUCTOR/ASSESSOR | TRAINING/ASSESSMENT DATE |
|-----|--------------------------------|------------|--------|-------------------------------|------------------------|--------------------|-------------------------|----------------------------|------------------|-----------------------------|---------------------|---------------------------------|--------------------------|
| | | | | JOB CARD/WORK ORDER/TECH. LOG | DOCUMENTATION HANDLING | A/C FINAL CLOSE UP | ENVIRONMENTAL AWARENESS | PERFORM MAINTENANCE ACTION | AIRCRAFT REPORTS | USING REPORTS & INDICATIONS | | | |
| 05 | Time Limits/Maintenance Checks | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Caution : For all work on aircraft/Helicopter and components all relevant safety precautions must be observed.