Flight Standard Division of CAAC

Advise Circular

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High Performance Multi-engine Airplane Training Requirements

1. Background

Commercial Pilot License (CPL) trainings are normally carried out on single or multi-engine airplanes operated by a single pilot at low altitude and low speed. This training mainly focuses on the characteristics of general aviation operations.

Most of pilots in China, after receiving their Commercial Pilot License with Instrument Rating (CPL/IR) on a Multi Engine Airplane and obtaining a pass in their Airline Transport Pilot License (ATPL) Theory Exam, will proceed to join the commercial airlines immediately. They will operate on modern commercial airliners, cruising at high altitude and speed in a multi-crew flight deck environment.

These pilots may find it hard to adapt to the change in operating environment, with aircraft operating weights more than ten times compared to what they previously trained on. Cruising speeds in commercial airliners are also significantly higher (up to three times) than the light airplanes they were trained on.

A High Performance Multi-Engine Airplane training can be used as a transition training aimed at providing these pilots a easier transition from their relatively simple training airplanes to the more complex, higher gross weight and higher cruising speeds of commercial airliners. This transition training will also introduce equipments such as the Ground Proximity Warning System (GPWS), Traffic Collision and Avoidance System (TCAS) which are not found on the light aircrafts. Trainees will also be introduced to operating in pressurized cabin and its inherent risk.

Threat and Error Management (TEM) in a multi crew environment operating at high altitudes and speeds are also significantly different as compared to operating in a light aircraft at low altitudes.

The High Performance Multi-Engine training will also train pilots in Multi-Crew Cooperation (MCC) and Crew Resource Management (CRM), which are vital in operating in a modern commercial airliner that requires two or more crew members to operate. The lack of communication and understanding between crew members are one of the major causes of aviation accidents.

2. Applicability

2.1 This training can be used as transition training before initial type training in aircraft operated under CCAR-121 for the airline transport pilots. However, it cannot be used to substitute a type rating training.

2.2 Only schools authorized by CAAC under CCAR Part 141 are allowed to conduct this training program, provided both the ground and flight training curriculum have been certified and approved by CAAC.

3. Entry Conditions

3.1 Pilots must possess the multiengine Commercial Pilot License with Instrument Rating (CPL/IR) for entry into the program.

3.2 Item 3.1 does not apply to Ground Training - Theory, as required by this circular. Pilots can begin their theory training in advance before receiving their CPL/IR.

4. Requirements for training time

4.1 The High Performance Multiple Engines Aircraft Training Program can be divided into 20 hours Training Program and 50 hours Training Program in accordance with flight training time requirement:

1) 20-hour Training Program:

a. Minimum of 10 hour flight training as Pilot Flying (PF) in a High Performance Multi Engine Airplane or a simulator of the associated aircraft type. The program must also include a minimum of 10 hours flight training as Pilot Not Flying (PNF) in airplane or simulator to complete the Multi-Crew Cooperation (MCC) training.

b. Minimum of 10 hours of flight training in a High Performance Multi-Engine

airplane, including 5 hours of cross country flying and to conduct at least 3 full stop landings as PF.

c. Minimum of 10 instrument approaches to land as PF.

2) 50-hour Training Program:

a. Minimum of 25 hours flight training as Pilot Flying (PF) in a High Performance Multi Engine Airplane or a simulator of the associated aircraft type. The program must also include a minimum of 25 hours flight training as Pilot Not Flying (PNF) in an airplane or a simulator to complete the Multi-Crew Cooperation (MCC) training.

b. Minimum of 25 hours of flight training in a High Performance Multi-Engine airplane, including 15 hours of cross country flying and to conduct at least 6 full stop landings as PF.

c. Minimum of 20 instrument approaches to land as PF.

4.2 Within 24 consecutive hours, the trainee shall not receive more than 3 hours of flight training and not more than 6 hours of ground training - theory.

4.3 Actual airborne training time in a High Performance Multi-Engine airplane shall not be less than 80% if the trainees total flying time.

4.4 In simulator trainings with 2 trainees, only 50% of the total simulator training time shall be accorded to each trainee.

5. Flight Instructor Qualifications

5.1 To be eligible to undertake the role of the Chief Instructor of this training program, the candidate must have at least a total of 1500 flight hours, of which at least 500 flight hours must be carried out in a multi-crew airplane;

5.2 To be eligible to undertake the role as a Flight Instructor for this training program, the candidate must have at least a total of 1500 flight hours, of which at least 200 hours must be carried out in a multi-crew airplane, OR has received training as per Section 4.1 item (2) of this circular from a Chief Instructor qualified under Section 5.1.

5.3 An instructor with a license issued under AC-61-6 within the last 3 years, who has received training as per Section 4.1 item (2) of the circular from a Chief Instructor qualified under Section 5.1 above can undertake the

role as Flight Instructor without a Instructor License.

6. Training Syllabus Requirements

6.1 Ground School

1) Airline Operations

Airline Operating Procedure Training: minimum 20 hours

CCAR Part 121 Regulation Theory or (its equivalent when operating under different AOCR)

Introduction to Basic Airline Operating Procedures

Basic procedure of international route operations

2) Aeronautical knowledge on high altitude operations

Aeronautical knowledge training on high altitude operations must not be less than 20 hours

High Altitude Flying Environment

High Altitude Weather Conditions

Flight planning and navigation

Human Factors related to High Altitude Flying

Systems and components at High Altitude

Airplane aerodynamics and performance at High Altitude

Emergency Procedures when operating at High Altitude

3) High Performance Multi-Engine Airplane Theory

High Performance Multi-Engine Airplane Theory: Minimum 64 hours

General Operating Procedure

Performance and Limitations

Weight and Balance

Normal procedure under adverse weather conditions

Aerodynamics characteristics, performance, and Minimum Equipment Listing (MEL)

Airplane systems and components

Fuel and oil systems

Power plant

Electrical system

Hydraulic system

Landing gear and Brake system

Pneumatic system

Environmental system

Flight Controls

Rain and Ice protection

Fire and Overheat protection

Flight instruments

Navigation equipment and display

Auto-pilot system

Communication equipment

Emergency training specific by certain airplane

Emergency equipment

Abnormal and Emergency procedures

Integrated system training

Cockpit familiarization and Checklist usage

Flight maneuver and relevant instrument displays

Flight Management and auto-pilot system usage

Emergency Procedures

Navigation system usage under normal and abnormal situations

Flight Management under normal and abnormal situations

4) Multi-Crew Co-operation (MCC) Theory

Multi-Crew Cooperation is defined as teamwork between flight crew members, with the Captain as the leader.

Multi-Crew Cooperation Theory Training: Minimum 25 hours

MCC Ground School training shall include theory training, as well as the practice and feedback of the following:

A. Interface

- Examples of bad combinations between human, machine and environment that could eventually lead to problems.

B. Leadership /“Followship” and Authority

- Ability to Manage and Supervise

- Overconfidence

- Estrangement
- Cultural Influence
- Roles and Responsibilities of PF (pilot flying) and PNF (pilot not flying)
- Professionalism
- Team Responsibility

C. Personality, Attitude and Motivation

- Listening
- Conflict Management
- Mediation
- Critique (preflight analysis and planning, inflight evaluation, post-flight assessment)
- Teamwork

D. Clear and Efficient Communication during Flight

- Monitoring Skills
- Feedback
- Standard Phraseology
- Arbitrary
- Co-operation

E. Flight Crew Cooperation

- Flying Technique and Cockpit Standard Operating Procedure
- Order in the Cockpit
- Monitoring, Communication and Support between Crew Members.

6.2 Flight Training Practical

1) Training Requirements

Training should be carried out on a High Performance Multi-Engine Airplane or a CAAC approved Flight Simulators (minimum category “C” and above). The simulator (if begin used as a training device) should have performance characteristics and equipment similar to that of the High Performance Multi-Engine Airplane.

2) Training Curriculum

Preflight Preparation: include documents and takeoff performance

calculations;

Preflight Inspection: include checking and setting up radio and navigation equipment;

Before Takeoff Check: including thrust setting and PF’s take-off safety brief;

Takeoff with different flap settings, PF and PNF duties, standard callouts;

Reject takeoff procedure;

Crosswind takeoff;

Takeoff with maximum takeoff weight MTOW);

Engine failure after V1;

Normal and abnormal procedures, checklist usage;

Stall awareness and identification, and recovery under different aircraft configuration;

Instrument flight rules, holding pattern;

Precision approach using raw data navigation, flight director auto-pilot systems, simulated single-engine approach, non-precision approach, PF’s approach briefing, navigation equipment setup, standard callouts during approach, approach and landing performance data calculations.

Go-around: execute a Go-Around procedure under normal or simulated single-engine conditions, transiting from Instruments to Visual Flying upon reaching DA (DH) or MDA.

Landing: Landing in normal conditions, crosswind conditions and simulated single-engine conditions, transiting from Instruments to Visual flying upon reaching DA (DH) or MDA.

3) Multi -Crew Cooperation (MCC) Training

The Multi-Crew Cooperation training aims is to train proficiency in optimal decision making process, communication, tasking, checklist usage, monitoring, cooperation and positive interaction between crew members in order to safely operate a multi-crew airplane in normal, abnormal and emergency situations.

The training will deliver the basic concept of multi-crew cooperation and help trainees understand that good team organization as well as good cooperation between team members is the key to a successful flight. Having a team of

proficient crew members alone is simply not enough to form a team of effective Flight Crew.

MCC Training requirements should include having Instructors who are proficient in knowledge on human factors, performance and limitations. He/She should keep abreast in the latest development on human factors training and CRM; to be able to demonstrate to the trainees the necessary skills required as PF and PNF, in order to be an effective team.

Multi-crew cooperation training must follow the principle that the Captain is solely responsible for managing the flight and making the final decision regardless of whether he/she is the PF or PNF; in assigning the roles of PF and PNF, considerations should be given to ensure that PF can solely focus on flying the airplane.

The flight crew must be able to maintain full command and control of the airplane under normal, abnormal and emergency conditions. Checklist usage is critical for safety. Monitoring, communication, and positive interaction are vital between flight crew member. Standard callouts are extremely important for situational awareness (SA) especially during departure and approach. All changes to the flight systems, communication, or navigation equipment must be verified by both PF and PNF before execution.

7. Examination Requirements

7.1 After completing all the required modules of the training program, all trainees shall undergo a Flight Test of no less than 1.5 hours either in an airplane or a flight simulator. The duration of the test can be included in the total hours of the training program. If the trainee fails to pass the test, he/she shall be given additional training until he/she passes the test.

7.2 The examination for this training program will consists of an oral test as well as a flight test. The oral test shall cover items listed in Section 6 of this circular. The Flight Examiner conducting the oral test during the flight shall be circumspect not to affect Flight Safety while conducting the test. Refer to the appendix attached to this circular for the oral and flight test standards.

7.3 The examination may be conducted in one of the following methods:

1) The training organization shall assign at least one Flight Examiner in accordance with CCAR part 141 item 43, to conduct the test. The assigned Flight Examiner must be a CAAC certified Flight Instructor of this training program. The Flight Examiner is barred from conducting any tests or examinations for any of his/her trainees.

2) An airline may assign its own Flight Examiners to conduct tests or examinations on their trainees.

8. Certificate of Completion

8.1 The training organization shall issue a certificate of completion to all trainees who has successfully completed the High Performance Multi-Engine Airplane training program. The certificate shall contain the following information:

1) Name of Training Organization and Approval Certificate number;

2) Name of the Trainee, the Training Serial number;

3) Course Title;

4) Course Start and Completion date;

5) Type of Airplane and/or Simulator used for the training. (State the CAAC Simulator approval expiry date if a simulator was used in the training).

6) A declaration stating that the trainee has successfully completed all phases of the approved High Performance Airplane Training Program and has passed all the relevant examinations and tests. The number of full stop landings made by the trainee as PF shall also be listed in the declaration;

7) The Chief Instructor responsible for the training shall sign to certify the content of the license.

8.2 Pilots who wish to join commercial airlines as a First Officer in category II airplanes must present this High Performance Multi-Engine Airplane Training Certificate together with their First Officer application to CAAC prior to commencement of their initial training in the airline.

9. Effective Date

This circular is effective as of the date of issue.

All training organizations applying to conduct High Performance Multi-engine Airplane training from the abovementioned date onwards, must

comply with all the regulations and criteria set in this circular.

Approval granted prior to the abovementioned effective date will remain valid until the 31 December 2011. Thereafter, all training programs pertaining to this circular must be re-evaluated and approved by CAAC.

Appendix 1:

Flight Operation Test Standards for high-performance airplane training

The aim of this standard is to provide guidance to the Flight Examiners on the methods of conducting Flight Operation Test to determine if the candidate has reached the competency standard to operate the aircraft safely. It also serves to standardise amongst the Examiners the methods of evaluating the standards of the candidate.

Several of the test schedules require the assessment of Airmanship. Airmanship is the complex of all resources enabling the pilot to safely handle his aircraft with due regard to rules and regulations and good aviation practice, whatever the circumstances, both on the ground and in the air. It is not practical to give a comprehensive list of airmanship considerations, however, the Nontechnical column attempts to describe as many of these items as possible. Errors in this area should not constitute reason for failure unless satisfactory achievement of the Objective or the safety of the flight is compromised. It is the examiner’ s role to observe how the candidate manages the resources available to him to achieve a safe and uneventful flight. If the candidate shows early and consistent awareness of particular airmanship considerations (e.g. repetitive checking of icing conditions in a level cruise clear of icing conditions) the examiner may allow the candidate to brief only changes during the remainder of the flight.

In event that any of the following problems exists during the examination, the inspector could determine that the trainee pilot fails to pass the exam: Lacking of theoretical knowledge of the flight which would affect the effective completion of the mission or endanger safety; trainee pilots need the inspector’ s help to ensure the flight safety because of certain conducting control or omit action; corrective measures are not made timely when deviation happens; trainee pilots who act as captain or crew member could not effectively perform their responsibility in accordance with standard operation procedure and therefore affect the mission completion or cause endangered safety.

Content

Crew Resource Management

Crew Resource Management

Objective: To make sure the applicant has the knowledge, skills, and attitude relevant to all the plans, instructions, and controls of the flight that are necessary for a crew member in the multi-crew operating environment.

1. Basic knowledge:

The applicant should

- Fully explain the definition of human factors and human factor models
- Clearly specific meaning of crew's resource management
- Understand relevant standards of the crew resource management
- Cite cases that threaten flight safety either in physical or psychological
- List out the strategy to maintain situational awareness
- Analyze how to manage conflicts inside the cockpit

2. Communication

The applicant would

- Be able to know the object, content and extent of communication
- Ensure that the object is ready to communicate and able to receive the information
- Accurately, clearly and fully send message
- Ensure that the information content has been correctly understood by object when conveying important information
- Listen effectively and patiently and indicate that the received message has been understood
- Be able to raise relevant and influential questions and give advice
- Be able to make use of appropriate body language, eye contacts and voice tone
- Keep open and receptive attitude to other people's opinion

3. Leadership and teamwork

The applicant should:

- Understand and identify the objectives of the flight crew and the role

of each crewmember

- Treat others warm and friendly, communicate with and consider for others initiatively
- Take on responsibility and provide the appropriate assistance in case of need
- Keep open and sincere attitude to ideas and proposes
- Be able to give and receive criticism and praise as well as admit mistakes
- Have confidence in performing and specifying the important things to the crew unit
- Show deserved respect and tolerance to the crewmember
- Allow the crew members to have equal participation in planning

4. Workload management

The applicant should

- Be calm, relax, attentive, but no excessive impulse
- Be able to reasonably arrange tasks, identify priority tasks and effectively manage tasks
- Be able to perform tasks effectively
- Be able to provide or receive assistance, authorize and seek help early when necessary
- Seriously implement reviewing, monitoring and cross-examination procedures
- Be able to consistently adhere to the procedure
- Be able to focus on only one thing at certain time and without distraction before completion
- Be able to execute instructions as required

5. Situational awareness

The applicant should:

- Clearly understand the working state of airplane and its systems
- Clearly understand the position and surroundings of the airplane
- Clearly understand the residual fuel and cruising duration
- Clearly understand the condition of the personnel involved in operation,

including the passengers

- Maintain the predictability, be aware of what might happen and make proper plans at all times
- Build scene for next step and make decisions ahead of time
- Identify threats that affecting the security of the airplane and the personnel

6. Decision-making

The applicant should

- Be able to obtain sufficient and accurate information from appropriate resources
- Be able to solve problems continuously
- Be able to select a correct decision process
- Be able to make priority facility considering the significance and reasonability of the problem
- Be able to consider more options as much as possible
- Be able to make decision timely and evaluation as well as changes in case of need
- Be able to take the possible risks into account and avoid unnecessary risks

PRE FLIGHT PROCEDURES-LICENSES, FLIGHT DOCUMENTATIONS AND WEATHER

1. Flight Documents

Objective: To determine that the candidate exhibits knowledge of the elements related to flight preparation, with regard to:

- Airworthiness、 registration certificates and radio licences
- Operating limitations, placards, and instrument markings
- Weight and balance data and equipment list.
- Airworthiness directives, compliance records, maintenance requirements, and appropriate records.
- NOTAMS

2. Weather information

Objective: To determine that the candidate exhibits adequate knowledge of

the elements related to aviation weather information by obtaining, reading, and analysing the applicable items such as:

- Correctly analyses the assembled weather information pertaining to the proposed route of flight and destination aerodrome, and determines whether an alternate aerodrome is required, and, if required, whether the selected alternate aerodrome meets the regulatory requirement
- Makes a competent “go/no-go” decision based on available weather information.

PRE-FLIGHT PROCEDURES

1. The preparation for flight plan

Objective: To determine that the candidate exhibits adequate knowledge of the elements by presenting and explaining a pre-planned flight as previously assigned by the examiner (pre-planning at examiner’s discretion). The Examiner must ensure that the Candidate:

- Exhibits adequate knowledge of the aeroplane’s performance capabilities by calculating the estimated time en-route and total fuel requirement based upon such factors as-
  - o Power settings.
  - o Operating altitude or flight level.
  - o Wind.
  - o Fuel reserve requirements.
- Selects and correctly interprets the current and applicable en-route charts, maps, SID (standard instrument departure), STAR (standard terminal arrival), and standard instrument approach procedure charts, as appropriate to the flight.
- Obtains and correctly interprets applicable NOTAM information.
- Determines the calculated performance is within the aeroplane’s capability and operating limitations.
- Completes and files a flight plan in a manner that accurately reflects the conditions of the proposed flight.

2. Mass and Balance Calculation CG Calculations

Objective: To determine that the candidate:

- Computes the centre-of-gravity location for a specific load condition (as specified by the examiner), including adding, removing, or shifting mass
- Determines if the computed centre of gravity is within the forward and aft centre-of-gravity limits, and that lateral fuel balance is within limits for takeoff and landing
- Demonstrates good planning and knowledge of procedures in applying operational factors affecting aeroplane performance.

PRE START CHECKS-EXTERNAL AND INTERNAL

1. Inspection of aircraft and equipment

Objective: To determine that the candidate show the following knowledge and skills:

- Required instruments and equipment for VFR/IFR.(night if applicable)
- Procedures and limitations for operating the aeroplane with inoperative instruments
- Exhibits adequate knowledge of the pre-flight inspection procedures including:
  - o The purpose of inspecting the items which must be checked
  - o Process for obtaining an MEL to include a letter of authorisation.
- Exhibits adequate knowledge of the operational status of the aeroplane by locating and explaining the significance and importance of related documents such as:
  - o Airworthiness and registration certificates.
  - o Operating limitations, handbooks, and manuals.
  - o Mass and balance data.
- The crew unit should implement internal and external inspection for the aircraft in accordance with requirements of SOP
- Verifies the aeroplane is safe for flight by emphasising (as appropriate) the need to look at and explain the purpose of inspecting items such

as:

- o Engine, including controls and indicators
- o Fuel quantity, grade, type, contamination safeguards, and servicing procedures
- o Oil quantity, grade, and type
- o Hydraulic fluid quantity, grade, type, and servicing procedures.
- o Oxygen quantity, pressures, servicing procedures, and associated systems and equipment for crew and passengers
- o Hull, landing gear, float devices, brakes, and steering system
- o Tires for condition, inflation, and correct mounting, where applicable
- o Fire protection/detection systems for proper operation, servicing, pressures, and discharge indications
- o Pneumatic system pressures and servicing
- o Ground environmental systems for proper servicing and operation.
- o Flight control systems including trim, spoilers, and leading/trailing edge
- o Anti-ice, de-ice systems, servicing, and operation

- Co-ordinates with ground crew and ensures adequate clearance prior to moving any devices such as door, hatches, and flight control surfaces
- Demonstrates proper operation of all applicable aeroplane systems
- Notes any discrepancies, determines if the aeroplane is airworthy and safe for flight, or takes the proper corrective action
- Checks the general area around the aeroplane for hazards to the safety of the aeroplane and personnel
- Makes a correct passenger and departure briefing
- Performs all items up to start procedures by systematically following the check list items
- The crew unit should clear up the cockpit so as to ensure that the charts, documents and other equipment are within scope of fingertip
- The trainee pilots should initialize FMS, input and verify the data (if applicable)
- The trainee pilots should optimize and check the take-off performance

as well as take-off data calculation

2. Engine starting

Objective: To determine the candidate have already shown the knowledge and skills relating to correct starting procedure, the candidate should:

- Starting under various atmospheric conditions, normal and abnormal starting limitations, and the proper action required in the event of a malfunction
- Ensuring the ground safety procedures are followed during the before-start, start, and after-start phases
- All items of the start procedures by systematically following the approved briefing/checklist items for the before-start, start, and after-start phases
- Demonstrates sound judgement and operating practices in those instances where specific instructions or briefing/checklist items are not published
- Completes the appropriate briefing/checklist

3. Taxiing

Objective: To determine that the candidate exhibits adequate knowledge of safe taxi procedures:

- Demonstrates proficiency by maintaining correct and positive aeroplane control
- Maintains proper spacing on other aeroplane, obstructions, and persons
- Exhibits adequate knowledge of safe taxi procedures (as appropriate to the aeroplane including push-back or powerback, as may be applicable)
- The flight crews complete cockpit procedures and checklists in accordance with SOP while keep control of taxi
- Accomplishes the applicable briefing
- Comply with the instructions of ATC and use standard communication procedures
- Observes runway hold lines, localizer and glide slope critical areas, beacons, and other surface control markings and lighting

- Maintains constant vigilance and lookout during taxi operation
- Demonstrates correct crew co-ordination (MPA)
- Divides attention properly inside and outside cockpit
- The flight crews manage the workload during taxi appropriately
- Obtains appropriate clearance before crossing/entering active runways

4. Pre-Departure Check

Objective: To determine that the candidate exhibits adequate knowledge of the pre-take-off procedures and actions:

- Ensures that all systems are within their normal operating range prior to beginning, during the performance of, and at the completion of those checks required by the approved checklist
- Ensures that the aeroplane is correctly configured for take-off
- Exhibits adequate knowledge of the pre-takeoff checks by stating the reason for checking the items outlined on the checklist and explaining how to detect possible malfunctions
- Determines the aeroplane's takeoff performance, considering such factors as wind, density altitude, weight, temperature, pressure altitude, and runway condition and length
- Completes the appropriate checklist.
- Divides attention properly inside and outside cockpit.
- Determines if the aeroplane is safe for the proposed flight or requires maintenance
- Ensures that correct crew and passenger briefings are completed
- Obtains appropriate take-off clearance using standard R/T phraseology
- Notes any surface conditions, obstructions or other hazards that might hinder a safe take

Take-off and departure procedures

1. Take-off procedures

Objective: To determine that the candidate present knowledge and skills for normal takeoff and climbing, including:

- Before initiating takeoff, complete the required inspections to

confirm the expected engine performances, and execute all the required pre-takeoff inspections

- Applies the controls correctly to maintain longitudinal alignment on the centreline of the runway prior to initiating and during the take-off
- Correctly sets take-off power
- Correctly assesses aeroplane acceleration during take-off
- Monitors engine controls, settings, and instruments during takeoff to ensure all predetermined parameters are maintained
- Adjusts the controls to attain the desired pitch attitude at the predetermined airspeed to obtain the desired performance
- Maintains the appropriate climb attitude
- Performs or calls for and verifies the accomplishment of gear and flap retractions, power adjustments, and other required pilot related activities at the required airspeeds within the tolerances established in the Pilot's Operating Handbook or AFM
- Make correct use of the navigation equipment to maintain takeoff and upward flight path
- Verifies and correctly applies correction for the existing wind component to the takeoff performance
- Uses the applicable noise abatement and wake turbulence avoidance procedures, as required
- Completes the appropriate briefing and checklist
- Recognize and manage the threats and errors in takeoff
- Correct crew co-ordination as required by type of operation (MPA)
- Correctly assesses take-off and climb hazards particularly those related to obstacles

2. Instrument take-off

Objective: To determine whether the candidate has already acquired the knowledge and skills in the environment of real or simulated instrument meteorological conditions, the candidate should:

- Sets the applicable radios/flight instruments to the desired setting prior to initiating the takeoff

- Takes into account, prior to beginning the takeoff, operational factors which could affect the manoeuvre such as Takeoff Warning Inhibit Systems or other aeroplane characteristics, runway length, surface conditions, wind, wake turbulence, obstructions, and other related factors that could adversely affect safety
- Transitions smoothly and accurately from visual meteorological conditions to actual or simulated instrument meteorological conditions
- Climb in a safe speed and accomplish airplane configuration setting
- Accomplishes the appropriate briefing/checklist items to ensure that the aeroplane systems applicable to the instrument takeoff are operating properly
- Complies with ATC clearances and instructions issued by ATC (or the examiner simulating ATC)

Crosswind take-off

Crosswind take-off

NOTE: If no crosswind condition exists, the use of proper techniques may be orally checked

Objective: To determine whether the candidate has the knowledge and skills for takeoff and climb with crosswind, including:

- Applies the controls correctly for the cross wind condition, to maintain longitudinal alignment on the centreline of the runway prior to initiating and during the takeoff
- Transitions smoothly and accurately from the runway, into balanced, climbing flight maintaining the runway centreline
- Ensures operation of the aircraft within the airframe limitations as determined by the Pilots' Operating Handbook / AFM and Operations Manual, as appropriate
- Correctly assesses the cross wind component

Departure ATC Communications

ATC Clearance

NOTE: The ATC clearance may be an actual or simulated ATC clearance based upon the flight plan.

Objective: To determine whether the candidate presents the knowledge and skills for correctly understand and execute the ATC clearances, including:

- Sets the appropriate communication and navigation frequencies and transponder codes in compliance with the ATC clearance
- Determines that it is possible to comply with ATC clearance
- Copies correctly, in a timely manner, the ATC clearance as issued
- Interprets correctly the ATC clearance received and, when necessary, requests clarification, verification, or change
- Reads back correctly, in a timely manner, the ATC clearance in the sequence received. Uses standard phraseology when reading back clearance

IFR DEPARTURE PROCEDURE

IFR Departures

Objective: To determine the candidate presents the knowledge and skills of IFR departure procedures, including:

- Makes correct use of Instruments, flight director, autopilot, navigation equipment and communication equipment appropriate to the performance of the procedure
- Intercepts, in a timely manner, all courses, radials, and bearings (QDM/QDR’s) appropriate to the procedure, route, ATC clearance, or as directed by the examiner
- Maintains the appropriate airspeed, altitude, headings
- Uses the current and appropriate navigation publications for the proposed flight
- Performs the aeroplane briefing/checklist items appropriate to the departure
- Ensures that correct crew and passenger briefings are completed
- Establishes communications with ATC, using proper phraseology
- Interprets correctly the ATC clearance received and, when necessary,

requests clarification, verification, or change

- Complies, in a timely manner, with all ATC clearances, instructions, and restrictions
- Exhibits adequate knowledge of two-way communications failure procedures
- Adheres to airspeed restrictions and adjustments required by regulations, ATC, the Pilot’s Operating Handbook, the AFM, and the examiner
- Complies with the provisions of the climb profile, SID, and other departure procedures, as appropriate
- Performs correct altimetry procedures, in accordance with the regulations, operational procedures and ATC requirements
- Completes the appropriate checklist
- Demonstrates terrain awareness, orientation, division of attention, and proper planning
- Liaises with other crewmembers for correct operation of the aircraft systems during departure(MPA)
- In VMC, demonstrates adequate lookout and traffic avoidance

EN-ROUTE PROCEDURES NAVIGATION AIDS TRACKING

Intercepting & Tracking Radio Navigation Aids (VOR, NDB, DME)

Objective: To determine that the candidate exhibits adequate knowledge and skill of the use of Radio Navigation aids, and is able to intercept and maintain specified bearings or radials or tracks.

- Intercepts and tracks a specific bearing/radial (QDM/QDR) to or from the NDB facility, using appropriate interception procedures
- Intercepts and tracks a specific DME arc if required, using appropriate interception procedures
- Maintains, while intercepting and tracking, the applicable airspeed, headings and altitude
- Applies proper correction for wind to maintain track
- Correctly utilises crew to operate equipment and identify navigational

aids (MPA)

- Correctly tunes and identifies the facility
- Correctly sets cockpit displays (HSI, RMI etc.)
- Correctly monitors the facility for failure (failure flags, coding etc as appropriate)
- Recognizes facility failure, and, when required, reports the failure to ATC.
- Determines accurately the relative bearing (QDM/QDR) of the VOR/ NDB facility
- Determines the aircraft position relative to the facility
- Completes the appropriate checklist

ANTI-ICING PROCEDURES

Anti-icing Procedures

Objective: To determine that the candidate exhibits knowledge and skill of the elements related to ice protection equipment and procedures.

- Inspects all surfaces of the aeroplane with emphasis on ice
- Clears all surfaces of ice before flight
- Operates anti/de-icing equipment correctly
- Taxies and accomplishes the before takeoff check adhering to good operating practice for flight into icing conditions
- Performs takeoff and climb, cruise, descent and landing with emphasis on correct procedures in icing conditions
- Completes all appropriate briefing/checklists
- Monitors ice accretion during flight
- Plans and executes ice avoidance if necessary
- Demonstrates correct crew co-ordination as required by type of operation

Radio communication procedures - Professional flight quality(applicable to all the flight phases)

Radio communication procedures

Objective: To determine that the candidate uses correct R/T procedures, complies with ATC instructions and conducts the flight efficiently and safely.

- Operates radio equipment correctly

Operates transponder correctly

- Uses ICAO R/T phraseology
- Speaks clearly on R/T
- Reads back clearances correctly
- Complies with ATC clearances or instructions
- Manages flight safely with due regard to weather, other traffic and procedures

ABNORMAL AND EMERGENCY PROCEDURES

Abnormal and emergency procedures

NOTE: Depending on the aeroplane used these items may be checked by other means i.e. oral or by 'touch-drills' if required for safety

While simulating engine failure on a multi engine aeroplane, the examiner or the safety pilot must be able to cope with a real failure on an other engine.

The examiner or the safety pilot must also know the alarm inhibitions and the inefficacy of a continuous alarm due to any failure simulation.

Objective: To determine that the candidate exhibits adequate knowledge and skill of the abnormal/emergency procedures (as may be determined by the examiner) relating to the particular aeroplane type

- Maintains control of aeroplane
- Demonstrates the proper procedure for any emergency/abnormal situation (as determined by the examiner) in the appropriate approved AFM
- Completes the appropriate abnormal/emergency checklist
- Shows correct fault diagnosis
- Confirms fault diagnosis (with other crew members in MPA)
- Reviews causal factors (with other crew members in MPA)
- Identifies alternative courses of action
- Involves other crew members in option analysis (MPA)
- Considers and shares the risks of alternative courses of action

- Confirms intended plan of action (with other crew members in MPA)
- Ensures that correct crew and passenger briefings are completed
- Divides attention properly inside and outside cockpit
- Maintains adequate lookout, before, during and after execution of any manoeuvre by visual references
- Alerts ATC if necessary and obtains appropriate level of service

Simulated one engine failure During Approach

Objective:To determine that the candidate presents sufficient knowledge and skills for the relevant factors in approach and landing with one engine failure, including:

- Maintains crosswind correction and directional control throughout the approach and landing
- Sets the engine controls, reduces drag, and identifies and verifies the inoperative engine after simulated engine failure
- Carries out the recommended emergency procedure
- Simulates feathering the propeller of the inoperative engine, if appropriate
- Establishes the recommended best engine inoperative approach landing configuration, and airspeed
- Monitors the operating engine and makes adjustments as necessary
- Maintains a stabilised approach and the recommended approach airspeed until landing is assured
- Makes smooth, timely, and correct control application during the round out and touchdown
- Considers the wind conditions, landing surface, and obstructions, and selects the most suitable touchdown point
- Touches down smoothly at the predetermined zone, with no drift, and with the aeroplane's longitudinal axis aligned with and over the runway centerline

Simulated one engine failure During Approach (with reference to the instruments)

Objective: To determine that the candidate presents sufficient knowledge

and skillson the published approach with one engine failure procedures (with reference to the instruments) , including:

- Establishes and maintains the recommended flight attitude and configuration for the best performance for all manoeuvring necessary for the instrument approach procedure
- Maintains a stabilised approach and the recommended approach airspeed until landing is assured
- Monitors the operating engine(s) and makes adjustments as necessary
- Complies with the published approach procedure
- Displays efficient cockpit management procedures throughout the approach

Go-around with one Engine (Simulated) Inoperative

Objective: To determine that the candidate exhibits adequate knowledge of a go-around procedure with one engine simulated inoperative, including the conditions that dictate a rejected landing, the importance of a timely decision, the recommended airspeeds.

- Applies the appropriate power setting for the flight condition and establishes a pitch attitude necessary to obtain the desired performance
- Establishes a positive rate of climb and climb at the appropriate airspeed to the correct acceleration altitude
- Retracts the wing flaps/drag devices and landing gear, if appropriate, in the correct sequence
- Trims the aeroplane as necessary, and maintains the proper ground track and altitudes during the rejected landing procedure
- Accomplishes the appropriate briefing/checklist items in a timely manner in accordance with approved procedures
- Makes a timely decision to reject the landing for actual or simulated circumstances and makes appropriate notification when safety-of-flight is not an issue

Landing with one Engine (Simulated) Inoperative

Objective: To determine that the candidate exhibits adequate knowledge of

the flight characteristics and controllability associated with manoeuvring to a landing with (a) engine(s) inoperative (or simulated inoperative) including the controllability factors associated with manoeuvring, and the applicable emergency procedures.

- Establishes the approach and landing configuration appropriate for the runway and meteorological conditions; and adjusts the engine controls as required
- Maintains a stabilized approach and the desired airspeed
- Maintains the operating engine(s) within acceptable operating limits
- Accomplishes a smooth, positively controlled transition from final approach to touchdown
- Uses spoilers, propeller reverse, thrust reversers, wheel brakes, and other drag/braking devices, as appropriate, in such a manner to bring the aeroplane to a safe stop after landing
- Maintains positive directional control and crosswind corrections during the after-landing roll
- Completes the applicable before landing checklist
- Completes the applicable after-landing briefing/checklist items in a timely manner, after clearing the runway, and as recommended by the manufacture

Simulated Cabin Pressure Failure/Emergency Descent

Objective: To determine that the candidate exhibits adequate knowledge (simulated) cabin pressure failure/emergency descent.

- Demonstrates sound judgment and knowledge of the aeroplane manoeuvring capabilities throughout the procedure
- Performs emergency descent in a smooth, positive, and timely manner without exceeding limitations
- Demonstrates proper procedures in accordance with approved procedure/briefing/checklist or the manufacturer’s recommended procedures and pertinent briefing/checklist items

ARRIVAL PROCEDURES

Arrival Procedures and Instrument Procedures

Objective: To determine that the candidate, In actual or simulated instrument conditions, exhibits adequate knowledge of En Route Low and High Altitude Charts, STARS, Instrument Approach Procedure Charts, and related pilot and controller responsibilities

- Makes correct use of Instruments, flight director, autopilot, navigation equipment and communication equipment appropriate to the performance of the procedure
- Intercepts, in a timely manner, all courses, radials, and bearings (QDM/QDR's) appropriate to the procedure, route, ATC clearance, or as directed by the examiner
- Establishes, where appropriate, a rate of descent consistent with the aeroplane operating characteristics and safety
- Maintains the appropriate airspeed- altitude, headings and accurately tracks radials, courses, and bearing (QDM/QDR's)
- Uses the current and appropriate navigation publications for the proposed flight
- Performs the aeroplane briefing/checklist items appropriate to the arrival
- Establishes communications with ATC, using proper phraseology
- Interprets correctly the ATC clearance received and, when necessary, requests clarification, verification, or change
- Complies, in a timely manner, with all ATC clearances, instructions, and restrictions
- Exhibits adequate knowledge of two-way communications failure procedures
- Adheres to airspeed restrictions and adjustments required by regulations, ATC, the Pilot's Operating Handbook, the AFM, and the examiner
- Complies with the provisions of the descent profile, STAR, and other arrival procedures, as appropriate

- Performs correct altimetry procedures, in accordance with the regulations, operational procedures and ATC requirements
- Completes the appropriate checklist
- Demonstrates terrain awareness, orientation, division of attention, and proper planning
- Communicate with other crew members for correct operation of the aircraft systems during approach and landing

HOLDING PROCEDURES

Holding Procedure

Objective: To determine that the candidate, In actual or simulated instrument conditions, exhibits adequate knowledge of and proficiency in holding procedures for standard and non-standard, published and non-published IFR holding patterns.

- Changes to the recommended holding airspeed appropriate for the aeroplane and holding altitude, so as to cross the holding fix at or below maximum holding airspeed
- Uses wind-drift correction techniques accurately to maintain the appropriate joining and holding pattern and to establish and maintain the correct tracks and bearings
- Maintains the appropriate airspeed, altitude and headings accurately to establish and maintain the correct tracks and bearings
- Demonstrates adequate knowledge of holding endurance, including, but not necessarily limited to, fuel on board, fuel flow while holding, fuel required to alternate, etc
- Recognizes arrival at the clearance limit or holding fix
- Follows appropriate entry procedures in accordance with standard operational procedures or as required by ATC or the examiner
- Complies with ATC reporting requirements
- Uses the correct timing criteria where required by the holding procedure, ATC or the examiner’ s instructions
- Makes appropriate adjustments to the procedure timing, to allow for

the effects of known wind

- Makes appropriate adjustments in order to arrive over the holding fix as close as possible to the “Expected Approach Time”

PRECISION APPROACH

Precision Approach

NOTE: Precision approaches, using aeroplane NAVAID equipment for centerline and glide slope guidance may be accomplished in simulated or actual instrument conditions to Decision Altitude/Height (DA/DH) and must be flown without the use of an autopilot. .

For ILS displays with a normal scale, the approach should be contained within a half scale deflection of the localizer and glide slope indications. For aircraft with an expanded scale display of the localizer, the approach should be contained within the full scale deflection of the localizer and half scale deflection of the glide slope indications.

Objective: To determine that the candidate presents sufficient knowledge and skills for precision instrument approach procedures, including:

- Intercepts and tracks localizer within prescribed limits
- Establishes a predetermined rate of descent at the point where the electronic glide slope begins, in order to follow the glide slope. Maintains electronic glide slope within prescribed limits
- Arrives at the DA/DH in such a position that a landing, go-around or circling approach may be accomplished safely
- Avoids descent below the DA/DH before initiating a missed approach procedure or transitioning to a landing
- Initiates immediately the missed approach, when at the DA/DH, if the required visual references for the runway are not unmistakably visible and identifiable
- Maintains localizer and glide slope during the visual descent from DA/DH to a point over the runway where glide slope must be abandoned to accomplish a normal landing

NON-PRECISION APPROACH

Non-precision Approach

Objective: To determine that the candidate presents sufficient knowledge and skills on the non-precision approach procedures specified by the inspector, including:

- Establishes a rate of descent that will ensure arrival at the MDA/H (at, or prior to reaching, the visual descent point if published) with the aeroplane in a position from which a descent from MDA/H to a landing on the intended runway can be made, at a normal rate using normal manoeuvring
- Executes the missed approach if the required visual references for the intended runway are not unmistakably visible and identifiable at the missed approach point
- Demonstrates adequate judgement and knowledge of the aeroplane. performance in order to comply with published approach procedures equipment used for the approach

MISSED APPROACH PROCEDURES

Go-Around & Missed approach

Objective: To determine that the candidate exhibits adequate knowledge and skill in the application of missed approach procedures associated with standard instrument procedures.

- Initiates the missed approach procedure promptly by the timely application of power, establishes the proper climb attitude, and re-configures the aircraft in accordance with the approved procedures
- Maintains the desired altitudes, airspeed, heading and accurately tracks courses, radials, and bearings
- Follows the recommended aeroplane briefing/checklist items appropriate to the go-around procedure for the aeroplane used
- Complies with the appropriate missed approach procedure or ATC clearance
- Requests clearance, if appropriate, to the alternate aerodrome,

another approach, a holding fix, or as directed by the examiner

Interprets correctly the ATC clearance received and, when necessary, requests clarification, verification, or change

ARRIVAL AND LANDING PROCEDURES

Aerodrome Arrival Procedures

Objective: To determine that the candidate exhibits adequate knowledge of the appropriate arrival procedures and relevant pilot and controller responsibilities, and makes proper reference to the appropriate navigation publications and charts.

- Maintains the appropriate airspeed- altitude, headings
- Establishes communications with ATC, using proper phraseology
- Interprets correctly the ATC clearance received and, when necessary, requests clarification, verification, or change
- Exhibits adequate knowledge of two-way communications failure procedures
- Uses the current and appropriate navigation publications for the proposed arrival routing
- Complies in a timely manner with ATC instructions and airspace restrictions
- Performs the aeroplane briefing / checklist items appropriate to the arrival
- Ensures that correct crew and passenger briefings are completed
- Performs correct altimetry procedures, in accordance with the regulations, operational procedures and ATC requirements
- Completes the appropriate checklist
- Demonstrates terrain awareness, orientation, division of attention, and proper planning
- Communicate with other crewmembers for correct operation of the aircraft systems throughout the arrival phase
- Communicate with other crew members for lookout (where appropriate)

High Performance Airplane Flight Test Tolerances

Flight Phases	Limits
Normal Flight	± 100ft
Simulated engine failure	± 100ft
Restricted or partial panel	± 200ft
Starting go-around at decision Altitude/Decision Hight	+50/ - 0ft (One engine failure + 100 / -0ft)
Minimum Descending Altitude/Minimum Descending Hight	+50/ - 0ft (One engine failure +100/ - 0ft)
Using radio navigation equipment	± 5°
Precision approach	Localizer and glideslope half-full
Fly along DME arc	± 1nm
Dual engine operating	± 5°
Simulate engine failure	± 10°
Restricted or partial instrument	± 15° +5/ - 0kt ± 5kt
Takeoff/ Vr	
Climb and approach	
Vat / Vref	+5/ - 0kt ± 5kt
Cruise	
Restricted or partial instrument	± 10kt
Simulate engine failure	-2kt
Vyse / V2	± 5kt
Maximum airspeed error in any other phases	± 10kt

Appendix 2:

Worksheet for high-performance aircraft training test

Name	Pilots License Number
Flight School	
Examination Date: _____ Location: _____	
Aircraft Model Aircraft Type___ Use aircraft aircraft registration number_____ Use simulator registration number of CAAC_____Grade_____	

Examination Items			Conclusion	
			pass	failed
Departure	1.	Preparation before flight		
	1.1	Document		
	1.2	Weight and Balance		
	1.3	Meteorological Information		
	1.4	Flight Plan		
	2.	Checking before start- external inspection and internal inspection		
	3.	Motor starting- normal and fault		
	4.	Sliding		
	5.	Pre-departure check- engine run		
	6.	Take-off procedures- simulated instrument meteorological conditions		
	6.1	Crosswind (if weather permits)		
	6.2	Engine failed after simulating at V1 speed		
	7	Departure ATC communication		
Instrument Flight	1.	Instrument Departure		
	2.	Rout instrument flight- cut-in radial		
	3.	Waiting procedure		
	4.	Missed approach after ILS approaching to DH/A 200 ft		
	5.	Non-precision approach to MDH/A and MAP- Missed approach		
	6.	Anti-icing procedures		
	7.	Regulatory Contact- obedience, radio communication procedures		

Signature of Applicant:

Approach and landing	1.	Approach Procedures		
	2.	Normal ILS approach and landing		
	3.	Non-precision approach and landing		
	4.	Normal landing- visual		
	5.	Missed approach at minimum altitude		
	6.	Missed approach and landing at night flight (on demand)		
	7.	Regulatory contact- obedience, radio communication		
non-normal and emergency procedures	1.	Simulation emergency (system failure, on-demand)		
	2.	Implement ILS approach by manual operation when simulated one engine failure		
	3.	Simulated one engine failure approach and a missed approach		
	4.	Simulated an engine failure approach and full-stop		
	5.	Regulatory contact -obedience, radio communication		
Unit resource management	1.	Fundamentals		
	2.	Communication		
	3.	Leadership and teamwork		
	4.	Situational awareness		
	5.	Work Load Management		

Inspectors comments and conclusions

Comments:

Conclusions:

Inspector's License Number_____Signature_____Date_____

Note: Tick "√" at "Pass" or "Failed" in the conclusion area for every action