Civil Aviation Administration of China
Flight Standards Department

Advisory Circular

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High Performance Multiengine Airplane Training Requirements

1. Background

Generally, commercial pilot license is earned by operating alone at low-altitude, low-speed general aviation airplanes with either single or multi piston engines. In China, pilots holding a commercial pilot license with an airplane category and multiengine class rating and an instrument rating may progress to ATPL knowledge training before being employed by an air carrier to operate at a high altitude and high speed multi-crew modern commercial transport airplane. However, pilots accustomed to low speed airplanes always develop a corresponding thinking mode and may find it overwhelming to move up to airplanes three or more times faster and higher, and ten or times heavier. High performance airplane training serves as a transitional training course for pilots to adjust their thinking and mode of actions, facilitating their transition from relatively simply-equipped low-altitude and low-airspeed small airplanes to medium or heavy jet transport airplanes. In addition, small airplanes are often non-pressurized and not equipped with such equipment as Ground Proximity Warning System (GPWS) and radar. Safety threats encountered at high-altitude and high-speed flights are often thoroughly different from those of low-altitude and low-speed flights. Therefore, threat and error management (TEM) also requires a different way of thinking.

High performance airplane training covers all of the above contents. It is mandated that modern commercial transport airplanes be crewed with two or more pilots, and the automation and complexity of the aircraft often requires all crewmembers to work as a

team instead of as independent individuals. A lack of communication or understanding between crewmembers is often cited as one of the main causes of aviation accidents. Therefore, multi-crew cooperation (MCC) and crew resource management (CRM) are increasingly gaining attention. The training program for high performance multi-engine airplane training courses covers all of these contents in both knowledge and practice.

2. Applicability

2.1 This Advisory Circular is developed in accordance with the requirements of CCAR-141.

2.2 High performance multiengine airplane training course shall be conducted as a transitional training for pilots flying for a CCAR-121 air carrier prior to initial training for Group II airplanes. And flight training and simulator training included in the course may not substitute for type rate training.

2.3 High performance multiengine airplane training course shall be conducted at a CAAC approved CCAR-141 pilot school under its approved ground instruction program and flight training program.

3. Eligibility Requirements

3.1 Any individual applying for a high performance multiengine airplane training shall hold a commercial pilot license with a multiengine airplane rating and instrument rating.

3.2 The aeronautical knowledge training required is not subject to Paragraph 3.1 of this advisory circular and may be performed in advance.

4. Requirements for Training Duration

4.1 The aeronautical knowledge training hours and flight training hours shall meet the relevant requirements of appendix E of CCAR-141.

4.2 Student pilots shall not take more than 3 hours of flight training or 6 hours of aeronautical knowledge (ground) training within any 24 consecutive hours.

4.3 The minimum flight training hours in aircraft included in a high performance multiengine airplane training course shall not amount to less than 80% of the total flight training hours.

4.4 As for training conducted in a flight simulator representative of the type of aircraft for which the course is approved, when two students seated at the controls are

given instruction at the same time, only 50% of the training time may be counted toward each student's individual training experience.

5. Requirements for Flight Instructors

5.1 To be eligible for designation as a chief instructor for the course, a person shall meet the relevant requirements of Section 141.45 or 141.47 of CCAR-141, in which flight experience required to be acquired in multicrew settings shall meet either of the following two requirements:

1) flight training time acquired as a pilot in an airplane type-certificated or required by the appropriate regulations to be crewed with two or more pilots.
2) instruction time acquired as a flight instructor in high performance multiengine airplane training course.

5.2 To be eligible for designation as a chief instructor for high performance multiengine airplane training course, a person shall at least have logged 1500 hours of flight experience time, including at least over 200 flight hours in a multicrew setting or have received trainings for chef instructor required by Paragraph 5.1 in accordance with Subparagraph 2) of Paragraph 4.1 of this advisory circular.

5.2 For those persons who once held air transport flight instructor certificate issued in accordance with AC-61-6 in recent 3 years, and have received trainings for chef instructor required by Paragraph 5.1 in accordance with Subparagraph 2) of Paragraph 4.1 of this advisory circular, they can be designated as a flight instructor for the high performance training course regardless of whether or not they hold an instructor certificate.

6. Requirements for Training Contents

6.1 Aeronautical Knowledge Training

1) Operations of the employing air carrier
   (a) Knowledge training on the operations of the air carrier shall not be less than 20 hours.
   (b) The requirements of CCAR-121 (or the appropriate operations regulations of the State where training is conducted)
   (c) Basic operating procedures of the employing air carrier
   (d) Operations on international routes

2) High-altitude flight knowledge
   (a) Knowledge training on high-altitude flights shall not be less than 20 hours.
   (b) High altitude flight environment
   (c) Weather
   (d) Flight planning and navigation
   (e) Physiological Training
   (f) High altitude systems and components
   (g) Aerodynamics and performance factors
   (h) Emergencies
3) High performance multiengine airplane type knowledge
   (a) Training on operating requirements that are specific to the high-altitude multiengine airplane for which the type rating is required shall not be less than 64 hours.
   (b) General operational subjects
   (c) Introduction to the aircraft and operating limitations
   (d) Weight and balance
   (e) Adverse weather practices
   (f) Aerodynamics, performance and Minimum equipment list(MEL)
   (g) Airplane systems and components
   (h) Fuel and oil systems
   (i) Powerplant
   (j) Electrical system
   (k) Hydraulic systems
   (l) Landing gear and brakes
   (m) Pneumatic systems
   (n) Environmental systems
   (o) Flight control systems
   (p) Ice and rain protection systems
   (q) Fire and overheat protection systems
   (r) Flight instruments
   (s) Navigation equipment and display systems
   (t) Auto flight systems
   (u) Communication equipment

(v) Aircraft specific emergency training

(w) Emergency equipment

(x) Abnormal and emergency procedures

(y) System integration training

(z) Cockpit familiarization and use of checklists

(aa) Flight maneuvers and display systems

(bb) Flight operations and the use of auto flight systems

(cc) Emergency procedures

(dd) The use of navigation systems

(ee) Normal and abnormal flight procedures

4) Multicrew cooperation theoretical knowledge

Multicrew cooperation refers to a flight environment where the crew works as a team of cooperating members led by the pilot-in-command (PIC). The knowledge training on multicrew coordination shall not be less than 25 hours. The contents of the basic multi-crew cooperation course should cover theoretical knowledge training, practice and feedback in:

A. Interfaces

—Examples of software, hardware, environment, and liveware mismatches in practice.

B. Leadership/ “followship” and authority

—Managerial and supervisory skills

—Assertiveness

—Barriers

—Cultural influence

—PF and PNF roles

—Professionalism

—Team responsibilities

C. Personality, altitude and motivation

—Listening

—Conflict resolution

—Mediating

— Critique (preflight analyses and planning, ongoing-review and postflight)

—Team building

D. Effective and clear communication during flight

—Listening

—Feedback

—Standard Phraseologies

—Assertiveness

—Participation

E. Crew co-ordination procedures

—Flight techniques and cockpit procedures

—discipline

—Mutual supervision, information and support

6.2 Flight training

1) Flight training contents:

(a) Preflight Preparation: including documentation and computation of takeoff performance data;

(b) Preflight checks: including radio and navigation equipment checks and setting;

(c) Before takeoff checks: including powerplant checks and takeoff briefing by PF;

(d) Normal take-offs with different flap settings, tasks of PF and PNF, call-outs;

(e) Rejected Takeoffs; crosswind takeoffs; takeoffs at maximum takeoff mass; engine failure after V1;

(f) Normal and abnormal operation of aircraft systems, use of checklists;

(g) Early recognition and reaction on approaching to stalls in different aircraft configurations;

(h) Instrument flight procedures including holding procedures; precision approaches with raw navigation data, flight director and autopilot, one engine simulated inoperative approaches, non-precision approach, approach briefing by PF, setting of navigation equipment, call-out procedures during approaches; computation of approach and landing data;

(i) Go-arounds: normal and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum decent height/altitude;

(j) Landings: normal, crosswind and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum decent height/altitude;

2) Multi-crew co-operation (MCC) training

The objectives of MCC training are optimum decision making, communication, division of tasks, use of checklists, mutual supervision, teamwork, and support throughout all phases of flight under normal, abnormal and emergency conditions, so as to operate multi-engine airplane safely in multi-crew environment under varies situation.

The training should focus on teaching students the basics on the functioning of crew members as teams in a multi-crew environment, not simply as a collection of technically competent individuals.

The requirements of multi-crew cooperation training include that: the instructor must have relevant knowledge on human performance training and Crew Resource Management (CRM), and catch up with the latest development of human performance training and CRM skills; The course requires training exercises which include students as crew members in the PF and PNF roles. And the course should provide students with opportunities to practice the skills that are necessary to be effective team leaders and members.

Multi-crew co-operation training shall fallow the following principles: both PF and PNF shall exercise their responsibilities of management and decision making. Tasks undertaken by PF and PNF shall be explicitly assigned in a proper way. The purpose of multi-crew co-operation is to control the airplane orderly no matter normal, abnormal or emergency situations. The use of checklist is of special importance for an orderly and safe conduct of flight. Crew members shall ensure mutual supervision, information and support in flight. Any action in handling the aircraft should be performed by mutual supervision. The pilot responsible for the specific action or task (PF or PNF) should be advised when substantial deviations are observed. Call-out procedures are essential, especially during take-off and approach, to indicate

progress of the flight, systems status etc. Operation of aircraft systems, setting of radios and navigation equipment etc. should not be performed without demand by the PF or without information to the PF and his confirmation.

7. Testing Requirements

7.1 Upon completion of all required subjects of a high performance multiengine airplane training course, each student must take a flight test of at least 1.5 hours in an airplane or simulator. The flight test may be included in the programmed training hours. For those who do not pass the test, remedial training must be provided until they pass the test.

7.2 The test for an endorsement of high performance multiengine airplane training course includes oral test and flight test. Oral test shall cover all subjects required in Paragraph 6 of this AC. Questioning inflight should be used judiciously so that safety is not jeopardized.

7.3 An end-of-course tests for a high performance multiengine airplane training course may be conducted through one of the following methods:

1) A pilot school may designate at least one check instructor to conduct tests in accordance with the requirements of Section 43 of CCAR-141. The designated instructor shall hold a current flight instructor certificate for the training course and be approved by the appropriate CAAC office. A check instructor may not conduct a stage check or an end-of-course test of any student for whom the check instructor has served as the principle instructor.
2) The employing air carrier may designate a check airman to conduct tests for student pilots.

8. Requirements for Graduation Certificate

8.1 The pilot school must issue a high performance training graduation certificate to each student pilot who has completed its approved high performance training course. The graduation certificate must contain at least the following information.

1) The name of the pilot school and the certificate number of the school;
2) The name of the graduate to whom it was issued, and the graduate’s certificate number;
3) The course of training for which it was issued;

4) The date of enrollment and graduation;
5) Airplane type used in training course and, if simulator is used, list simulator type and expiration date approved by CAAC.
6) A statement that the student has satisfactorily completed each required stage of the approved high performance training course, and the number of full-stop landings the student made as Pilot Flying;
7) A certification of the information contained on the graduation certificate by the chief instructor for that course of training.

8.2 When applying for initial training for SIC in Group II airplanes, a high performance training graduation certificate must be presented to CAAC.

9. Explanatory Notes and Effectiveness of the Revision

The 1st revision of this advisory circular was made on January 26th , 2011, adding the requirements for daily training hours, flight instruction time, cross-country flight training, instrument approach training, chef instructor requirements and test requirements, and specifying the relevant test standards and test work sheet.

As the 1st revision of CCAR-141, dated April 1st, 2017, added the relevant requirements for high performance airplane training courses, the 2nd revision of this advisory circular removes the requirements for training duration, simulator and etc., which are already specified in CCAR-141, and aligns the qualification requirements for chief instructor and assistant chief instructor with those prescribed in CCAR-141.

This advisory circular is effective since its issuance.

Appendix1：High performance airplane training and test standard

High Performance Airplane Training and Test Standard

This test standard provides a guidance for flight instructor to conduct flight test and decide whether the student pilot can meet the skill standard of safely control the airplane. The standard is a guidance for flight instructor and student pilot to prepare for test.

Certain test contents require to test professional flight quality. As a comprehensive quality, professional flight quality may assure that pilot comply with laws and regulations as well as aviation routines and safely control the airplane no matter air or ground. It is not practicable to list all considerations about professional flight quality. However, we have list those items in non-technology block as more as possible. As long as it does not affect the flight safety and the successful completion of the flight tasks, the mistakes made by student pilots in this aspect shall not be considered as the cause of the unqualified test. The inspector's role is to observe how the student pilots complete a safe, event-free flight with available resources. If the student pilot shows a particular professional flight quality early and consistently (for example, continually checking the airplane for ice accretion after escaping from the icy conditions during horizontal cruising), the inspector may only conduct oral test about the changed situation on him or her on the subsequent range.

Upon the judgment of the inspector, if a student pilot has one of the following problems during the test, then he/she is considered as failed the test: lack of flight knowledge, affecting the effective completion of the flight task or endangering the safety; certain actions or omissions made it necessary that the inspectors help to ensure flight safety; in the event of deviations, corrective measures are not taken in time; not able to effectively perform their duties in accordance with standard operating procedures as captain or crew member in multicrew operating environment, affecting the effective completion of the flight task or endangering the safety.

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Crew Resource Management

Crew Resource Management

Purpose: To identify the knowledge, skills and attitude about plan, instruction and control that an applicant shall obtain as a crew member in the multicrew operating environment.

1. Basic Knowledge:

- Be able to make a full definition on human factors and give an explanation on human factor model
- Be clear about the specific meaning of crew resource management
- Be familiar with relevant standards about crew resource management
- Be able to rise examples that the flight safety is threatened by physiological and psychological factors
- Be able to list the strategies of keeping situation awareness
- Be able to analyze how to deal with conflicts in the cockpit

2. Communication

- Be clear about the objects, contents and degree of communication
- Be sure that the target communication person is prepared and able to receive messages.
- Be able to transfer messages accurately, clearly and adequately
- Be sure that the communication staff has understood the messages correctly when transferring important messages.
- Be able to listen patiently and effectively and make clear that it has been understood upon the reception of the message.
- Be able the rise relevant and effective questions and provide suggestions.
- Be able to adopt proper body language, eye contact as well as tone and manner.
- Be open and receptive to others' opinion.

3. Leadership and teamwork

- Be clear and identify the purpose of the crew and the role of every individual crew member.
- Be friendly to others, be active in communication and be thoughtful towards others.
- Be active in shouldering responsibilities and provide assistance when necessary.
- Be open and honest to others' opinions and suggestions.
- Be able to give and accept criticism and praise, be able to admit mistakes.
- Be confident to put forward and carry out what is important to the crew.
- Show respect and tolerance to crew members.
- Allow crew members to equally participate in the plan formulation.

4. Work load management

- Be able to be calm, relax, careful and not foolhardy.
- Be able to arrange tasks reasonably, determine the priority of tasks and effectively manage tasks.
- Be able to make effective use of time to perform tasks.
- Be able to provide or accept assistance, authorize crew members to ask for help as early as possible when necessary.
- Be able to carefully recheck, monitor and cross-check.
- Be able to stick to procedures in a consistent manner
- Be able to focus on one thing at a time, and do not be distracted by other things before finished.
- Be able to follow instructions as required.

5. Situational Awareness

- Be clear with the operating state of the airplane and its systems.
- Be clear with the location and ambient environment of the airplane.
- Be clear with the amount of remaining fuel and the endurance time.
- Be familiar with conditions of people involved in the operation, including passengers onboard.
- Maintain predictability, become aware of an actual or potential situation at every moment and plan accordingly.
- Forecast the forthcoming situation and make decisions in advance.

- Identify threats that may jeopardize the airplane and personnel.

6. Decision-making

- Be able to obtain plenty of accurate information from proper resources.
- Be able to continuously solve problems.
- Be able to select correct decision-making procedures.
- Be able to give priority to certain tasks in accordance with the principle of importance and rationality.
- Be able to consider as many options as possible.
- Be able to make timely decisions, assess and change those decisions when necessary.
- Be able to take risks into consideration and do not take unnecessary risks.

Preflight Procedure — Flight Document and Meteorological Information

1. Flight Document

Purpose: To ensure that the student pilots demonstrate the following knowledge and skills about pre-flight preparation:

- Airplane airworthiness certificate, registration certificate and radio station license,
- Operating limitations, signs and instrument marks,
- Weight and balance data and equipment list,
- Airworthiness maintenance and related records,
- Notice to Airman (NOTAMS)

2. Weather Information

Purpose: To ensure that the student pilots demonstrate the following knowledge of aeronautical meteorological information and are able to obtain, interpret and analyze the corresponding documents.

- Correct analysis on the assembled weather information pertaining to the proposed route of flight and destination airport, and confirmation on whether an alternate airport is required, and, if required, whether the selected alternate airport meets the regulatory requirement.

- Right decision on “fly or not fly” in accordance with the acquired meteorological information.

Preflight Procedure

1. Preparation for Flight Planning

Purpose: To ensure that the student pilots demonstrate the following knowledge to present and explain a preplanned flight assigned by the examiner (preplanning is at examiner’s discretion). It is the examiner that identifies whether the applicant is able to:

- Exhibit adequate knowledge of the aircraft's performance capabilities by calculating the estimated time en route and total fuel requirement based upon factors, such as
  - Power settings
  - Operating altitude or flight level
  - Wind
  - Fuel reserve requirements
- Select and correctly interpret the current and applicable en route charts, map, Standard Instrument departure (SID), Standard Terminal Approach Route(STAR) and applicable Standard Instrument Approach Procedure Charts (IAP).
- Obtain and correctly interpret applicable NOTAM information
- Determine the calculated performance is within the aircraft's capability and operating limitations.
- Complete and file a flight plan in a manner that accurately reflects the conditions of the proposed flight.

2. Weight and Balance Calculation

Purpose: To ensure that the student pilots are able to:

- Calculate center of gravity (CG) positions of the aircraft under the given loading conditions (provided by the inspector), including the increase and reduction in loading weight, as well as the movement of seats.

- Determine that whether the calculated CG is within the extreme forward and the extreme aft center of gravity limitations; and whether the fuel balance is within the limits of takeoff and landing.
- Master relevant knowledge and properly handle operational factors that affect airplane performance.

Pre-start Check—External Inspection and Internal Inspection

1、 Inspections on Airplane and Equipment

Purpose: To ensure the student pilots demonstrate the following knowledge and skills:

- Instruments and equipment required for Instrument Flight Rules (night flight, if needed)
- Airplanes' operating procedure and limitation under instrument failure
- Sufficient knowledge concerning pre-flight inspection, including:
  - The reason and purpose of every inspection item
  - The use of Minimum Equipment List
- The knowledge in terms of operating condition of airplanes, which enable the student pilots to find the relevant documents and explain its significance and importance:
  - Certificate of Airworthiness and Registration Certificate
  - Operating limitations and manuals
  - Weight and balance data
- External and internal inspection of the airplane conducted by the air crew according to the requirements in SOP (Standard Operating Procedure)
- The ability to verify that the airplane can operate safely and emphasize (if needed) the necessity and purpose to inspect the following parts:
  - Engine, including control and instruction
  - Fuel quantity, grade and type
  - Oil quantity, grade and type
  - Hydraulic fluid quantity, grade, type and usage procedure

- Oxygen, pressure, service procedure, relevant systems and equipment for the use of crew members and passengers
- Airframe, landing gear, skid, brake and steering system
- Tire status, inflation condition, and its correct installation
- Fire protection and detection systems' running status, service condition, pressure and release indication
- Air supply system's pressure and service condition
- Ground environment control system's service and working condition
- Control system, including trim tab, speed brake, wing leading edge devices and trailing edge devices
- Anti-icing and de-icing systems' service and working condition.

- Coordination with ground crew so as to guarantee a sufficient distance between the personnel and the moving doors, hatch cover and flight control surfaces
- Correct operation of all airplane systems
- The ability to find problems deciding the airworthiness and safe flight of the airplane, and the competence to take appropriate corrective actions
- Inspection on the potential risks existing around the airplane that could threaten the safety of the airplane and personnel
- Correct execution of passenger briefing and takeoff briefing
- Correct execution of all prescribed operations before start procedure through completing all the checklist items systematically
- Reasonable arrangement in the cockpit to keep the charts, documents and other appliances within reach
- Conducting of FMS initialization, data input and confirmation (if applicable)
- Optimization and inspection of takeoff performance and calculation of takeoff data

2、 Engine Start

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about engine start procedure:

- The limitations for normal and abnormal engine start under different atmospheric conditions, and the right measures to be taken should there is a malfunction

- Strict execution of ground safety procedure during pre-start, start and post-start
- Systematic perform of all engine start procedures according to the approved briefing/ checklist of pre-start, start, and post-start period
- Good judgement and operating habit when there is no prescribed instruction or briefing/ checklist item
- Completion of relevant briefing/ checklist

3、Taxi

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about safe taxi procedures:

- Correct operation of taxiing of the airplane
- Appropriate taxi interval maintained from other airplanes, obstructions and personnel
- Sufficient knowledge about safe taxi procedure
- Completion of procedures and checklist in the cockpit according to SOP while maintaining the control of taxi
- Completion of relevant briefing
- Compliance with ATC clearances and usage of standard communication procedure
- Obedience in the ground control signs and lights such as runway hold line, sensitive areas of localizer and glideslope, and beacons
- Unremitting vigilance and outward observation during taxiing
- Cooperation between flight crew members
- Logical allocation of attention to both inside and outside of the cockpit
- Appropriate management of flight crew’s work load during taxiing
- Obtaining of relevant clearance before crossing and entering runway

4、Pre-flight Inspection

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about pre-flight procedures and operations:

- Confirmation of the airplane system’s normal running condition before, during, and after executing the approved checklist
- Setting and confirmation of the airplane’s right attitude for takeoff
- Sufficient knowledge to explain the reason for going through checklist and the method to find possible failure
- Confirmation of the airplane’s takeoff performance in consideration of wind, density altitude, weight of the airplane, pressure altitude, runway condition and runway length
- Completion of relevant checklist
- Appropriate distribution of attention to both inside and outside of the cockpit
- Confirmation of the airplane’s condition for a safe flight
- Right completion of crew briefing and passenger briefing
- Acquirement of the relevant takeoff clearance with standard radiotelephony communication terminology
- Observation of ground condition, obstacles and other threats that may hazard the safety of takeoff.

Takeoff and Departure Procedures

1、 Takeoff procedure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about takeoff and climbing:

- Completion of all the prescribed pre-flight inspections to check engine performance
- Correct manipulation of control devices before and during takeoff to align the airplane with the runway center line
- Correct setting of takeoff thrust
- Correct assessment for the acceleration condition of airplane before takeoff
- Monitoring of the control, setting and gauge of the engine to maintain default parameters during the takeoff procedure

- Adjustment of operation in the scheduled airspeed to gain required pitch attitude and performance
- Maintaining of the appropriate climb attitude
- Execution or claim and confirmation of the change of airplane configuration and adjustment of thrust to gain the appropriate airspeed before and during climbing
- Correct use of navigation equipment to maintain the takeoff and climb track of the airplane
- Verification and correct calibration to the airplane's takeoff performance according to the current wind component
- Execution of the required noise reduction procedure and the wake turbulence avoid procedure
- Completion of relevant briefing and checklist
- Identification and management of the threats and errors during takeoff
- Correct crew cooperation required by the operation type (multi-crew)
- Correct evaluation of the dangerous factors during takeoff and climb, especially the factors related to obstacles.

2、 Instrument Takeoff

Purpose: To ensure the student pilots demonstrate the following knowledge and skills of instrument takeoff under real or simulated instrument meteorological conditions:

- Right setting of the radio and flight instrument in accordance with requirements before takeoff
- Full consideration of all factors that may affect the maneuverability and safety of the airplane including takeoff warning suppressed system, characteristics of the airplane, runway length, surface condition, wind, turbulence, obstacle, etc.
- Stable and precise transition from visual meteorological condition to real or simulated instrument condition
- Completion of correct setting of airplane's configuration while maintaining a safe speed in climbing
- Completion of relevant checklist
- Compliance with the clearances and commands given by air traffic controllers

Cross-wind Takeoff

Cross-wind Takeoff

Note: If there is no cross-wind, the examination of the relevant ability can be done orally.

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about takeoff and climbing in cross-wind:

- Correct setting of the configuration of the airplane and appropriate adjustment of the air speed
- Correct operation under the condition of cross-wind to maintain a good direction for takeoff
- Stable and precise transition from taxiing on the runway to climbing condition in the direction of the runway centerline
- Correct control of the airplane in accordance with the requirements stipulated in Pilots Operation Manual, Airplane Flight Manual and Aircraft Operating Manual
- Correct assessment for the cross-wind component

Departure ATC Communication

ATC Clearances

Note: Clearances can be both real clearance or simulated clearance base on the flight plan

Purpose: To ensure the student pilots demonstrate the following knowledge and skills on understanding and executing clearances:

- Setting of communication and navigation frequency and transponder code according to the clearance
- Confirmation of the feasibility of ATC clearance
- Timely and correct copy of published clearance

- Correct interpretation of the received clearance and ask for clarification, verification or modification if needed
- Timely and correct readback in the use of standard terminology according to the sequence of received clearances

Instrument Departure Procedure

Instrument Departure Procedure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about instrument departure procedures:

- Correct use of instrument, flight director, automatic pilot, navigation equipment and communication equipment according to the requirement of performance
- Timely capture of radial and azimuth (QDM/QDR) according to the requirements of procedures, clearances and inspectors
- The ability of maintaining the required airspeed, altitude and heading
- Employment of applicable navigation materials needed by the flight mission
- Execution of briefing or checklist items required during the departure
- Correct completion of crew briefing and passenger briefing
- Communication with controllers with correct terminology
- Correct interpretation of the received clearance and ask for clarification, verification or modification if needed
- Timely obey to the clearances, commands and restrictions
- Sufficient knowledge about the procedure for the two-way radio communication failure
- Compliance with the airspeed limitation and adjustment requirement according to laws, Pilots Operation Manual, Airplane Flight Manual
- Compliance with the requirements of climb profile map, standard instrument departure chart and other departure procedures
- Correction of the altimeter according to the requirements of laws, operating procedures and air traffic control
- Completion of relevant checklists

- The awareness about terrain obstacles, spatial orientation and situation, and the ability of splitting attention
- Effective communication with other flight crew members (multi-crew) to guarantee the normal operation of the airplane systems during the departure procedure
- Ability of visual observation and avoid under visual meteorological condition.

Airway Procedure Flight Along Navigation Facilities

Cut-in and Flying Alone the Line of Radio Navigation Facilities (VOR, NDB, DME)

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the use of radio navigation facilities and the capture and maintaining of specific azimuth, radial and track:

- Cut-in and maintaining of the specific azimuth or radial (QDM/QDR) for flying to or flying off the NDB navigation station in the use of relevant cut-in procedures
- Cut-in and maintaining of the flying in specific CME arc in the use of relevant cut-in procedure if needed
- Maintaining of an appropriate airspeed, heading and altitude when cutting in and flying along a track
- Correct operation of crosswind calibration to maintain the track
- Correct operation of equipment and monitoring of navigation facilities according to the work spilt of the crew members (multi-crew airplane)
- Correct harmonization and identification to the frequency of navigation stations
- Correct setting of cockpit display (HIS, RMI, etc.)
- Correct monitoring of the failure of navigation facilities (fail warning, codes, etc.)
- Identification and report of the failure of navigation stations
- Correct confirmation of the location of the airplane relative to the navigation station according to the relative azimuth (QDM/QDR) of VOR/NDB navigation stations
- Completion of relevant checklist

Anti-icing Procedure

Anti-icing Procedure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about anti-icer and anti-icing procedures:

- Inspection of all surfaces of the airplane to check the ice accretion situation
- Deicing for the surfaces of the airplane before flight
- Correct engagement of anti-icing or de-icing facilities
- Correct completion of taxiing and pre-flight inspection under icing condition
- Execution of all procedures of takeoff and departure, climb, cruise, descent, and landing under icing condition
- Completion of all the relevant briefing and checklists
- Monitoring of ice accretion during flying
- Planning and execution of ice accretion avoidance procedure if needed
- Correct cooperation between crew members under different situations

Radiotelephony Procedure – Professional Flying Qualities (Apply to all Flight Phases)

Radiotelephony Procedure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the radiotelephony procedure and efficient and safe flying according to the clearances:

- Correct use of radio facilities
- Correct use of the transponder
- Correct use of the standard radiotelephony terminology
- Clear pronunciation in the radiotelephony
- Correct read-back of clearances
- Compliance with clearances or commands
- Safe flight in consideration of the weather, other airplanes and procedures

Abnormal and Emergency Procedures

Note: For security, the following items can be assessed in other ways, such as oral test or simulation exercises

The inspector shall have the ability of handling on engine failure when the simulation test is conducted on a multi-engine airplane.

The inspector shall know the situation of warning inhibition and continuous warning failure caused by the simulation of engine failure.

Abnormal and Emergency Procedures

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the abnormal and emergency procedures (selected by the inspector)

- Maintaining of the control of the airplane
- Processing an emergency or abnormal situation (selected by the inspector) according to the requirements stipulated in the flight manual
- Completion of the relevant abnormal or emergency checklist
- Correct diagnosis of the malfunction
- Confirmation of the fault diagnosis (cooperation with other crew members in multi-crew)
- Inspection of inducing factors (cooperation with other crew members in multi-crew)
- Employment of alternatives
- Analysis of optional plan with other crew members (multi-crew)
- Discussion and evaluation of the risk of the alternatives
- Confirmation of the final plan (consultation with other crew members in multi-crew)
- Correct completion of crew briefing and passenger briefing
- Rational allocation of the attention to both inside and outside of the cockpit
- Sufficient visual observation before, during and after all operations
- Report to and acquisition of the relevant air traffic services if necessary

Approach with Simulated Engine Failure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the approach and landing with simulated engine failure:

- Maintain of the crosswind calibration and direction control during the whole process
- Quick and correct recognition of the failed engine and correct setting of the engine to reduce the drag
- Execution of the recommended emergency procedure
- Application of engine feathered operation if applicable
- Establishment of the recommended best approach and landing configuration and airspeed with one engine failure
- Monitoring of the working engine and adjustment based on the need
- Maintaining of the stable approach condition and recommended airspeed before landing
- Gentle, prompt and correct operation during leveling up and landing
- Selection of the best touching point in consideration of wind, landing surface and obstacles
- Soft landing on the scheduled runway area with no deviation and perfect alignment with the runway center line.

Approach with One Engine Failure (refer to the instruments)

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the approach procedure with one engine failure (refer to the instruments):

- Establishment and maintaining of the recommended flight level and configuration to gain the best performance required by the maneuverability in an instrument approaching
- Maintaining of a stable approach and recommended airspeed before landing
- Monitoring of the working engine and adjustment based on the need
- Compliance with the published approach procedure
- Efficient CRM during the approaching process

Missed Approach with One Engine Failure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the missed approach procedure with one engine failure:

- Correct setting of the appropriate engine power and pitch attitude to gain the required performance
- Correct setting of the rate of climb and climbing in the prescribed airspeed before gain the right altitude
- Correct sequence in retracting flaps or drag-producing devices and landing gear if applicable
- Trimming of the airplane during refused landing procedure and maintaining of the appropriate ground track and terrain clearance
- Timely completion of the relevant briefing and checklist items according to the approved procedures
- Timely decision of missed approach and completion of warning without endanger the safety of the flight

Landing with Simulated One Engine Failure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the landing with one engine failure (or simulated condition), including factors that may affect the maneuverability of the airplane:

- Establishment of the configuration required by the runway and weather condition and setting of the engine power based on need
- Maintaining of a stable speed during approaching
- Maintain the working of the working engine within permitted control limit
- Soft and stable transition from the final approach to landing
- Employment of the speed brake, propeller reverse, reverse thrust, brakes and other drag-producing devices to stop the airplane after landing
- Maintaining of the direction control and crosswind calibration during the landing roll
- Completion of the pre-landing checklist

- Completion of the relevant briefing or checklist recommended by the manufacturer of the airplane after turning off the runway

Simulated Cabin Decompression or Emergency Descent

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the cabin decompression (simulated condition) or emergency descent:

- Correct judgement and sufficient knowledge about the maneuverability of the airplane
- Soft, stable and prompt control within control limit during the emergency descent
- Completion of the relevant briefing or checklist recommended manufacturer of the airplane

Approach Procedure

Approach Procedure and Instrument Procedure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about the enroute chart upper airspace and lower airspace, STARS (Standard Terminal Arrival Routes), instrument approach procedure chart and the responsibility of the pilot and air traffic controller:

- Correct employment of the instruments, flight director, autopilot, navigation devices and communication devices
- Prompt cut-in to the airway, radial, azimuth (QDM/QDR) required by the procedure, clearances or air traffic controllers
- Establishment of the appropriate descent rate compared to the operating characteristics of the airplane and safety requirements
- Maintaining of the correct airspeed, altitude and heading, flying in the scheduled radial, airway and azimuth (QDM/QDR)
- Application of the relevant navigation materials needed by the flight plan
- Completion of the briefing or checklist related to the approach
- Completion of the correct crew briefing and passenger briefing

- Establishment of the communication with air traffic control with the appropriate terminology
- Correct interpretation of the received clearances and ask for clarification, verification or modification if needed
- Compliance with all the clearances, commands and limitations
- Sufficient knowledge about two-way radiotelephony failure
- Compliance with the airspeed limitations and speed governing requirement prescribed by the laws, clearances, Pilots Operation Manual, Airplane Flight Manual and inspector
- Compliance with the regulations of descent profile, STAR and other approach procedures
- Execution of correct altimeter setting procedure required by laws, operating procedure and clearances
- Completion of the relevant checklists
- The awareness about terrain obstacles, spatial orientation and situation, and the ability of splitting attention
- Effective communication with other flight crew members to guarantee the normal operation of the airplane during the approach and landing procedure.

Holding Procedures

Holding Procedures

Purpose： To ensure the student pilots demonstrate the following knowledge and skills about standard and non-standard, published and non-published instrument holding pattern under real or simulated instrument conditions:

- Correct calibration of the recommended holding airspeed required by the aircraft type and holding altitude within the maximum holding airspeed when flying across the holding fix.
- Cut in and maintaining of the required holding pattern with proper crosswind calibration, and establishment and maintaining of the correct flight path and azimuth.

- Maintenance of the scheduled airspeed, altitude and heading so as to establish and maintain the correct track and azimuth
- Sufficient knowledge about the endurance capability including fuel on board, holding fuel, and alternate fuel.
- Confirmation of the timing for break out of the pattern after arriving at the permitted limits or holding fix.
- Execution of the required entry procedure following standard procedure or requirements given by ATC and instructor.
- Compliance with ATC reporting requirements.
- Correct use of the timing criteria at the location required by the holding procedure, ATC or instructor.
- Proper adjustment to the outbound timing according to wind direction and speed.
    - Proper adjustment to the route so as to let the airplane arrive the holding fix at the “expected approach time”.

Precision Approach

Precision Approach

Note: Student pilots can use airborne navigation system but not autopilot under simulated or actual instrument conditions, and decent to decision altitude/decision height(DA/DH) with reference to localizer and glide slope.
During the approach, when ILS display a full-scale deflection, the deviation of localizer and glide slope indication shall be within half-scale. If the airplane is equipped with localizer extended scale indication, the localizer indication shall be within full-scale and glide slope shall not exceed half-scale.

Purpose: To ensure student pilots demonstrate the following knowledge and skills about precision instrument approach procedure:

- Interception and maintaining of the localizer within specified limits.
- Establishment of predetermined rate of descent where glide slope digital display is shown, so as to maintain glide slope and keep digital display within the specific limits.

- Descent to DA/DH at the position where landing, go-around or hover can be safely completed.
- Avoiding of the descent to the height lower than DA/DH before conducting go-around procedure or normal landing.
- Prompt go-around when the specified runway visual reference cannot be clearly seen or identified at DA/DH
- Maintaining of the localizer and glide slope from DA/DH to the position leaving glide slope to complete normal landing.

Non-precision Approach

Non-precision Approach

Purpose: To ensure the student pilots demonstrate the following knowledge and skills about non-precision instrument approach procedure specified by the instructor.

- Establishment of a certain rate of descent to let the airplane descent to MDA/MDH (prior to reaching the VDP if published), completion of a landing on the planned runway at normal rate of descent.
- Conduction of the go-around procedure if it is unable to see or identify the specified runway visual reference at missed approach point
- Assurance and judgement towards the aircraft performance required to accomplish published approach procedure and equipment needed to approach.

Go-around Procedure

Go-around

Purpose: To ensure the student pilots demonstrate the following knowledge and skills of related go-around procedure to conduct standard instrument approach procedure, including:

- Completion of the approved procedures including increase thrust on time, establish proper climbing attitude and change airplane’s configuration, and go-around immediately

- Maintaining of the specified altitude, airspeed and heading and the flight following the flight course, radial, and azimuth.
- Completion of the recommended airplane briefing or checklist items required by the go-around procedures
- Compliance with go-around procedure or ATC clearances.
- Requirement for clearances of diversion to alternate airport, another approach and flight to holding fix if needed, and completion of the relevant operations required by the instructor
- Correct interpretation of the received ATC clearances, if necessary, request for assurance, verification or alteration.

Approach and Landing Procedures

Approach Procedure

Purpose: To ensure the student pilots demonstrate the following knowledge and skills of approach procedures, pilot/ATC's responsibilities and proper references to navigation documents and charts:

- Maintaining of the specified airspeed, altitude and heading
- Communication with ATC with proper terminologies
- Correct interpretation of the received clearance and ask for clarification, verification or modification if needed
- Sufficient knowledge about two-way radio communication failure procedure.
- Planning of the approach course in the use of the existing navigation documents
- Compliance with the ATC clearances and airspace limits.
- Completion of the airplane briefing/checklist required by the approach procedure
- Correct completion of crew briefing and passenger briefing
- Correction of the altimeter according to the requirements of laws, operating procedures and air traffic control
- Completion of the relevant checklists
- The awareness about terrain obstacles, spatial orientation and situation, and the ability of splitting attention

- Maintaining of the communication with other crew members to ensure the normal operation of the airplane system in the process of approach
- Maintaining of the communication with other crew members to ensure outside visual observation (if needed).

Permissible Error in high-performance Flight Examination

Flight Phases	Limits
Normal flight	± 100ft
Stimulated engine failure	± 100ft
Limited or local instrument	± 200ft
DA/DH of go-around	+50/ - 0ft (one-engine failure + 100 / -0ft)
Minimum decent height/minimum decent altitude	+50/ - 0ft (one-engine failure + 100 / -0ft)
Use radio navigation system	± 5°
Precision approach	Localizer and glide slope half-scale
Flying along DME arc	± *1nm*
Two-engine operation	± 5°
Stimulated engine failure	± 10°
Limited or local instrument	± *15*° +5/ - 0kt ± 5kt
Take-off/Vr	
Climb and approach	
Vat / Vref	+5/ - 0kt ± 5kt
cruising	
Limited or local instrument	± 10kt
Stimulated engine failure	-2kt
Vyse / V2	± 5kt
Maximum airspeed error in any other phases	± 10kt

Appendix2: High-performance Airplane Training Examination Work Sheet

High-performance Airplane Training Examination Work Sheet

Name:			License number:	
Flight School:				
Date of examination From___Month___Day___Year to ___Month___Day___Year Location_____				
Aircraft type: Aircraft Make/Model_____ If aircraft is used, aircraft registration number If simulator is used, CAAC Simulator number_____ Level_____				
Test Items			**Conclusion**	
			Pass	Fail
Departure	1.	Preflight Preparation		
	1.1	document		
	1.2	Weight and balance		
	1.3	Weather information		
	1.4	Flight plan		
	2.	Pre-start-up check- external and internal		
	3.	Engine-on-normal and abnormal		
	4.	taxi		
	5.	Take-off check- engine test		
	6.	Take-off procedure-simulate instrument weather condition		
	6.1	Crosswind(if weather permitted)		
	6.2	Engine failure after simulating V1		
	7.	Contact ATC when departure		
Instrument Flight	1.	Instrument departure		
	2.	En-route instrument flight-entry radio		
	3.	Holding procedure		
	4.	ILS approach to DH/A go-around at 200feet		
	5.	No-precision approach to MDH/A and MAP go-around		
	6.	Anti-icing procedure		
	7.	Contact ATC-follow radio communication procedure		

Applicant's Signature:

Approach and Landing	1.	Approach procedure		
	2.	Normal ILS approach and landing		
	3.	No-precision approach and landing		
	4.	Normal landing-visual		
	5.	Go-around minimum height		
	6.	Go-around and landing at night(if needed)		
	7.	Contact ATC-follow radio communication procedure		
Abnormal and Emergency Procedure	1.	Simulate urgent situation(engine failure, if needed)		
	2.	Simulate one-engine failure and execute Manual ILS		
	3.	Simulate one-engine failure approach and go-around		
	4.	Simulate one-engine failure approach and		
	5.	Contact ATC-follow radio communication procedure		
Crew Resource Management	1.	Basic knowledge		
	2.	Communication		
	3.	Leadership and team cooperation		
	4.	Situational awareness		
	5.	Workload Management		

Instructor remark and conclusion

Remark:

Conclusion:

Instructor license number_____ Signature_____Date_____