Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC61-14

Pilot Licences and Ratings – Instrument Rating

Issue 2

31 October 2022

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the instrument rating requirements of Rule Part 61 and explanatory material to assist in showing compliance.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Parts 61 Subpart Q.

CHANGE NOTICE

This AC replaces Issue 1 dated 1 April 2015.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation
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TABLE OF CONTENTS

Introduction

This act is in support of Rule Part 61 Subpart Q.

Subpart Q – Instrument Rating

Rule 61.801 Eligibility requirements

(a) Rule 61.801(a)(2) requires an applicant for an instrument rating to have flight time experience as specified. The following would meet that requirement—

(i) 50 hours of VFR cross-country navigation flight time as pilot-in-command, of which not less than 10 hours are in the appropriate category of aircraft; and

(ii) 10 hours dual instrument cross-country flight time under an IFR flight plan; and

(iii) 40 hours instrument time; and

(iv) 20 hours instrument flight time in that category of aircraft, of which at least 10 hours are dual instruction as required by Rule 61.801(a)(4).

(b) Instrument time accumulated in a synthetic flight trainer towards this experience requirement should be certified in the holder's logbook in accordance with rule 61.33.

(c) Rule 61.801(a)(5) requires an applicant for an instrument rating to have passed written examinations acceptable to the Director, in air law; flight navigation - IFR; meteorology; instruments and navigational aids; and human factors. The syllabuses detailed in Appendix I of this subpart advisory circular would meet these requirements.

(d) The meteorology and human factors training and examinations required by rule 61.801(a)(5) are the same as those for the CPL; therefore credits in these subjects are acceptable towards the issue of an instrument rating.

(e) Rule 61.801(a)(6) requires an applicant for an instrument rating to demonstrate to a flight examiner the procedures and manoeuvres applicable to the navigation systems on which the applicant is being tested. Attainment of standards detailed in Appendix II of this subpart advisory circular would meet these requirements.

Rule 61.803 Issue

(a) Rule 61.803(b) and (c) provides for the licence endorsement of additional privileges to an instrument rating.

(b) The additional privileges, which may be endorsed on the licence, are: ILS, GPS or PAR.

(c) All other privileges, such as the type and model of GPS, auto-pilot or non auto-pilot, single pilot or two pilot, single engine or multi-engine, are entered in the pilot's logbook.

Rule 61.805 Privileges and limitations

(a) Because Part 91 does not contain the requirement for aircraft to be fitted with an auto- pilot for single pilot IFR operations, Part 61 requires a flight test without an auto-pilot in order to have the privileges of an instrument rating in an aircraft without auto-pilot, and a flight test with an auto-pilot in order to have the privileges of an instrument rating in an aircraft with auto-pilot.

(b) Rule 61.805(b)(3) requires a flight examiner to certify in the holder's logbook that a satisfactory demonstration of competency on the approach aid or system to be used under IFR has been

given. The approach aids or systems that may be endorsed are; ADF, VOR, GPS, PAR or ILS and in the case of GPS the type and model of each GPS unit demonstrated also needs to be recorded.

The following wording would be acceptable:

I hereby certify that_____ has satisfactorily demonstrated competency in the use of ADF, VOR, PAR, ILS, GPS (delete as applicable) for aeroplanes/helicopters (delete one).

GPS type_____ Model_____ Examiner_____ Client ID _____Date_____

Rule 61.807 Currency requirements

(a) Rule 61.807(a)(4) allows for recent experience using a similar type of navigation system. For the purposes of this rule, ILS and PAR are regarded as similar types of navigation systems, and VOR**,** NDB and LLZ are regarded as similar types of navigation systems. In the case of GPS, only an approach using GPS meets the recency requirements of this rule.

(b) Rule 61.807(a)(1) requires demonstration of competency in accordance with Rule 61.801(a)(6). A demonstration in accordance with Appendix II of this subpart advisory circular would meet this requirement.

(c) Rule 61.807(a)(1) also requires that a record of any successful demonstration of competency be entered in the holder's logbook.

The following wording would be acceptable:

I hereby certify that_____has successfully demonstrated competency in accordance with the instrument rating flight test syllabus in a centreline thrust/ multi-engine/single engine aeroplane/helicopter to single pilot/two pilot standard with auto-pilot/without auto- pilot (delete as applicable).

Annual recency demonstration due (day/month/year). Examiner__

Client ID_____Date _____

(d) The number and type of approach procedure carried out on each flight should be recorded in the holder's logbook. Column 16 may be used for this purpose; for example, 1xVOR.

(e) Where a safety pilot is used for the purpose of simulated instrument flight, the safety pilot's name should be entered in the holder's logbook under the co-pilot column.

(f) Instrument rating holders acting as co-pilot in a two pilot crew may not credit instrument time toward the recency requirement of 61.807(a)(3) unless the aircraft's type certificate, flight manual, or operating rules, requires that the aircraft be operated by a two pilot crew and; in accordance with CAR 61.31(e), the co-pilot is manipulating the controls during actual or simulated instrument conditions.

(g) Rule 61.807(a)(5), allows for the recency requirements of a pilot conducting an IFR operation in accordance with Part 121 or 125 and under the authority of an air operator certificate issued under Part 119, where the holder of that certificate satisfies the Director that its pilots have an equivalent level of instrument rating competency to that required in 61.807(a)(1)

(h) For the holder of a Part 119 certificate operating under Part 121, the following would meet the requirements of rule 61.807(a)(2);

(i) A satisfactory demonstration of competency required in accordance with Rule 61.801(a)(6), each element of which may be spread over the immediately preceding 12 months; and

(ii) the certificate holder is authorised in accordance with Rule 119.13(b)(3) and Rule 121.603; and

(iii) the pilot is the 'handling pilot' and is flying as if they were pilot-in-command during the demonstration of each element required by Rule 61.801(a)(6); and

(iv) the demonstration of competence is conducted by a Flight Examiner meeting the requirements of Rule 121.583; and,

(v) the type of aircraft is authorised by Rule 119.15(b)(4) or in the flight simulator is approved for the purpose under Rule 121.11.

Appendix I Instrument Rating Written Examination Syllabuses

1.1 Air Law

Candidates are required to have a broad knowledge of the purpose and content of the following documents or groups of documents:

- Civil Aviation Act 2000.
- Civil Aviation Rules (CARs).
- Civil Aviation Advisory Circulars (ACs).
- Papua New Guinea Aeronautical Information Publication (PNGAIP):

  -Instrument Flight Guide (IFG).

  -Planning Manual En Route Charts Area Charts.

➢ **Civil Aviation Act 2000**

Candidates are required to have knowledge of the following section of the ACT:

Section 13 Duties of pilot in command.

➢ **Civil Aviation Rules (CARs)**

Candidate must demonstrate knowledge of the following Rules parts. The level of knowledge for each section of the Rules is specified by the following grading.

Level	Standard
1	Candidates are to thoroughly understand the operational provisions of this essential knowledge.
2	Candidates are to have a working understanding of this knowledge.

CAR Part 1 - Definitions and Abbreviations

Definitions

Candidates must understand the meaning of the following terms:

Accident	
Act	Adequate aerodrome
Aerodrome	Aerodrome control service
Aerodrome Control Tower	Aerodrome Flight Information service
Aerodrome operational area	Aerodrome traffic
Aerodrome traffic circuit	Aerodrome traffic zone
Aeronautical Information Circular	Aeronautical Information Publication
Aeronautical information service	Aeroplane

Aeroplane movement	AIP Supplement
Aircraft	Aircraft Flight Manual craft
Air Traffic	Aircraft radio station
Air Traffic Control (ATC) service	Air Traffic advisory service Air
Traffic Control unit	Air Traffic service
Air Transport operation	Airworthiness certificate
Aircraft category	Altitude
Alerting service	Approach control office
Approach control service	Area control centre
Area Control service	Area navigation
ATC instruction	ATC clearance
Augmented crew	ATS unit
Aviation Medical Assessor	Authority
Baggage	Category II precision approach procedure
Category III precision approach procedure	Ceiling
Certificated organisation	Clearance limit
Command practice	Co-pilot
Contaminated	Configuration
Control area	Control zone
Controlled flight	Controlled airspace
Conversion instruction	Crew member
Cross country flight	Cruising level
Current	Decision altitude
Day	Designated Medical Examiner
Decision height	Document
Domestic aerodrome	
Dry	Extended-range twin-engine operations
Dual flight time	Final reserve fuel
Extended over-water operation	Flight Examiner
Flight crew member	Flight Information region

Flight following flight plan	Flight manual
Flight instruction	Flight plan
Flight level	General Aviation Area
Flight time	Height
IFR flight	Instrument approach procedure
Incident	Instrument flight time
Instrument flight	Instrument meteorological conditions
Instrument time	Level
International airport	Mach number
International NOTAM office	Maintenance
Landing distance available	Manoeuvring area Maximum
certificated take-off weight	Meteorological information Minimum
descent altitude	Minimum descent height
Movement area	Papua New Guinea registered aircraft
Papua New Guinea Aeronautical Information Publications	Night
NOTAM	NOTAM service
Operable	Operate
Operating cycle	Operational flight plan
Originating aircraft	Owner
Passenger	Pilot-in-command
Precision approach procedure	Pressure altitude
Rating	Regular air transport passenger service
Regular air transport service	Reporting point Required
navigation performance	RNP performance Runway
	Runway visual range
SARTIME	Security
Serious incident	Shore
SIGMET information	Synthetic flight trainer
Take-off distance available	Take-off run available
Take-off weight	Taxi

Time in service	Turbine powered
Type	Unlawful interference
Valid	VFR flight
Visibility	Visual meteorological conditions
Wet	ZFT simulator

Abbreviations

Candidates must have an awareness of the abbreviations listed in CAR Part 1.

CAR PART 12 - Accidents Incidents and Statistics

Section		Level
12.1	Applicability	2
12.3	Definitions	1
12.51	Notification of an accident	1
12.53	Details of an accident	1
12.55	Notification of an incident	1
12.57	Details of an incident	1
12.59	Investigation and reporting	2
12.101	Access to aircraft involved in an accident	2
12.103	Preservation of records	1
12.151	Aircraft operating statistics	1

CAR PART 61 - Licences and Ratings Pilot

Section		Level
61.3	Reserved	
61.5	Requirement for licence and ratings	2
61.15	Duration of licences and ratings	2
61.17	Written examinations - prerequisites and grades	2
61.19	Cheating or other unauthorised conduct	1
61.21	Flight test prerequisites	2
61.23	Reserved	
61.25	Flight training and testing - general requirements	2
61.31	Pilot Logbooks - crediting flight time	1

61.33	Pilot Logbooks - crediting ground time	1
61.801	Instrument ratings eligibility requirements	1
61.803	Issue	1
61.805	Privileges and limitations	1
61.807	Recency requirements	1

CAR PART 67 - Medical Standards and Certification

Section		Level
67.11	Currency of medical certificates	1

CAR PART 71 - Designation and Classification of Airspace

Section		Level
71.11	Controlled and Uncontrolled airspace	1
71.15	QNH zones	2
71.51	Control areas	1
71.53	Control zones	1
71.57	General aviation areas	1
71.105	Class C airspace	1
71.107	Class D airspace	1
71.109	Class E airspace	1
71. 111	Class F airspace	1
71.113	Class G airspace	1

CAR PART 73 - Special Use Airspace

Section		Level
73.53	Restricted areas	1
73.55	Military operational areas	1
73.57	Conditional areas	1
73.59	Danger areas	1
73.63	Aerodrome traffic zones	1
73.67	Temporary airspace	1

CAR PART 91 - General Operating and Flight Rules

Section		Level
91.125	Simulated instrument flight	1
91.135	Conditional areas	1
91.137	Volcanic hazard areas	1
91.209	Use of oxygen	1
91.217	Preflight action	1
91.219	Familiarity with limitations and emergency equipment	1
91.221	Flying equipment and operating information	1
91.223	Operating on and in the vicinity of an aerodrome	1

CAR PART 91 - General Operating and Flight Rules

Section		Level
91.225	Operations at aerodromes with air traffic services	1
91.229	Right-of-way rules	1
91.233	Aircraft lights	1
91.237	Aircraft speed	1
91.239	Altimeter settings	1
91.241	Compliance with ATC clearances and instructions	1
91.245	Operations in classified and designated airspace	1
91.247	SSR transponder equipment and codes	1
91.249	Aircraft callsigns	1
91.401	Minimum flightcrew	1
91.403	Fuel requirements for IFR	1
91.405	IFR alternate aerodrome requirement	1
91.407	IFR flight plan	1
91.409	Adherence to flight plan	1
91.411	Inadvertent change to flight plan	1
91.413	Takeoff and landing under IFR	1
91.415	Category II and III precision approach procedures	1
91.417	Category II and III precision approach procedure manual	1
91.419	Approval of category II and III precision approach procedure manual	1

91.421	Operating in icing conditions	1
91.423	Minimum altitudes for IFR flights	1
91.425	IFR cruising altitude or flight level	1
91.427	IFR Radio Communications	1
91.429	IFR operations - Two way Radio Communications failure	1
91.431	Notification of facility malfunctions	2
91.501	General requirements - instruments and equipment	1
91.509	Minimum instruments and equipment	1
91.511	Night VFR instruments and equipment	1
91.517	IFR instruments and equipment	1

CAR PART 91 - General Operating and Flight Rules

Section		**Level**
91.519	IFR communication and navigation equipment	1
91.521	Category II and III precision approach equipment	1
91.537	Inoperative instruments and equipment	1
91.541	Transponder and altitude reporting equipment	1
91.545	Assigned altitude indicator	1

- **Advisory Circulars**

Candidates must have a working knowledge of the following Subparts of the current Advisory Circulars:

- AC 12-1 Mandatory Occurrence Notification and Information
- AC 61-1 Pilot Licences and Ratings
- Subpart C - Student Pilot licence.
- Subpart D - Private Pilot licence.
- Subpart E - Commercial Pilot licence.
- Subpart H - Instrument Rating.
- AC 67-1 Medical Standards and Certification

- **PNGAIP Planning Manual**

Candidates for the Instrument Rating must have a satisfactory working knowledge of the information contained in the PNGAIP Planning Manual.

- **GEN Section** - have an awareness of GEN9 (Miscellaneous Information), GEN10

(Abbreviations), and GEN 11 (Definitions).

- **AGA Section** - have an awareness of all sections.
- **COM Section** - have an awareness of all sections.
- **RAC Section** - have an awareness of all sections.
- **OPS Section** - have an awareness of all sections.
- **MAP Section** - have an awareness of all information in this section.

➢ **Instrument Flight Guide (IFG)**

Candidates must have a satisfactory working knowledge of all sections of this publication. In particular,

find required information in the following areas:-

- **Emergency section**:- Distress, com/nav aid failure.
- **Communications section**:- Telephone/fax numbers, frequencies of communication stations and nav aids, broadcast stations.
- **Operations section**:- IFR procedures, VFR procedures, special ATS requirements, search and rescue.
- **Chart section**:- operational data, aerodrome and chart symbols and legends, and abbreviations. Instrument takeoff procedure charts (Rate of climb table), authorised IFR alternate aerodrome minima arrival/departure procedures, sids, stars, approach charts and associated information. Aerodrome charts, com and nav aid frequencies, uncharted routes.
- **Enroute and area charts**:- Interpretation of information on charts, symbols and scale.

1.2 Flight navigation – IFR

Flight planning: Selection of route, flight level or altitude, and time of departure with due regard to weather, terrain, aircraft performance, available alternate airfields, air traffic control requirements including standard IFR procedures as listed in the PNGAIP and other documents.

Flight plan: Preparation of the IFR flight plan using a flight plan form including the pre- requisites of inserting “G” in block item 10, the calculation of climbing and descending wind velocities; the determination of fuel load required including provision for diversion and reserves.

Navigation: Use of the navigation computer, solution of the triangle of velocities, time/speed/distance problems, conversion of CAS to TAS, and conversion of indicated to ambient temperature.

Charts: Knowledge and purpose of PNG-enroute, area and visual terminal charts, instrument approach, and aerodrome charts.

Use of charts: Ability to plot and transfer position lines derived from bearings and ranges and to measure distance on aeronautical charts, identification of Morse code characters from in-flight documentation.

En route navigation: Use of navigational aids to determine drift, ground speed, position and wind velocity, calculation of alterations to heading and estimated times of arrival, determination of instrument readings necessary to define the aircraft’s position on a given magnetic bearing or radial from a navigational aid.

1.3 Meteorology

The instrument rating meteorology syllabus is the same as that for CPL meteorology; and the meteorology written examination is the same as for CPL. A pass in this written examination is therefore accepted as a credit for both CPL and for the instrument rating.

1.4 Instruments and Navigational Aids

Instruments: The principles, method of operation, operating limitations, errors, corrections, sources of power supply where applicable and purpose of the sensitive pressure altimeter, airspeed indicator, turn and slip indicator, gyro direction indicator, gyro horizon, vertical speed indicator and outside air temperature gauge.

Compasses: The direct reading magnetic compass, principles, serviceability tests and operational limitations including turning and acceleration errors, sources of compass deviation and their control, principal features of remote indicating compasses.

Visual landing aids: Principles and use of the T-VASI, VASI, PAPI and other visual aids in use in Papua New Guinea.

Radio propagation: Terminology, cycles, frequency, amplitude, wavelength, frequency spectrum, polarisation of waves, propagation of electromagnetic waves including ground and sky waves, skip distance, attenuation and the effect of ionised layers, night effect, coastal refraction and reflection by high ground, precipitation static and the effect of atmospheric electrical discharge in the flight area on radio reception.

Navigation aids: NDB, ADF, VOR, CDI, RMDI, DME, VHF marker system, ILS, SRE, PAR, and SSR including transponder, principles of operation, airborne and ground equipment, use, effective ranges and accuracy, effect of ionised layers, advantages and limitations.

GPS: system components; space, control and user; aircraft equipment requirements; composition of the satellite constellation including pseudolites; satellites required for 2D and 3D navigation; barometric aiding; satellite ranging; type of code used; minimisation of clock error; masking; effect of ionised layers; WGS84 datum and the effect of using any other datum; almanac and ephemeris data; PDOP/VDOP/HDOP; CDI sensitivity; loss of RAIM.

1.5 Human factors

The instrument rating human factors syllabus is the same as that for CPL human factors; and the human factors written examination is the same as for CPL. A pass in this written examination is therefore accepted as a credit for both CPL and for the instrument rating.

Appendix II Instrument Rating Flight Test Syllabus

2.1 Flight Test Conduct

The use of checklists is mandatory for the purpose of instrument rating issue or recency demonstrations.

At aerodromes where both aids are available, demonstrations of NDB and VOR tracking, holding and approach procedures should be carried out individually (without the benefit of the other aid).

For single pilot privileges without auto-pilot, the flight examiner will examine the ability of the candidate to competently perform all normal and emergency phases of flight without auto- pilot use.

For single pilot privileges, with auto-pilot, the flight examiner will examine the ability of the candidate to fully utilise the auto-pilot during at least one approach and to manually fly at least one approach using a minimum of automation. The extent to which auto-pilot use is permitted throughout the remainder of the flight test, is at the examiner's discretion.

Licence holders are reminded that single pilot IFR Air Transport operations require a recency demonstration with auto-pilot.

If the flight examiner deems it necessary, in the interests of safety, to intervene with any physical action, then the test will result in mandatory failure.

Unless otherwise stated all manoeuvres and procedures are to be performed having recourse to all available instruments. The applicant may demonstrate competence either using a co-pilot or as a single-pilot.

It is expected that crewing of the aircraft will be in accordance with its flight manual. However, if an applicant elects to operate with two crew in a single-pilot certificated aircraft or the test is conducted in a multi-crew certificated aircraft, the candidate will be expected to demonstrate proper management of the co-pilot. In this case the flight examiner or a suitably rated co-pilot will act as a co-pilot.

An instrument rating issue flight test taken as single-pilot will be one in which the candidate is to carry out all the pilot duties relating to that flight. If any assistance in the form of oral advice is necessary from the flight examiner during the issue flight test, then the test will result in mandatory failure.

If any assistance in the form of oral advice is necessary from the flight examiner during a recency demonstration, then at the discretion of the flight examiner and with the candidate's consent, the recency demonstration *may* be continued as a two pilot flight test with the examiner acting as co-pilot.

Where the examiner carries out the duties of the co-pilot, for the purpose of a two pilot flight test, the examiner will perform those duties by neither being obstructive nor above average, primarily relying on prompts from the candidate.

The competency demonstrations required by two pilot and single pilot demonstrations are the same. However, for two pilot demonstrations the candidate is required to divide in-flight responsibilities so as to utilise the co-pilot in a meaningful way.

Where the examiner, with the candidate's consent, elects to continue a single pilot recency demonstration as a two pilot demonstration, the candidate's pre-flight briefing of the co-pilot's duties may be examined post flight.

Where the instrument rating flight test is carried out in an approved simulator, the flight examiner *may* elect to conduct the flight test from an observer's position.

The degree of accuracy required is for flight examiner guidance, and while the applicant is intended to maintain flight within these tolerances, temporary excursions outside the established limits are acceptable providing positive remedial action is taken.

It is neither recommended nor required that unusual attitudes or simulated asymmetric (where applicable) be carried out in IMC.

Flight test form, CAA 61/07, may be used as an aid to examiners for instrument rating issue or competency demonstrations.

2.2 Aircraft and Equipment

The radio communication and navigation equipment is to be of an approved standard, an approved intercommunication system is to be fitted, and the aircraft is to be fitted with an acceptable means of simulating instrument flight conditions by excluding outside visual reference to the pilot being tested. Should a flight examiner determine, during the course of the test, that the aircraft instrumentation or equipment fails to meet an acceptable standard, the flight examiner may cancel the test and the aircraft is not to be used for such purposes again until such time as the defects have been remedied.

An applicant is to demonstrate an ability to perform solely by reference to instruments the flight manoeuvres and procedures applicable to the type of approach aid or system for which a rating is desired. For the purpose of issue or recency, a demonstration of the DME arc procedure and both the VOR and ADF approach aids are compulsory with at least one approach commencing from overhead the aid.

For a demonstration with auto-pilot; the aircraft must be fitted with a serviceable auto-pilot capable of maintaining heading and altitude.

2.3 Before Departure

The applicant is to demonstrate proficiency in;

Preparation of an operational flight plan along charted or promulgated routes between two aerodromes at least 35nm route distance apart, one of which must be a controlled aerodrome. The applicant is to have ordered the appropriate meteorological information and is to have a good knowledge of the requirements governing such flights including fuel requirements, applicable weather minima, choice of altitudes and air traffic services procedures.

Flight preparation including possession of the relevant current charts including en-route chart, area charts and instrument approach charts**;** ground check of radio navigation equipment and radio communication equipment and ground check of flight instruments.

Correct radio telephone procedure including the ability to copy and understand airways and departure clearances, the tuning of radio navigation equipment and use of the transponder.

Knowledge of loss-of-communications procedures. When the flight test is to demonstrate multi-crew IFR competency; the applicant is to brief the co-pilot/examiner on their duties and responsibilities. Prior to departure the applicant is to demonstrate proficiency in radio telephone procedures, understanding clearances and the ground checking of radio navigation/communication equipment and flight instruments. The examiner will carry out these duties, in flight, when requested.

2.4 In Flight

(a) In a single-engined or multi-engined aircraft as the case may be, the applicant is to demonstrate competence to the given limitations. Flight under IFR between two aerodromes - simulated instrument flight being introduced at the take-off minima height for the aerodrome of departure, and discontinued at the landing minima altitude for the aerodrome of destination. The flight will be planned at least in part within controlled airspace through at least one compulsory reporting point that is not overhead a navigation aid, or alternatively, to establish position by cross-bearings using NDB or VOR, or both. Attention will be given to the applicant's ability to fly the

aircraft accurately on instruments, to conform to the appropriate departure procedure, to intercept and track using both the NDB and VOR individually as en route and approach aids, to update estimated times of arrival as required and to transition to the instrument approach procedure.

(b) **Climb:** Heading ± 5 degrees, airspeed ± 5 knots.

(c) **Climbing turns:** To a predetermined altitude, airspeed ± 5 knots, height ± 100 feet.

(d) **Straight and level flight:** Heading ± 5 degrees, height ± 100 feet.

(e) **Level turns:** At least 180 degrees left and right to a predetermined selected heading, ± 5 degrees, height ± 100 feet.

(f) **Descent:** Heading ± 5 degrees, airspeed ± 5 knots.

(g) **Descending turns:** To a predetermined altitude, airspeed ± 5 knots, height ± 100 ft.

(h) **Limited panel:** An applicant for the issue of an instrument rating is to manually demonstrate the ability to safely control the aircraft by sole reference to limited (emergency) flight instruments, and in the case of helicopters (where the flight manual permits), without benefit of stabilisation systems, to the following accuracy:

Cruise: Heading ± 10 degrees. Height ± 200 feet. Turns: Height ± 200 feet.

Compass turns: Heading ± 20 degrees initially thence corrected to ± 10 degrees with heights ± 200 feet.

Note: If the weather precludes, this item may be completed on a separate flight within 30 days of the initial part of the test.

(i) **Unusual attitudes, limited panel:** Immediate recognition and correct recovery from steep climbing turns and spiral dives as appropriate to the aircraft size and type. Note: If the weather precludes, this item may be completed on a separate flight within 30 days of the initial part of the test.

(j) **Unusual attitudes, full panel:** Immediate recognition and correct recovery from steep climbing turns and spiral dives as appropriate to the aircraft size and type. Note: If the weather precludes, this item may be completed on a separate flight within 30 days of the initial part of the test.

(k) At the discretion of the flight examiner, if the applicant is the holder of an appropriate CPL(A) or higher, competence in 4(b) to 4(h) need not be demonstrated as specific test items but may be assessed from those manoeuvres completed during the procedural and en route part of the test.

Plus for multi-engined aeroplanes only

Simulated engine failure after take-off, under simulated instrument flight conditions (at least 10 knots above safety speed and landing gear fully retracted - recommended)*. Asymmetric climb in accordance with departure procedure, then engine power restored at discretion of flight examiner. Simulated feathering of one engine may be achieved by setting power to zero thrust. Feathering the propeller is neither required nor encouraged. In approved simulators, engine failure at or above V1 may be simulated.

* Where these exercises are carried out in an approved airline flight simulator, these recommended guidelines may not be appropriate.

Take-off headings: ± 15 degrees initially then ± 5 degrees.

Altitude: Continued climb.

Airspeed: Achieve and maintain best rate-of-climb speed or recommended speed with one engine inoperative.

Approach and missed approach procedure: Failure of an engine will be simulated prior to, or during, an instrument approach procedure and an engine-out missed approach initiated from minimum altitude in accordance with the missed approach procedure for that aid. Heading ± 15 degrees initially on simulated engine failure then ± 5 degrees.

Plus for multi-engined helicopters only

The applicant is to demonstrate competency in controlling the helicopter to within the specified limitations of the helicopter at a given weight with one engine idle or simulated engine inoperative. Correct handling of the ancillary controls and adherence to engine limitations as applicable is a requirement for satisfactory performance of these manoeuvres. The degree of accuracy required is;

Heading: ± 15 degrees initially (on simulated engine failure) then ± 5 degrees.

Airspeed: Not lower than take-off safety speed.

Approach and missed approach procedure: Failure of an engine will be simulated prior to, or during, an instrument approach procedure and an engine-out missed approach initiated from minimum altitude in accordance with the missed approach procedure for that aid. Heading ± 15 degrees initially on simulated engine failure then ± 5 degrees.

2.5 Accuracy for all aircraft

Recovery from unusual attitudes: Immediate recognition and correct recovery to straight and level flight followed by a return to the heading and height nominated by the examiner.

Speeds: Instrument procedures flown are to comply with the requirements of the aircraft flight manual and with the relevant approach procedure design speeds. If nominated, the higher minima is to be applied when a higher speed is utilised for the approach.

En route tracking: NDB ± 5 degrees, VOR ± 5 degrees, GPS ± half scale CDI deflection. En route tolerances are subject to consideration of bends or fluctuations of track guidance and within the rated coverage of the navigation aid.

Holding procedure: The tracking tolerance is that applicable to the en route standards for the applicable aid. Altitude ± 100 feet. The holding procedure design is based on turns at 25 degrees angle of bank or Rate 1 (whichever is the lesser). The pilot may increase or decrease the angle of bank to make good the inbound track. A VOR and NDB holding procedure are a compulsory demonstration for issue. For the purpose of instrument rating renewal, only one holding procedure (at the discretion of the flight examiner) need be demonstrated.

Departure and missed approach: Tolerances are as for instrument approach procedures.

DME Arc arrival procedures: ± 1 nm of arc and descent as required to maintain profile on crossing designated radials. Tracking standards are those for the appropriate navigation aid.

Initiation of missed approach procedures: Up to 3 seconds for recognition and up to 3 seconds to initiate climb or turn, or both, as appropriate.

Angle of bank and rate of turn: For all procedures except circling approach, the approach procedures are designed to provide terrain clearance using a maximum of 25 degrees angle of bank or Rate 1 (whichever is the lesser). Lesser angles of bank apply to procedure design for high performance aircraft on departure. Circling approach procedure designs are based on, 20 degrees angle of bank or Rate 1 (whichever is the lesser). The angle of bank and rate of turn used by the pilot should be appropriate to the procedure and the conditions. Therefore, the pilot may increase or decrease the angle of bank to make good the desired track, however, the procedure design minimum angles of bank must be achieved in terrain critical areas, whilst excessive angles of bank must also be avoided.

NDB approach: Altitudes ± 100 feet reducing to a maximum of + 50 feet and not below MDA. Tracking, ± 5 degrees. When within 5 degrees of the inbound track, descent may be commenced and the tracking tolerance reduced to ± 3 degrees in the final 300 feet to MDA.

VOR approach: Altitudes, ± 100 feet reducing to a maximum of + 50 feet and not below MDA. Tracking, ± 5 degrees, and when within 5 degrees of the inbound track, descent may be commenced, ± 5 degrees reducing to ± 2.5 degrees in the final 300 feet to MDA.

GPS approach: Altitude ± 100 feet reducing to a maximum of + 50 feet and not below MDA. Tracking, ± half scale CDI deflection and when within half scale of the inbound track, descent may be commenced. On final, within ± half scale deflection reducing to ± 1 dot in the final
300 feet to MDA. Alternatively, Bearing to waypoint should remain within 2 degrees of desired track to waypoint.

Subsequent makes and model of GPS unit are to be demonstrated to a flight examiner in flight. Except that, a current instrument rating holder whose instrument rating is endorsed with one make and model of GPS unit and who meets the recency requirements for GPS as an approach aid, may demonstrated subsequent types and models of GPS unit to a flight examiner in the 'simulation' mode.

ILS approach: LLZ tracking left or right one-quarter scale from FAF or FAP onward. Glide path (slope), from FAF or FAP onward, one half scale above, one quarter scale below, reducing so that in the final 300 feet to DA one quarter scale above or below, *go-around* commenced not below DA. Knowledge of LLZ procedure.

Precision radar approach: Positioning ± 100 feet of assigned altitude reducing to a maximum of + 50 feet and not below MDA. Satisfactory compliance with radar directions, smooth acquisition and maintenance of track and approach profile.

Missed approach procedure: The applicant is to demonstrate a missed approach from minimum altitude in accordance with the missed approach procedure for the aid. Heading ± 5 degrees.

Circling approach: Demonstration of the transition from an instrument approach procedure to a visual circuit approach and landing on a runway preferably at an angle of at least 80 degrees to the final instrument approach track within the lowest circling minima authorised for the aircraft at the aerodrome concerned. A higher altitude may be nominated by the flight examiner. Distance from aerodrome -- not more than visibility minima.

2.6 IR Annual Competency Demonstration

This will be to the same standard and contain the same elements (except where provided) as the initial issue flight test.

For the holders of a Part 119 certificate operating under Part 121 the Director may approve the use of an alternative instrument rating competency demonstration.

Operators certificated to conduct annual competency demonstrations within their training organisations may be certificated to conduct annual instrument rating competency demonstrations using an approved synthetic flight trainer, in accordance with an exemption to 61.707(a)(6).

2.7 IR Approach Aid Endorsement

An applicant for an additional approach-aid endorsement to the instrument rating is to demonstrate competence, to a flight examiner, on that approach aid in accordance with the syllabus in this Appendix. Such a demonstration may be completed independently or as part of the annual competency demonstration.