

ÚŘAD PRO CIVILNÍ LETECTVÍ ČESKÁ REPUBLIKA

CIVIL AVIATION AUTHORITY CZECH REPUBLIC

**PŘIJATELNÉ ZPŮSOBY PRŮKAZU/
VÝKLADOVÝ A VYSVĚTLUJÍCÍ MATERIÁL**

**ACCEPTABLE MEANS OF COMPLIANCE/
INTERPRETATIVE AND EXPLANOATORY
MATERIAL**

JAR-FCL 2

**Způsobilost členů letových posádek
(Vrtulník)**

**Flight Crew Licensing
(Helicopter)**

Amendment 5

(ORIGINÁLNÍ ZNĚNÍ)

(ORIGINAL WORDING)

AMC/IEM A – GENERAL REQUIREMENTS

IEM FCL 2.001

Abbreviations

A	Aeroplane
A/C	Aircraft
AIS	Aeronautical Information Services
AMC	Acceptable Means of Compliance
AMC	Aeromedical Centre
AME	Authorised Medical Examiner
AMS	Aeromedical Section
ATC	Air Traffic Control
ATP	Airline Transport Pilot
ATPL	Airline Transport Pilot Licence
CFI	Chief Flying Instructor
CGI	Chief Ground Instructor
CP	Co-pilot
CPL	Commercial Pilot Licence
CQB	Central Question Bank
FCL	Flight Crew Licensing
FE	Flight Examiner
FI	Flight Instructor
FIE	Flight Instructor Examiner
FNPT	Flight and Navigation Procedures Trainer
FS	Flight Simulator
FTD	Flight Training Device
FTO	Flying Training Organisation
H	Helicopter
HPA	High Performance Aeroplane
HT	Head of Training
ICAO	International Civil Aviation Organisation
IEM	Interpretative and Explanatory Material
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
IR	Instrument Rating
IRE	Instrument Rating Examiner
IRI	Instrument Rating Instructor
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
LOFT	Line Orientated Flight Training

MCC	Multi Crew Co-operation
ME	Multi-engine
MEL	Minimum Equipment List
MET	Multi-engine Turbo-prop
MPA	Multi-pilot Aeroplane
MPH	Multi-pilot Helicopter
nm	Nautical Miles
OML	Operational Multicrew Limitation
OSL	Operational Safety Pilot Limitation
OTD	Other Training Devices
PF	Pilot Flying
PIC	Pilot-In-Command
PICUS	Pilot-In-Command Under Supervision
PNF	Pilot Not Flying
PPL	Private Pilot Licence
R/T	Radiotelephony
SE	Single-engine
SET	Single-engine Turbo-prop
SFE	Synthetic Flight Examiner
SFI	Synthetic Flight Instructor
SPA	Single-pilot Aeroplane
SPH	Single-pilot Helicopter
SPIC	Student Pilot-In-Command
STD	Synthetic Training Devices
TMG	Touring Motor Glider
TR	Type Rating
TRE	Type Rating Examiner
TRI	Type Rating Instructor
TRTO	Type Rating Training Organisation
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

[Amdt.2, 01.11.02]

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AMC FCL 2.005 & 2.015

Knowledge requirements for the issue of a JAR-FCL licence on the basis of a national licence issued in a JAA Member State or for the validation of pilot licences of non-JAA States

JAR-FCL 2 (HELICOPTER)

JAR-FCL SUBPART A – GENERAL REQUIREMENTS

- 2.010 – Basic Authority to act as a flight crew member
- 2.015 – Acceptance of licences, ratings, authorisations, approvals or certificates
- 2.016 – Credit given to a holder of a licence issued by a non-JAA Member State
- 2.017 – Authorisations/Ratings for special purposes
- 2.020 – Credit for military service
- 2.025 – Validity of licences and ratings
- 2.026 – Recent experience for pilots not operating in accordance with JAR-OPS 3
- 2.035 – Medical fitness
- 2.040 – Decrease in medical fitness
- 2.050 – Crediting of flight time and theoretical knowledge
- 2.060 – Curtailment of privileges of licence holders aged 60 years or more.
- 2.080 – Recording of flight time
- Appendix 1 to JAR-FCL 2.005 – Minimum requirements for the issue of a JAR-FCL licence/authorisation on the basis of a national licence/authorisation issued in a JAA Member State.
- Appendix 1 to JAR-FCL 2.015 – Minimum requirements for the validation of pilot licences of non-JAA States.

JAR-FCL SUBPART C – PRIVATE PILOT LICENCE (Helicopter) – PPL(H)

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- 2.105 – Medical fitness
- 2.110 – Privileges and conditions
- 2.120 – Experience and crediting

JAR-FCL SUBPART D – COMMERCIAL PILOT LICENCE (Helicopter) – CPL(H)

- 2.140 – Minimum age
- 2.145 – Medical fitness
- 2.150 – Privileges and conditions
- 2.155 – Experience and crediting

JAR-FCL SUBPART E – INSTRUMENT RATING (Helicopter) – IR(H)

- 2.174 – Medical fitness
- 2.175 – Circumstances in which an IR(H) is required
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- 2.225 – Circumstances in which type ratings are required
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- Appendix 1 to JAR-FCL 2.240 & 2.295 – Skill test and proficiency check for helicopter type ratings and ATPL
- Appendix 3 to JAR-FCL 2.240 – Contents of the type rating/training/skill test and proficiency check for single-engine and multi-engine single-pilot helicopters and the addendum to the PPL and the CPL skill test in multi-engine single-pilot helicopters

JAR-FCL SUBPART G – AIRLINE TRANSPORT PILOT LICENCE (Helicopter) – ATPL(H)

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- 2.315 – Instructor ratings and authorisations – Period of validity
- 2.320A – Flight Instructor (helicopter) (FI(H)) – Pre-requisite requirements
- 2.320B – FI(H) – Pre-Restricted privileges
- 2.320C – FI(H) – Privileges and Requirements
- 2.320D – FI(H) – Course
- 2.320E – FI(H) – Skill Test
- 2.320F – FI(H) – Rating Issue
- 2.320G – FI(H) – Revalidation and renewal
- 2.330A – Type Rating Instructor (helicopter) (TRI(H)) – Privileges
- 2.330B – TRI(H) – Pre-requisite and Requirements
- 2.330C – TRI(H) – Course
- 2.330D – TRI(H) – Skill Test
- 2.330E – TRI(H) – Rating Issue
- 2.330F – TRI(H) – Revalidation and renewal
- 2.340A – Instrument Rating Instructor (helicopter) (IRI(H)) – Privileges
- 2.340B – IRI(H) – Pre-requisite and Requirements
- 2.340C – IRI(H) – Course

- 2.340D – IRI(H) – Skill Test
- 2.340E – IRI(H) – Rating Issue
- 2.340F – IRI(H) – Revalidation and renewal
- 2.350A – Synthetic Flight Instructor (helicopter) (SFI(H)) – Privileges
- 2.350B – SFI(H) – Pre-requisite and Requirements
- 2.350C – SFI(H) – Course
- 2.350D – SFI(H) – Skill Test
- 2.350E – SFI(H) – Authorisation Issue
- 2.350F – SFI(H) – Revalidation and renewal
- 2.360A – Instructor (helicopter) (STI(H)) – Privileges
- 2.360B – STI(H) – Pre-requisite and Requirements
- 2.360C – STI(H) – Course
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- 2.360E – STI(H) – Authorisation Issue
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- Appendix 1 to JAR-FCL 2.305 – Requirements for a specific authorisation for instructors not holding a JAR-FCL licence to instruct in a FTO or TRTO outside JAA Member States
- Appendix 1 to JAR-FCL 2.320C & 2.320E – Arrangements for the flight instructor rating (FI(H)) skill test, proficiency check and oral theoretical knowledge examination
- Appendix 2 to JAR-FCL 2.320E – Contents of the flight instructor rating (FI(H)) skill test, oral theoretical knowledge examination and proficiency check
- Appendix 1 to JAR-FCL 2.320C – Flight instructor rating (helicopter) (FI(H)) course
- Appendix 1 to JAR-FCL 2.330C – Course for the type rating instructor (helicopter) for, as applicable, single or multi-pilot helicopters certificated for VFR or IFR operation (TRI(H))
- Appendix 1 to JAR FCL 2.340C – Course for the instrument rating instructor rating (helicopter) (IRI(H))

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- 3.001 – Applicability

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- 3.025 – Common Language
- 3.030 – Minimum Equipment Lists – Operator's Responsibilities
- 3.040 – Additional crew members
- 3.065 – Carriage of weapons of war and munitions of war
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- 3.075 – Method of carriage of persons
- 3.085 – Crew responsibilities
- 3.090 – Authority of the commander
- 3.100 – Admission to cockpit
- 3.105 – Unauthorised carriage
- 3.110 – Portable electronic devices
- 3.115 – Alcohol and drugs
- 3.120 – Endangering safety
- 3.130 – Manuals to be carried
- 3.135 – Additional information and forms to be carried
- 3.140 – Information retained on the ground
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- Appendix 1 to 3.005(d) – Helicopter Emergency Medical Service (HEMS)

JAR-OPS SUBPART D – OPERATIONAL PROCEDURES

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- 3.210 – Establishment of procedures
- 3.225 – Heliport Operating Minima
- 3.260 – Carriage of Persons with Reduced Mobility
- 3.265 – Carriage of inadmissible passengers, deportees or persons in custody
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- 3.280 – Passenger Seating
- 3.285 – Passenger briefing
- 3.290 – Flight preparation

- 3.295 – Selection of heliports
- 3.300 – Submission of ATS Flight Plan
- 3.305 – Re/de-fuelling with passengers embarking, on board or disembarking
- 3.310 – Crew members at stations
- 3.320 – Seats, safety belts and harnesses
- 3.325 – Securing of passenger cabin and galley(s)
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- 3.335 – Smoking on board
- 3.340 – Meteorological Conditions
- 3.345 – Ice and other contaminants
- 3.350 – Fuel and oil supply
- 3.355 – Take-off conditions
- 3.360 – Application of take-off minima
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- 3.370 – Simulated abnormal situations in flight
- 3.375 – In-flight fuel management
- 3.385 – Use of supplemental oxygen
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JAR-OPS SUBPART E – ALL WEATHER OPERATIONS

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- 3.690 – Crew member interphone system
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- 3.700 – Cockpit voice recorders – 1
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- 3.775 – Supplemental oxygen – Non-pressurised helicopters
- 3.820 – Automatic Emergency Locator Transmitter
- 3.825 – Life Jackets
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- 3.835 – Survival equipment
- 3.840 – Helicopters certificated for operating on water – Miscellaneous equipment
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JAR-OPS SUBPART N – FLIGHT CREW

- 3.940 – Composition of Flight Crew
- 3.945 – Conversion Training and checking
- 3.950 – Differences Training and Familiarisation training
- 3.955 – Upgrade to commander
- 3.960 – Commanders – Minimum Qualification Requirements
- 3.965 – Recurrent Training and Checking

- 3.968 – Pilot qualification to operate in either pilot's seat
- 3.970 – Recent experience
- 3.975 – Pilot in command – Route/Role/Area Competence Qualification
- 3.980 – Operation on more than one type or variant
- 3.985 – Training Records
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JAR-OPS SUBPART P – MANUALS, LOGS AND RECORDS

- 3.1040 – General Rules for Operations Manuals
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JAR-OPS SUBPART Q – FLIGHT AND DUTY TIME LIMITATIONS AND REST REQUIREMENTS

RESERVED

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- 3.1215 – Provision of information

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[Amdt.1, 01.12.00; Amdt.2, 01.11.02; Amdt.4, 01.08.06]

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[IEM FCL 2.010

Language Proficiency assessment guide

(See AMC No. 2 to JAR-FCL 2.010)

1. The language proficiency assessment should be designed to reflect a range of tasks undertaken by pilots but with the specific focus on language rather than operational procedures.
2. The assessment should determine the applicant's ability to:
 - communicate effectively using standard radiotelephony phraseology; and
 - deliver and understand messages in plain language in both usual and unusual situations that necessitate departure from standard radiotelephony phraseology.

Refer to the 'Manual on the Implementation of ICAO Language Proficiency Requirements' (ICAO Doc 9835), Appendix A Part III and Appendix B for further guidance.

3. The assessment may be subdivided into three elements, as follows:
 - i. Listening – assessment of comprehension
 - ii. Speaking – assessment of pronunciation, fluency, structure and vocabulary
 - iii. Interaction
4. The three elements mentioned above may be combined and they can be covered by using a wide variety of means/technologies.
5. Where appropriate, some or all of these elements may be achieved through the use of the radiotelephony testing arrangements.
6. When the elements of the testing are assessed separately, the final assessment should be consolidated in the language proficiency endorsement issued by the Authority.
7. The assessment may be conducted during one of the several existing checking or training activities, such as licence issue or rating issue and revalidation, line training, operator line checks or proficiency checks.

[Amdt.5, 01.12.06]

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IEM FCL 2.025

Validity of medical certificates

This IEM is a reproduction of the requirements as set out in JAR-FCL 3.105

JAR-FCL 3.105 Period of Validity of Medical Certificates

(a) *Period of validity.* A medical certificate shall be valid from the date of the initial general medical examination and for:

(1) Class 1 medical certificates, 12 months except that for holders who have passed their 40th birthday the interval is reduced to six months.

(2) Class 2 medical certificates, 60 months until age 30, then 24 months until age 50, 12 months until age 65 and 6 monthly thereafter.

(3) The expiry date of the medical certificate is calculated on the basis of the information contained in (1) and (2).

(4) Despite (2) above, a medical certificate issued prior to the holder's 30th birthday will not be valid for Class 2 privileges after his 32nd birthday.

(b) *Revalidation.* If the medical revalidation is taken up to 45 days prior to the expiry date calculated in accordance with (a), the validity of the new certificate extends from the previous medical certificate expiry date by the period stated in (a) (1) or (2) as applicable.

(c) *Renewal.* If the medical examination is not taken within the 45 day period referred to in (b) above, the expiry date will be calculated in accordance with paragraph (a) with effect from the date of the next general medical examination.

(d) *Requirements for revalidation or renewal.* The requirements to be met for the revalidation or renewal of medical certificates are the same as those for the initial issue of the certificate, except where specifically stated otherwise.

(e) *Reduction in the period of validity.* The period of validity of a medical certificate may be reduced by an AME in consultation with the AMS when clinically indicated.

(f) *Additional examination.* Where the Authority has reasonable doubt about the continuing fitness of the holder of a medical certificate, the AMS may require the holder to submit to further examination, investigation or tests. The reports shall be forwarded to the AMS.

See further Appendix 1 to JAR-FCL 3.105.

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IEM FCL 2.035

Carriage of safety pilots

(See JAR-FCL 2.035)

INTRODUCTION

1 A safety pilot is a pilot who is qualified to act as PIC on the type of helicopter and carried on board the helicopter for the purpose of taking over control should the person acting as a PIC holding a specific medical certificate restriction become incapacitated.

2 The following information should be provided to assist persons acting as safety pilots:

- a. the background for establishing the role of a safety pilot;
- b. the logging of flight time whilst acting as a safety pilot;
- c. the types of medical condition which restrict a particular pilot from flying solo;
- d. the safety pilot's role and responsibilities; and
- e. guidance material to assist the safety pilot in the conduct of this role.

3 Whenever a pilot licence holder with a safety pilot restriction renews or is issued with the related medical certificate, the holder should receive from the Authority an information sheet. This sheet will give advice to pilots utilised by the licence holder in the capacity of safety pilot. An example of this information sheet is shown below.

INFORMATION SHEET

General considerations

4 The following are a few notes to help you in your role as a safety pilot. Your pilot has been assessed by the Medical Section of the Authority as unfit for solo private flying, but fit to fly with a safety pilot. Although this may sound medically rather alarming, the standards for such pilots are still high, and he/she would undoubtedly be passed fit to lead a 'normal life' on the ground. The chances of any problem occurring during the flight are therefore remote. Nevertheless, as with any aspect of flight safety, remote possibilities should be assessed and, as far as possible, eliminated. This is the purpose of the safety pilot limitation.

5 Unless you have to take over the controls you are supernumerary and cannot log any flying time. You should be checked out and current on the aircraft. It must have dual controls and you must be licensed to fly in the proposed airspace and conditions.

6 You should have some idea of your pilot's medical condition and the problems that might occur during the flight. These could be due to a sudden or subtle incapacitation in a pilot who is otherwise functioning perfectly normally. Alternatively, there may be some fixed problem that is always present (such as poor vision in one eye or an amputated leg) which might cause difficulties in special circumstances.

7 When flying with a pilot who might suffer some form of incapacitation, you should particularly monitor the critical stages of the flight (such as take-off and approach). It may be useful to use some form of question and answer routine as is done during commercial flights. If your pilot does become incapacitated, the two priorities are to fly the helicopter and try to prevent him/her from compromising the controls. The greatest help in the latter situation is the continuous wearing of a fixed seat belt and shoulder harness (not an inertia reel). With a fixed disability it should be possible to anticipate when help may be needed and take appropriate action. Further points of consideration are as follows:

- a. You should check the medical certificate of your intended PIC to see if the medical restriction is tied to an helicopter with specially adapted controls, or to a specific type of helicopter. If so, ensure your PIC is in compliance in this respect.
- b. Before the flight, discuss with your PIC the circumstances under which you should intercede and take control of the helicopter. During this discussion, also establish whether the PIC wishes you to conduct any flight crew ancillary tasks. If so, these should be clearly specified to avoid confusion between the PIC and you during the flight. This is particularly important when events are moving quickly and the helicopter is near the surface, for example, during take-off or final approach to landing.
- c. Bear in mind that you are not just a passenger but may, at any time during the flight, be called upon to take over control. Therefore, you will need to remain alert to this possible situation at all times.
- d. You should also keep in mind that accidents have occurred with two qualified pilots on board when both pilots thought the other was in control. A means of communication must be established between you and the PIC in order that both of you know who is in control of the helicopter at any given time. The spoken words 'I have control' from one pilot and the response words 'you have control' from the other pilot is simple and appropriate for this purpose.
- e. In order to avoid distraction or confusion to the PIC during the flight, you should keep your hands and feet away from the controls unless safety circumstances arise which require you to take over control of the helicopter.

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AMC FCL 2.055

Quality system for FTO/TRTOs

(See Appendix 1a and 2 to JAR-FCL 2.055)

(See IEM No. 1 to JAR-FCL 2.055)

1. In accordance with Appendix 1a and 2 to JAR-FCL 2.055, a FTO and a TRTO shall, as a condition for approval, establish and maintain a quality system. This AMC establishes the objectives of such a system, and offers a means of compliance as to which elements must be included and how the system can be integrated in the organisations.

2. The rationale for the requirements of quality systems is the need to establish a distinct assignment of roles between Authority and training organisations by creating an evident division between the regulatory and surveillance responsibility on the one hand, and responsibility of the training activities in itself on the other. Therefore the training organisations must establish a system whereby they can monitor their activities, be able to detect deviations from set rules and standards, take the necessary corrective actions and thus ensure compliance with authority regulations and own requirements. A well established and functioning quality system will make it possible for the supervising Authority to perform inspections and surveillance efficiently and with a reasonable amount of resources.

3. It is obvious and well recognised that the scope and complexity of a quality system should reflect the size and complexity of the training organisation and its training activities. The objectives and the same principles apply, however, to any training organisation, irrespective of size and complexity. Thus, in small and relatively small training organisations, the quality system may be quite simple and integrated in the basic organisation, whereas larger organisations with more complex training activities will need to establish separate and independent quality organisations within the overall organisational set-up.

4. In determining size and complexity in this context the following guidelines apply:

- training organisations with 5 or less instructors employed are considered very small;
- training organisations employing between 6 and 20 instructors are considered small.

In determining complexity, factors such as number of helicopter types used for training, range of training courses offered, geographical spread of training activities (e.g. the use of satellites), range of training arrangements with other training organisations, etc. will be considered.

5. In a quality system of any FTO or TRTO the following five elements must be clearly identifiable:

- a. determination of the organisation's training policy and training and flight safety standards;
- b. determination and establishment of assignment of responsibility, resources, organisation and operational processes, which will make allowance for policy and training and flight safety standards;
- c. follow up system to ensure that policy, training and flight safety standards are complied with;
- d. registration and documentation of deviations from policy, training and flight safety standards together with necessary analysis, evaluations and correction of such deviations;
- e. evaluation of experiences and trends concerning policy, training and flight safety standards.

6. IEM No. 1 to JAR-FCL 2.055 describes in more detail objectives, the different elements of a quality system and offers guidance as to the set-up of quality systems in larger and/or more complex training organisations. For very small and small organisations paragraph 23 of IEM No. 1 to JAR-FCL 2.055 applies.

The Quality System required in JAR-FCL or in other JAR's may be integrated.

[Amdt.1, 01.12.00]

AMC FCL 2.055(d)

Approval of Modular Theoretical Knowledge Distance Learning Courses

(See JAR-FCL 2.055(d))

(See Appendix 3 to JAR-FCL 2.055)

(See Appendix 1 to JAR-FCL 2.130 & 2.135)

(See Appendix 1 to JAR-FCL 2.160 & 2.165(a)(3))

(See Appendix 1 to JAR-FCL 2.205)

(See Appendix 1 to JAR-FCL 2.285)

GENERAL

1. Modular theoretical knowledge training may be conducted to meet licensing requirements for the issue of a PPL, CPL, IR and ATPL, or first single pilot multi engine helicopter. Approved distance learning courses may be offered as part of modular theoretical knowledge training at the discretion of the Authority.

TRAINING ORGANISATION

2. A variety of methods are open to FTOs to present course material. It is, however, necessary for FTOs to maintain comprehensive records in order to ensure that students make satisfactory academic progress and meet the time constraints laid down in JAR-FCL for the completion of modular courses.

3. The following are given as planning guidelines for FTOs developing the distance learning element of modular courses:

- a. An assumption that a student will study for at least 15 hours per week.
- b. An indication throughout the course material of what constitutes a week's study.
- c. A recommended course structure and order of teaching acceptable to the Authority.
- d. One progress test for each subject for every 15 hours of study, which should be submitted to the FTO for assessment. Additional self-assessed progress tests should be completed at intervals of 5 to 10 study hours.
- e. Appropriate contact times throughout the course when a student can have access to an instructor by telephone, fax, e-mail or Internet.
- f. Measurement criteria to determine whether a student has satisfactorily completed the appropriate elements of the course to a standard that, in the judgement of the Head of Training, or CGI, will enable them to be entered for the JAR-FCL theoretical examinations with a good prospect of success.
- g. If the FTO provides the distance learning by help of I.T. solutions, for example the Internet, instructors should monitor student's progress by appropriate means.

[Amdt.3, 01.09.03]

[AMC No. 1 to JAR-FCL 2.010
Language Proficiency Rating Scale
 (See JAR-FCL 2.010(a)(4))

LEVEL	PRONUNCIATION	STRUCTURE	VOCABULARY	FLUENCY	COMPREHENSION	INTERACTIONS
	Assumes a dialect and/or accent intelligible to the aeronautical community	Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task				
Expert (Level 6)	Pronunciation, stress, rhythm, and intonation, though possibly influenced by the first language or regional variation, almost never interfere with ease of understanding.	Both basic and complex grammatical structures and sentence patterns are consistently well controlled.	Vocabulary range and accuracy are sufficient to communicate effectively on a wide variety of familiar and unfamiliar topics. Vocabulary is idiomatic, nuanced and sensitive to register.	Able to speak at length with a natural, effortless flow. Varies speech flow for stylistic effect, e.g. to emphasize a point. Uses appropriate discourse markers and connectors spontaneously	Comprehension is consistently accurate in nearly all contexts and includes comprehension of linguistic and cultural subtleties.	Interacts with ease in nearly all situations. Is sensitive to verbal and non-verbal cues, and responds to them appropriately.
Extended (Level 5)	Pronunciation, stress, rhythm, and intonation, though influenced by the first language or regional variation, rarely interfere with ease of understanding.	Basic grammatical structures and sentence patterns are consistently well controlled. Complex structures are attempted but with errors which sometimes interfere with meaning.	Vocabulary range and accuracy are sufficient to communicate effectively on common, concrete, and work related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.	Able to speak at length with relative ease on familiar topics, but may not vary speech flow as a stylistic device. Can make use of appropriate discourse markers or connectors.	Comprehension is accurate on common, concrete, and work related topics and mostly accurate when the speaker is confronted with a linguistic or situational complication or an unexpected turn of events. Is able to comprehend a range of speech varieties (dialect and/or accent) or registers.	Responses are immediate, appropriate, and informative. Manages the speaker/listener relationship effectively.

LEVEL	PRONUNCIATION	STRUCTURE	VOCABULARY	FLUENCY	COMPREHENSION	INTERACTIONS
	Assumes a dialect and/or accent intelligible to the aeronautical community	Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task				
Operational I (Level 4)	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding.	Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.	Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work related topics. Can often paraphrase successfully when lacking vocabulary particularly in unusual or unexpected circumstances.	Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers and connectors. Fillers are not distracting.	Comprehension is mostly accurate on common, concrete, and work related topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.	Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.

LEVEL	PRONUNCIATION	STRUCTURE	VOCABULARY	FLUENCY	COMPREHENSION	INTERACTIONS
	Assumes a dialect and/or accent intelligible to the aeronautical community	Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task				
Pre-operational (Level 3)	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation and frequently interfere with ease of understanding.	Basic grammatical structures and sentence patterns associated with predictable situations are not always well controlled. Errors frequently interfere with meaning.	Vocabulary range and accuracy are often sufficient to communicate effectively on common, concrete, and work related topics but range is limited and the word choice often inappropriate. Is often unable to paraphrase successfully when lacking vocabulary.	Produces stretches of language, but phrasing and pausing are often inappropriate. Hesitations or slowness in language processing may prevent effective communication. Fillers are sometimes distracting.	Comprehension is often accurate on common, concrete, and work related topics when the accent or variety used is sufficiently intelligible for an international community of users. May fall to understand a linguistic or situational complication or an unexpected turn of events.	Responses are sometimes immediate, appropriate, and informative. Can initiate and maintain exchanges with reasonable ease on familiar topics and in predictable situations. Generally inadequate when dealing with an unexpected turn of events.
Elementary (Level 2)	Pronunciation, stress, rhythm, and intonation are heavily influenced by the first language or regional variation and usually interfere with ease of understanding.	Shows only limited control of few simple memorized grammatical structures and sentence patterns.	Limited vocabulary range consisting only of isolated words and memorized phrases.	Can produce very short, isolated, memorized utterances with frequent pausing and a distracting use of fillers to search for expressions and articulate less familiar words.	Comprehension is limited to isolated, memorized phrases when they are carefully and slowly articulated.	Response time is slow, and often inappropriate. Interaction is limited to simple routine exchanges.
Pre-elementary (Level 1)	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.

Note: The Operational Level (Level 4) is the minimum required proficiency level for radiotelephony communication.

Levels 1 through 3 describe Pre-elementary, Elementary and Pre-operational levels of language proficiency respectively, all of which describe a level below the language proficiency requirement.

Levels 5 and 6 describe Extended and Expert levels at levels of proficiency more advanced than the minimum required standard.

[Amdt.5, 01.12.06]

[AMC No. 2 to JAR-FCL 2.010
Language Proficiency Assessment
(See Appendix 1 to JAR-FCL 2.010)
(See AMC No. 1 to JAR-FCL 2.010)
(See IEM FCL 2.010)

GENERAL

1. The Authority may use its own resources in developing or conducting the language proficiency assessment, or may delegate this task to language assessment bodies.
2. The assessment should meet the basic requirements stated in paragraphs 7 to 10, and the persons nominated as language proficiency assessors should meet the criteria at paragraphs 11 to 13 of this AMC.
3. The Authority should establish an appeal procedure for applicants.
4. Based on existing assessment methods the Authority may decide that active holders of a ATPL issued in accordance with JAR-FCL requirements should graded level 4 as of the 5 March 2008.

LANGUAGE PROFICIENCY RE-EVALUATION

5. The recommended Language Proficiency re-evaluation intervals referred to in Appendix 1 to JAR-FCL 2.010 paragraph 3 should not exceed:
 - a) 3 years if the Language Proficiency level demonstrated is Operational Level (level 4) of the ICAO Language Proficiency Rating; or
 - b) 6 years if the Language Proficiency level demonstrated is Extended Level (level 5) of the ICAO Language Proficiency Rating.

It is recommended that the holder of a licence receives a statement containing the level and validity of the language endorsements.

6. Formal re-evaluation is not required for applicants who demonstrate expert (level 6) language proficiency, e.g. native and very proficient non-native speakers with a dialect or accent intelligible to the international aeronautical community.

BASIC ASSESSMENT REQUIREMENTS

2. The aim of the assessment is to determine the ability of an applicant for a pilot licence or a licence holder to speak and understand the language used for radiotelephony communications.
3.
 - a) The assessment should determine the ability of the applicant to use both:
 - standard radiotelephony phraseology; and
 - plain language, in situations when standardised phraseology cannot serve an intended transmission.
 - b) The assessment should include:
 - voice-only and/or face-to face situations
 - common, concrete and work-related topics for pilots.
 - a) The applicants should demonstrate their linguistic ability in dealing with an unexpected turn of events, and in solving apparent misunderstandings.
 - b) The assessment should determine the applicant's speaking and listening abilities. Indirect assessments, of grammatical knowledge, reading and writing, are not appropriate.

For further guidance see IEM FCL 2.010.

4. The assessment should determine the language skills of the applicant in the following areas:

- a) Pronunciation:
 - the extent to which the pronunciation, stress, rhythm and intonation are influenced by the applicant's first language or national variations; and
 - how much they interfere with ease of understanding.
- b) Structure:
 - the ability of the applicant to use both basic and complex grammatical structures; and
 - the extent to which the applicant's errors interfere with the meaning.
- c) Vocabulary:
 - the range and accuracy of the vocabulary used; and
 - the ability of the applicant to paraphrase successfully when lacking vocabulary
- d) Fluency:
 - tempo
 - hesitancy
 - rehearsed versus spontaneous speech
 - use of discourse markers and connectors
- e) Comprehension:
 - on common, concrete and work-related topics; and
 - when confronted with a linguistic or situational complication or an unexpected turn of events,

Note: The accent or variety of accents used in the test material should be sufficiently intelligible for an international community of users.

- f) Interactions
 - quality of response (immediate, appropriate, and informative)
 - the ability to initiate and maintain exchanges:
 - on common, concrete and work-related topics; and
 - when dealing with an unexpected turn of events
 - the ability to deal with apparent misunderstandings by checking, confirming or clarifying.

Note: The assessment of the language skills in the areas mentioned above is conducted using the Rating Scale in the AMC No. 1 to JAR-FCL 2.010.

5. When the assessment is not conducted in a face-to-face situation, it should use appropriate technologies for the assessment of the applicant's abilities in listening and speaking, and for enabling interactions (for example: simulated pilot/controller communication).

ASSESSORS

6. It is essential that the persons responsible for language proficiency assessment ('assessors') are suitably trained and qualified. They should be either aviation specialists (i.e. current or former flight crew members or air traffic controllers), or language specialists with additional aviation-related training. An alternative approach would be to form an assessment team consisting of an operational expert and a language expert (see ICAO Doc 9835 paragraph 6.5.5).

7. The assessors should be trained on the specific requirements of the assessment.

8. Assessors should not test applicants to whom they have given language training.

CRITERIA FOR THE ACCEPTABILITY OF LANGUAGE ASSESSMENT BODIES

9. A language assessment body offering services on behalf of the Authority (see Appendix 1 to JAR-FCL 2.010 paragraph 5) should meet the specifications at paragraphs 14 to 18.

10. In order to ensure an impartial assessment process, the language assessment should be independent of the language training.

11. In order to be acceptable, the language assessment bodies should demonstrate:
- a) appropriate management and staffing, and
 - b) Quality System established and maintained to ensure compliance with, and adequacy of, assessment requirements, standards and procedures.
12. The Quality system established by a language assessment body should address the following:
- a) Management
 - b) Policy and strategy
 - c) Processes
 - d) The relevant provisions of ICAO / JAR-FCL, standards and assessment procedures
 - e) Organisational structure
 - f) Responsibility for the development, establishment and management of the Quality System
 - g) Documentation
 - h) Quality Assurance Programme
 - i) Human Resources and training (initial, recurrent)
 - j) Assessment requirements
 - k) Customer satisfaction
13. The assessment documentation and records should be kept for a period of time determined by the Authority and made available to the Authority, on request.
14. The assessment documentation should include at least the following:
- a) assessment objectives
 - b) assessment layout, time scale, technologies used, assessment samples, voice samples
 - c) assessment criteria and standards (at least for the levels 4, 5 and 6 of the Rating Scale in the AMC No. 1 to JAR-FCL 2.010)
 - d) documentation demonstrating the assessment validity, relevance and reliability
 - e) assessment procedures and responsibilities
 - preparation of individual assessment
 - administration: location(s), identity check and invigilation, assessment discipline, confidentiality/security
 - reporting and documentation provided to the Authority and/or to the applicant, including sample certificate
 - retention of documents and records

Note: Refer to the 'Manual on the Implementation of ICAO Language Proficiency Requirements' (ICAO Doc 9835) for further guidance.

[Amdt.5, 01.12.06]

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IEM No. 1 to JAR-FCL 2.055
Quality System for FTO/TRTOs
(See AMC FCL 2.055)

INTRODUCTION

A basis for quality should be established by every FTO/TRTO and problem-solving techniques to run processes should be applied. Knowledge in how to measure, establish and ultimately achieve quality in training and education is considered to be essential.

The purpose of this IEM is to provide information and guidance to the training organisations on how to establish a Quality System that enables compliance with Appendix 1a to JAR-FCL 2.055, item 3 and Appendix 2 to JAR-FCL 2.055, item 3 (Quality Systems)

In order to show compliance with Appendix 1a to JAR-FCL 2.055, item 3 and Appendix 2 to JAR-FCL 2.055, item 3, an FTO/TRTO should establish its Quality System in accordance with the instructions and information contained in the succeeding paragraphs.

THE QUALITY SYSTEM OF THE FTO/TRTO

1 Terminology

Accountable Manager.

A person acceptable to the Authority who has authority for ensuring that all training activities can be financed and carried out to the standards required by the Authority, and additional requirements defined by the FTO/TRTO.

Quality.

The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

Quality Assurance.

All those planned and systematic actions necessary to provide adequate confidence that all training activities satisfy given requirements, including the ones specified by the FTO/TRTO in relevant manuals.

Quality Manager.

The manager, acceptable to the Authority, responsible for the management of the Quality System, monitoring function and requesting corrective actions.

Quality Manual.

The document containing the relevant information pertaining to the operator's quality system and quality assurance programme.

Quality Audit.

A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives.

2 Quality Policy and Strategy

It is of vital importance that the FTO/TRTO describes how the organisation formulates, deploys, reviews its policy and strategy and turns it into plans and actions. A formal written Quality Policy Statement should be established that is a commitment by the Head of Training as to what the Quality System is intended to achieve. The Quality Policy should reflect the achievement and continued compliance with relevant parts of JAR-FCL together with any additional standards specified by the FTO/TRTO.

The Accountable Manager will have overall responsibility for the Quality System including the frequency, format and structure of the internal management evaluation activities.

3 Purpose of a Quality System

The implementation and employment of a Quality System will enable the FTO/TRTO to monitor compliance with relevant parts of JAR-FCL, the Operations Manual, the Training Manual, and any other standards as established by that FTO/TRTO, or the Authority, to ensure safe and efficient training.

4 Quality Manager

- 4.1 The primary role of the Quality Manager is to verify, by monitoring activities in the field of training, that the standards required by the Authority, and any additional requirements as established by the FTO/TRTO, are being carried out properly under the supervision of the Head of Training, the Chief Flying Instructor and the Chief Ground Instructor.
- 4.2 The Quality Manager should be responsible for ensuring that the Quality Assurance Programme is properly implemented, maintained and continuously reviewed and improved. The Quality Manager should:
- have direct access to the Head of Training;
 - have access to all parts of the FTO/TRTO's organisation.
- 4.3 In the case of small or very small FTO/TRTOs, the posts of the Head of Training and the Quality Manager may be combined. However, in this event, quality audits should be conducted by independent personnel. In the case of a training organisation offering integrated training the Quality Manager should not hold the position of Head of Training, Chief Flying Instructor and Chief Ground Instructor.

5 Quality System

- 5.1 The Quality System of the FTO/TRTO should ensure compliance with and adequacy of training activities requirements, standards and procedures.
- 5.2 The FTO/TRTO should specify the basic structure of the Quality System applicable to all training activities conducted.
- 5.3 The Quality System should be structured according to the size of the FTO/TRTO and the complexity of the training to be monitored.

6 Scope

A Quality System should address the following:

- 6.1 Leadership
- 6.2 Policy and Strategy
- 6.3 Processes
- 6.4 The provisions of JAR-FCL;
- 6.5 Additional standards and training procedures as stated by the FTO/TRTO;
- 6.6 The organisational structure of the FTO/TRTO;
- 6.7 Responsibility for the development, establishment and management of the Quality System;
- 6.8 Documentation, including manuals, reports and records;
- 6.9 Quality Assurance Programme;
- 6.10 The required financial, material, and human resources;
- 6.11 Training requirements.
- 6.12 Customer satisfaction.

7 Feedback System

The quality system should include a feedback system to ensure that corrective actions are both identified and promptly addressed. The feedback system should also specify who is required to rectify discrepancies and non-compliance in each particular case, and the procedure to be followed if corrective action is not completed within an appropriate timescale.

8 Documentation

Relevant documentation includes the relevant part(s) of the Training and Operations Manual, which may be included in a separate Quality Manual.

8.1 In addition relevant documentation should also include the following:

Quality Policy;
Terminology;
Specified training standards;
A description of the organisation;
The allocation of duties and responsibilities;
Training procedures to ensure regulatory compliance;

8.2 The Quality Assurance Programme, reflecting:

Schedule of the monitoring process;
Audit procedures;
Reporting procedures;
Follow-up and corrective action procedures;
Recording system.
The training syllabus; and
Document control.

9 Quality Assurance Programme

The Quality Assurance Programme should include all planned and systematic actions necessary to provide confidence that all training are conducted in accordance with all applicable requirements, standards and procedures.

10 Quality Inspection

The primary purpose of a quality inspection is to observe a particular event/action/document etc., in order to verify whether established training procedures and requirements are followed during the accomplishment of that event and whether the required standard is achieved.

Typical subject areas for quality inspections are:
Actual flight and ground training;
Maintenance;
Technical Standards; and
Training Standards.

11 Audit

An audit is a systematic, and independent comparison of the way in which a training is being conducted against the way in which the published training procedures say it should be conducted.

Audits should include at least the following quality procedures and processes:

An explanation of the scope of the audit;
Planning and preparation;
Gathering and recording evidence; and
Analysis of the evidence.

The various techniques that make up an effective audit are:

Interviews or discussions with personnel;
A review of published documents;
The examination of an adequate sample of records;
The witnessing of the activities which make up the training; and
The preservation of documents and the recording of observations.

12 Auditors

The FTO/TRTO should decide, depending on the complexity of the training, whether to make use of a dedicated audit team or a single auditor. In any event, the auditor or audit team should have relevant training and/or operational experience.

The responsibilities of the auditors should be clearly defined in the relevant documentation.

13 Auditor's Independence

Auditors should not have any day-to-day involvement in the area of the operation or maintenance activity which is to be audited. An FTO/TRTO may, in addition to using the services of full-time dedicated personnel belonging to a separate quality department, undertake the monitoring of specific areas or activities by the use of part-time auditors.

An FTO/TRTO whose structure and size does not justify the establishment of full-time auditors, may undertake the audit function by the use of part-time personnel from within his own organisation or from an external source under the terms of an agreement acceptable to the Authority.

In all cases the FTO/TRTO should develop suitable procedures to ensure that persons directly responsible for the activities to be audited are not selected as part of the auditing team. Where external auditors are used, it is essential that any external specialist is familiar with the type of training conducted by the FTO/TRTO.

The Quality Assurance Programme of the FTO/TRTO should identify the persons within the company who have the experience, responsibility and authority to:

- Perform quality inspections and audits as part of ongoing Quality Assurance;
- Identify and record any concerns or findings, and the evidence necessary to substantiate such concerns or findings;
- Initiate or recommend solutions to concerns or findings through designated reporting channels;
- Verify the implementation of solutions within specific timescales;
- Report directly to the Quality Manager.

14 Audit Scope

FTO/TRTOs are required to monitor compliance with the training and Operations Manuals they have designed to ensure safe and efficient training. In doing so they should as a minimum, and where appropriate, monitor:

- (a) Organisation;
- (b) Plans and objectives;
- (c) Training Procedures;
- (d) Flight Safety;
- (e) Manuals, Logs, and Records;
- (f) Flight and Duty Time Limitations;
- (g) Rest Requirements, and Scheduling;
- (h) Helicopter Maintenance/Operations interface;
- (i) Maintenance Programmes and Continued Airworthiness;

- (j) Airworthiness Directives management;
- (k) Maintenance Accomplishment;

15 Audit Scheduling

A Quality Assurance Programme should include a defined audit schedule and a periodic review cycle. The schedule should be flexible, and allow unscheduled audits when trends are identified. Follow-up audits should be scheduled when necessary to verify that corrective action was carried out and that it was effective.

An FTO/TRTO should establish a schedule of audits to be completed during a specific calendar period. All aspects of the training should be reviewed within a period of 12 months in accordance with the programme unless an extension to the audit period is accepted as explained below.

An FTO/TRTO may increase the frequency of their audits at their discretion but should not decrease the frequency without the acceptance of the Authority. It is considered unlikely that a period of greater than 24 months would be acceptable for any audit topic.

When an FTO/TRTO defines the audit schedule, significant changes to the management, organisation, training, or technologies should be considered, as well as changes to the regulatory requirements

16 Monitoring and Corrective Action

The aim of monitoring within the Quality System is primarily to investigate and judge its effectiveness and thereby to ensure that defined policy, training standards are continuously complied with. Monitoring activity is based upon quality inspections, audits, corrective action and follow-up. The FTO/TRTO should establish and publish a quality procedure to monitor regulatory compliance on a continuing basis. This monitoring activity should be aimed at eliminating the causes of unsatisfactory performance.

Any non-compliance identified should be communicated to the manager responsible for taking corrective action or, if appropriate, the Accountable Manager. Such non-compliance should be recorded, for the purpose of further investigation, in order to determine the cause and to enable the recommendation of appropriate corrective action.

The Quality Assurance Programme should include procedures to ensure that corrective actions are developed in response to findings. These quality procedures should monitor such actions to verify their effectiveness and that they have been completed. Organisational responsibility and accountability for the implementation of corrective action resides with the department cited in the report identifying the finding. The Accountable Manager will have the ultimate responsibility for ensuring, through the Quality Manager(s), that corrective action has re-established compliance with the standard required by the Authority and any additional requirements established by the FTO/TRTO.

17 Corrective action.

Subsequent to the quality inspection/audit, the FTO/TRTO should establish:

- (a) The seriousness of any findings and any need for immediate corrective action;
- (b) The origin of the finding;
- (c) What corrective actions are required to ensure that the non-compliance does not recur;
- (d) A schedule for corrective action;
- (e) The identification of individuals or departments responsible for implementing corrective action;
- (f) Allocation of resources by the Accountable Manager where appropriate.

17.1 The Quality Manager should:

- 17.1.1 Verify that corrective action is taken by the manager responsible in response to any finding of non-compliance;
- 17.1.2 Verify that corrective action includes the elements outlined in paragraph 16 above;
- 17.1.3 Monitor the implementation and completion of corrective action;
- 17.1.4 Provide management with an independent assessment of corrective action, implementation and completion;
- 17.1.5 Evaluate the effectiveness of corrective action through the follow-up process

18 Management Evaluation

A management evaluation is a comprehensive, systematic documented review by the management of the quality system, training policies, and procedures, and should consider: The results of quality inspections, audits and any other indicators; as well as the overall effectiveness of the management organisation in achieving stated objectives.

A management evaluation should identify and correct trends, and prevent, where possible, future non-conformities. Conclusions and recommendations made as a result of an evaluation should be submitted in writing to the responsible manager for action. The responsible manager should be an individual who has the authority to resolve issues and take action.

The Accountable Manager should decide upon the frequency, format, and structure of internal management evaluation activities.

19 Recording

Accurate, complete, and readily accessible records documenting the results of the Quality Assurance Programme should be maintained by the FTO/TRTO. Records are essential data to enable an FTO/TRTO to analyse and determine the root causes of non-conformity, so that areas of non-compliance can be identified and subsequently addressed.

The following records should be retained for a period of 5 years:

- Audit Schedules;
- Quality inspection and Audit reports;
- Responses to findings;
- Corrective action reports;
- Follow-up and closure reports;
- Management Evaluation reports.

20 Quality Assurance Responsibility for Sub-Contractors

An FTO/TRTO may decide to sub-contract out certain activities to external organisations subject to the approval of the authority.

The ultimate responsibility for the training provided by the subcontractor always remains with the FTO/TRTO. A written agreement should exist between the FTO/TRTO and the sub-contractor clearly defining the safety related services and quality to be provided. The sub-contractor's safety related activities relevant to the agreement should be included in the FTO/TRTO's Quality Assurance Programme.

The FTO/TRTO should ensure that the sub-contractor has the necessary authorisation/approval when required, and commands the resources and competence to undertake the task. If the FTO/TRTO requires the sub-contractor to conduct activity which exceeds the sub-contractor's authorisation/approval, the FTO/TRTO is responsible for ensuring that the sub-contractor's quality assurance takes account of such additional requirements.

21 Quality System Training

Correct and thorough training is essential to optimise quality in every organisation. In order to achieve significant outcomes of such training the FTO/TRTO should ensure that all staff understands the objectives as laid down in the Quality Manual.

Those responsible for managing the Quality System should receive training covering:

An introduction to the concept of Quality System;
Quality management;
Concept of Quality Assurance;
Quality manuals;
Audit techniques;
Reporting and recording; and
The way in which the Quality System will function in the FTO/TRTO.

Time should be provided to train every individual involved in quality management and for briefing the remainder of the employees. The allocation of time and resources should be governed by the size and complexity of the operation concerned.

22 Sources of Training

Quality management courses are available from the various National or International Standards Institutions, and an FTO/TRTO should consider whether to offer such courses to those likely to be involved in the management of Quality Systems. Organisations with sufficient appropriately qualified staff should consider whether to carry out in-house training.

23 Quality Systems for small/very small Organisations

The requirement to establish and document a Quality System, and to employ a Quality Manager applies to all FTO/TRTOs.

Complex quality systems could be inappropriate for small or very small FTO/TRTOs and the clerical effort required to draw up manuals and quality procedures for a complex system may stretch their resources. It is therefore accepted that such FTO/TRTOs should tailor their quality systems to suit the size and complexity of their training and allocate resources accordingly.

For small and very small FTO/TRTOs it may be appropriate to develop a Quality Assurance Programme that employs a checklist. The checklist should have a supporting schedule that requires completion of all checklist items within a specified timescale, together with a statement acknowledging completion of a periodic review by top management. An occasional independent overview of the checklist content and achievement of the Quality Assurance should be undertaken.

The small FTO/TRTO may decide to use internal or external auditors or a combination of the two. In these circumstances it would be acceptable for external specialists and or qualified organisations to perform the quality audits on behalf of the Quality Manager.

If the independent quality audit function is being conducted by external auditors, the audit schedule should be shown in the relevant documentation.

Whatever arrangements are made, the FTO/TRTO retains the ultimate responsibility for the quality system and especially the completion and follow-up of corrective actions.

IEM No. 2 to JAR-FCL 2.055

Financial Evaluation of Flying Training Organisations (FTOs) / Type Rating Training Organisations (TRTOs)

(See Appendix 1a and 2 to JAR-FCL 2.055)

OBJECTIVE

1. The objective of this IEM is to set out the means of compliance for the Authority to be satisfied that FTOs/TRTOs have sufficient funding available to conduct training to the approved standards of JAR-FCL. Paragraph 9 of Appendix 1a to JAR-FCL 2.055 and paragraph 8 of Appendix 2 to JAR-FCL 2.055 address the maintenance of acceptable flying training standards throughout the duration of a course. It is not intended to be a consumer protection provision. The grant and revalidation of an approval cannot therefore be construed as a guarantee of the underlying financial soundness of the organisation. It is an indication, on the basis of financial information provided, that the approved organisation can provide sufficient facilities and qualified staff such that flying training can be, or can continue to be, provided in accordance with relevant JAR-FCL training requirements and standards.

APPLICATION FOR APPROVAL OR REVALIDATION

2. Any application for initial approval or revalidation is to be supported by a plan, covering the period of approval requested, which includes at least the following information:

(a) Training facilities and number of students

Details, as appropriate, of:

- the number and types of training helicopters that will be used;
- the number of flight and ground instructors that will be employed;
- the number of classrooms and other types of training facilities (synthetic training devices, etc.) intended for use;
- the supporting infrastructure (staff offices, operations room, briefing rooms, rest rooms, hangars, etc.)
- planned number of students (by month and course)

(b) Financial Details

- capital expenditure necessary to provide the planned facilities;
- costs associated with running each of the courses for which approval is sought;
- income forecasts for the period of approval;
- a forecast financial operating statement for the business for which approval is sought;
- details of any other financial trading arrangement on which the viability of the approved organisation may be dependent.

3. The plan submitted in support of an application for initial approval or revalidation is to be accompanied by a Financial Statement from the applicant's bankers or auditors which certifies that the applicant has, or has recourse to, sufficient financial resources to meet the applicant's proposals as described in the plan to conduct JAR-FCL approved courses. An appropriately revised Financial Statement will be required whenever the applicants wish to expand their activities in addition to those described in the plan, in order to satisfy the requirements of JAR-FCL.

ONGOING FINANCIAL MONITORING

4. After approval has been granted, if the Authority has reason to believe that the necessary standards of compliance with JAR-FCL are not being met or may not be met due to a lack or apparent lack of financial resources, the Authority may require the organisation to demonstrate in a written submission that sufficient funds can and will be made available to continue to meet the terms of approval, or such modifications to it as may have been agreed with the Authority. Any such submission is to be accompanied by a further Financial Statement signed by the approved organisation's bankers or auditors.

5. The Authority may also require a Financial Statement if it appears to the Authority that operation of the approved course(s) is significantly at variance with the proposals contained in the business plan.

IEM No.3 to JAR-FCL 2.055

Flying Training Organisations for pilot licences and ratings

(See Appendix 1a and 2 to JAR-FCL 2.055)

(See IEM No. 4 to JAR-FCL 2.055)

TRAINING MANUAL

Training Manuals for use at an FTO or TRTO conducting approved integrated or modular flying training courses should include the following:

Part 1 – The Training Plan

The aim of the course (ATP(H), CPL/IR(H), CPL(H) as applicable)	A statement of what the student is expected to do as a result of the training, the level of performance, and the training constraints to be observed.
Pre-entry requirements	Minimum age, educational requirements (including language), medical requirements. Any individual State requirements.
Credits for previous experience	To be obtained from the Authority before training begins.
Training Syllabi	The flying syllabus (single-engine), the flying syllabus (multi-engine), the synthetic flight training syllabus and the theoretical knowledge training syllabus.
The time scale and scale, in weeks, for each syllabus	Arrangements of the course and the integration of syllabi time.
Training programme	The general arrangements of daily and weekly programmes for flying, ground and synthetic flight training. Bad weather constraints. Programme constraints in terms of maximum student training times, (flying, theoretical knowledge, synthetic) e.g. per day/week/month. Restrictions in respect of duty periods for students. Duration of dual and solo flights at various stages. Maximum flying hours in any day/night; maximum number of training flights in any day/night. Minimum rest period between duty periods.
Training records	Rules for security of records and documents. Attendance records. The form of training records to be kept. Persons responsible for checking records and students' log books. The nature and frequency of record checks. Standardisation of entries in training records. Rules concerning log book entries.
Safety training	Individual responsibilities. Essential exercises. Emergency drills (frequency). Dual checks (frequency at various stages). Requirement before first solo day/night/navigation etc.

Tests and examinations	<p>Flying</p> <p>(a) Progress checks</p> <p>(b) Qualifying tests</p> <p>Theoretical Knowledge</p> <p>(a) Progress tests</p> <p>(b) Qualifying examinations</p> <p>Authorisation for test.</p> <p>Rules concerning refresher training before retest.</p> <p>Test reports and records.</p> <p>Procedures for examination paper preparation, type of question and assessment, standard required for 'Pass'.</p> <p>Procedure for question analysis and review and for raising replacement papers.</p> <p>Examination resit procedures.</p>
Training effectiveness	<p>Individual responsibilities.</p> <p>General assessment.</p> <p>Liaison between departments.</p> <p>Identification of unsatisfactory progress (individual students).</p> <p>Actions to correct unsatisfactory progress.</p> <p>Procedure for changing instructors.</p> <p>Maximum number of instructor changes per student.</p> <p>Internal feedback system for detecting training deficiencies.</p> <p>Procedure for suspending a student from training.</p> <p>Discipline.</p> <p>Reporting and documentation.</p>
Standards and Level of performance at various stages	<p>Individual responsibilities.</p> <p>Standardisation.</p> <p>Standardisation requirements and procedures.</p> <p>Application of test criteria.</p>

Part 2 – Briefing and Air Exercises

Air Exercise	<p>A detailed statement of the content specification of all the air exercises to be taught, arranged in the sequence to be flown with main and sub-titles. This should normally be the same as the air exercise specification for the flight instructor rating course.</p>
Air exercise reference List	<p>An abbreviated list of the above exercises giving only main and sub-titles for quick reference, and preferably in flip-card form to facilitate daily use by flight instructors.</p>
Course structure - Phase of training	<p>A statement of how the course will be divided into phases, indication of how the above air exercises will be divided between the phases and how they will be arranged to ensure that they are completed in the most suitable learning sequence and that essential (emergency) exercises are repeated at the correct frequency. Also, the syllabus hours for each phase and for groups of exercises within each phase shall be stated and when progress tests are to be conducted, etc.</p>

Course structure integration of syllabi	The manner in which theoretical knowledge, synthetic flight training and flying training will be integrated so that as the flying training] [exercises are carried out students will be able to apply the knowledge gained from the associated theoretical knowledge instruction and synthetic flight training.
Student progress	The requirement for student progress and include a brief but specific statement of what a student is expected to be able to do and the standard of proficiency he must achieve before progressing from one phase of air exercise training to the next. Include minimum experience requirements in terms of hours, satisfactory exercise completion, etc. as necessary before significant exercises, e.g. night flying.
Instructional methods	The FTO requirements, particularly in respect of pre- and post-flying briefing, adherence to syllabi and training specifications, authorisation of solo flights, etc.
Progress tests	The instructions given to examining staff in respect of the conduct and documentation of all progress tests.
Glossary of terms	Definition of significant terms as necessary.
Appendices	Progress test report forms. Skill test report forms. FTO certificates of experience, competence, etc. as required.

Part 3 – Synthetic Flight Training

Structure generally as for Part 2.

Part 4 – Theoretical knowledge instruction

Structure of the theoretical knowledge course	A statement of the structure of the course, including the general sequence of the topics to be taught in each subject, the time allocated to each topic, the breakdown per subject and an example of a course schedule. Distance Learning courses should include instructions of the material to be studied for individual elements of the course.
Lesson Plans	A description of each lesson or group of lessons including teaching materials, training aids, progress test organisation and inter-connection of topics with other subjects.
Teaching materials	Specification of the training aids to be used (e.g. study materials, course manual references, exercises, self-study materials, demonstration equipment).
Student progress	The requirements for student progress, including a brief but specific statement of the standard that must be achieved and the mechanism for achieving this, before application for theoretical knowledge examinations.
Progress testing	The organisation of progress testing in each subject, including topics covered, evaluation methods and documentation.
Review procedure	The procedure to be followed if the standard required at any stage of the course is not achieved, including an agreed action plan with remedial training if required.

OPERATIONS MANUAL

Operations Manuals for use at an FTO conducting approved integrated or modular flying training courses include the following:

- (a) General
 - A list and description of all volumes in the Operations Manual
 - Administration (function and management)
 - Responsibilities (all management and administrative staff)
 - Student discipline and disciplinary action
 - Approval/authorisation of flights
 - Preparation of flying programme (restriction of numbers of helicopters in poor weather)
 - Command of helicopter
 - Responsibilities of pilot-in-command
 - Carriage of passengers
 - Helicopter documentation
 - Retention of documents
 - Flight crew qualification records (licences and ratings)
 - Revalidation (medical certificates and ratings)
 - Flying duty period and flight time limitations (flying instructors)
 - Flying duty period and flight time limitations (students)
 - Rest periods (flying instructors)
 - Rest periods (students)
 - Pilots' log books
 - Flight planning (general)
 - Safety (general) – equipment, radio listening watch, hazards, accidents and incidents (including reports), safety pilots etc.
- (b) Technical
 - Helicopter descriptive notes
 - Helicopter handling (including checklists, limitations, helicopter maintenance and technical logs, in accordance with relevant JARs, etc.)
 - Emergency procedures
 - Radio and radio navigation aids
 - Allowable deficiencies, (based on MMEL, if available)
- (c) Route
 - Performance (legislation, take-off, route, landing etc.)
 - Flight planning (fuel, oil, minimum safe altitude, navigation equipment etc.)
 - Loading (loadsheets, mass, balance, limitations)
 - Weather minima (flying instructors)
 - Weather minima (students – at various stages of training)
 - Training routes/areas
- (d) Staff Training
 - Appointments of persons responsible for standards/competence of flying staff
 - Initial training
 - Refresher training
 - Standardisation training
 - Proficiency checks
 - Upgrading training
 - FTO staff standards evaluation

IEM no. 4 to JAR-FCL 2.055
Overview of Synthetic Flight Training Credits for Dual Instruction in Helicopter Flying Training Courses

	ATPL(H)/IR Integrated				FSTD Credits
	Dual	Solo		Total	FS; FTD; FNPT
Visual, including ME T/R training	75 hrs	15 hrs	40 hrs	130 hrs	30 hrs FS C/D level or 25 hrs FTD 2,3 or 20 hrs FNPT II, III
Basic Instrument	10 hrs	-	-	10 hrs	5 hrs FTD 1; FNPT 1
Instrument Rating training	40 hrs	-		40 hrs	20 hrs FS; FTD, 2,3 ;FNPT II, III or 5 hrs FTD 1; FNPT I
MCC	15 hrs	-	-	15 hrs	15hrs FS; FTD2,3(MCC) ;FNPT II,III; (MCC)
Total	140 hrs	55 hrs		195 hrs	65 hrs FS or 60 hrs FTD 2, 3 or 55 hrs FNPT II, III or 10 hrs FTD 1; FNPT I
	ATPL(H)/VFR Integrated				
	Dual	Solo	SPIC	Total	FS; FTD; FNPT
Visual including ME T/R training	75 hrs	15 hrs	40 hrs	130 hrs	30 hrs FS C/D level or 25 hrs FTD 2,3 or 20 hrs FNPT II, III
Basic instrument	10 hrs	-	-	10 hrs	5 hrs FTD 1; FNPT I
MCC / VFR	10 hrs	-	-	10 hrs	10hrs FS, FTD 2,3(MCC); FNPT ,II,III (MCC)
Total	95 hrs	55 hrs		150 hrs	40 hrs FS or 35 hrs FTD 2,3 or 30 hrs FNPT II, III or 5 hrs FTD 1; FNPT I
	CPL(H)/IR Integrated				
	Dual	Solo	SPIC	Total	FS; FTD; FNPT
Visual including ME T/R training	75 hrs	15 hrs	40hrs	130 hrs	30 hrs FS C/D level or 25 hrs FTD 2, 3 or 20 hrs FNPT II, III
Basic instrument	10 hrs	-	-	10 hrs	5 hrs FTD; FNPT I
Instrument Rating training	40 hrs	-		40 hrs	20 hrs FS; FTD 2, 3 ; FNPT II, III or 5 hrs FTD 1; FNPT I
Total	125 hrs	55 hrs		180 hrs	50 hrs FS C/D level or 45 hrs FTD 2, 3 or 40 hrs FNPT II, III, 10 hrs FTD1; FNPT I

		CPL(H) Integrated			
	Dual	Solo	SPIC	Total	FS; FTD; FNPT
Visual	75 hrs	15 hrs	35 hrs	125 hrs	30 hrs FS C/D level or 25 hrs FTD 2, 3 or 20 hrs FNPT II, III
Basic instrument	10 hrs	-	-	10 hrs	5 hrs FS; FTD 1,2,3;FNPT I,II,III
Total	85 hrs	50 hrs		135 hrs	35 hrs FS or 30 hrs FTD 2,3 or 25 hrs FNPT II, III or 5 hrs FTD 1;FNPT I
		CPL(H) Modular			
	Dual	Solo	SPIC	Total	FS; FTD; FNPT
Visual	20 hrs	-	-	20 hrs	5 hrs FS, FTD 2,3;FNPT II,III
Basic instrument	10 hrs	-	-	10 hrs	5 hrs FS, FTD 1,2,3;FNPT I,II,III
Total	30 hrs	-	-	30 hrs *	10 hrs FS, FTD 2,3; FNPT II, III or 5 hrs FTD 1;FNPT I
		IR(H) Modular			
	Dual	Solo	SPIC	Total	FS; FTD; FNPT
Single Engine	50 hrs	-	-	50 hrs	35 hrs FS; FTD 2,3; FNPT II, III or 20 hrs FTD 1; FNPT I
Multi Engine	55 hrs	-	-	55 hrs	40 hrs FS; FTD 2,3 FNPT II, III or 20 hrs FTD1; FNPT I
		MCC(H) Modular			
	Dual	Solo	SPIC	Total	FS; FTD; FNPT
MCC / VFR	15 hrs	-	-	15 hrs	15hrs FS;FTD 2,3(MCC);FNPT,II,III(MCC)
MCC / IR	5 hrs	-	-	5 hrs	5 hrs FS;FTD 2,3(MCC);FNPT,II,III(MCC)
MCC(VFR+IR)	20 hrs	-	-	20 hrs	20 hrs FS;FTD 2,3(MCC);FNPT,II,III(MCC)

Note :

Credits in FNPT I means, credits in an aeroplane FNPT I or in an helicopter FNPT I or in an aeroplane.

- Before commencing a CPL(H) modular course an applicant shall :
 - a) be the holder of a PPL(H) issued in accordance with ICAO Annex 1;
 - b) 155 hours flight time as a pilot in helicopters ,or 105 hours flight time as pilot in helicopters if holder of CPL(A), or 135 hours flight time as a pilot in helicopters if holder of PPL(A).

[Amdt.3, 01.09.03; Amdt.4, 01.08.06]



PILOT LOGBOOK

HOLDER'S NAME:

HOLDER'S LICENCE NUMBER:

HOLDER'S ADDRESS:	
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INSTRUCTIONS FOR USE

1. JAR-FCL 1.080 and JAR-FCL 2.080 requires holders of a flight crew licence to record details of all flights flown in a format acceptable to the National Aviation Authority responsible for licence or rating issue. This log book enables pilot licence holders to record flying experience in a manner which will facilitate this process while providing a permanent record of the licence holders flying. Pilots who fly regularly aeroplanes and helicopters or other aircraft types are recommended to maintain separate log books for each type of flying.
2. Flight crew log book entries should be made as soon as practicable after any flight undertaken. All entries in the log book shall be made in ink or indelible pencil.
3. The particulars of every flight in the course of which the holder of a flight crew licence acts as a member of the operating crew of an aircraft are to be recorded in the appropriate columns using one line for each flight, provided that if an aircraft carries out a number of flights upon the same day returning on each occasion to the same place of departure and the interval between successive flights does not exceed thirty minutes, such series of flights may be recorded as a single entry.
4. Flight time is recorded from the time the aircraft first moves under its own power for the purpose of taking off until the time the aircraft finally comes to rest after landing (see JAR-FCL 2.001).
5. When an aircraft carries two or more pilots as members of the operating crew, one of them shall, before the flight commences, be designated by the operator as the aircraft "commander", in accordance with JAR-OPS, who may delegate the conduct of the flight to another suitable qualified pilot. All flying carried out as "commander" shall be entered in the log book as "pilot-in-command". A pilot flying as "pilot-in-command under supervision" or "student pilot-in-command" shall enter flying times as "pilot-in-command" but all such entries shall be certified by the commander or flight instructor in the "Remarks" column of the log book.
6. **Notes on recording of flight time:**
 - Column 1: enter date (dd/mm/yy) on which the flight commences
 - Column 2/3: enter place of departure and destination either in full or the internationally recognised three or four letter designator. All times should be UTC.
 - Column 5: indicate whether the operation was single or multi-pilot, and for single-pilot operation whether single or multi-engine.

1 DATE (dd/mm/yy)	2 DEPARTURE		3 ARRIVAL		4 AIRCRAFT		5 SINGLE PILOT TIME		6 TOTAL TIME OF FLIGHT	7 NAME PIC	8 LANDINGS	
	PLACE	TIME	PLACE	TIME	MAKE, MODEL, VARIANT	REGISTRATION	SE	ME			DAY	NIGHT
7/8/98	LIS	1430	OPO	1645	MD500 N	CS-HBL	✓		2 15	SELF	1	
20/8/98	SPL	920	RTM	1050	SA365 N2	PH-HAP			1 30	SELF	2	

Notes (continued):

- Column 6: total time of flight may be entered in hours and minutes or decimal notation as desired.
- Column 7: enter name of pilot-in-command or SELF as appropriate.
- Column 8: indicate number of landings as pilot flying by day and/or night.
- Column 9: enter flight time undertaken at night or under instrument flight rules if applicable.
- Column 10: Pilot function time:
 - enter flight time as pilot-in-command (PIC), student pilot-in-command (SPIC) and pilot-in-command under supervision (PICUS) as PIC.
 - all time recorded as SPIC or PICUS must be countersigned by the aircraft commander/flight instructor in the Remarks (column 12).
 - instructor time should be recorded as appropriate and also entered as PIC.
- Column 11: Flight Simulator (FS) or Flight Navigation Procedures Trainer (FNPT):
 - for FS enter type of aircraft and qualification number of the device. For other flight training devices enter either FNPT I or FNPT II as appropriate.
 - Total time of session includes all exercises carried out in the device, including pre- and after-flight checks.
 - Enter type of exercise performed in the Remarks (column 12), e.g. operator proficiency check, revalidation.
- Column 12: the Remarks column may be used to record details of the flight at the holder's discretion. The following entries, however, must be made:
 - instrument flight time undertaken as part of training for a licence or rating
 - details of all skill tests and proficiency checks
 - signature of PIC if the pilot is recording flight time as SPIC or PICUS
 - signature of instructor if flight is part of a single-engine piston or touring motor glider class rating revalidation

9		10				11			12	
OPERATIONAL CONDITION TIME		PILOT FUNCTION TIME				SYNTHETIC TRAINING DEVICES SESSION			REMARKS AND ENDORSEMENTS	
NIGHT	IFR	PILOT-IN-COMMAND		CO-PILOT	DUAL	INSTRUCTOR		DATE (dd/mm/yy)	TYPE	TOTAL TIME OF SESSION
			2 15							
	1 30	1 30				1 30				
								2/9/98	AS332C	1 40
										ME Type Rating Training
										Revalidation Prof Check

7. When each page is completed, accumulated flight times should be entered in the appropriate columns and certified by the pilot in the Remarks column.

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AMC FCL 2.125

Syllabus of theoretical knowledge and flight instruction for the private pilot licence (helicopter) – PPL(H)

(See JAR–FCL 2.125)

(See Appendix 1 to JAR–FCL 2.125)

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE PRIVATE PILOT LICENCE (HELICOPTER)

AIR LAW

Legislation

- 1 The Convention on International Civil Aviation
- 2 The International Civil Aviation Organisation
- 3 Articles of the Convention
 - 1 Sovereignty
 - 2 Territory
 - 5 Flight over territory of Contracting States
 - 10 Landing at customs airports
 - 11 Applicability of air regulations
 - 12 Rules of the air
 - 13 Entry and clearance regulations of Contracting States
 - 16 Search of aircraft
 - 22 Facilitation of formalities
 - 23 Customs and immigration procedures
 - 24 Customs duty
 - 29 Documents to be carried in aircraft
 - 30 Use of aircraft radio equipment
 - 31 Certificate of airworthiness
 - 32 Licences of personnel
 - 33 Recognition of certificates and licences
 - 34 Journey log books
 - 35 Cargo restrictions
 - 36 Restrictions on use of photographic equipment
 - 37 Adoption of international standards and procedures
 - 39 Endorsement of certificates and licences
 - 40 Validity of endorsed certificates and licences
- 4 Annexes to the Convention ('ICAO Annexes')
 - Annex 7 Aircraft nationality and registration marks
 - definitions
 - aircraft registration marks
 - certificate of registration
 - identification plate
 - Annex 8 Airworthiness of aircraft
 - definitions
 - certificate of airworthiness
 - continuing airworthiness
 - validity of certificate of airworthiness
 - instruments and equipment
 - aircraft limitations and information

Rules of the air

- Annex 2 Rules of the air
 - definitions
 - applicability
 - general rules
 - visual flight rules
 - signals (Appendix 1)
 - interception of civil aircraft (Appendix 2)

Air traffic regulations and air traffic services

- Annex 11 Air traffic regulations and air traffic services
 - definitions
 - objectives of air traffic services
 - classification of airspace
 - flight information regions, control areas and control zones
 - air traffic control services
 - flight information services
 - alerting service
 - visual meteorological conditions
 - instrument meteorological conditions
 - in-flight contingencies

- Annex 14 Aerodrome data
 - definitions
 - conditions of the movement area and related facilities

Visual aids for navigation

- indicators and signalling devices
- markings
- lights
- signs
- markers
- signal area

Visual aids for denoting obstacles

- marking of objects
- lighting of objects

Visual aids for denoting restricted use of areas

Emergency and other services

- fire and rescue service
- apron management service

Aerodrome ground lights and surface marking colours

- colours for aeronautical ground lights
- colours for surface markings

5 ICAO Document 4444 – Rules of the air and air traffic services

General provisions

- definitions
- ATS operating practices
- flight plan clearance and information
- control of air traffic flow
- altimeter setting procedures
- wake turbulence information
- meteorological information

- air reports (AIREP)

Area control service

- separation of controlled traffic in the various classes of airspace
- pilots, responsibility to maintain separation in VMC
- emergency and communications failure procedures by the pilot
- interception of civil aircraft

Approach control service

- departing and arriving aircraft procedures in VMC

Aerodrome control service

- function of aerodrome control towers
- VFR operations
- traffic and circuit procedures
- information to aircraft

Flight information and alerting service

- air traffic advisory service
- objectives and basic principles

JAA regulations

6 Joint Aviation Authorities (JAA) Regulations (JAR)

JAR–FCL Subpart A – General Requirements

- 2.025 – Validity of licences and ratings
- 2.035 – Medical fitness
- 2.040 – Decrease in medical fitness
- 2.050 – Crediting of flight time and theoretical knowledge
- 2.065 – State of licence issue

JAR–FCL Subpart B – Student pilot

- 2.085 – Requirements
- 2.090 – Minimum Age
- 2.095 – Medical fitness

JAR–FCL Subpart C – Private pilot licence

- 2.100 – Minimum Age
- 2.105 – Medical fitness
- 2.110 – Privileges and conditions
- 2.115 – Ratings for special purposes
- 2.120 – Experience and Crediting
- 2.125 – Training Course
- 2.130 – Theoretical knowledge examination
- 2.135 – Skill test

JAR–FCL Subpart E – Instrument rating

- 2.175 – Circumstances in which an instrument rating is required

JAR–FCL Subpart F – Type ratings

- 2.225 – Circumstances in which type ratings are required
- 2.245 – Validity, revalidation and renewal

JAR–FCL Subpart H – Instructor ratings

- 2.3[][05] – Instruction – General

AIRCRAFT GENERAL KNOWLEDGE

Airframe/Rotors

- 7 Airframe structure
 - helicopter configuration (single, tandem, co-axial, side by side rotors, directional controls)
 - fuselage (type of construction, structural components, materials)
 - rotors (types, components, materials)
 - blades (aerodynamic profiles, construction, materials)
 - control surfaces (vertical fin, horizontal plane, construction, material)
 - primary flying control systems (type, components)
 - cockpit and cabin
 - landing gear (types, wheels and tyres, braking system, shock absorbers)

- 8 Airframe loads
 - limiting loads
 - safety factor
 - control and rotor locks and use
 - ground/flight precautions

Powerplant

- 9 Piston engine
 - causes of pre-ignition and detonation

- 10 General
 - design types
 - principles of the 4-stroke internal combustion engine
 - mechanical components

- 11 Lubrication system
 - function
 - schematic construction
 - monitoring instruments and indicators
 - lubricants

- 12 Air cooling
 - system monitoring
 - cylinder head temperature
 - cowl flaps

- 13 Ignition
 - schematic construction and function
 - types of ignition
 - magneto check

- 14 Engine fuel supply
 - carburettor (construction and mode of operation, carburettor icing)
 - fuel injection (construction and mode of operation)
 - alternate air

- 15 Engine performance
 - pressure/density altitude
 - performance as a function of pressure and temperature

- 16 Power augmentation devices

- turbocharger, supercharger (construction and effect on engine performance)
- 17 Fuel
- types, grades
 - detonation characteristics, octane rating
 - colour coding
 - additives
 - water content, ice formation
 - fuel density
 - alternate fuels, differences in specifications, limitations
- 18 Mixture
- rich and lean mixture
 - maximum power and fuel economy mixture setting
- 19 Engine handling and manipulation
- power setting, power range
 - mixture setting
 - operational limitations
- 20 Operational criteria
- maximum and minimum RPM
 - (induced) engine vibration and critical RPM
 - remedial action by abnormal engine start, run-up and in flight
 - type related items (see AMC FCL 2.261(a), paragraphs 1.2 to 1.2.4)

Systems

- 21 Electrical system
- installation and operation of alternators/generators
 - direct current supply
 - batteries, capacity and charging
 - voltmeters and ammeters
 - circuit breakers and fuses
 - electrically operated services and instruments
 - recognition of malfunctions
 - procedure in the event of malfunctions
- 22 Hydraulic systems
- components, fluids
 - operation, indication, warning systems
 - auxiliary systems

Instruments

- 23 Pitot/static system
- pitot tube, function
 - pitot tube, principles and construction
 - static source
 - alternate static source
 - position error
 - system drains
 - heating element
 - errors caused by blockage or leakage
- 24 Airspeed indicator
- principles of operation and construction

- relationship between pitot and static pressure
 - definitions of indicated, calibrated and true airspeed
 - instrument errors
 - airspeed indications, colour coding
 - pilot's serviceability checks
- 25 Altimeter
- principles of operation and construction
 - function of the sub-scale
 - effects of atmospheric density
 - pressure altitude
 - true altitude
 - international standard atmosphere
 - flight level
 - presentation (three needle)
 - instrument errors
 - pilot's serviceability checks
- 26 Vertical speed indicator
- principles of operation and construction
 - function
 - inherent lag
 - instantaneous VSI
 - presentation
 - pilot's serviceability checks
- 27 Gyroscopes
- principles
 - rigidity
 - precession
- 28 Turn indicator
- rate gyro
 - purpose and function
 - effect of speed
 - presentation
 - turn co-ordinator
 - limited rate of turn indications
 - power source
 - balance indicator
 - principle
 - presentation
 - pilot's serviceability checks
- 29 Attitude indicator
- earth gyro
 - purpose and function
 - presentations
 - interpretation
 - operating limitations
 - power source
 - pilot's serviceability checks

- 30 Heading indicator
 - directional gyro
 - purpose and function
 - presentation
 - use with magnetic compass
 - setting mechanism
 - apparent drift
 - operating limitations
 - power source
 - pilot's serviceability checks

- 31 Magnetic compass
 - construction and function
 - earth's magnetic field
 - variation and deviation
 - turning, acceleration errors
 - precautions when carrying magnetic items
 - pilot's serviceability checks

- 32 Engine instruments
 - principles, presentation and operational use of:
 - oil temperature gauge
 - oil pressure gauge
 - cylinder head temperature gauge
 - exhaust gas meter
 - manifold pressure gauge
 - fuel pressure gauge
 - fuel flow gauge
 - fuel quantity gauge(s)
 - tachometers

- 33 Other instruments
 - principles, presentation and operational use of:
 - voltmeter and ammeter
 - warning indicators (audio or visual)
 - others relevant to helicopter type

Airworthiness

- 34 Airworthiness
 - certificate to be in force
 - compliance with requirements
 - periodic maintenance inspections
 - compliance with flight manual (or equivalent), e.g. H/V diagram instructions, limitations, placards
 - flight manual supplements
 - provision and maintenance of documents
 - helicopter, engine and rotorblade log books
 - recording of defects
 - permitted maintenance by pilots

FLIGHT PERFORMANCE AND PLANNING

Mass and balance

- 35 Mass and balance
 - limitations on maximum mass
 - forward and aft limitations of centre of gravity, normal and utility operation
 - mass and centre of gravity calculations
 - helicopter manual and balance sheet

Performance

- 36 Take-off
 - take-off run and distance available
 - take-off and initial climb
 - effects of mass, wind and density altitude
 - effects of ground surface and gradient
- 37 Landing
 - effects of mass, wind, density altitude and approach speed
 - ground surface and gradient
- 38 In flight
 - relationship between power required and power available
 - performance diagram
 - maximum rate and maximum angle of climb
 - range and endurance
 - effects of configuration, mass, temperature and altitude
 - reduction of performance during climbing turns
 - autorotation
 - adverse effects
 - icing, rain
 - condition of the airframe

HUMAN PERFORMANCE AND LIMITATIONS

Basic physiology

- 39 Concepts
 - composition of the atmosphere
 - the gas laws
 - respiration and blood circulation
- 40 Effects of partial pressure
 - effect of increasing altitude
 - gas transfer
 - hypoxia
 - symptoms
 - prevention
 - cabin pressurisation
 - effects of rapid decompression
 - time of useful consciousness
 - the use of oxygen masks and rapid descent
 - hyperventilation
 - symptoms
 - avoidance
 - effects of accelerations

- 41 Vision
 - physiology of vision
 - limitations of the visual system
 - vision defects
 - optical illusions
 - spatial disorientation
 - avoidance of disorientation
- 42 Hearing
 - physiology of hearing
 - inner ear sensations
 - effects of altitude change
 - noise and hearing loss
 - protection of hearing
 - spatial disorientation
 - conflicts between ears and eyes
 - prevention of disorientation
- 43 Motion sickness
 - causes
 - symptoms
 - prevention
- 44 Flying and health
 - medical requirements
 - effect of common ailments and cures
 - colds
 - stomach upsets
 - drugs, medicines, and side effects
 - alcohol
 - fatigue
 - personal fitness
 - passenger care
 - scuba diving – precautions before flying
- 45 Toxic hazards
 - dangerous goods
 - carbon monoxide from heaters

Basic psychology

- 46 The information process
 - concepts of sensation
 - cognitive perception
 - expectancy
 - anticipation
 - habits
- 47 The central decision channel
 - mental workload, limitations
 - information sources
 - stimuli and attention
 - verbal communication
 - memory and its limitations
 - causes of misinterpretation
- 48 Stress

- causes and effects
 - concepts of arousal
 - effects on performance
 - identifying and reducing stress
- 49 Judgement and decision making
- concepts of pilots' judgement
 - psychological attitudes
 - behavioural aspects
 - risk assessment
 - development of situational awareness

METEOROLOGY

- 50 The atmosphere
- composition and structure
 - vertical divisions
- 51 Pressure, density and temperature
- barometric pressure, isobars
 - changes of pressure, density and temperature with altitude
 - altimetry terminology
 - solar and terrestrial energy radiation, temperature
 - diurnal variation of temperature
 - adiabatic process
 - temperature lapse rate
 - stability and instability
 - effects of radiation, advection subsidence and convergence
- 52 Humidity and precipitation
- water vapour in the atmosphere
 - vapour pressure
 - dew point and relative humidity
 - condensation and vaporisation
 - precipitation
- 53 Pressure and wind
- high and low pressure areas
 - motion of the atmosphere, pressure gradient
 - vertical and horizontal motion, convergence, divergence
 - surface and geostrophic wind
 - effect of wind gradient and windshear on take-off and landing
 - relationship between isobars and wind, Buys Ballot's law
 - turbulence and gustiness
 - local winds, föhn, land and sea breezes
- 54 Cloud formation
- cooling by advection, radiation and adiabatic expansion
 - cloud types
 - convection clouds
 - orographic clouds
 - stratiform and cumulus clouds
 - flying conditions in each cloud type
- 55 Fog, mist and haze
- radiation, advection, frontal, freezing fog
 - formation and dispersal

- reduction of visibility due to mist, snow, smoke, dust and sand
 - assessment of probability of reduced visibility
 - hazards in flight due to low visibility, horizontal and vertical
- 56 Airmasses
- description of and factors affecting the properties of airmasses
 - classification of airmasses, region of origin
 - modification of airmasses during their movement
 - development of low and high pressure systems
 - weather associated with pressure systems
- 57 Frontology
- formation of cold and warm fronts
 - boundaries between airmasses
 - development of a warm front
 - associated clouds and weather
 - weather in the warm sector
 - development of a cold front
 - associated clouds and weather
 - occlusions
 - associated clouds and weather
 - stationary fronts
 - associated clouds and weather
- 58 Ice accretion
- conditions conducive to ice formation
 - effects of hoar frost, rime ice, clear ice
 - effects of icing on aeroplane performance
 - precautions and avoidance of icing conditions
 - powerplant icing
 - precautions, prevention and clearance of induction and carburettor icing
- 59 Thunderstorms
- formation – airmass, frontal, orographic
 - conditions required
 - development process
 - recognition of favourable conditions for formation
 - hazards for aeroplanes
 - effects of lightning and severe turbulence
 - avoidance of flight in the vicinity of thunderstorms
- 60 Flight over mountainous areas
- hazards
 - influence of terrain on atmospheric processes
 - mountain waves, windshear, turbulence, vertical movement, rotor effects, valley winds
- 61 Climatology
- general seasonal circulation in the troposphere over Europe
 - local seasonal weather and winds
- 62 Altimetry
- operational aspects of pressure settings
 - pressure altitude, density altitude
 - height, altitude, flight level
 - ICAO standard atmosphere
 - QNH, QFE, standard setting
 - transition altitude, layer and level
- 63 The meteorological organisation

- aerodrome meteorological offices
 - aeronautical meteorological stations
 - forecasting service
 - meteorological services at aerodromes
 - availability of periodic weather forecasts
- 64 Weather analysis and forecasting
- weather charts, symbols, signs
 - significant weather charts
 - prognostic charts for general aviation
- 65 Weather information for flight planning
- reports and forecasts for departure, en-route, destination and alternate(s)
 - interpretation of coded information METAR, TAF, GAFOR
 - availability of ground reports for surface wind, windshear, visibility
- 66 Meteorological broadcasts for aviation
- VOLMET, ATIS, SIGMET

NAVIGATION

- 67 Form of the earth
- axis, poles
 - meridians of longitude
 - parallels of latitude
 - great circles, small circles, rhumb lines
 - hemispheres, north/south, east/west
- 68 Mapping
- aeronautical maps and charts (topographical)
 - projections and their properties
 - conformality
 - equivalence
 - scale
 - great circles and rhumb lines
- 69 Conformal conic projection
- main properties
 - construction
 - convergence of meridians
 - presentation of meridians, parallels, great circles and rhumb lines
 - scale, standard parallels
 - depiction of height
- 70 Direction
- true north
 - earth's magnetic field, variation – annual change
 - magnetic north
 - vertical and horizontal components
 - isogonals, agonic lines
- 71 Helicopter magnetism
- magnetic influences within the helicopter
 - compass deviation
 - turning, acceleration errors
 - avoiding magnetic interference with the compass

- 72 Distances
 - units
 - measurement of distance in relation to map projection
- 73 Charts in practical navigation
 - plotting positions
 - latitude and longitude
 - bearing and distance
 - use of navigation protractor
 - measurement of tracks and distances
- 74 Chart reference material/map reading
 - map analysis
 - topography
 - relief
 - cultural features
 - permanent features (e.g. line features, spot features, unique or special features)
 - features subject to change (e.g. water)
 - preparation
 - folding the map for use
 - methods of map reading
 - map orientation
 - checkpoint features
 - anticipation of checkpoints
 - with continuous visual contact
 - without continuous visual contact
 - when uncertain of position
 - aeronautical symbols
 - aeronautical information
 - conversion of units
- 75 Principles of navigation
 - IAS, CAS and TAS
 - track, true and magnetic
 - wind velocity, heading and groundspeed
 - triangle of velocities
 - calculation of heading and groundspeed
 - drift, wind correction angle
 - ETA
 - dead reckoning, position, fix
- 76 The navigation computer
 - use of the circular slide rule to determine
 - TAS, time and distance
 - conversion of units
 - fuel required
 - pressure, density and true altitude
 - time en-route and ETA
 - use of the computer to solve triangle of velocities
 - application of TAS and wind velocity to track
 - determination of heading and ground speed
 - drift and wind correction angle
- 77 Time
 - relationship between universal co-ordinated (standard) (UTC) time and local mean time (LMT)
 - definition of sunrise and sunset times
- 78 Flight planning

- selection of charts
- route and aerodrome weather forecasts and reports
- assessing the weather situation
- plotting the route
- considerations of controlled/regulated airspace, airspace restrictions, danger areas, etc
- use of AIP and NOTAMS
- ATC liaison procedures in controlled/regulated airspace
- fuel considerations
- en-route safety altitude(s)
- alternate aerodromes
- communications and radio/navaid frequencies
- compilation of flight log
- compilation of ATC flight plan
- selection of check points, time and distance marks
- mass and balance calculations
- mass and performance calculations

79 Practical navigation

- compass headings, use of deviation card
- organisation of in-flight workload
- departure procedure, log entries, altimeter setting and establishing IAS
- maintenance of heading and altitude
- use of visual observations
- establishing position, checkpoints
- revisions to heading and ETA
- arrival procedures, ATC liaison
- completion of flight log and helicopter log entries

Radio navigation

80 Ground D/F

- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting range and accuracy

81 ADF, including associated beacons (NDBs) and use of the RMI

- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting range and accuracy

82 VOR/DME

- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting range and accuracy

83 GPS/DGPS

- application
- principles

- presentation and interpretation
 - coverage
 - errors and accuracy
 - factors affecting range and accuracy
- 84 Ground radar
 - application
 - principles
 - presentation and interpretation
 - coverage
 - errors and accuracy
 - factors affecting range and accuracy
- 85 Secondary surveillance radar
 - principles (transponders)
 - application
 - presentation and interpretation
 - modes and codes

OPERATIONAL PROCEDURES

- 86 ICAO Annex 6, Part III – Operation of helicopters
 - foreword
 - definitions
 - general statement
 - flight preparation and in-flight procedures
 - performance and operating limitations
 - instruments and equipment
 - communications and navigation equipment
 - maintenance
 - flight crew
 - lights to be displayed
- 87 ICAO Annex 12 – Search and rescue
 - definitions
 - alerting phases
 - procedures for pilot-in-command (paragraphs 5.8 and 5.9)
 - search and rescue signals (paragraph 5.9 and Appendix A)
- 88 ICAO Annex 13 – Aircraft accident investigation
 - definitions
 - national procedures

- 89 ICAO Annex 16 – Environmental Protection – Noise limitations
 - Noise abatement
 - general procedures
 - application to take-off and landing
 - criteria
 - limits
 - noise limitation certificate
- 90 Contravention of aviation regulations
 - offences
 - penalties

PRINCIPLES OF FLIGHT

- 91 The atmosphere
 - composition and structure
 - ICAO standard atmosphere
 - atmospheric pressure
- 92 Airflow around a body, sub-sonic
 - air resistance and air density
 - boundary layer
 - friction forces
 - laminar and turbulent flow
 - Bernoulli's principle – venturi effect
- 93 Airflow about a two dimensional aerofoil
 - airflow around a flat plate
 - airflow around a curved plate (aerofoil)
 - description of aerofoil cross section
 - lift and drag
 - C_l and C_d and their relationship to angle of attack
- 94 Three dimensional flow about an aerofoil
 - aerofoil shapes and wing platforms
 - induced drag
 - downwash angle, vortex drag, ground effect
 - aspect ratio
 - parasite (profile) drag
 - form, skin friction and interference drag
 - lift/drag ratio
- 95 Rotor aerodynamics
 - blade movement (feathering, flapping, dragging)
 - forces acting on rotors (blades lift/drag, weight, rotor thrust, H-force)
 - forces acting on entire helicopter (M.R.thrust, helicopter weight, fuselage drag, tail rotor thrust)
 - finite blade element and momentum theory
 - advancing blade high mach, retreating blade high incidence
 - distribution of lift
 - autorotation anti-torque
- 96 Flying controls
 - the three planes
 - pitching about the lateral axis
 - rolling about the longitudinal axis
 - yawing about the normal axis
 - effects of cyclic, collective and rudder pedal inputs

- stabiliser and rudder
- control in pitch, roll and yaw
- cross coupling, roll and yaw
- effect of rotor configuration on control power
- 97 Stability
 - definitions of static and dynamic stability
 - longitudinal stability
 - centre of gravity effect on control in pitch
 - lateral and directional stability
 - interrelationship, lateral and directional stability
- 98 Load factor and manoeuvres
 - structural considerations
 - manoeuvring and gust envelope
 - limiting load factors
 - changes in load factor in turns and pull-ups
 - vibrations, controls feedback
 - in-flight precautions
 - H/V diagram, take off and landing
 Stress loads on the ground
 - side loads on the landing gear
 - landing
 - taxiing, precautions during turns
- 99 Helicopter specific hazards
 - ground resonance
 - blade stall
 - mast bumping
 - vortex ring (main and tail rotor)
 - settling with power
 - dynamic and static rollover

COMMUNICATIONS

- 100 Radio telephony and communications
 - use of AIP and frequency selection
 - microphone technique
 - phonetic alphabet
 - station/helicopter callsigns/abbreviations
 - transmission technique
 - use of standard words and phrases
 - listening out
 - required 'readback' instructions
- 101 Departure procedures
 - radio checks
 - taxi instructions
 - holding on ground
 - departure clearance
- 102 En-route procedures
 - frequency changing
 - position, altitude/flight level reporting
 - flight information service
 - weather information
 - weather reporting
 - procedures to obtain bearings, headings, position
 - procedural phraseology

- height/range coverage
- 103 Arrival and traffic pattern procedures
- arrival clearance
 - calls and ATC instructions during the:
 - circuit
 - approach and landing
 - vacating runway or landing site
- 104 Communications failure
- Action to be taken
 - alternate frequency
 - serviceability check, including microphone and headphones
 - in-flight procedures according to type of airspace
- 105 Distress and urgency procedures
- distress (Mayday), definition and when to use
 - frequencies to use
 - contents of Mayday message
 - urgency (Pan), definition and when to use
 - frequencies to use
 - relay of messages
 - maintenance of silence when distress/urgency calls heard
 - cancellation of distress/urgency

General flight safety

- 106 Helicopter
- seat adjustment and security
 - harnesses and seat belts
 - emergency equipment and its use
 - fire extinguisher
 - engine/cabin fires
 - anti-icing – de-icing systems
 - survival equipment, life jackets, life rafts
 - carbon monoxide poisoning
 - refuelling precautions
 - flammable goods/pressurised containers
- 107 Operational
- wake turbulence
 - low level flight (obstacles, wires)
 - wind shear, take-off, approach and landing
 - passenger briefings
 - emergency exits
 - evacuation from the helicopter
 - forced landings (limited power, autorotation)
 - ditching (limited power, autorotation)

SYLLABUS OF FLIGHT INSTRUCTION FOR THE PRIVATE PILOT LICENCE (HELICOPTER)

Note : Airmanship should be included as required in each exercise

Exercise 1a Familiarisation with the helicopter

- characteristics of the helicopter, external features
- cockpit layout
- systems
- check lists, procedures, controls

Exercise 1b Emergency procedures

- action in the event of fire on the ground and in the air
- engine, cabin and electrical system fire
- systems failures
- escape drills, location and use of emergency equipment and exits

Exercise 2 Preparation for and action after flight

- flight authorisation and helicopter acceptance
- serviceability documents
- equipment required, maps, etc.
- external checks
- internal checks
- seat, harness and flight controls adjustments
- starting and warm up checks clutch engagement, starting rotors
- power checks
- running down system checks and switching off the engine
- parking, security and picketing
- completion of authorisation sheet and serviceability documents

Exercise 3 Air experience

- to introduce the student to rotary wing flight
- flight exercise

Exercise 4 Effects of controls

- function of flight controls, primary and secondary effect
- effect of airspeed
- effect of power changes (torque)
- effect of yaw(sideslip)
- effect of disc loading (bank and flare)
- effect on controls of selecting hydraulics on/off
- effect of control friction
- instruments
- use of carburettor heat/anti-icing control

Exercise 5 Power and attitude changes

- relationship between cyclic control position, disc attitude, fuselage attitude, airspeed
- flapback
- power required diagram in relation to airspeed
- power and airspeed changes in level flight
- use of instruments for precision
- engine and airspeed limitations

Exercise 6a Straight and level

- at normal cruising power, attaining and maintaining straight and level flight
- control in pitch, including use of control friction and/or trim
- maintaining direction and balance, (ball/yawstring use)
- setting power for selected airspeeds/speed changes
- use of instruments for precision

Exercise 6b Climbing

- optimum climb speed, best angle/rate of climb from power required diagram
- initiation, maintaining the normal and maximum rate of climb, levelling off
- levelling off at selected altitudes/heights
- use of instruments for precision

Exercise 6c Descending

- optimum descent speed, best angle/rate of descent from power required diagram
- initiation, maintaining and levelling off
- levelling off at selected altitudes/heights
- descent (including effect of power and airspeed)
- use of instruments for precision

Exercise 6d Turning

- initiation and maintaining medium level turns
- resuming straight flight
- altitude, bank and co-ordination
- climbing and descending turns and effect on rate of climb/descent
- turns onto selected headings, use of gyro heading indicator and compass
- use of instruments for precision

Exercise 7 Basic autorotation

- safety checks, verbal warning, lookout
- entry, development and characteristics
- control of airspeed and RRPM, rotor and engine limitations
- effect of AUM, IAS, disc loading, G forces and density altitude
- re-engagement and go around procedures (throttle over-ride/ERPM control)
- vortex condition during recovery
- gentle/medium turns in autorotation
- demonstration of variable flare simulated engine off landing

Exercise 8a Hovering

- demonstrate hover I.G.E, importance of wind effect and attitude, ground cushion, stability in the hover, effects of over controlling
- student holding cyclic stick only
- student handling collective lever (and throttle) only
- student handling collective lever, (throttle) and pedals
- student handling all controls
- demonstration of ground effect
- demonstration of wind effect
- demonstrate gentle forward running touchdown
- specific hazards e.g. snow, dust, litter

Exercise 8b Hover taxiing, spot turns

- revise hovering
- precise ground speed/height control
- effect of wind direction on helicopter attitude and control margin
- control, co-ordination during spot turns
- carefully introduce gentle forward running touchdown

Exercise 8C Hovering, taxiing emergencies

- revise hovering and gentle forward running touchdown, explain (demonstrate where applicable) effect of hydraulics failure in the hover
- demonstrate simulated engine failure in the hover and hover taxi
- demonstrate dangers of mishandling and over-pitching

Exercise 9 Take-off and landing

- pre-take off checks/drills
- lookout
- lifting to hover
- after take-off checks
- danger of horizontal movement near ground
- danger of mishandling and overpitching
- landing (without sideways or backwards movement)
- after landing checks/drills
- take-off and landing cross wind, downwind

Exercise 10 Transitions from hover to climb and approach to hover

- lookout
- revise take-off and landing
- ground effect, translational lift and its effects
- flapback and its effects
- effect of wind speed/direction during transitions from/to the hover
- the constant angle approach
- demonstration of variable flare simulated engine off landing

Exercise 11a Circuit, approach and landing

- revise transitions from hover to climb and approach to hover
- circuit procedures, downwind, base leg
- approach and landing with power
- pre landing checks
- effect of wind on approach and I.G.E. hover
- crosswind approach and landing
- go around
- noise abatement procedures

Exercise 11b Steep and limited power approaches and landings

- revise the constant angle approach
- the steep approach (explain danger of high sink rate and low air speed)
- limited power approach (explain danger of high speed at touch down)
- use of the ground effect
- variable flare simulated engine off landing

Exercise 11c Emergency procedures

- abandoned take-off
- missed approach/go-around

- hydraulic OFF landing, (if applicable)
- tail rotor control or tail rotor drive failure (briefing only)
- simulated emergencies in the circuit to include:
 - hydraulics failure
 - simulated engine failure on take-off, cross wind, downwind and baseleg
- governor failure

Exercise 12 First solo

- instructor's briefing, observation of flight and debriefing
- warn of change of attitude from reduced and laterally displaced weight
- warn of low tail, low skid/wheel during hover, landing
- warn of dangers of loss of RRPM and overpitching
- pre take-off checks
- into wind take-off
- procedures during and after take-off
- normal circuit, approaches and landings
- action in the event of an Emergency

Exercise 13 Sideways and backwards hover manoeuvring

- manoeuvring sideways flight heading into wind
- manoeuvring backwards flight heading into wind
- combination of sideways and backwards manoeuvring
- manoeuvring sideways and backwards, heading out of wind
- stability, weathercocking
- recovery from backwards manoeuvring, (pitch nose down)
- groundspeed limitations for sideways and backwards manoeuvring

Exercise 14 Spot turns

- revise hovering into wind and downwind
- turn on spot through 360°:
 - around pilots position
 - around tail rotor
 - around helicopter geometric centre
 - square, safe visibility clearing turn
- rotor RPM control, torque effect, cyclic limiting stops due to C of G position and wind speed/direction

Exercise 15 Hover out of ground effect (OGE), vortex ring

- establishing hover O.G.E
- drift/height/power control
- demonstration of incipient stage of vortex ring, recognition and recovery (from a safe altitude)
- loss of tail rotor effectiveness

Exercise 16 Simulated engine off landings (EOL)

- the effect of weight, disc loading, density altitude, RRPM decay
- revise basic autorotation entry
- optimum use of cyclic and collective to control speed/RRPM
- variable flare simulated EOL
- demonstrate constant attitude simulated EOL
- demonstrate simulated EOL from hover/hover taxi
- demonstrate simulated EOL from transition and low level

Exercise 17 Advanced autorotation

- over a selected point at various height and speed
- revise basic autorotation - note ground distance covered
- range autorotation
- low speed autorotation
- constant attitude autorotation (terminate at safe altitude)
- 'S' turns
- turns through 180° and 360°
- effects on angles of descent, IAS, RRPM and effect of AUM

Exercise 18 Practice forced landings

- procedure and choice of the forced landing area
- forced landing checks and crash action
- re-engagement and go-around procedures

Exercise 19 Steep turns

- steep (level) turns (30° bank)
- maximum rate turns (45° bank if possible)
- steep autorotative turns
- faults in the turn - balance, attitude, bank and co-ordination
- RRPM control, disc loading
- vibration and control feedback
- effect of wind at low level

Exercise 20 Transitions

- revise ground effect, translational lift, flapback
- maintaining constant height, (20-30 feet AGL):
 - transition from hover to minimum 50 knots IAS and back to hover
- demonstrate effect of wind

Exercise 21 Quickstops

- use of power and controls
- effect of wind
- quickstops into wind
- quickstops from crosswind and downwind terminating into wind
- danger of vortex ring
- danger of high disc loading

Exercise 22a Navigation

Flight planning

- weather forecast and actuals
- map selection and preparation and use
- choice of route
 - controlled airspace, danger and prohibited areas
 - safety altitudes and noise abatement considerations
- calculations
 - magnetic heading(s) and time(s) en-route
 - fuel consumption
 - mass and balance
- flight information
 - NOTAMs etc
 - radio frequencies

- selection of alternate landing sites
- helicopter documentation
- notification of the flight
 - pre-flight administrative procedures
 - flight plan form (where appropriate)

Departure

- organisation of cockpit workload
- departure procedures
 - altimeter settings
 - ATC liaison in controlled/regulated airspace
 - setting heading procedure
 - noting of ETAs
- maintenance of height/altitude and heading
- revisions of ETA and heading
 - 10° line, double track and track error, closing angle
 - 1 in 60 rule
 - amending an ETA
- log keeping
- use of radio
- use of nav aids [(if fitted)]
- minimum weather conditions for continuation of flight
- in-flight decisions
- transiting controlled/regulated airspace
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure

- ATC liaison in controlled/regulated airspace
- altimeter setting
- entering the traffic pattern
- circuit procedures
- parking
- security of helicopter
- refuelling
- closing of flight plan, (if appropriate)
- post-flight administrative procedures

Exercise 22b Navigation problems at low heights and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, other aircraft)
- difficulties of map reading
- effects of wind and turbulence
- avoidance of noise sensitive areas
- joining the circuit
- bad weather circuit and landing
- [appropriate procedures and choice of landing area]

Exercise 22c Radio navigation

- Use of VHF Omni Range
 - availability, AIP, frequencies
 - selection and identification
 - omni bearing selector (OMB)
 - to/from indications, orientation

- course deviation indicator (CDI)
- determination of radial
- intercepting and maintaining a radial
- VOR passage
- obtaining a fix from two VORs
- use of automatic direction finding equipment (ADF)/non directional beacons (NDBs)
 - availability, AIP, frequencies
 - selection and identification
 - orientation relative to the beacon
 - homing
- use of VHF direction finding (VHF/DF)
 - availability, AIP, frequencies
 - RTF procedures and ATC liaison
 - obtaining a QDM and homing
- use of en-route/terminal radar
 - availability, AIP
 - procedures and ATC liaison
 - pilots responsibilities
 - secondary surveillance radar [(if transponder fitted)]
 - transponders
 - code selection
 - interrogation and reply
- use of distance measuring equipment (DME)
 - station selection and identification
 - modes of operation
 - distance, groundspeed, time to run

Exercise 23 Advanced take-off, landings, transitions

- landing and take-off out of wind (performance reduction)
- ground effect, translational lift and directional stability variation when out of wind
- downwind transitions
- vertical takeoff over obstacles
- reconnaissance of landing site
- running landing
- zero speed landing
- cross wind and downwind landings
- steep approach
- go-around

Exercise 24 Sloping ground

- limitations, assessing slope angle
- wind and slope relationship - blade and control stops
- effect of C of G when on slope
- ground effect on slope, power required
- right skid up slope
- left skid up slope

- nose up slope
- avoidance of dynamic roll over, dangers soft ground and sideways movement on touchdown
- danger of striking main/tail rotor by harsh control movement near ground

Exercise 25 Limited power

- take-off power check
- vertical take-off over obstacles
- in flight power check
- running landing
- zero speed landing
- approach to low hover
- approach to hover
- approach to hover OGE
- steep approach
- go-around

Exercise 26 Confined areas

- landing capability, performance assessment
- locating landing site, assessing wind speed/direction
- reconnaissance of landing site
- select markers
- select direction and type of approach
- circuit
- approach to committed point and go around
- approach
- clearing turn
- landing
- power check, performance assessment in and out of ground effect
- normal take-off to best angle of climb speed
- vertical take-off from hover

Exercise 27 Basic instrument flight

- physiological sensations
- instrument appreciation
 - attitude instrument flight
 - instrument scan
- instrument limitations
- basic manoeuvres
 - straight and level at various airspeeds and configurations
 - climbing and descending
 - standard rate turns, climbing and descending, onto selected headings
- recoveries from climbing and descending turns
- recoveries from unusual attitudes

Exercise 28a Night flying (if night qualification required)

- pre-flight inspection using torch, pan lights, etc.
- take-off (no sideways or backwards manoeuvring)
- hover taxi (higher and slower than by day)
- transition to climb
- level flight
- approach and transition to hover
- landing
- autorotation
- practice forced landing (with flares if appropriate - simulated)

- night Emergencies (e.g. failure of lights, etc.)

Exercise 28b Night cross country (if night qualification required)

- nav principles as for day cross country
- map marking (highlighting built up areas with thicker lines, etc.)

REQUIREMENTS FOR ENTRY TO TRAINING

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

[Amdt. 1, 01.12.00; Amdt. 4, 01.08.06]

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IEM FCL 2.135
PPL(H) skill test form
(See JAR–FCL 2.135)

APPLICATION AND REPORT FORM FOR THE PPL(H) SKILL TEST

Applicant's last name:		First name:	
------------------------	--	-------------	--

1	Details of the flight		
Type of helicopter:		Departure aerodrome/site:	
Registration:		Destination aerodrome/site:	
Take-off time:			
Landing time:			
Total flight time:			

2	Result of the test <i>*delete as necessary</i>		
Passed*		Failed*	Partial pass*

3	Remarks

Location and date:		Type and number of FE's licence:	
Signature of FE:		Name of FE, in capitals:	

AMC FCL 2.160 & 2.165(a)(1)

ATP(H) Integrated course

(See JAR–FCL 2.160 & 2.165)

(See AMC FCL 2.470(a))

(See IEM FCL 2.170)

(See Appendix 1 to JAR-FCL 2.470)

The flight instruction is divided into four phases:

Phase 1

1 Flight exercises up to the first solo flight comprise a total of not less than 12 hours dual flight instruction on a helicopter including:

- a. pre-flight operations, mass and balance determination helicopter inspection and servicing;
- b. aerodrome and traffic pattern operations, collision avoidance and procedures;
- c. control of the helicopter by external visual reference;
- d. take-offs, landings, hovering, look out turns and normal transitions from and to the hover;
- e. emergency procedures, basic auto-rotations, simulated engine failure, ground resonance recovery if relevant to type.

Phase 2

2 Flight exercises until general handling and day VFR navigation progress check, and basic instrument flying progress check. This phase comprises a total flight time of not less than [] [128] hours including [] [73] hours of dual flight instruction [flight time and including at least 5 hours VFR conversion training on a multi-engine helicopter], 15 hours of solo flight and 40 hours flown as student pilot-in-command. The instruction and testing contain the following:

- a. sideways and backwards flight, turns on the spot;
- b. incipient vortex ring recovery;
- c. advanced/touchdown auto-rotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;
- d. steep turns;
- e. transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;
- f. limited power and confined area operations including low level operations to and from unprepared sites;
- g. flight by sole reference to basic flight instruments including completion of a 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud;
- h. cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;
- i. aerodrome and traffic pattern operations at different aerodromes;
- j. operations to, from and transiting controlled aerodromes; compliance with air traffic services procedures, radio telephony procedures and phraseology;
- k. application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);
- l. night flight including take-offs and landings as pilot-in-command;
- m. general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 1 to JAR–FCL 2.170, conducted by a flight instructor not connected with the applicants training.

Phase 3

3 Flight exercises up to Instrument Rating skill test. This part comprises a total of [] [40] hours [] [dual instrument flight time including 10 hours of a multi engine IFR certificated helicopter.]

[]

The instruction and testing shall contain the following:

- a. Pre-flight procedures for IFR flights including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan.
- b. Procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:
 - transition from visual to instrument flight on take-off.
 - standard instrument departures and arrivals.
 - en-route IFR procedures.
 - holding procedures.
 - instrument approaches to specified minima.
 - missed approach procedure.
 - landings from instrument approaches.
 - in-flight manoeuvres and particular flight characteristics.
 - [– instrument exercises with one engine simulated inoperative.]

[]

Phase 4

4 Instruction [] in multi-crew co-operation (MCC) comprise the relevant training requirements set out in Appendix 1 to JAR-FCL 2.261(d) and AMC FCL 2.261(d).

5 If a type rating for multi-pilot helicopter is not required on completion of this part, the applicant shall be provided with a certificate of course completion for MCC training (see Appendix 1 to AMC FCL 2.261(d)).

[Amdt. 1, 01.12.00; Amdt. 2, 01.11.02; Amdt. 3, 01.09.03; Amdt. 4, 01.08.06]

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AMC FCL 2.160 & 2.165(a)(2)
[] [ATPL(H)] integrated course [(No Instrument Rating)]
(See JAR-FCL 2.160 & 2.165)
(See AMC-FCL 2.470 (b))
(See IEM-FCL 2.170)
(See Appendix 1 to JAR-FCL 2.170)

The flight instruction is divided into [] [three] phases.

Phase 1

1 Flight exercises up to the first solo flight [comprise a total of not less than] [] 12 hours dual flight instruction on a helicopter including:

- a. pre-flight operations, mass and balance determination helicopter inspection and servicing;
- b. aerodrome and traffic pattern operations, collision avoidance and procedures;
- c. control of the helicopter by external visual reference;
- d. take-offs, landings, hovering, look out turns and normal transitions from and to the hover;
- e. emergency procedures, basic auto-rotations, simulated engine failure, ground resonance recovery if relevant to type.

Phase 2

2 Flight exercises until general handling and day VFR navigation progress [and basic instrument flying progress] check conducted by a flight instructor not connected with the applicant's training[]. This [] [phase] comprises a total flight time of not less than [] [128] hours including [] [73] hours of dual [] instruction [flight time and including at least 5 hours VFR conversion training on a multi-engine helicopter], 15 hours of solo flight and [] [40] hours flown as [] [student pilot-in-command.]. The instruction and testing contain the following:

- a. sideways and backwards flight, turns on the spot;
- b. incipient vortex ring recovery;
- c. touchdown/advanced auto-rotations[,] [] simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;
- d. steep turns;
- e. transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;
- f. limited power and confined area operations including [] low level operations to and from unprepared sites;
- g. [10 hours] flight by sole reference to basic flight instruments, including completion of a 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud;
- h. cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;
- i. aerodrome and traffic pattern operations at different aerodromes;
- j. operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology;
- k. application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);
- l. night flight including take-offs and landings as pilot-in-command;]

[]

[][m.] general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 1 to JAR-FCL 2.170, conducted by a flight instructor not connected with the applicants training.

[Amdt. 1, 01.12.00; Amdt. 2, 01.11.02; Amdt. 3, 01.09.03; Amdt. 4, 01.08.06]

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AMC FCL 2.160 & 2.165(a)(3)
CPL(H) [][Integrated Course]
(See JAR-FCL 2.160 & 2.165)
(See AMC-FCL 2.470 (b))
(See IEM-FCL 2.170)

[]

[The flight instruction is divided into three phases:]

[][Phase 1]

[]

[1. Flight exercises up to the first solo flight. This part comprises a total of not less than 12 hours dual flight instruction on a helicopter including:

- a. pre-flight operations: mass and balance determination helicopter inspection and servicing;
- b. aerodrome and traffic pattern operations, collision avoidance and procedures;
- c. control of the helicopter by external visual reference;
- d. take-offs, landings, hovering, look out turns and normal transitions from and to the hover;
- e. emergency procedures, basic auto-rotation, simulated engine failure, ground resonance recovery if relevant to type.]

[]

[][Phase 2]

[2. Flight exercises until general handling and day VFR navigation progress check conducted by a flight instructor not connected with the applicant's training, and basic instrument progress check. This part comprises a total flight time of not less than 128 hours including 73 hours of dual instruction flight time and including at least 5 hours VFR conversion training on a multi-engine helicopter, 15 hours of solo flight and 40 hours flown as SPIC. The instruction and testing contain the following:

- a. sideways and backwards flight, turns on the spot;
- b. incipient vortex ring recovery;
- c. touchdown/advanced auto-rotation and simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;
- d. steep turns;
- e. transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;
- f. limited power and confined area operations including selection of and low level operations to and from unprepared sites;
- g. flight by sole reference to basic flight instruments, including completion of 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud;
- h. cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;
- i. aerodrome and traffic pattern operations at different aerodromes;

- j. operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology;
- k. application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);
- l. general handling progress test conducted by a delegated instructor not connected with the applicant's training;
- m. night flight including take-offs and landings as pilot-in-command;
- n. general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 1 to JAR-FCL 2.170, conducted by a flight instructor not connected with the applicants training.]

[]

[Phase 3

3. Flight exercises up to Instrument Rating skill test. This part comprises a total of 40 hours dual instrument flight time including 10 hours of a multi engine IFR certificated helicopter.

The instruction and testing shall contain the following:

- a. pre-flight procedures for IFR flights including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan.
- b. procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:
 - transition from visual to instrument flight on take-off.
 - standard instrument departures and arrivals.
 - en-route IFR procedures.
 - holding procedures.
 - instrument approaches to specified minima.
 - missed approach procedure.
 - landings from instrument approaches.
 - in-flight manoeuvres and particular flight characteristics.
 - instrument exercises with one engine simulated inoperative.]

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[Amdt. 1, 01.12.00; Amdt. 3, 01.09.03; Amdt. 4, 01.08.06]

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[AMC FCL 2.160 & 2.165(a)(4)

CPL(H) integrated course

See JAR-FCL 2.160 & 2.165

(See AMC-FCL 2.470 (b))

(See IEM-FCL 2.170)

(See Appendix 1 to JAR-FCL 2.170)

The flight instruction is divided into two phases.

Phase 1

1 Flight exercises up to the first solo flight. This part comprises a total of not less than 12 hours dual flight instruction on a helicopter including:

- a. pre-flight operations, mass and balance determination helicopter inspection and servicing;
- b. aerodrome and traffic pattern operations, collision avoidance and procedures;
- c. control of the helicopter by external visual reference;
- d. take-offs, landings, hovering, look out turns and normal transitions from and to the hover;
- e. emergency procedures, basic auto-rotations, simulated engine failure, ground resonance recovery if relevant to type.

Phase 2

2 Flight exercises until general handling and day VFR navigation progress check conducted by a flight instructor not connected with the applicant's training, and basic instrument progress check. This part comprises a total flight time of not less than 123 hours including 73 hours of dual instruction flight time, 15 hours of solo flight and 35 hours flown as SPIC. The instruction and testing contain the following:

- a. sideways and backwards flight, turns on the spot;
- b. incipient vortex ring recovery;
- c. touchdown/advanced auto-rotations and simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;
- d. steep turns;
- e. transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;
- f. limited power and confined area operations including selection of and low level operations to and from unprepared sites;
- g. flight by sole reference to basic flight instruments, including completion of a 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud;
- h. cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;
- i. aerodrome and traffic pattern operations at different aerodromes;
- j. operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology;
- k. application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);
- l. general handling progress test conducted by a delegated instructor not connected with the applicant's training;
- m. night flight including take-offs and landings as pilot-in-command;

- n. general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 1 to JAR-FCL 2.170, conducted by a flight instructor not connected with the applicants training.]

[Amdt. 4, 01.08.06]

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[AMC FCL 2.160 & 2.165(a)(5)
CPL(H) modular course
See JAR-FCL 2.160 & 2.165
(See AMC-FCL 2.470 (b))
(See IEM-FCL 2.170)

The flying instruction comprises the following items. The flight time allocated to each exercise is at the discretion of the flight instructor, provided at least 5 hours flight time is allocated to cross-country flying.

Visual flight

Within the total of dual flight instruction time, the applicant may have completed during the visual phase up to 5 hours in a helicopter FS or FTD 2,3 or FNPTII,III.

- a. Pre-flight operations: mass and balance calculations, helicopter inspection and servicing.
- b. Level flight speed changes, climbing, descending, turns, basic auto-rotations, use of checklist, collision avoidance, checking procedures.
- c. Take-offs and landings, traffic pattern, approach, simulated engine failures in the traffic pattern. Sideways and backwards flight and spot turns in the hover.
- d. Recovery from incipient vortex ring condition.
- e. Advanced auto-rotations covering the speed range from low speed to maximum range and manoeuvre in auto-rotations (180° 360° and 'S' turns), simulated engine off landings.
- f. Selection of emergency landing areas, auto-rotations following simulated emergencies to given areas. Steep turns at 30° and 45° bank.
- g. Manoeuvres at low level and quick-stops.
- h. Landings, take-offs and transitions to and from the hover when heading out of wind.
- i. Landings and take-offs from sloping or uneven ground.
- j. Landings and take-offs with limited power.
- k. Low level operations into and out of confined landing sites.
- l. Cross-country flying – using dead reckoning and radio navigation aids. Flight planning by the applicant; filing of ATC flight plan; evaluation of weather briefing documentation, NOTAM etc; radiotelephony procedures and phraseology; positioning by radio navigation aids; operation to, from and transiting controlled aerodromes, compliance with air traffic services procedures for VFR flights, simulated radio communication failure, weather deterioration, diversion procedures; location of an off airfield landing site and simulated approach.

Basic Instrument Flight

A maximum of 5 hours of the following exercises may be performed in a FS or FTD or FNPT. Flight training should be carried out in VMC using a suitable means of simulating IMC for the student

- m. Instrument flying without external visual cues. Level flight performing speed changes, maintaining flight altitude (level, heading) turns in level flight at rate one and 30° bank, left and right; roll-out on predetermined headings.
- n. Repetition of exercise (m); additionally climbing and descending, maintaining heading and speed, transition to horizontal flight; climbing and descending turns.

- o. Repetition of exercise (m); and recovery from unusual attitudes.
- p. Radio navigation.
- q. Repetition of exercise (m); and turns using standby magnetic compass and standby artificial horizon (if fitted).]

[Amdt. 4, 01.08.06]

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IEM FCL 2.170
CPL(H) skill test form
(See JAR–FCL 2.170)

APPLICATION AND REPORT FORM FOR THE CPL(H) SKILL TEST

Applicant's last name:		First name:	
Licence held:		Number:	

1	Details of the flight		
Type of helicopter:		Departure aerodrome/site:	
Registration:		Destination aerodrome/site:	
Take-off time:			
Landing time:			
Total flight time:			

2	Result of the test <i>*delete as necessary</i>		
Passed*		Failed*	Partial pass*

3	Remarks

Location and date:		Type and number of FE's licence:	
Signature of FE:		Name of FE, in capitals:	

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AMC/IEM E – INSTRUMENT RATING

IEM FCL 2.210

IR(H) skill test form

(See JAR-FCL 2.185 & 2.210)

APPLICATION AND REPORT FORM FOR THE IR(H) SKILL TEST

Applicant's last name:		First names:	
Licence held:		Number:	
State of licence issue in which test performed:		Signature:	

1	Details		
Type of helicopter:		Registration:	

2	Result of the test <i>*delete as necessary</i>	
Passed*	Failed*	Partial pass*

3	Remarks

Location and date:		Type and number of FE's licence:	
Signature of FE:		Name of FE, in capitals:	

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AMC/IEM F – TYPE RATING

IEM FCL 2.240(b)(1)

ATPL/type rating/training/skill test and proficiency check on multi-pilot helicopters

(See JAR–FCL 2.240)

APPLICATION AND REPORT FORM

Applicant's last name		First name	
Type of licence		Number	
State	Type rating as pilot in command/co-pilot*	Signature of applicant	
Multi-engine helicopter		Proficiency check	
Training record		Type rating	
Skill test		ATPL(H)	

Satisfactory completion of Type rating -training according to requirements is certified below:

1	Theoretical training for the issue of a type rating performed during period		
from:	to:	at:	
mark obtained:	% (Pass mark 75%):	Type and number of licence:	
Signature of instructor		Name in capital letters	

2	Flight simulator (helicopter type):	Three or more axes	YES*	NO*	Ready for service and used
Flight simulator manufacturer:		motion / system			
Flight simulator operator:		Visual aid:	YES*	NO*	
Total training time at the controls:					
Instrument approaches at aerodromes to a decision altitude of:					
Location/date/time:		Signature of type rating instructor/examiner*:			
Type and No of licence:		Name in capital letters:			

3	Flight training:		
Type of helicopter:	Registration:	Flight time at the controls:	
Take-offs	Landings:	Training aerodromes/sites (take-offs, approaches and landings)	
Location and date:		Signature of type rating instructor/examiner*:	
Type and No of licence		Name in capital letters	

4	Skill test/Proficiency Check Remark: if the applicant failed the examiner shall indicate the reasons why	<i>Passed*</i>	<i>Failed*</i>	SIM/Aircraft Reg:
Location and date		Type and number of licence		
Signature of authorised examiner*		Name in capital letters		

**delete as necessary*

IEM FCL 2.240(b)(2)**Type rating/training/skill test and proficiency check on single-engine and multi-engine single-pilot helicopters and the addendum to the PPL and the CPL skill test in multi-engine single-pilot helicopters**

(See JAR-FCL 2.240)

APPLICATION AND REPORT FORM

Applicant's last name		First name	
Type of licence		Number	
State		Signature of applicant	
Helicopter		Proficiency check	
Training record		Type rating	
Skill test			

Satisfactory completion of Type rating -training according to requirements is certified below:

1	Theoretical training for the issue of a type rating performed during period		
from:	to:	at:	
mark obtained:	% (Pass mark 75%):	Type and number of licence:	
Signature of instructor		Name in capital letters	

2	Flight simulator (helicopter type):	Three or more axes	YES*	NO*	Ready for service and used
Flight simulator manufacturer:		motion / system			
Flight simulator operator:		Visual aid:	YES*	NO*	
Total training time at the controls:					
Instrument approaches at aerodromes to a decision altitude of:					
Location/date/time:		Signature of type rating instructor/examiner*:			
Type and No of licence:		Name in capital letters:			

3	Flight training:		
Type of helicopter:	Registration:	Flight time at the controls:	
Take-offs	Landings:	Training aerodromes/sites (take-offs, approaches and landings)	
Location and date:	Signature of type rating instructor/examiner*:		
Type and No of licence	Name in capital letters		

4	Skill test/Proficiency Check Remark: if the applicant failed the examiner shall indicate the reasons why	<i>Passed*</i>	<i>Failed*</i>	SIM/Aircraft Reg:
Location and date		Type and number of licence		
Signature of authorised examiner*		Name in capital letters		

**delete as necessary*

AMC FCL 2.261(a)**Syllabus of theoretical instruction for type ratings for single and multi-engine helicopters**

(See JAR–FCL 2.261(a))

(See Appendix 1 to JAR–FCL 2.261(a))

DETAILED LISTING

1 Helicopters structure, transmissions, rotors and equipment, normal and abnormal operation of systems.

1.1 Dimensions

1.2 Engine including aux. power unit, rotor and transmissions; if an initial type rating for a turbine engine helicopter is applied for, the applicant shall have received turbine engine instruction (see AMC FCL 2.470(b)).

1.2.1 type of engine/engines

1.2.2 in general the function of the following systems or components:

- engine
- aux. power unit
- oil system
- fuel system
- ignition system
- starting system
- fire warning and extinguishing system
- generators and generator drives
- power indication
- water/methanol injection

1.2.3 engine controls (including starter), engine instruments and indications in the cockpit, their function and interrelation and interpretation

1.2.4 engine operation, including APU, during engine start and engine malfunctions, procedures for normal operation in the correct sequence

1.2.5 transmission system

- lubrication
- generators and generator drives
- freewheeling units
- hydraulic drives
- indication and warning systems

1.2.6 type of rotor systems

- indication and warning systems

1.3 Fuel system

1.3.1 location of the fuel tanks, fuel pumps, fuel lines to the engines tank capacities, valves and measuring

1.3.2 the following systems:

- filtering
- fuelling and defuelling heatings
- dumping
- transferring
- venting

1.3.3 in the cockpit

the monitors and indicators of the fuel system, quantity and flow indication, interpretation

- 1.3.4 fuel procedures distribution into the various tanks
fuel supply and fuel dumping
- 1.4 Air conditioning
 - 1.4.1 components of the system and protection devices
 - 1.4.2 cockpit monitors and indicators
interpretation with regard to the operational condition
 - 1.4.3 normal operation of the system during start, cruise approach and landing, air conditioning airflow and temperature control
- 1.5 Ice and rain protection, windshield wipers and rain repellent
 - 1.5.1 ice protected components of the helicopter, including engines and rotor systems, heat sources, controls and indications
 - 1.5.2 operation of the anti-icing/de-icing system during T/O, climb, cruise and descent, conditions requiring the use of the protection systems
 - 1.5.3 controls and indications of the windshield wipers and rain repellent system operation
- 1.6 Hydraulic system
 - 1.6.1 components of the hydraulic system(s), quantities and system pressure, hydraulically actuated components associated to the respective hydraulic system
 - 1.6.2 controls, monitors and indicators in the cockpit, function and interrelation and interpretation of indications
- Landing gear, skids fixed, floats
 - 1.7.1 main components of the
 - main landing gear
 - nose gear
 - tail gear
 - gear steering
 - wheel brake system
 - 1.7.2 gear retraction and extension
 - 1.7.3 required tyre pressure, or location of the relevant placard
 - 1.7.4 controls and indicators including warning indicators in the cockpit in relation to the retraction/extension condition of the landing gear
 - 1.7.5 components of the emergency extension system
- 1.8 Flight controls, stab-and autopilot systems
 - 1.8.1 controls, monitors and indicators including warning indicators of the systems, interrelation and dependencies
- 1.9 Electrical power supply
 - 1.9.1 Number, power, voltage, frequency and if applicable phase and location of the main power system (AC or DC) auxiliary power system location and external power system
 - 1.9.2 location of the controls, monitors and indicators in the cockpit
 - 1.9.3 main and back-up power sources flight instruments, communication and navigation systems, main and back-up power sources
 - 1.9.4 location of vital circuit breakers
 - 1.9.5 generator operation and monitoring procedures of the electrical power supply
- 1.10 Flight instruments, communication, radar and navigation equipment, autoflight and flight recorder
 - 1.10.1 antennas

1.10.2 controls and instruments of the following equipment in the cockpit:

- flight instruments (e.g. airspeed indicator, pitot static system, compass system, flight director)
- flight management systems
- radar equipment (e.g. wx radar, transponder)
- communication and navigation system (e.g. HF, VHF, ADF, VOR/DME, ILS, marker beacon) and area navigation systems (e.g. GPS, VLF Omega)
- stabilisation and autopilot system
- flight data recorder, cockpit voice recorder, radio altimeter
- collision avoidance system
- ground proximity warning system
- HUMS (Health and Usage Monitoring System)

1.11 Cockpit, cabin and cargo compartment

1.11.1 operation of the exterior, cockpit, cabin and cargo compartment lighting and the emergency lighting

1.11.2 operation of the cabin doors and emergency exits

1.12 Emergency equipment

operation and correct application of the following emergency equipment in the helicopter:

- | <i>Mobile equipment</i> | <i>Fixed equipment</i> |
|------------------------------|------------------------|
| – portable fire extinguisher | emergency floats |
| – first aid kits | |
| – portable oxygen equipment | |
| – emergency ropes | |
| – life vest | |
| – life rafts | |
| – emergency transmitters | |
| – crash axes | |
| – megaphones | |
| – emergency signals | |
| – torches | |

2 LIMITATIONS

2.1 General limitations, according to the helicopter flight manual

2.2 Minimum equipment list

3 PERFORMANCE, FLIGHT PLANNING AND MONITORING

3.1 Performance

Performance calculation concerning speeds, gradients, masses in all conditions for take-off, en route, approach and landing

3.1.1 Take off

- hover performance in and out of ground effect
- all approved profiles, cat A and B
- HV diagram
- take off and rejected take off distance
- take off decision point (TDP) or (DPAT)
- calculation of first and second segment distances
- climb performance

3.1.2 En-route

- airspeed indicator correction
- service ceiling
- optimum/economic cruising altitude
- max endurance
- max range
- cruise climb performance

3.1.3 Landing

- hovering in and out of ground effect
- landing distance
- landing decision point (LDP) or (DPBL)

3.1.4 Knowledge and/or calculation of

- V_{Lo} , V_{Le} , V_{MO} , V_x , V_y , V_{toss} , V_{ne} , $V_{max\ range}$, V_{mini}

3.2 Flight planning

Flight planning for normal and abnormal conditions

- optimum/maximum flight level
- minimum required flight altitude
- drift down procedure after an engine failure during cruise flight
- power setting of the engines during climb, cruise and holding under various circumstances as well as at the most economic cruising flight level
- optimum and maximum flight level and power setting after an engine failure

3.3 Effect of optional equipment on performance

4 LOAD, BALANCE AND SERVICING

4.1 Load and balance

- load and trim sheet with respect to the maximum masses for take-off and landing
- centre of gravity limits

4.1.1 influence of the fuel consumption on the centre of gravity

4.1.2 lashing points, load clamping, max ground load

4.2 Servicing on the ground
servicing connections for

- fuel
- oil, etc...
and safety regulations for servicing

5 EMERGENCY, PROCEDURES

6 SPECIAL REQUIREMENTS FOR EXTENSION OF A TYPE RATING FOR INSTRUMENT APPROACHES DOWN TO A DECISION HEIGHT OF LESS THAN 200 FT (60 M)

6.1 Airborne and ground equipment

- Technical requirements
- Operational requirements
- Operational reliability
- Fail operational
- Fail-passive
- Equipment reliability
- Operating procedures
- Preparatory measures
- Operational downgrading

- Communication

6.2 Procedures and limitations

- Operational procedures
- Crew co-ordination

7 SPECIAL REQUIREMENTS FOR HELICOPTERS WITH ELECTRONIC FLIGHT
INSTRUMENT SYSTEMS (EFIS)

8 OPTIONAL EQUIPMENT

[Amdt. 2, 01.11.02]

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AMC FCL 2.261(c)(2)

Guidelines for Approval of a Helicopter Type Rating Course

(See JAR-FCL 2.261(c)(2))

(See Appendix 1 and 2 to JAR-FCL 2.055)

TRAINING PROGRAMME

(1) Type

For approval the course should, as far as possible, provide for integrated ground, flight simulator and flight training designated to enable the student to operate safely and qualify for the grant of a type rating. The course should be directed towards a helicopter type, but where variants exist, all flying and ground training forming the basis of the approved course should relate to a single variant.

(2) Variants

Additional training should be required in accordance with JAR-FCL 2.235(c).

(3) Training in Helicopter and [F]STDs

The training programme should specify the amounts of flight training in the helicopter type and in [F]STDs (simulators, flight training devices (FTDs), or other training devices (OTDs)) as agreed by the Authority. (See Appendix 2 to JAR-FCL 2.240). Where a suitable flight simulator is geographically remote from the normal training base, the Authority may agree to some additional training being included in the programme at a remote facility.

(4) Skill Test

The content of the flying training programme should be directed towards the skill test for that type. The practical training given in Appendix 2 and 3 to JAR-FCL 2.240 should be modified as necessary. The skill test may be completed in a helicopter, in a flight simulator or partially in a helicopter and in a flight simulator. The use of a [F]STD for skill tests is governed by the level of approval of the flight simulator and the previous experience of the candidate. Where a flight simulator is not available, abnormal operations of systems should not be practised in a helicopter other than as allowed for in the skill test form for the type.

(5) Phase Progress Tests and Final Theoretical Knowledge Examination

Prior to the final theoretical knowledge examination covering the whole syllabus, the training programme should provide for phase progress tests associated with each phase of theoretical knowledge instruction. The phase progress tests should assess the candidate's knowledge on completion of each phase of the training programme.

(6) Facilities: Ground School Equipment

Training Facilities and Aids

A TRTO should provide, as a minimum, facilities for classroom instruction. Additional classroom training aids and equipment including, where appropriate, computers, should reflect the content of the course and the complexity of the helicopter. For multi-pilot helicopters, the minimum level of ground training aids for approval should include equipment that provides a realistic cockpit working environment. Task analysis and the latest state of the art training technology is encouraged and should be fully incorporated into the training facilities wherever possible. Facilities for self and supervised testing should be available to the student.

(7) Training Devices

A Flight Training Device or Other Training Device may be provided to supplement classroom training in order to enable students to practice and consolidate theoretical instruction. Where suitable equipment is not available, or is not appropriate, a helicopter or flight simulator of the relevant variant should be available. If a FTD represents a different variant of the same helicopter type for which the student is being trained, then differences and/or familiarisation training is required.

(8) Computer Based Training (CBT)

Where CBT aids are used as a training tool, the organisation should ensure that a fully qualified ground instructor is available at all times when such equipment is being used by course students. Other than for revision periods, CBT lessons should be briefed and debriefed by a qualified ground instructor.

(9) Theoretical Knowledge Instruction

The Theoretical knowledge instruction training should meet the general objectives of:-

- (a) giving the student a thorough knowledge of the helicopter structure, power plant and systems, and their associated limitations;
- (b) giving the student a knowledge of the positioning and operation of the flight deck controls and indicators for the helicopter and its systems;
- (c) giving the student an understanding of system malfunctions, their effect on helicopter operations and interaction with other systems;
- (d) giving the student the understanding of normal, abnormal and emergency procedures

The amount of time and the contents of the theoretical instruction will depend on the complexity of the helicopter type involved and, to some extent, on the previous experience of the student.

(10) Flight Training

10.1 [Flight Simulation][] Training Devices ([F]STDs)

The level of qualification and the complexity of the type will determine the amount of practical training that may be accomplished in a [F]STD, including completion of the skill test. Prior to undertaking the skill test, a student should demonstrate competency in the skill test items during the practical training. []

10.2 Helicopter (with flight simulator)

With the exception of courses approved for zero flight time the amount of flight time in a helicopter should be adequate for completion of the skill test. []

10.3 Helicopters (without flight simulator)

Whenever a helicopter is used for training the amount of flight time practical training should be adequate for the completion of the skill test. [The amount of flight training will depend on the complexity of the helicopter type involved and, to some extent, on the previous experience of the applicant (See Appendix 1 to JAR-FCL 2.261(b))][]

[]

[Amdt. 1, 01.12.00; Amdt. 4, 01.08.06]

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AMC FCL 2.261(d)**Multi-crew co-operation course (helicopter)**

(See JAR–FCL 2.261(d))

(See IEM FCL 2.261(d))

MULTI-CREW CO-OPERATION TRAINING

1 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. The training emphasises the development of non-technical skills applicable to working in a multi-crew environment.

2 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. Furthermore, the course should provide students with opportunities to practice the skills that are necessary to be effective team leaders and members. This requires training exercises which include students as crew members in the PF and PNF roles.

3 Students should be made familiar with inter-personal interfaces and how to make best use of crew co-operation techniques and their personal and leadership styles in a way that fosters crew effectiveness. Students should be made aware that their behaviour during normal circumstances can have a powerful impact on crew functioning during high workload and stressful situations

4 Research studies strongly suggest that behavioural changes in any environment cannot be accomplished in a short period even if the training is very well designed. Trainees need time, awareness, practice and feedback, and continual reinforcement to learn lessons that will endure. In order to be effective, multi-crew co-operation training should be accomplished in several phases spread over a period.

5 The contents of the basic MCC course should cover theoretical knowledge training, practice and feedback in:

- a. interfaces
 - examples of Software, Hardware, Environment and Liveware mismatches in practice
- b. leadership/'followership' and authority
 - managerial and supervisory skills
 - assertiveness
 - barriers
 - cultural influence
 - PF and PNF roles
 - professionalism
 - team responsibility
- c. personality, attitude and motivation
 - listening
 - conflict resolution
 - mediating
 - critique (pre-flight analyses and planning, ongoing-review, 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
 - standard phraseologies
 - discipline

6 The use of checklists is of special importance for an orderly and safe conduct of the flights. Different philosophies have been developed for the use of checklists. Whichever philosophy is used depends on the complexity of the aircraft concerned, the situation presented, the flight crew composition and their operating experience and the operator's procedures as laid down in the Flight Operations Manual.

7 Mutual supervision, information and support.

- a. 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 (flight path, aircraft configuration etc.) are observed.
- b. Call-out procedures are essential, especially during take-off and approach, to indicate progress of the flight, systems status etc.
- c. 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.

COURSE OBJECTIVE

8 The contents of paragraphs 3 and 4 can best be practised by performing the exercises in IEM FCL 2.261(d).

9 Practice and feedback of MCC with regard to the L-L (liveware-liveware) interface should also make provision for students for self and peer critique in order to improve communication, decision making and leadership skills. This phase is best accomplished through the use of []FSTDs and video equipment. Video feedback is particularly effective because it allows participants to view themselves from a third-person perspective; this promotes acceptance of one's weak areas which encourages attitude and behavioural changes.

EXERCISES

10 The instruction should be accomplished as far as possible in a simulated commercial air transport environment and cover the following areas:

- a. pre-flight preparation, including documentation; computation of take off performance data; radio and navigation equipment checks and setting;
- b. before take-off checks, including powerplant checks; take-off briefing by PF;
- c. take-offs and landings to and from :
 - standard surface heliport
 - pinpoint surface heliport
 - elevated site
 - helideck

task of PF and PNF; call outs;

d. rejected take-offs; crosswind take-offs; take-offs at maximum take-off mass ; engine failure before and after Take off Decision Point (TDP); engine failure before and after Defined Point After Take-off (DPATO);

e. normal and abnormal operation of aircraft systems; use of checklists;

f. Emergency procedures to include engines (shut down and restart at a safe height) failure, fire, smoke control and removal; auto pilot/flight director failure, autorotation descent, tail rotor control failure (if applicable), tail rotor loss, hydraulic failure, SAS failure; wind and turbulence effect on raised structures, or due to heliport environment; emergency descent; incapacitation of a flight crew member;

- g. early recognition of specific helicopter hazards, e.g. ground resonance, dynamic and static rollover, blade stall, vortex ring/setting with power, settling with power depending on type of operation;
- h. instrument flight procedures including holding procedures; precision approaches using raw navigation data, flight director and autopilot; one engine simulated inoperative approaches; autopilot inoperative approaches; non precision and circling approaches; radar approaches on fixed or moving platforms; call out procedures during approaches; computation of approach and landing data;
- i. normal go-arounds; go arounds with one engine simulated inoperative and with autopilot or stabiliser inoperative; rejected landing; support of the PF by the PNF;
- j. normal and crosswind landings with one simulated engine failure before and after landing decision point (LDP) and one simulated engine failure before defined point before landing (DPBL) and with autopilot or Stability Augmentation System (SAS) inoperative; transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.

Where MCC training is combined for an initial type rating on a multi-pilot helicopter, the exercises (a) and (b) may be conducted in a [FS or] FTD as part of an approved course.

REINFORCEMENT

11 No matter how effective the classroom curriculum, interpersonal drills, LOFT exercises, and feedback techniques are, a single exposure during the multi-crew co-operation course for the initial issue of a multi-pilot helicopter type rating will be insufficient. The attitudes and influences which contribute to ineffective crew co-ordination are ubiquitous and may develop over a pilot's lifetime. Thus it will be necessary that the training of non-technical skills will be an integral part of all recurrent training for revalidation of a multi-pilot helicopter type rating as well as of the training for the issue of further multi-pilot type ratings.

[Amdt. 2, 01.11.02; Amdt. 4, 01.08.06]

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Appendix 1 to AMC FCL 2.261(d)**Multi-crew co-operation course (helicopter) - Certificate of completion of MCC training**

(See JAR-FCL 2.261(d))

CERTIFICATE OF COMPLETION OF MCC-TRAINING

Applicant's last name:		First names:	
Type of licence:		Number:	State:
Instrument rating:		OR	Instrument rating skill test:
issued on:		passed on:	
	Signature of applicant:		

The satisfactory completion of MCC-Training according to requirements is certified below:

TRAINING			
Multi-crew co-operation training received during period:			
from:	to:	at:	FTO /TRTO / operator*
Location and date:		Signature of Head of TRTO/FTO or authorised instructor*:	
Type and number of licence and state of issue:		Name in capital letters of authorised instructor:	

** Delete as appropriate*

IEM FCL 2.320E**Flight instructor rating (Helicopter) (FI(H)) – Skill test form**

(See JAR–FCL 2.320E)

APPLICATION AND REPORT FORM FOR THE FI(H) SKILL TEST

1	Applicants personal particulars:		
Applicant's last name:		First names:	
Date of Birth:		Tel (Home):	Tel (Work):
Address:		Country:	

2	Licence Details		
Licence type:		Number:	
		Exp. Date:	
Type ratings included in the licence:	1.		
	2.		
	3.		
	4.		
	5.		
Other ratings included in the licence:	1.		
	2.		
	3.		
	4.		
	5.		

3	Pre-course flying experience (See JAR–FCL 2.335)			
IR (hours)	PIC (hours)	TOTAL (hours)	CROSS-COUNTRY (hours)	

CPL THEORETICAL EXAMINATION PASSED(date) (For PPL holders only)
 (Copy of pass shall be submitted with this form)

4	Pre-entry flight test (See JAR-FCL 2.335(f))
<i>I recommendfor the Flight Instructor Course.</i>	
Name of FTO:	Date of flight test:
Name of FI conducting the test (Block capitals):	
Licence number:	
Signature:	

5	Declaration by the applicant		
<i>I have received a course of training in accordance with the syllabus approved by the Authority for the:</i> (Tick as applicable)			
Flight Instructor Rating FI(H)		Instrument Rating Instructor Rating (IRI(H))	
Applicant's name: (Block Letters)		Signature:	

6	Declaration by the chief flight instructor		
<i>I certify that has satisfactorily completed an approved course of training for the</i>			
Flight Instructor Rating FI(H)		Instrument Rating Instructor Rating (IRI(H))	
<i>in accordance with the relevant syllabus approved by the Authority.</i>			
Flying hours during the course:			
Helicopter/s, flight simulator/s or flight and navigation procedure trainers used :			
Name of CFI:			
Signature:			
Name of FTO:			

7	Flight instructor examiner's certificate		
<i>I have tested the applicant according to the examination report</i>			
A – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:			
Theoretical oral examination:		Skill test:	
<i>Passed</i>	<i>Failed</i>	<i>Passed</i>	<i>Failed</i>
<input type="checkbox"/>	I recommend further flight/ground training with a FI instructor before re-test		
<input type="checkbox"/>	I do not consider further flight/theoretical instruction necessary before re-test		
<i>Tick as applicable</i>			
B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:			
<input type="checkbox"/>	Flight Instructor rating		
<input type="checkbox"/>	Instrument Instructor rating		
<i>Tick as applicable</i>			
FIE's name (block letters):			
Signature:			
Licence number:		Date:	

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AMC FCL 2.3[][20D]

Flight instructor rating (helicopter) (FI(H)) course

(See JAR-FCL 2.3[][20D])

(See Appendix 1 to JAR-FCL 2.3[][20D])

COURSE OBJECTIVE

The aim of this course is to give adequate training to the applicant in theoretical knowledge instruction and flight instruction in order to instruct for a PPL(H), a CPL(H), type ratings for single-engine helicopters and, if applicable, a helicopter night qualification.

PART 1

TEACHING AND LEARNING

Item No.

1 THE LEARNING PROCESS

Motivation
Perception and understanding
Memory and its application
Habits and transfer
Obstacles to learning
Incentives to learning
Learning methods
Rates of learning

2 THE TEACHING PROCESS

Elements of effective teaching
Planning of instructional activity
Teaching methods
Teaching from the 'known' to the 'unknown'
Use of 'lesson plans'

3 TRAINING PHILOSOPHIES

Value of a structured (approved) course of training
Importance of a planned syllabus
Integration of theoretical knowledge and flight instruction

4 TECHNIQUES OF APPLIED INSTRUCTION

- a. Theoretical knowledge – Classroom instruction techniques
 - Use of training aids
 - Group lectures
 - Individual briefings
 - Student participation/discussion
- b. FLIGHT – Airborne instruction techniques
 - The flight/cockpit environment
 - Techniques of applied instruction
 - Post-flight and inflight judgement and decision making

5 STUDENT EVALUATION AND TESTING

a. Assessment of student performance

The function of progress tests
Recall of knowledge
Translation of knowledge into understanding
Development of understanding into actions
The need to evaluate rate of progress

b. Analysis of student errors

Establish the reason for errors
Tackle major faults first, minor faults second
Avoidance of over criticism
The need for clear concise communication

6 TRAINING PROGRAMME DEVELOPMENT

Lesson planning
Preparation
Explanation and demonstration
Student participation and practice
Evaluation

7 HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION

Physiological factors
Psychological factors
Human information processing
Behavioural attitudes
Development of judgement and decision making

8 ALL HELICOPTER SPECIFIC HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE HELICOPTER DURING FLIGHT

Selection of a safe altitude
Importance of 'touch drills'
Situational awareness
Adherence to correct procedures

9 TRAINING ADMINISTRATION

Flight/theoretical knowledge instruction records
Pilot's personal flying log book
The flight/ground curriculum
Study material
Official forms
Aircraft Flight/Owner's Manuals/Pilot's Operating Handbooks
Flight authorisation papers
Aircraft documents
The private pilot's licence regulations

SUGGESTED APPROXIMATE BREAKDOWN OF HOURS FOR THE THEORETICAL KNOWLEDGE
INSTRUCTION SECTION OF THE FLIGHT INSTRUCTOR (HELICOPTER) COURSE.

(The item numbers shown below relate to the item numbers of 'Teaching and learning' above.)

Item No	Tuition hours	Practice hrs in class	Comment	Progress tests
1	2.00	-	Allow for questions and short discussion periods.	0.30
2	4.00	-	The tuition time should allow for questions and short discussion periods.	1.00
3	2.00	-	The PPL training syllabus should be used as reference material.	0.30
4.a.	5.00	34	The time spent in practice under this item will involve the applicants refreshing their technical knowledge, and developing their classroom instruction techniques. It will also include discussion between applicants and advice on teaching from the supervising instructor.	
4.b.	4.00	34	The time spent in practice will be mainly directed to the giving of pre-flight briefings. It will allow the applicants to develop their ability to give a practical and short briefing (10-15 minutes) to a student pilot. The briefing will outline in a logical sequence the flight lesson to be undertaken.	
5.a.	2.00	-	Emphasis should be placed on the validity of questions used in progress tests	1.00
5.b.	2.00	-	Emphasis should be placed on the need to give encouragement to the student.	1.00
6	5.00	15	The time spent in practice will be directed towards the planning of classroom lesson periods and the development of the applicants' ability to construct lesson plans.	
7	5.00	-	Scenarios relevant to good judgement and decision making should be set and analysed	1.00
8	2.00	-	Examples of hazards e.g. mast bumping, blade stall, should cover a broad range of helicopters and types of operation and not to be confined to the aircraft used on the course.	1.00
9	5.00	-	Long briefings to teach an applicant to give instruction in night flying	
10	2.00	-	General revision of relevant documents	1.00
TOTAL:	40.00	83		7.00
COURSE TOTAL:			125 HOURS (including progress tests)	

PART 2

AIR EXERCISES

1 The air exercises are similar to those used for the training of PPL(H) but with additional items designed to cover the needs of a flight instructor.

2 The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide: therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

- The applicant's progress and ability
- The weather conditions affecting the flight
- The flight time available
- Instructional technique considerations
- The local operating environment
- Applicability of the exercises to the helicopter type

3 It follows that student instructors will eventually be faced with similar interrelated factors. They should be shown and taught how to construct flight lesson plans, taking these factors into account, so as to make the best use of each flight lesson, combining parts of the set exercises as necessary.

GENERAL

4 The briefing normally includes a statement of the objectives and a brief reference to principles of flight only if relevant. An explanation is to be given of exactly what air exercises are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the helicopter and what airmanship, weather and flight safety aspects currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.

5 The four basic components of the briefing will be:

- 1 The aim
- 2 Principles of Flight (briefest reference only)
- 3 The Air Exercise(s) (what, and how and by whom)
- 4 Airmanship

PLANNING OF FLIGHT LESSONS

6 The preparation of lesson plans is an essential pre-requisite of good instruction and the student instructor is to be given supervised practice in the planning and practical application of flight lesson plans.

GENERAL CONSIDERATIONS

7 The student instructor should complete flight training in order to practise the principles of basic instruction at the PPL(H) level.

8 During this training, except when acting as a student pilot for mutual flights, the student instructor shall occupy the seat normally occupied by the Flight Instructor.

9 It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship are to be stressed at the appropriate times during each flight.

10 If the privileges of the FI(H) rating are to include instruction for night flying, exercise 28 should be undertaken either as a part of the course or subsequent to rating issue.

FLIGHT INSTRUCTION SYLLABUS CONTENTS

LONG BRIEFINGS AND AIR EXERCISES

- 1 Familiarisation with the helicopter
- 2 Preparation before and action after flight
- 3 Air experience
- 4 Effects of controls
- 5 Power and attitude changes
- 6 Level flight, climbing and descending and turning
- 7 Auto-rotations
- 8 Hovering and hover taxiing
- 9 Take-off and landing
- 10 Transitions from hover to climb and approach to hover
- 11 Circuits and emergencies
- 12 First solo
- 13 Sideways and backwards hover manoeuvring
- 14 Spot turns
- 15 Hover out of ground effect (OGE) and Vortex ring
- 16 Simulated engine off landings
- 17 Advanced auto-rotations
- 18 Practice forced landings
- 19 Steep turns
- 20 Transitions
- 21 Quick-stops
- 22 Navigation
- 23 Advanced take-offs, landings and transitions
- 24 Sloping ground
- 25 Limited power
- 26 Confined areas
- 27 Basic instrument flying
- 28 Night flying (if night instructional qualification required)

Note: Airmanship should be included as required in each exercise.

EXERCISE 1 - FAMILIARISATION WITH THE HELICOPTER

LONG BRIEFING

Objectives

to familiarise the student with the helicopter

- to explain the characteristics of the helicopter
 - the cockpit layout
 - the helicopter and engine systems
 - the use of the check list(s) and procedures
- to familiarise the student with the helicopter controls
- to explain the differences when occupying the instructor's seat

EMERGENCY DRILLS

- to explain the action in the event of a fire on the ground or in the air:
 - engine fire
 - cockpit/cabin fire
 - electrical fire
 - system failure drills as applicable to type
 - escape exits
- to demonstrate escape drills including use of Emergency equipment

EXERCISE 2 - PREPARATION FOR AND ACTION AFTER FLIGHT

LONG BRIEFING

Objectives

- to explain flight authorisation and helicopter acceptance including tech log (if applicable) and maintenance
- certificate of equipment required for flight (maps, etc.)
 - external checks
 - internal checks
- to demonstrate harness, seat and rudder pedal adjustment, (student comfort)
 - starting and after starting checks
 - system/power/serviceability checks (as applicable)
 - closing down/shutting down the helicopter (including system checks)
- to explain parking, leaving the helicopter (including safety/security as applicable)
 - completion of the authorisation sheet and helicopter serviceability documents

EXERCISE 3 - AIR EXPERIENCE

Note: there is no requirement for a long briefing for this exercise

AIR EXERCISE

Objectives

- to give the student air experience
- to familiarise the student with the cockpit layout, ergonomics, controls
- to demonstrate cockpit procedures
 - stability and control

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EXERCISE 4 - EFFECTS OF CONTROLS

LONG BRIEFING

Objectives

- to explain
- the function of the flying controls (primary and secondary effect)
 - the effect of airspeed
 - the effect of power changes (torque)
 - the effect of yaw (sideslip)
 - the effect of disc loading (bank and flare)
 - the effect on controls of selecting hydraulics on/off
 - the effect of control friction
 - the instruments
 - the use of carburettor heat/anti-icing control

AIR EXERCISE

Objectives

- to demonstrate
- the function of the flying controls
 - the effects of airspeed
 - the effect of power changes (torque)
 - the effect of yaw (sideslip)
 - the effect of disc loading (bank and flare)
 - the effect on controls of selecting hydraulics on/off
 - the effect of control friction
 - the instruments (including instrument scan)
 - the use of carburettor heat/anti-icing control

EXERCISE 5 - POWER AND ATTITUDE CHANGES

LONG BRIEFING

Objectives

- to explain
- the relationship between cyclic control position, disc attitude, fuselage attitude and airspeed flapback
 - the power required diagram in relation to airspeed
 - power and airspeed changes in level flight
 - the use of the instruments for precision
 - the engine and airspeed limitations

AIR EXERCISE

Objectives

- to demonstrate
- the relationship between cyclic control position, disc attitude, fuselage attitude and airspeed flapback
 - power and airspeed changes in level flight
 - the use of instruments for precision (including instrument scan and lookout)

EXERCISE 6 - LEVEL FLIGHT, CLIMBING, DESCENDING AND TURNING

Note: For ease of training this exercise is divided into four separate parts in the PPL(H) syllabus but may be taught complete or in convenient parts

LONG BRIEFING

Objectives

to explain

- the basic factors involved in level flight
- the normal power settings
- the use of control friction and/or trim
- the importance of maintaining direction and balance
- the power required/power available diagram
- the optimum climb and descent speeds/angles/rates
- the importance of balance, attitude and co-ordination in the turn
- the effects of turning on rate of climb/descent
- the use of the gyro direction/heading indicator and compass
- the use of instruments for precision

AIR EXERCISE

Objectives

to demonstrate

- maintaining straight and level flight at normal cruise power
- control in pitch, including use of control friction and/or trim
- the use of the ball/yawstring to maintain direction and balance
- setting and use of power for selected airspeeds/speed changes
- entry to climb
- normal and maximum rate of climb
- levelling off from climb at selected altitudes/heights
- entry to descent
- effect of power and airspeed on rate of descent
- levelling off from descent at selected altitudes/heights
- entry to medium rate turns
- importance of balance, attitude and co-ordination to maintain level turn
- resuming straight and level flight
- turns onto selected headings, use of direction indicator and compass
- turns whilst climbing and descending
- effect of turn on rate of climb or descent
- the use of instruments for precision (including instrument scan and lookout)

EXERCISE 7 - AUTOROTATION

LONG BRIEFING

Objectives

to explain

- the characteristics of autorotation
- safety checks (including lookout and verbal warning)
- entry and development of autorotation
- the effect of AUM, IAS, disc loading, G forces and density altitude on RRPM and rate of descent
- rotor and engine limitations
- control of airspeed and RRPM
- recovery to powered flight
- throttle override and control of ERPM/RRPM during re-engagement (as applicable)
- danger of vortex condition during recovery

AIR EXERCISE

Objectives

to demonstrate

- safety checks (including verbal warning and lookout)
- entry to and establishing in autorotation
- effect of IAS and disc loading on RRPM and rate of descent
- control of airspeed and RRPM

- recovery to powered flight
- medium turns in autorotation
- a simulated engine off landing (as appropriate)

EXERCISE 8 - HOVERING AND HOVER TAXIING

LONG BRIEFING

Objectives

to explain

- ground effect and power required
- effect of wind, attitude and surface
- stability in hover and effects of over controlling
- effects of controls in hover
- control and co-ordination during spot turns

- requirement for slow hover speed to maintain ground effect
- effect of hydraulic failure in hover
- specific hazards, e.g. snow, dust, etc.

AIR EXERCISE

Objectives

to demonstrate

- ground effect and power/height relationship
- effect of wind, attitude and surface
- stability in hover and effects of over controlling
- effects of controls and hover technique
- gentle forward running touchdown
- control and co-ordination during spot (90 degree clearing) turns
- control and co-ordination during hover taxi
- dangers of mishandling and overpitching
- (where applicable) effect of hydraulics failure in hover
- simulated engine failure in the hover and hover taxi

EXERCISE 9 - TAKE-OFF AND LANDING

LONG BRIEFING

Objectives

to explain

- pre-take-off checks/drills
- importance of good lookout
- technique for lifting to hover
- after take-off checks
- danger of horizontal movement near ground
- dangers of mishandling and overpitching
- technique for landing
- after landing checks
- take-off and landing cross wind and downwind

AIR EXERCISE

Objectives

to demonstrate

- pre-take-off checks/drills
- pre-take-off lookout technique
- lifting to hover
- after take-off checks
- landing
- after landing checks/drills
- take-off and landing cross wind and downwind

EXERCISE 10 - TRANSITIONS FROM HOVER TO CLIMB AND APPROACH TO HOVER

LONG BRIEFING

Objectives

- to revise ground effect
- to explain translational lift and its effects
inflow roll and its effects
- to revise flapback and its effects
- to explain avoid curve diagram and associated dangers
effect/dangers of wind speed/direction during transitions
transition to climb technique
constant angle approach
transition to hover technique

AIR EXERCISE

Objectives

- to revise take-off and landing
- to demonstrate transition from hover to climb
effects of translational lift, inflow roll and flapback
constant angle approach
technique for transition from descent to hover
a variable flare simulated engine off landing

EXERCISE 11 - CIRCUIT, APPROACH AND LANDING

LONG BRIEFING

Objectives

- to explain circuit and associated procedures
take-off and climb (including checks/speeds)
cross wind leg (including checks/speeds/angles of bank in turns)
downwind leg (including pre-landing checks)
base leg (including checks/speeds/angles of bank in turns)
final approach (including checks/speeds)
effect of wind on approach and hover IGE
cross wind approach and landing technique
missed approach and go around technique (as applicable)
steep approach technique (including danger of high sink rate)
limited power approach technique (including danger of high speed at touch down)
use of the ground effect
abandoned take-off technique
hydraulic failure drills and hydraulics off landing technique (where applicable)
drills/technique for tail rotor control/tail rotor drive failure
engine failure drills in the circuit to include
engine failure
 - on take-off
 - cross wind
 - downwind
 - base leg
 - on final approachnoise abatement procedures (as applicable)

AIR EXERCISE

Objectives

- to revise transitions and constant angle approach
- to demonstrate a basic training circuit, including checks
 - cross wind approach and landing technique
 - missed approach and go around technique (as applicable)
 - steep approach technique
 - basic limited power approach/run on technique
 - use of ground effect
 - hydraulic failure and approach to touchdown with hydraulics off
 - and to recover at safe height (as applicable)
 - simulated engine failure on take-off, cross wind, downwind, base leg and finals
 - variable flare simulated engine off landing

EXERCISE 12 - FIRST SOLO

INSTRUCTORS BRIEF TO STUDENT TO INCLUDE:

- warning of change of attitude due to reduced and laterally displaced weight
 - low tail, low skid/wheel during hover/landing
 - dangers of loss of RRPM and overpitching
 - pre-take-off checks
 - into wind take-off
 - drills during and after take-off
 - normal circuit, approach and landing
 - action in the event of an emergency

EXERCISE 13 - SIDEWAYS AND BACKWARDS HOVER MANOEUVRING

LONG BRIEFING

Objectives

- to revise hovering
- to explain directional stability and weathercocking effect
 - danger of pitching nose down on recovery from backwards manoeuvring
 - helicopter limitations for sideways and backwards manoeuvring
 - effect of C of G position

AIR EXERCISE

Objectives

- to revise hovering and 90 degree clearing turns
- to demonstrate manoeuvring sideways heading into wind
 - manoeuvring backwards heading into wind
 - manoeuvring sideways and backwards heading out of wind
 - manoeuvring backwards too fast and recovery action

EXERCISE 14 - SPOT TURNS

LONG BRIEFING

Objectives

- to revise ground effect and effect of wind
- to explain weathercocking and control actions

- control of RRPM
- torque effect
- cyclic limiting stops due to C of G position (where applicable)
- rate of turn limitations
- spot turn about pilot position
- spot turn about tail rotor position
- spot turn about helicopter geometric centre
- square (safe visibility) clearing turn

AIR EXERCISE

Objectives

to demonstrate	weathercocking, torque effect and control actions
	rate of turn
	spot turn about pilot position
	spot turn about tail rotor position
	spot turn about helicopter geometric centre
	square, clearing turn

EXERCISE 15 - HOVER OUT OF GROUND EFFECT AND VORTEX RING

LONG BRIEFING

Objectives

to revise	ground effect and power required diagram
to explain	drift/height/power control/lookout/scan
	vortex ring, (including dangers, recognition and recovery actions)
	loss of tail rotor effectiveness

AIR EXERCISE

Objectives

to demonstrate	hover OGE
	drift/height/power control/lookout and instrument scan technique
	recognition of incipient stage of vortex ring/settling with power
	recovery action from incipient stage of vortex ring
	recognition of loss of tail rotor effectiveness and recovery actions

EXERCISE 16 - SIMULATED ENGINE OFF LANDINGS

LONG BRIEFING

Objectives

to revise	basic autorotation
	effect of AUM, disc loading, density altitude and RRPM decay
	use of cyclic and collective to control speed/RRPM
	torque effect
to explain	use of flare/turn to restore RRPM
	technique for variable flare simulated EOL
	technique for constant attitude simulated EOL
to revise	technique for hover/hover taxi simulated EOL
to explain	emergency technique for engine failure during transition
	technique for low level simulated EOL

AIR EXERCISE

Objectives

- to revise entry to and control in autorotation
- to demonstrate variable flare simulated EOL
constant attitude simulated EOL
hover simulated EOL
hover taxi simulated EOL
low level simulated EOL

EXERCISE 17 - ADVANCED AUTOROTATIONS

LONG BRIEFING

Objectives

- to explain effect of airspeed/AUM on angles/rates of descent
effect of RRPM setting on angle/rate of descent
reason and technique for range autorotation
reason and technique for constant attitude autorotation
reason and technique for low speed and 'S' turns in autorotation
speed/bank limitations in turns in autorotation
- to revise re-engagement/go-around procedures

AIR EXERCISE

Objectives

- to select ground marker and standard datum height to determine distance covered during various autorotation techniques
- to revise basic autorotation
- to demonstrate technique for range autorotation
technique for constant attitude autorotation
technique for low speed autorotation, including need for timely speed recovery
technique for 'S' turn in autorotation
180 and 360 degree turns in autorotation
- to revise re-engagement and go-around technique

EXERCISE 18 - PRACTICE FORCED LANDINGS

LONG BRIEFING

Objectives

- to explain types of terrain/surface options for choice of best landing area
practice forced landing procedure
forced landing checks and crash actions
rules/height for recovery and go-around

AIR EXERCISE

Objectives

- to demonstrate recognition of types of terrain from normal cruise height/altitude
practice forced landing technique
- to revise recovery/go-around technique

EXERCISE 19 - STEEP TURNS

LONG BRIEFING

Objectives

- to explain airspeed/angle of bank limitations
 technique for co-ordination to hold bank/attitude
- to revise speed/bank limitations in autorotation including RRPM control
- to explain significance of disc loading, vibration and control feedback
 effect of wind in turns at low level

AIR EXERCISE

Objectives

- to demonstrate technique for turning at 30 degrees of bank
 technique for turning at 45 degrees of bank (where possible)
 steep autorotative turns
- to explain faults in the turn - balance, attitude, bank and co-ordination
- to demonstrate effect of wind at low level

EXERCISE 20 - TRANSITIONS

LONG BRIEFING

objectives

- to revise effect of ground cushion, translational lift, flapback
- to explain training requirement for precision exercise
 technique for transition to forward flight and back to hover as precision exercise
 effect of wind

AIR EXERCISE

Objectives

- to demonstrate transition from hover to minimum 50 knots IAS and back to hover

note: select constant height (20 - 30 feet) and maintain

- to demonstrate effect of wind

EXERCISE 21 - QUICKSTOPS

LONG BRIEFING

Objectives

- to explain power control co-ordination
- to revise effect of wind
- to explain technique for quickstop into wind
 technique for quickstop from cross wind
- to revise airspeed/angles of bank limitations
- to explain technique for Emergency turn from downwind
 technique for quickstop from downwind from high speed - flare and turn
 technique for quickstop from downwind from low speed - turn and flare

note: use reasonable datum speed e.g. high speed, low speed

to explain	danger of holding flare when downwind, (vortex ring) - (minimum speed 70 knots)
to revise	danger of high disc loading

AIR EXERCISE

Objectives

to demonstrate	technique for quickstop into wind
	technique for quickstop from cross wind
	danger of vortex ring and disc loading
	technique for quickstop from downwind with low speed
	technique for quickstop from downwind with high speed
	Emergency turns from downwind

EXERCISE 22 - NAVIGATION

LONG BRIEFING - to be broken down into manageable parts at discretion of instructor

Objectives

flight planning

to explain	use of weather forecasts/actuals
	map selection, orientation, preparation and use
	route choice with particular regard to:
	controlled airspace, danger and prohibited areas
	safety altitudes
	calculations with particular regard to:
	magnetic heading(s), time(s) en route
	fuel consumption
	mass and balance
	use of flight information with particular regard to:
	NOTAM's
	radio frequencies
	selection of alternate landing sites

to revise and explain	helicopter documentation
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to explain	notification of the flight, to include
	pre-flight administration procedures
	flight plan form (where appropriate)

departure

to explain	importance of organisation of cockpit workload
	departure procedures to include
	altimeter settings
	ATC liaison in controlled/regulated airspace
	setting heading procedure
	noting of ETA's
	maintenance of height/altitude and heading
	procedure for revisions of ETA and headings to include
	10 degree line, double track, track error, closing angle
	1 in 60 rule
	amending an ETA
	log keeping
	use of radio
	use of nav aids
	weather monitoring and minimum weather conditions for continuation of flight
	significance of in flight decision making
	technique for transiting controlled/regulated airspace
	uncertainty of position procedure
	lost procedure

arrival

- to explain
 - aerodrome joining procedure, in particular
 - ATC liaison in controlled/regulated airspace
 - altimeter setting
 - entering traffic pattern
 - circuit procedures
 - parking procedures, in particular
 - security of helicopter
 - refuelling
 - closing of flight plan, (if appropriate)
 - post flight administrative procedures

navigation problems at low heights and reduced visibility

- to explain
 - actions prior to descending
 - significance of hazards, (e.g. obstacles, other traffic)
 - difficulties of map reading
 - effects of wind and turbulence
 - significance of avoiding noise sensitive areas
 - procedures for joining a circuit from low level
 - procedures for a bad weather circuit and landing

radio navigation

- to explain
 - use of VHF Omni Range, including:
 - availability, AIP, frequencies
 - selection and identification
 - omni bearing selector (OBS)
 - to/from indications, orientation
 - course deviation indicator (CDI)
 - determination of radial
 - intercepting and maintaining a radial
 - VOR passage
 - obtaining a fix from two VORs
 - use of automatic direction finding equipment (ADF)/ non-directional
 - beacons (NDBs), including:
 - availability, AIP, frequencies
 - selection and identification
 - orientation relative to beacon
 - homing
 - use of VHF direction finding (VHF/DF)
 - availability, AIP, frequencies
 - R/T procedures and ATC liaison
 - obtaining a QDM and homing
 - use of en-route/terminal radar, including:
 - availability, AIP
 - procedures and ATC liaison
 - pilots responsibilities
 - secondary surveillance radar, including:
 - transponders
 - code selection
 - interrogation and reply
 - use of distance measuring equipment (DME), including:
 - station selection and identification
 - modes of operation, including:
 - distance, groundspeed, time to run

AIR EXERCISE

Objectives

- to demonstrate navigation procedures as necessary
- to advise student and correct errors as necessary
- to demonstrate map reading techniques
 - the significance of calculations
 - revision of headings and ETA's
 - use of radio
 - use of nav aids, including ADF/NDB, VOR, VHF/DF, DME, Transponder
 - log keeping
 - importance of decision making
 - procedure to deal with uncertainty of position
 - lost procedure
 - aerodrome joining procedure
 - parking and shut-down procedures
 - post-flight administration procedures

EXERCISE 23 - ADVANCED TAKE-OFF, LANDINGS, TRANSITIONS

LONG BRIEFING

Objectives

- to revise
 - landing and takeoff out of wind (performance reduction)
 - wind limitations
 - directional stability variation when out of wind
 - power required diagram
- to explain
 - technique for downwind transitions
 - technique for vertical take-off over obstacles
 - reconnaissance technique for landing site
 - power checks
 - technique for running landing
 - technique for zero speed landing
 - technique for cross wind and downwind landings
 - steep approach, including dangers
- to revise
 - go around procedures

AIR EXERCISE

Objectives

- to demonstrate
 - technique for downwind transition
 - technique for vertical take-off over obstacles
 - reconnaissance technique for landing site
 - power check and assessment
 - technique for running landing
 - technique for zero speed landing
 - technique for cross wind and downwind landings
 - technique for steep approach
 - go around procedures

EXERCISE 24 - SLOPING GROUND

LONG BRIEFING

Objectives

- to explain
 - limitations

- wind and slope relationship, including blade and control stops
- the effect of C of G when on slope
- ground effect and power required when on slope
- landing technique when on slope, left, right and nose-up
- avoidance of dynamic rollover, dangers of soft ground and sideways movement
- dangers of overcontrolling near ground on slope
- danger of striking main/tail rotor on up slope

AIR EXERCISE

Objectives

- to demonstrate
 - technique for assessing slope angle
 - technique for landing/take-off left skid up slope
 - technique for landing/take-off right skid up slope
 - technique for landing nose up slope
 - dangers of overcontrolling near ground

EXERCISE 25 - LIMITED POWER

LONG BRIEFING

Objectives

- to explain
 - use of appropriate helicopter performance graphs
 - selection of technique according to available power
 - effect of wind on available power

AIR EXERCISE

Objectives

- to revise and refine techniques demonstrated in Exercise 23

EXERCISE 26 - CONFINED AREAS

LONG BRIEFING

Objectives

- to revise
 - use of helicopter performance graphs
- to explain
 - procedure for locating landing site and selecting site marker
 - procedures for assessing wind speed/direction
 - landing site reconnaissance techniques
 - reason for selecting landing markers
 - procedure for selecting direction and type of approach
 - dangers of out of wind approach
 - circuit procedures
 - reason for approach to committal point and go around, (practice approach)
 - approach technique
- to revise
 - clearing turn and landing, (sloping ground technique)
- to explain
 - hover power check/performance assessment IGE and OGE, (if necessary)
 - take-off procedures

AIR EXERCISE

Objectives

- to demonstrate
 - procedure for locating landing site and selecting site marker
 - procedure for assessing wind speed/direction
 - landing site reconnaissance techniques

	selecting landing markers, direction and type of approach
	circuit procedure
to revise	practice approach, go around and approach technique
to demonstrate	clearing turn and landing, (sloping ground technique)
	hover power check/performance assessment IGE and OGE, (if necessary)
	take-off procedures

EXERCISE 27 - BASIC INSTRUMENT FLIGHT

LONG BRIEFING

Objectives

to explain	physiological sensations
	instrument appreciation
	attitude instrument flight
	instrument scan
	instrument limitations
	basic manoeuvres by sole reference to instruments, including:
	straight and level flight at various airspeeds and configurations
	climbing and descending
	standard rate turns, climbing and descending , onto selected headings
	recoveries from climbing and descending turns (unusual attitudes)

AIR EXERCISE

Objectives

to demonstrate	attitude instrument flight and instrument scan
	basic manoeuvres by sole reference to instruments, including:
	straight and level flight at various airspeeds and configurations
	climbing and descending
	standard rate turns, climbing and descending, onto selected headings
	recoveries from climbing and descending turns (unusual attitudes)

EXERCISE 28 - NIGHT FLYING (if night instructional qualification required)

LONG BRIEFING

Objectives

to explain	medical/physiological aspects of night vision
	requirement for torch to be carried, (pre-flight inspection, etc.)
	use of the landing light
	take-off and hover taxi procedures at night
	night take-off procedure
	cockpit procedures at night
	approach techniques
	night landing techniques
	night autorotation techniques (power recovery at safe height)
	technique for practice forced landing at night (using appropriate illumination)
	Emergency procedures at night
	navigation principles at night
	map marking for night use, (highlighting built up/lit areas with thicker lines, etc.)

AIR EXERCISE

Objectives

to demonstrate

- use of torch for pre-flight inspection
- use of landing light
- night take-off to hover, (no sideways or backwards movement)
- night hover taxi, (higher and slower than by day)
- night transition procedure
- night circuit
- night approach and landing, (including use of landing light)
- night autorotation (power recovery at safe height)
- practice forced landing at night, (using appropriate illumination)
- night Emergency procedures
- night cross country techniques, as appropriate

[Amdt.1, 01.12.00; Amdt.2, 01.11.02; Amdt.4, 01.08.06; Amdt.5, 01.12.06]

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IEM FCL 2.3[][20G]**Flight instructor rating (Helicopter) (FI(H)) – Revalidation and renewal form**

(See JAR–FCL 2.3[][20G])

INSTRUCTIONAL FLYING EXPERIENCE []	
<i>Instructors applying for revalidation of the Flight Instructor Rating should enter the instructional hours flown during the preceding 36 months.</i>	
INSTRUMENT:	
Total instructional hours (preceding. 36 months):	
Total instructional hours (preceding. 12 months):	

FLIGHT INSTRUCTOR REFRESHER SEMINAR []	
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1	This is to certify that the undersigned attended a Flight Instructor Seminar approved by the Authority
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2	Attendees personal particulars:	
Name:		Address:
Licence number:		Exp. date of FI(H) rating:

3	Seminar particulars:	
Date/s of seminar:		Place:

4	Declaration by the responsible organiser:			
<i>I certify that the above data are correct and that the Flight Instructor Seminar was carried out as approved by the Authority.</i>				
Date of approval:		Name of organiser: (block letters)		
Date and place:		Signature:		
5	Declaration by the attendee:			
<i>I confirm the data under 1 through 3</i>				
Attendee's signature:				

PROFICIENCY CHECK []	
<p>.....(Name of applicant) has given proof of flying instructional ability during a proficiency check flight. This was done to my satisfaction.</p>	
Flying time:	Helicopter/Flight simulator used:
Main exercise:	
Name of FIE:	Licence number:
<p>Date and place:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Signature:</p> </div>	

[Amdt.5, 01.12.06]

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AMC FCL 2.320(a)(2) (was first AMC FCL 2.355(a)(2))

Instructor Refresher Seminar

(See JAR-FCL 2.320G)

1 FI/IRI refresher seminar made available in JAA member States should have due regard to geographical location, numbers attending, and periodicity throughout the State concerned.

2 Such seminars should run for at least two days, and attendance from participants will be required for the whole duration of the seminar including breakout groups/workshops. Different aspects, such as inclusion of participants holding ratings in other categories of aircraft should be considered.

3 Some experienced FIs/IRIs currently involved with flying training and with a practical understanding of the revalidation requirements and current instructional techniques should be included as speakers at these seminars.

4 The attendance form (see IEM FCL 2.355) will be completed and signed by the organiser of the seminar, as approved by the Authority, following attendance and satisfactory participation by the FI/IRI.

5 The content of the FI/IRI refresher seminar should be selected from the following:

- a. new and/or current rules/regulations, with emphasis on knowledge of JAR-FCL and JAR-OPS requirements;
- b. teaching and learning;
- c. instructional techniques;
- d. the role of the instructor;
- e. national regulations (as applicable);
- f. human factors;
- g. flight safety, incident and accident prevention;
- h. airmanship;
- i. legal aspects and enforcement procedures;
- j. navigational skills including new/current radio navigation aids;
- k. teaching instrument flying;
- l. weather related topics including methods of distribution; and
- m. any additional topic is selected by the Authority.

Formal sessions should allow for a presentation time of 45 minutes, with 15 minutes for questions. The use of visual aids is recommended, with interactive video and other teaching aids (where available) for breakout groups/workshops.

[Amdt.1, 01.12.00; Amdt.4, 01.08.06]

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AMC FCL 2.365 (New paragraph JAR-FCL 2.330B)

[Amdt.2, 01.11.02; Amdt.4, 01.08.06]

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AMC FCL 2.340C

Course for the instrument rating instructor rating (helicopter) (IRI(H))

(See JAR-FCL 2.340C)

((See Appendix 1 to JAR-FCL 2.340C)

COURSE OBJECTIVE

1 The IRI(H) course should give particular stress to the role of the individual in relation to the importance of human factors in the man-machine environment. Special attention should be paid to the applicant's levels of maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

2 With the exception of the section on Teaching and Learning, all the subject detail contained in the Theoretical knowledge and Flight Training Syllabus is complementary to the Instrument Rating Course Syllabus which should already be known by the applicant. Therefore the objective of the course is to:

- a. refresh and bring up to date the technical knowledge of the student instructor;
- b. train pilots in accordance with the requirements of the modular instrument flying training course (see Appendix 1 to JAR-FCL 2.205);
- c. enable the applicant to develop the necessary instructional techniques required for teaching of instrument flying, radio navigation and instrument procedures to the level required for the issue of an IR; and
- d. ensure that the student instrument instructor's flying is of a sufficiently high standard.

3 Some of the air exercise in Part Three – Flight Training Syllabus of this AMC may be combined in the same flight.

4 During the course, the applicants should be made aware of their own attitudes to the important aspect of flight safety. Improving safety awareness should be a fundamental objective throughout the course. It will be of major importance for the course of training to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor's task and to achieve this, the course curriculum, in terms of objectives should comprise at least the following areas.

PART 1

TEACHING AND LEARNING

Item No

1 THE LEARNING PROCESS

Motivation
Perception and understanding
Memory and its application
Habits and transfer
Obstacles to learning
Incentives to learning
Learning methods
Rates of learning

2 THE TEACHING PROCESS

Elements of effective teaching
Planning of instructional activity
Teaching methods
Teaching from the 'known' to the 'unknown'
Use of 'lesson plans'

3 TRAINING PHILOSOPHIES

Value of a structured (approved) course of training
Importance of a planned syllabus
Integration of theoretical knowledge and flight training

4 TECHNIQUES OF APPLIED INSTRUCTION

- a. THEORETICAL KNOWLEDGE – Classroom instruction techniques
 - Use of training aids
 - Group lectures
 - Individual briefings
 - Student participation/discussion
- b. FLIGHT – Airborne instruction techniques
 - The flight/cockpit environment
 - Techniques of applied instruction
 - Post flight and in-flight judgement and decision making

5 STUDENT EVALUATION AND TESTING

- a. Assessment of student performance
 - The function of progress tests
 - Recall of knowledge
 - Translation of knowledge into understanding
 - Development of understanding into actions
 - The need to evaluate rate of progress
- b. Analysis of student errors
 - Establish the reason for errors
 - Tackle major faults first, minor faults second
 - Avoidance of over criticism
 - The need for clear concise communication

6 TRAINING PROGRAMME DEVELOPMENT

Lesson planning
Preparation
Explanation and demonstration
Student participation and practice
Evaluation

7 HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FIGHT INSTRUCTION

Physiological factors
Psychological factors
Human information processing
Behavioural attitudes
Development of judgement and decision making

8 HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE HELICOPTER DURING FLIGHT

Selection of a safe altitude (i.e. SE operation with low or no power)
Importance of 'touch drills'

Situational awareness
Adherence to correct procedures

9 TRAINING ADMINISTRATIONS

Flight/theoretical knowledge training records
Pilot's personal flying log book
The flight/theoretical knowledge curriculum
Study material
Official forms
Aircraft Flight/Owner's Manuals/Pilot's Operating Handbooks
Flight authorization papers
Aircraft documents
The Instrument Pilot's rating regulations

PART 2

THEORETICAL KNOWLEDGE INSTRUCTION SYLLABUS

The theoretical subjects covered below should be used to develop the instructor's teaching skills. The items selected should relate to the student's background and should be applied to training for an IR(H).

GENERAL SUBJECTS

PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS

The Senses
Spatial Disorientation
Sensory Illusions
Stress

FLIGHT INSTRUMENTS

Airspeed Indicator
Altimeter
Vertical Speed Indicator
Attitude Indicator
Heading Indicator
Turn and [Slip] Indicator[]
Magnetic Compass

In relation to the above instruments the following items should be covered:

Principles of Operation
Errors and in-flight Serviceability Checks
System Failures

RADIO NAVIGATION AIDS

Basic Radio Principles
Use of VHF R/T Channels
The Morse Code
Basic Principles of Radio Aids

VHF Omni Range (VOR)

Ground and Helicopter Equipment

Non Directional Beacons (NDB[])

VHF Direction Finding (VHF/DF)

Ground and Helicopter Equipment

Radio Detection and Ranging (RADAR)

Ground Equipment

Primary Radar

Secondary Surveillance Radar

Helicopter Equipment

Transponders

Precision Approach System

Other Navigational Systems (as applicable) in current Operational use

Ground and Helicopter Equipment

Distance Measuring Equipment (DME)

Ground and Helicopter Equipment

Marker Beacons

Ground and Helicopter Equipment

Pre-Flight Serviceability Checks

Range, Accuracy and Limitations of Equipment

FLIGHT PLANNING CONSIDERATIONS

AERONAUTICAL INFORMATION PUBLICATIONS

The course of training should cover the items listed below, but the applicant's aptitude and previous aviation experience should be taken into account when determining the amount of instructional time allotted.

Although a number of items contained under this heading are complementary to those contained in the PPL/CPL/IR syllabi, the instructor should ensure that they have been covered during the applicant's training and due allowance should be made for the time needed to revise these items as necessary.

The Aeronautical Information Publication

NOTAM Class 1 and 2

Aeronautical Information Circulars

Information of an Operational Nature

The Rules of the Air and Air Traffic Services (RAC)

Visual Flight Rules and Instrument Flight Rules

Flight Plans and ATS Messages

Use of Radar in Air Traffic Services

Radio Failure

Classification of Airspace

Airspace Restrictions and Hazards

Holding and Approach to Land Procedures

Precision Approaches/Non Precision Approaches

Radar Approach Procedures

Missed Approach Procedures

Visual Manoeuvring after an Instrument Approach

Conflict Hazards in Uncontrolled Airspace

Communications

Types of Services

Extraction of AIP Data Relating to Radio Aids

Charts Available
En-route
Departure and Arrival
Instrument Approach and Landing
Amendments, Corrections and Revision Service

FLIGHT PLANNING GENERAL

The Objectives of Flight Planning
Factors Affecting Helicopter and Engine Performance
Selection of Alternate(s)
Obtaining Meteorological Information
Services Available
Met Briefing
[Telephone or Electronic Data Processing]
Actual Weather Reports (TAFs, METARs, SIGMET and ATIS)
The Route Forecast
The Operational Significance of the Meteorological Information Obtained (including Icing, Turbulence and Visibility)
Altimeter Considerations
Definitions of
Transition Altitude
Transition Level
Flight Level
QNH
Regional QNH
Standard Pressure Setting
QFE
Altimeter Setting Procedures
Pre-Flight Altimeter Checks
Take off and Climb
En-Route
Approach and Landing
Missed Approach
Terrain Clearance
Selection of a Minimum Safe En-Route Altitude
Instrument Flight Rules
Preparation of Charts
Choice of Routes and Flight Levels
Compilation of Flight Plan/Log Sheet
Log Sheet Entries
Navigation Ground Aids to be used
Frequencies/[Identification]
Radials and Bearings
Tracks and Fixes
Safety Altitude(s)
Fuel Calculations
ATC Frequencies (VHF)
Tower, Approach, En-Route, Radar, FIS, ATIS, and weather reports
Minimum [] Sector Altitudes [] at Destination and Alternate Aerodromes
Determination of Minimum Safe Descent Heights/Altitudes (Decision Heights) at Destination and Alternate Aerodromes

THE PRIVILEGES OF THE INSTRUMENT RATING

Outside Controlled Airspace

Within Controlled Airspace

Period of Validity and Renewal Procedures

PART 3

FLIGHT INSTRUCTION SYLLABUS CONTENTS

LONG BRIEFINGS AND AIR EXERCISES

- 1 Instrument Flying (For revision as deemed necessary by the Course Instructor)
- 2 Instrument Flying (Advanced)
- 3 Radio Navigation (Applied Procedures) – use of VOR
- 4 Radio Navigation (Applied Procedures) – use of NDB
- 5 Radio Navigation (Applied Procedures) – use of VHF/DF
- 6 Radio Navigation (Applied Procedures) – use of DME
- 7 Radio Navigation (Applied Procedures) – use of Transponders
- 8 Radio Navigation (Applied Procedures) – use of En-Route Radar Services
- 9 Pre-Flight and Aerodrome Departure and Arrival Procedures
- 10 Instrument Approach – precision approach aid to Specified Minima- Missed Approach Procedures
- 11 Instrument Approach – non-precision approach to Specified Minima- Missed Approach Procedures
- 12 Radio navigation (Applied Procedures) – use of GPS (to be developed)

LONG BRIEFING 1

INSTRUMENT FLYING (Basic)

Flight Instruments

Physiological Considerations

Instrument Appreciation

Attitude Instrument Flight

Pitch Indications

Bank Indications

Different Instrument Presentations

Introduction to the Use of the Attitude Indicator

Pitch Attitude

Bank Attitude

Maintenance of Heading and Balanced flight

Instrument Limitations (inc System Failures)

ATTITUDE, POWER & PERFORMANCE

Attitude Instrument Flight

Control Instruments
Performance Instruments
Effect of Changing Power
Cross Checking the Instrument Indications
Instrument Interpretation
Direct and Indirect Indications (Performance Instruments)
Instrument Lag
Selective Radial Scan

THE BASIC FLIGHT MANOEUVRES (FULL PANEL)

Straight and Level Flight at Various Airspeeds
Climbing
Descending
Standard Rate Turns
Level, Climbing and Descending On to Pre-Selected Headings

AIR EXERCISE 1

INSTRUMENT FLYING (Basic)

Physiological Sensations
Instrument Appreciation
Attitude Instrument Flight
Pitch Attitude
Bank Attitude
Maintenance of Heading and Balanced Flight
Attitude Instrument Flight
Effect of Changing Power
Cross Checking the Instruments
Selective Radial Scan

THE BASIC FLIGHT MANOEUVRES (FULL PANEL)

Straight and Level Flight at various Airspeeds and Helicopter Configurations
Climbing
Descending
Standard Rate Turns
Level, Climbing and Descending on to Pre-Selected Headings
[Manoeuvring at minimum and maximum IMC speed]

LONG BRIEFING 2

INSTRUMENT FLYING (Advanced)

Full Panel
30 degrees Level Turns
Unusual Attitudes – Recoveries
Transition to Instruments after Take-off
Limited Panel
Basic Flight Manoeuvres

Unusual Attitudes – Recoveries

AIR EXERCISE 2

Full Panel

30 degrees Level Turns

Unusual Attitudes – Recoveries

Identification and Recovery from Low Pitch Steep Bank and High Pitch Steep Bank Attitudes (at low and high power settings)

Limited Panel

Repeat of the Above Exercises

LONG BRIEFING 3

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VOR (VHF OMNI RANGE)

Availability of VOR Stations En-Route

Station Frequencies and Identification

Signal Reception Range

Effect of Altitude

VOR Radials

Use of Omni Bearing Selector

To/From Indicator

Orientation

Selecting Radials

Intercepting a Pre-Selected Radial

Assessment of Distance to Interception

Effects of Wind

Maintaining a Radial

Tracking To/From a VOR Station

Procedure Turns

Station Passage

Use of Two Stations for Obtaining a Fix

Pre-Selecting Fixes Along a Track

Assessment of Ground Speed and Timing

Holding Procedures

Various Entries

Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 3

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VOR (VHF OMNI RANGE)

Station Selection and Identification

Orientation

Intercepting a Pre-Selected Radial

R/T Procedures and ATC Liaison

Maintaining a Radial Inbound

Recognition of Station Passage

Maintaining a Radial Outbound

Procedure Turns

Use of Two Stations to Obtain a Fix Along the Track

Assessment of Ground Speed and Timing

Holding Procedures/Entries
Holding at a Pre-Selected Fix
Holding at a VOR Station

LONG BRIEFING 4

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF ADF (AUTOMATIC DIRECTION FINDING EQUIPMENT)

Availability of NDB (Non Directional Beacons) Facilities En-Route
Location, Frequencies, Tuning (as applicable) and Identification Codes
AMC FCL 2.395 (continued)
Signal Reception Range
Static Interference
Night Effect
Station Interference
Mountain Effect
Coastal Refraction
Orientation in Relation to a NDB
Homing
Intercepting a Pre-Selected Magnetic Bearing and Tracking Inbound
Station Passage
Tracking Outbound
Time/Distance Checks
Use of Two NDBs to Obtain a Fix or alternatively use of One NDB and One other Navaid
Holding Procedures
Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 4

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF ADF (AUTOMATIC DIRECTION FINDING EQUIPMENT)

Selecting, Tuning and Identifying a NDB
ADF Orientation
Communication (R/T Procedures and ATC Liaison)
Homing
Tracking Inbound
Station Passage
Tracking Outbound
Time/Distance Checks
Intercepting a Pre-Selected Magnetic Bearing
Determining the Helicopter's position from Two NDBs or alternatively from One NDB and One Other Navaid
ADF Holding Procedures

LONG BRIEFING 5

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VHF/DF (Very High Frequency/Direction Finding)

Availability of VHF/DF Facilities En-Route

Location, Frequencies, Station Call Signs and Hours of Operation

Signal and Reception Range

Effect of Altitude

Communication (R/T Procedures and ATC Liaison)

Obtaining and Using Types of Bearings, e.g. QTE, QDM, QDR

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

AIR EXERCISE 5

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VHF/DF (Very High Frequency/Direction Finding)

Establishing Contact with a VHF/DF Station

R/T Procedures and ATC Liaison

Obtaining and Using a QDR and QTE

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

LONG BRIEFING 6

USE OF DME (Distance Measuring Equipment)

Availability of DME Facilities

Location, Frequencies and Identification Codes

Signal Reception Range

Slant Range

Use of DME to obtain Distance, Groundspeed and Timing

Use of DME to obtain a Fix

AIR EXERCISE 6

USE OF DME (Distance Measuring Equipment)

Station Selection and Identification

Use of Equipment Functions

Distance

Groundspeed

Timing

DME Arc Approach

DME Holding

LONG BRIEFING 7

USE OF TRANSPONDERS (SSR)

Operation of Transponders
Code Selection Procedure
Emergency Codes
Precautions when using Airborne Equipment

AIR EXERCISE 7

USE OF TRANSPONDERS (SSR)

Operation of Transponders

AMC FCL 2.395 (continued)
Types of Transponders
Code Selection Procedure
Emergency Codes
Precautions when Selecting the Required Code

LONG BRIEFING 8

USE OF EN-ROUTE RADAR

Availability of Radar Services
Location, Station Frequencies, Call Signs and Hours of Operation
AIP and NOTAMS
Provision of Service
Communication (R/T, Procedures and ATC Liaison)
Airspace Radar Advisory Service
Emergency Service
Aircraft Separation Standards

AIR EXERCISE 8

USE OF EN-ROUTE RADAR

Communication (R/T Procedures and ATC Liaison)
Establishing the Service Required and Position Reporting
Method of Reporting Conflicting Traffic
Terrain Clearance

LONG BRIEFING 9

PRE-FLIGHT AND AERODROME DEPARTURE

Determining the Serviceability of the Radio equipment
Navigation Equipment
Obtaining the Departure Clearance
Setting up Radio Nav aids prior to Take-off e.g. VOR Frequencies, Required Radials, etc
Aerodrome Departure Procedures, Frequency Changes

Altitude and Position Reporting as Required

Standard Instrument Departure Procedures (SIDs)
Obstacle Clearance Considerations

AIR EXERCISE 9

PRE-FLIGHT AND AERODROME DEPARTURE

Radio Equipment Serviceability Checks
Departure Clearance
Navaid Selection
Frequencies, Radials, etc
Aerodrome Departure Checks, Frequency Changes, Altitude and Position Reports
Standard Instrument Departure Procedures (SIDs)

LONG BRIEFING 10

INITIAL/INTERMEDIATE/FINAL APPROACH PROCEDURES

AMC FCL 2.395 (continued)
Precision Approach Charts
Approach to the Initial Approach Fix and Minimum Sector Altitude
Navaid Requirements, e.g. Radar, ADF, etc
Communication (ATC Liaison and R/T Phraseology)
Review:
Holding Procedure
The Final Approach Track
Forming a Mental Picture of the Approach
Completion of Aerodrome Approach Checks
Initial Approach Procedure
Selection of the ILS Frequency and Identification
Obstacle Clearance Altitude/Height
Operating Minima
Achieving the Horizontal and Vertical Patterns
Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix to the Aerodrome
Use of DME (as applicable)
Go Around and Missed Approach Procedure
Review of the Published Instructions
Transition from Instrument to Visual Flight (Sensory Illusions)

VISUAL MANOEUVRING AFTER AN INSTRUMENT APPROACH

Circling Approach
Visual Approach to Landing

AIR EXERCISE 10

PRECISION APPROACH PROCEDURE

Initial Approach to the ILS
Completion of Approach Planning
Holding Procedure
Frequency Selection and Identification of ILS
Review of the Published Procedure and Minimum Sector Altitude
Communication (ATC Liaison and R/T Phraseology)
Determination of Operating Minima and Altimeter Setting
Weather Consideration, e.g. Cloud Base and Visibility
Availability of Landing site Lighting
ILS Entry Methods
Radar Vectors

Procedural Method

Assessment of Approach Time from the Final Approach Fix to the Aerodrome

Determination of:

The Descent Rate on Final Approach

The Wind Velocity at the Surface and the Length of the Landing Site

The Obstruction Heights to be borne in mind during Visual manoeuvring after an Instrument Approach

Circling approach

The Approach:

At the Final Approach Fix

Use of DME (as applicable)

ATC liaison

Note Time and establish Airspeed and Descent Rate

Maintaining the Localizer and Glide Path

Anticipation in Change of Wind Velocity and its Effect on Drift

Decision Height

Landing Direction

Go Around and Missed Approach Procedure

Transition from Instrument to Visual Flight

Circling Approach

Visual Approach to Landing

LONG BRIEFING 11

NON-PRECISION APPROACH PROCEDURE

Non-Precision Approach Charts

Initial Approach to the Initial Approach Fix and Minimum Sector Altitude

ATC Liaison

Communication (ATC Procedures and R/T Phraseology)

Approach Planning:

Holding Procedure

The Approach Track

Forming a Mental Picture of the Approach

Initial Approach Procedure

Operating Minima

Completion of Approach Planning

Achieving the Horizontal and Vertical Patterns

Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix (FAF) to the Aerodrome

Use of DME (as applicable)

Go Around and Missed Approach Procedure

Review of the Published Instructions

Transition from Instrument to Visual Flight (Sensory Illusions)

Visual Manoeuvring after an Instrument Approach

Circling Approach

Visual Approach to Landing

AIR EXERCISE 11

NON-PRECISION APPROACH PROCEDURE

Completion of Approach Planning including

Determination of:

Descent Rate from the Final Approach Fix

The Wind Velocity at the Surface and Length of the Landing site

The Obstruction Heights to be Borne in Mind During Visual Manoeuvring after an Instrument Approach
Circling Approach
Go Around and Missed Approach Procedure
Initial Approach
Frequency Selection and Identification
Review of the Published Procedure and Minimum Safe Sector Altitude
ATC liaison and R/T Phraseology
Determination of Decision Height and Altimeter Setting
Weather Considerations, e.g. Cloud Base and Visibility
Availability of Landing site Lighting
Determination of Inbound Track
Assessment of Time from Final Approach Fix to the Missed Approach Point
ATC Liaison
The Outbound Procedure (incl. Completion of Pre-Landing Checks)
The Inbound Procedure
Re-Check of Identification Code
Altimeter Setting Re-Checked
The Final Approach
Note Time and Establish Airspeed and Descent Rate
Maintaining the Final Approach Track
Anticipation of Change in Wind Velocity and its Effect on the Drift
Minimum Descent Altitude/Height
Landing site Direction
Go Around and Missed Approach Procedure
Transition from Instrument to Visual Flight (Sensory Illusions)
Visual Approach

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AMC/IEM I – EXAMINERS

AMC FCL 2.425

Standardisation arrangements for examiners

[(See Appendix 1 to JAR-FCL 2.425)]

General

1 The standards of competence of pilots depends to a great extent on the competence of examiners. Examiners will be briefed by the Authority on the JAR–FCL requirements, the conduct of skill tests and proficiency checks, and their documentation and reporting. Examiners should also be briefed on the protection requirements for personal data, liability, accident insurance and fees, as applicable in the JAA member State concerned.

[]

EXAMINER AUTHORISATION

[2] Any dispensation from the qualification requirements of JAR–FCL 2.425(a) through (c) should be limited to circumstances in which a fully qualified examiner cannot be made available. Such circumstances may, for example, include skill tests on a new or rare type, for which the examiner should at least hold an instructor rating on a helicopter having the same kind and number of rotors/engines and of the same order of mass.

[3] Inspectors of the Authority supervising examiners should ideally meet the same requirements as the examiners being supervised. However, it is unlikely that they could be so qualified on the large variety of types and tasks for which they have a responsibility and, since they normally only observe training and testing, it is acceptable if they are qualified for the role of inspector.

[4] The standardisation arrangements should include, as appropriate to the role of the examiner, at least the following instruction:

- (i) those national requirements relevant to their examination duties;
- (ii) fundamentals of human performance and limitations relevant to flight examination;
- (iii) fundamentals of evaluation relevant to examinee's performance;
- (iv) JAR-FCL, related JARs and Joint Implementation Procedures (JIP)
- (v) Quality System as related to JAR-FCL; and
- (vi) Multi-crew co-operation (MCC), Human Performance and Limitations, if applicable.

The Authority will employ, or have available, a sufficient number of inspectors or senior examiners to conduct, supervise and/or inspect the standardisation arrangements according to JAR-FCL 2.425(c).

LIMITATIONS

[5] An examiner should plan per working day not more than three test checks relating to PPL, CPL, IR rating, or more than two test/checks relating to FI, CPL/IR and ATPL or more than four tests/checks relating to type/rating.

[6] An examiner should plan at least three hours for a PPL, CPL, IR rating test/checks, and at least four hours for FI, ATPL or type rating tests/checks, including pre-flight briefing and preparation, conduct of the test/check, de-briefing and evaluation of the applicant and documentation.

[7] An examiner should allow an applicant adequate time to prepare for a test/check, normally not more than one hour.

[8] An examiner should plan a test/check flight so that the flight time in a helicopter or ground time in an approved synthetic training device is not less than:

- (a) 90 minutes for PPL and CPL, including navigation section;
60 minutes for IR, FI and single pilot type rating; and
120 minutes for ATPL.

PURPOSE OF A TEST/CHECK

- [9] Determine through practical demonstration during a test/check that an applicant has acquired or maintained the required level of knowledge and skill/proficiency;
- [10] Improve training and flight instruction in registered facilities, FTOs and TRTOs by feedback of information from examiners concerning items/sections of tests/checks that are most frequently failed;
- [11] Assist in maintaining and, where possible, improving air safety standards by having examiners display good airmanship and flight discipline during tests/checks.

JAR-FCL STANDARDS

- [12] It is essential that examiners consistently apply JAR-FCL standards during a test/check. However, as the circumstances of each test/check conducted by an examiner may vary, it is also important that an examiner's test/check assessment takes into account any adverse condition(s) encountered during the test/check.

CONDUCT OF TEST/CHECK

- [13] An examiner will ensure that an applicant completes a test/check in accordance with JAR-FCL requirements and is assessed against the required test/check standards.
- [14] (To be developed.)
- [15] Marginal or questionable performance of a test/check item should not influence an examiner's assessment of any subsequent items.
- [16] An examiner should verify the requirements and limitations of a test/check with an applicant during the pre-flight briefing.
- [17] When a test/check is completed or discontinued, an examiner should de-brief the applicant and give reasons for items/sections failed. In the event of a failed or discontinued skill test or proficiency check, the examiner should provide appropriate advice to assist the applicant in re-tests/re-checks.
- [18] Any comment on, or disagreement with, an examiner's test/check evaluation/assessment made during a debrief will be recorded by the examiner on the test/check report, and will be signed by the examiner and countersigned by the applicant. The same examiner should not re-examine a failed applicant without the agreement of the applicant.

EXAMINER PREPARATION

- [19] An examiner should supervise all aspects of the test/check flight preparation, including, where necessary, obtaining or assuring an ATC "slot" time.
- [20] An examiner will plan a test/check in accordance with JAR-FCL requirements. Only the manoeuvres and procedures set out in the appropriate test/check form will be undertaken. The same examiner should not re-examine a failed applicant without the agreement of the applicant.

EXAMINER APPROACH

- [21] An examiner should encourage a friendly and relaxed atmosphere to develop both before and during a test/check flight. A negative or hostile approach should not be used. During the test/check flight, the examiner should avoid negative comments or criticisms and all assessments should be reserved for the de-briefing.

ASSESSMENT SYSTEM

- [22] Although test/checks may specify flight test tolerances, an applicant should not be expected to achieve these at the expense of smoothness or stable flight. An examiner should make due allowance for unavoidable deviations due to turbulence, ATC instructions, etc.. An examiner should terminate a test/check only for the purpose of assessing the applicant, or for safety reasons. An examiner will use one of the following terms for assessment:

- (a) A “pass”, provided the applicant demonstrates the required level of knowledge, skill/proficiency and, where applicable, remains within the flight test tolerances for the licence or rating; or
- (b) A “fail”, provided that any of the following apply:
- (i) the flight test tolerances have been exceeded after the examiner has made due allowance for turbulence or ATC instructions;
 - (ii) the aim of the test/check is not completed;
 - (iii) the aim of exercise is completed but at the expense of unsafe flight, violation of a rule or regulation, poor airmanship or rough handling;
 - (iv) an acceptable level of knowledge is not demonstrated;
 - (v) an acceptable level of flight management is not demonstrated; or
 - (vi) the intervention of the examiner or safety pilot is required in the interest of safety.
- (c) A “partial pass” in accordance with the criteria shown in the relevant skill test appendix of JAR-FCL.

METHOD AND CONTENTS OF THE TEST/CHECK

[23] Before undertaking a test/check an examiner will verify that the helicopter or synthetic training device intended to be used, is suitable and appropriately equipped for the test/check. Only helicopters or synthetic training devices approved by the Authority for skill testing/proficiency checking may be used.

[24] A test/check flight will be conducted in accordance with the aircraft flight manual (AFM) and, if applicable, the aircraft operators manual (AOM).

[25] A test/check flight will be conducted within the limitations contained in the operations manual of a FTO/TRTO and, where applicable, the operations manual of a registered facility.

[26] Contents

- (a) A test/check is comprised of:
- oral examination on the ground (where applicable);
 - pre-flight briefing;
 - in-flight exercises; and
 - post-flight de-briefing
- (b) Oral examination on the ground should include:
- aircraft general knowledge and performance;
 - planning and operational procedures; and
 - other relevant items/sections of the test/check
- (c) Pre-flight briefing should include:
- test/check sequence;
 - power setting and speeds; and
 - safety considerations
- (d) In-flight exercises will include:
- each relevant item/section of the test/check
- (e) Post-flight de-briefing should include:
- assessment/evaluation of the applicant
 - documentation of the test/check with the applicants instructor present, if possible.

[27] A test/check is intended to simulate a practical flight. Accordingly, an examiner may set practical scenarios for an applicant while ensuring that the applicant is not confused and air safety is not compromised.

[28] An examiner should maintain a flight log and assessment record during the test/check for reference during the post/flight de-brief.

[29] An examiner should be flexible to the possibility of changes arising to pre-flight briefs due to ATC instructions, or other circumstances affecting the test/check.

[30] Where changes arise to a planned test/check an examiner should be satisfied that the applicant understands and accepts the changes. Otherwise, the test/check flight should be terminated.

[31] Should an applicant choose not to continue a test/check for reasons considered inadequate by an examiner, the applicant will be assessed as having failed those items/sections not attempted. If the test/check is terminated for reasons considered adequate by the examiner, only these items/sections not completed will be tested during a subsequent test/check.

[32] At the discretion of the examiner, any manoeuvre or procedure of the test/check may be repeated once by the applicant. An examiner may terminate a test/check at any stage, if it is considered that the applicant's competency requires a complete re-test/re-check.

[Amdt. 1, 01.12.00; Amdt. 2, 01.11.02]

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IEM FCL 2.425

Notes for guidance and training of type rating examiners (TREs)

(See JAR–FCL 2.425(c))

1 The following guidance material is intended for applicants seeking authorisation to act as a TRE. The related ‘Skill test and training record’ should also be referred to and consideration given to single-pilot/multi-pilot flight.

2 An inspector of the Authority, or a senior examiner, will observe all TRE applicants conducting a test on a ‘candidate’ in a helicopter for which TRE authorisation is sought. Items from the ‘Syllabi for training and skill tests/proficiency checks for type rating’ at Appendix 2 to JAR–FCL 2.240 will be selected by the inspector for examination of the ‘candidate’ by the TRE applicant. Having agreed with the inspector the content of the test, the TRE applicant will be expected to manage the entire test. This will include briefing, the conduct of the flight, assessment and debriefing of the ‘candidate’. The inspector will discuss the assessment with the TRE applicant before the ‘candidate’ is debriefed and informed of the result.

3 It is intended that all applicants for a TRE authorisation should have received some formal training for this purpose before undertaking a test flight with an inspector. The training should be acceptable to the inspector observing the applicant.

BRIEFING THE ‘CANDIDATE’

4 The ‘candidate’ should be given time and facilities to prepare for the test flight. The briefing should cover the following:-

- a. the objective of the flight
- b. licensing checks, as necessary
- c. freedom for the ‘candidate’ to ask questions
- d. operating procedures to be followed (e.g. operators manual)
- e. weather assessment
- f. operating capacity of ‘candidate’ and examiner
- g. aims to be identified by ‘candidate’
- h. simulated weather assumptions (e.g. icing, cloud base)
- i. contents of exercise to be performed
- j. agreed speed and handling parameters (e.g. V-speeds, bank angle)
- k. use of R/T
- l. respective roles of ‘candidate’ and examiner (e.g. during emergency)
- m. administrative procedures (e.g. submission of flight plan) in flight

5 The TRE applicant should maintain the necessary level of communication with the ‘candidate’. The following check details should be followed by the TRE applicant:

- a. involvement of examiner in a multi-pilot operating environment
- b. the need to give the ‘candidate’ precise instructions
- c. responsibility for safe conduct of the flight
- d. intervention by examiner, when necessary
- e. use of screens
- f. liaison with ATC and the need for concise, easily understood intentions
- g. prompting the ‘candidate’ regarding required sequence of events (e.g. following a go-around)
- h. keeping brief, factual and unobtrusive notes

ASSESSMENT

6 The TRE applicant should refer to the flight test tolerances given in Appendix 1 to JAR-FCL 2.210, 'Instrument rating (helicopter) – Skill test'. Attention should be paid to the following points:

- a. questions from the 'candidate'
- b. give results of the test and any sections failed
- c. give reasons for failure

DEBRIEFING

7 The TRE applicant should demonstrate to the inspector the ability to conduct a fair, unbiased, debriefing of the 'candidate' based on identifiable factual items. A balance between friendliness and firmness should be evident. The following points should be discussed with the 'candidate', at the applicant's discretion:

- a. advise the candidate how to avoid or correct mistakes
- b. mention any other points of criticism noted
- c. give any advice considered helpful

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AMC/IEM J – THEORETICAL KNOWLEDGE REQUIREMENTS

IEM FCL 2.475(a)

Construction of computer compatible questions

(See JAR–FCL 2.475)

1 The following principles should be observed when developing questions for the central question bank (CQB).

General

2 The examination should measure clearly formulated goals. Therefore the field and depth of knowledge to be measured by each question must be fully identified.

3 The more important the field of knowledge, the more questions should be included in the examination, or the more points the answer should be given.

4 Most of the questions should be of the multiple choice type with four alternative answers.

5 Questions should relate to the essentials of the fields of knowledge and not to minor related detail. Numerical questions which differ only in the numbers used and not the method of calculation test the same knowledge; nevertheless, a variety of examples of the same calculation should be available in the CQB to help to minimise cheating.

6 Purely academic questions which have no practical use should be avoided, unless they relate to fundamental concepts. Examples of academic questions which are acceptable are the role of dihedral and camber in aerodynamics, and the definition of dew point in meteorology.

7 Questions which require specialised knowledge of specific aircraft types, should not be asked in a licence examination.

8 Use abbreviations and acronyms only in forms internationally recognised. In case of doubt use the full form, eg angle of attack = 12 degrees instead of $\alpha = 12^\circ$. A list of recommended abbreviations for examination purposes is in IEM FCL 2.475(b).

9 Formulate the questions and answers as simply as possible: the examination is not a test of language. Avoid complex sentences, unusual grammar and double negatives.

10 A question should comprise one positive complete proposition. No more than 8 different statements should appear among the suggested responses otherwise the candidate may be able to deduce the correct answer by eliminating the unlikely combinations of statements.

11 Questions should have only one true answer.

12 The correct answer should be absolutely correct and complete or, without doubt, the most preferable. Avoid responses that are so essentially similar that the choice is a matter of opinion rather than a matter of fact. The main interest in MCQs is that they can be quickly performed: this is not achieved if doubt exists about the correct answer.

13 The incorrect alternatives must seem plausible to anyone ignorant of the subject. All of the alternatives should be clearly related to the question and of similar vocabulary, grammatical construction and length. In numerical questions, the incorrect answers should correspond to procedural errors such as corrections applied in the wrong sense or incorrect unit conversions: they must not be mere random numbers.

14 Questions must be referred to the examination syllabus/learning objectives. The level, eg ATPL, CPL, should be indicated.

15 An examination sitting should normally last for between 2 and 3 hours. Exceeding 3 hours may result in wrong answers because the candidate makes errors through fatigue and not because the answer is not known.

16 The author must estimate a reasonable time for answering: about 1–2 minutes, but could vary from 1 to 10 minutes. Consequently, the number of questions for a specific examination may vary.

17 Any documentation required to answer the question (eg tables, graphs) must be provided with the question. Such documentation must be of the same typographical and accuracy standards as normal aeronautical publications. Tables and graphs must include a typical example of their usage. All other documentation is forbidden.

18 Question producers may assume that a simple pocket calculator is available to the candidate.

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IEM FCL 2.475(b)**Common abbreviations to be used for the European CQB**

(See JAR–FCL 2.475)

ICAO = Doc8400/4, SI = international standard, JEP = Jeppesen, JAR = Joint Aviation Regulations

Abbreviations	Meaning
A	ampère
ABM	abeam
ABN	aerodrome beacon
AC	alternating current
AC	alto cumulus
ACFT	aircraft
ACT	active
AD	aerodrome
ADC	air data computer
ADDN	additional
ADF	automatic direction finding
ADI	attitude director indicator
AEO	all engines operating
AFIS	aerodrome flight information service
AFM	aircraft flight manual
AGL	above ground level
AIP	Aeronautical Information Publication
ALT	altitude
ALTN	alternate
APCH	approach
APT	airport
APU	auxiliary power unit
ARR	arrival
AS	alto stratus
ASDA	accelerate stop distance available
AMSL	above mean sea level
ATA	actual time of arrival
ATC	air traffic control
ATIS	automatic terminal information service
ATO	actual time overhead
ATS	air traffic services
AUX	auxiliary
AVG	average
AWY	airway
AZM	azimuth
BKN	broken
BRG	bearing

Abbreviations	Meaning
°C	degrees celsius
CAS	calibrated air speed
CAT	clear air turbulence
CB	cumulonimbus
CC	cirrocumulus
CD	drag coefficient
CDI	course duration indicator
CDU	control display unit
cg	centre of gravity
CI	cirrus
CL	lift coefficient
cm	centimetre
CO	communications
CP	critical point
CRM	crew resource management
CS	cirrostratus
CTR	control zone
CU	cumulus
CWY	clearway
DA	decision altitude
DC	direct current
DEG	degrees
DEP	departure
DES	descent
DEST	destination
DEV	deviation
D/F	direction finding
DG	directional gyroscope
DH	decision height
DIST	distance
DME	distance measuring equipment
DP	dewpoint
DR	dead reckoning
DVOR	doppler VOR
E	east
EAS	equivalent airspeed
EAT	expected approach time
ECAM	engine condition aircraft monitoring
EFIS	electronical flight instrument system
EGT	exhaust gas temperature
EICAS	engine indicator and crew alerting system
EPR	engine pressure ratio
EST	estimated
ETA	estimated time of arrival
ETO	estimated time overhead
°F	degrees fahrenheit
FAF	final approach fix
FCST	forecast
FD	flight director
FIS	flight indicator system

Abbreviations	Meaning
FL	flight level
FLT	flight
FMS	flight management system
FT	feet
FT/MIN	feet per minute
g	gramme
GAL	gallons
GND	ground
GP	glide path
GPWS	ground proximity warning system
GS	ground speed
HDG	heading
HF	high frequency
hPa	hectopascal
HR	hours
HSI	horizontal situation indicator
HT	height
Hz	hertz (cycles per second)
IAS	indicated airspeed
ILS	instrument landing system
IMC	instrument meteorological conditions
IMP GAL	imperial gallons
INS	inertial navigation system
INT	intersection
ISA	international standard atmosphere
ISOL	isolated
ITCZ	inter tropical convergence zone
IVSI	integrated vertical speed indicator
J	joule
kg	kilogramme
kHz	kilohertz
km	kilometer
kt	knot
kW	kilowatt
LAT	latitude
LB	pounds
LDG	landing
LDP	landing decision point
LEN	length
LLZ	localizer
LMC	last minute change
LMT	local mean time
LONG	longitude
LT	local time
LTD	limited
LVL	level
LYR	layer

Abbreviations	Meaning
m	metre
M	mass
M	machnumber
MAC	mean aerodynamic chord
MAP	manifold pressure
MAPt	missed approach point
max	maximum
MDH	minimum descent height
MDH/A	minimum descent height/altitude
MEA	minimum enroute altitude
MET	meteorological
MIN	minutes
MLS	microwave landing systems
MM	middle marker
MNM	minimum
MNPS	minimum navigation performance specifications
MOCA	minimum obstruction clearance altitude
MORA	minimum off route altitude
MPH	statute miles per hour
MPS, m/sec	metres per second
MSA	minimum sector altitude
MSL	mean sea level
MSU	mode selector unit
N	newton
NGT	night
N	north
NAT	north atlantic track
NAV	navigation
NDB	non directional beacon
NM	nautical miles
NOTAMS	notices to airmen
NS	nimbo stratus
OAT	outside air temperature
OBS	omni bearing selector
OCA(H)	obstacle clearance altitude (height)
OCL	obstacle clearance limit
OEI	one engine inoperative
OM	operating mass
OM	outer marker
OPS	operations
O/R	on request
OVC	overcast

Abbreviations	Meaning
P	pressure
PAX	passenger
PET	point of equal time
PIC	pilot in command
PLN	flight plan
PNR	point of no return
POS	position
PSI	pounds per square inch
PTS	polar track structure
PWR	power
r	radius
RAC	rules of the air and air traffic services
RAS	rectified airspeed
REP	reporting point
RMI	radio magnetic indicator
RMK	remark
RNAV	area navigation
ROC	rate of climb
ROD	rate of descent
RPM	revolution per minute
RVR	runway visual range
RWY	runway
S	south
SAR	search and rescue
SC	stratocumulus
SCT	scattered
SDBY	stand by
SEC	seconds
SEV	severe
SFC	surface
SID	standard instrument departure
SIM	simulator
SKC	sky clear
SR	sunrise
SS	sunset
SSR	secondary surveillance radar
ST	stratus
STAR	standard arrival route
STD	standard
STN	station
STNR	stationary
STS	status
SWY	stopway
T	temperature
TA	transition altitude
TAS	true airspeed
TAT	total air temperature
TC	tropical cyclone
TDP	take off decision point
THR	threshold
TL	transition level

Abbreviations	Meaning
T/O	take off
TOC	top of climb
TORA	take off run available
TS	thunderstorm
TWY	taxiway
U/S	unserviceable
US-GAL	US gallons
UTC	universal time coordinated
V	volt
VAR	magnetic variation
VDF	VHF direction finding station
VG	vertical gyro
VHF	very high frequency
VIS	visibility
VLF	very low frequency
VMC	visual meteorological conditions
VOLMET	meteorological information for aircraft flight
VOR	VHF omnidirectional range
vrh	variable
VSI	vertical speed indicator
VV	vertical visibility
V	speeds
V _A	design manoeuvring speed
V _B	design speed for max gust intensity
V _C /M _C	design cruise speed/ machnumber
V _D	design dive speed
V _F	design flap speed
V _{FE}	flap extended speed
V _{FO}	flap operating speed
V _{LE}	landing gear extended speed
V _{LO}	maximum landing gear operating speed
V _{LOF}	lift off speed
V _{Max Tyre}	max tyre speed
V _{MBE}	max break energy speed
V _{MC}	minimum control speed
V _{MCA}	air minimum control speed
V _{MCG}	ground minimum control speed
V _{MINI}	Minimum IFR speed for helicopters
V _{MO} /M _{MO}	max operating limit speed/ machnumber
V _{MU}	minimum unstick speed
V _{NE}	never exceed speed
V _{NO}	normal operating speed
V _R	rotating speed
V _{REF}	landing reference speed
V _S	stalling speed or minimum steady flight speed at which the aeroplane is controllable
V _{SO}	stalling speed or minimum steady flight speed in landing configuration
V _{S1}	stalling speed or minimum steady flight speed obtained in a specific configuration
V _X	speed for best angle of climb
V _Y	speed for best rate of climb

Abbreviations	Meaning
V ₁	critical engine failure speed
V ₂	take-off safety speed for piston engine aircraft, take-off climb speed or speed at 35 ft for jet aircraft
W	watt
W	west
WC	windcomponent
WCA	wind correction angle
W/V	wind direction and speed
WPT	waypoint
WS	windshear
WX	weather
X	cross
XTK	cross track distance
XX	heavy
YD	yard

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IEM FCL 2.480**Distribution of examination questions**

(See JAR–FCL 2.480)

Subject : 010 AIR LAW AND ATC PROCEDURES
Theoretical knowledge examination
Exam length, minimum number of questions, and distribution of questions

	CPL	IR	ATPL
Time :	0:45	01:00	1:40

Distribution of questions with regard to the topics of the syllabus			
010 01	03	02	04
02	01	xx	01
03	01	xx	01
04	04	02	04
05	06	02	02
06	02	14	14
07	09	12	26
08	02	02	02
09	05	05	08
10	02	00	02
11	02	02	02
12	02	xx	03
13	01	01	01
Total :	40	42	70

Subject : 020 AIRCRAFT GENERAL KNOWLEDGE
Theoretical knowledge examination
Exam length, minimum number of questions, and distribution of questions

	CPL	IR	ATPL
Time 021 + 022 :	02:30	01:15	(03:30)
Total :	91	46	xx

Subject : 021 AIRFRAME/SYSTEMS/POWER PLANT
Theoretical knowledge examination
Exam length, minimum number of questions, and distribution of questions

	CPL	IR	ATPL
Time :	01:30	00:15	02:00

Distribution of questions with regard to the topics of the syllabus			
021 01	15	06	29
02	10	05	21
03	24	xx	16
04	07	xx	18
Total :	56	11	84

Subject : 022 INSTRUMENTATION			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	01:00	01:00	01:30

Distribution of questions with regard to the topics of the syllabus			
022 01	15	18	24
02	10	17	15
03	04	xx	09
04	06	xx	08
Total :	35	35	56

Subject : 030 FLIGHT PERFORMANCE AND PLANNING			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time 031+032+033:	03:00	Flight Planning only	(05:00)
Total :	94	xx	xx

Subject : 031 MASS AND BALANCE			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	00:45	not applicable	01:00

Distribution of questions with regard to the topics of the syllabus			
031 01	05	xx	07
02	14	xx	18
03	07	xx	09
Total :	26	xx	34

Subject : 032 PERFORMANCE			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	00:45	not applicable	01:00

Distribution of questions with regard to the topics of the syllabus			
032 01	10	xx	06
02	18	xx	08
03	xx	xx	23
Total :	28	xx	37

Subject : 033 FLIGHT PLANNING AND MONITORING			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	01:30	02:00	03:00

Distribution of questions with regard to the topics of the syllabus			
033 01	13	13	13
02	10	10	10
03	11	05	05
04	xx	15	26
05	xx	xx	06
06	06	05	10
Total :	40	48	70

Subject : 040 HUMAN PERFORMANCE AND LIMITATIONS			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	00:30	00:30	01:00

Distribution of questions with regard to the topics of the syllabus			
040 01	00	00	00
02	16	16	32
03	05	05	10
Total :	21	21	42

Subject : 050 METEOROLOGY			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	01:30	01:30	02:30

Distribution of questions with regard to the topics of the syllabus			
050 01	07	06	09
02	03	03	10
03	01	02	03
04	03	04	05
05	02	02	02
06	05	05	07
07	02	02	04
08	02	02	07
09	06	06	10
10	11	10	13
Total :	42	42	70

Subject : 060 NAVIGATION			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time 061+062:	1:30	02:00	(03:30)
Total :	42	56	xx

Subject : 061 GENERAL NAVIGATION			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	01:00	00:30	02:00

Distribution of questions with regard to the topics of the syllabus			
061 01	06	xx	09
02	04	xx	06
03	06	14	09
04	08	xx	11
05	04	xx	10
06	xx	xx	08
Total :	28	14	53

Subject : 062 RADIO NAVIGATION			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	00:30	01:30	01:30

Distribution of questions with regard to the topics of the syllabus			
062 01	12	16	14
02	02	11	10
03	xx	xx	xx
04	xx	xx	xx
05	xx	13	11
06	xx	02	07
Total :	14	42	42

Subject : 070 OPERATIONAL PROCEDURES			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	00:45	included in the Air Law	01:20

Distribution of questions with regard to the topics of the syllabus			
071 01	10	5	28
02	15	1	24
Total :	25	6	52

Subject : 080 PRINCIPLES OF FLIGHT			
Theoretical knowledge examination			
Exam length, minimum number of questions, and distribution of questions			

	CPL	IR	ATPL
Time :	00:45	not applicable	01:00

Distribution of questions with regard to the topics of the syllabus			
081 01	10	xx	09
02	xx	xx	02
03	xx	xx	03
04	03	xx	05
05	03	xx	06
06	03	xx	03
07	03	xx	03
08	06	xx	08
Total :	28	xx	39

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Subject : 090 COMMUNICATION
Theoretical knowledge examination
Exam length, minimum number of questions, and distribution of questions

	CPL	IR	ATPL
Time :	00:30	00:30	01:00

Distribution of questions with regard to the topics of the syllabus			
090 01	05	xx	05
02	10	xx	10
03	01	xx	01
04	02	xx	02
05	02	xx	02
06	01	xx	01
07	xx	04	04
08	xx	11	11
09	xx	02	02
10	xx	03	03
11	xx	01	01
Total :	21	21	42

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[IEM FCL 2.490

Terminology used in Subpart J for procedures for the Conduct of Theoretical Knowledge Examinations

The meaning of terms used in Subpart J is given below.

- | | |
|------------------------------|---|
| 1. Complete Examination: | An examination in all subjects required by the licence level. |
| 2. Examination: | The demonstration of knowledge in 1 or more examination papers. |
| 3. Examination Paper: | A set of questions to be answered by a candidate for examination. |
| 4. Attempt: | A try to pass a specific paper. |
| 5. Sitting: | An examination session provided by the NAA for a candidate to undertake an examination. |
| 6. Re-sit or Re-examination: | A second or subsequent attempt to pass a failed paper.] |

[Amdt. 3, 01.09.03]

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