(2) code selection;

(3) interrogation and reply.

(F) use of DME:

(a) station selection and identification;

(b) modes of operation: distance, groundspeed and time to run.

(xxv) Exercise 19: Basic instrument flight:

(A) physiological sensations;

(B) instrument appreciation; attitude instrument flight;

(C) instrument limitations;

(D) basic manoeuvres:

(a) straight and level at various air speeds and configurations;

(b) climbing and descending;

(c) standard rate turns, climbing and descending, onto selected headings;

(d) recoveries from climbing and descending turns.

(d) BITD

(1) A BITD may be used for flight training for:

(i) flight by reference solely to instruments;

(ii) navigation using radio navigation aids;

(iii) basic instrument flight.

(2) The use of the BITD should be subject to the following:

(i) the training should be complemented by exercises on an aeroplane;

(ii) the record of the parameters of the flight must be available;

(iii) A FI(A) or STI(A) should conduct the instruction.

AMC2 FCL.210 PPL(H) – Training course

ED Decision 2020/005/R

FLIGHT INSTRUCTION FOR THE PPL(H)

(a) 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.

(b) Ground instruction

Enhanced ground instruction in weather interpretation, planning and route assessment, decision making on encountering DVE including reversing course or conducting a precautionary landing.

(c) Flight instruction

(1) The PPL(H) flight instruction syllabus should take into account the principles of threat and error management and cover:

(i) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iii) control of the helicopter by external visual reference;

(iv) take-offs, landings, hovering, look-out turns and normal transitions from and to the hover;

(v) emergency procedures, basic autorotations, simulated engine failure, ground resonance recovery if relevant to type;

(vi) sideways and backwards flight, turns on the spot;

(vii) incipient vortex ring recognition and recovery;

(viii) touchdown autorotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

(ix) steep turns;

(x) transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

(xi) limited power and confined area operations, including selection of and operations to and from unprepared sites;

(xii) flight by sole reference to basic flight instruments, including completion of a level 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud (this training may be conducted by an FI(H));

(xiii) cross-country flying by using visual reference, DR, GNNS and, where available, radio navigation aids; simulation of deteriorating weather conditions and actions to divert or conduct precautionary landing;

(xiv) operations to, from and transiting controlled aerodromes; compliance with air traffic services procedures, communication procedures and phraseology.

(2) Before allowing applicants for a PPL(H) to undertake their first solo flight, the FI should ensure that the applicants can use R/T communication and can operate the required systems and equipment.

(3) Wherever possible, flight simulation should be used to demonstrate to student pilots the effects of flight into DVE and to enhance their understanding and need for avoidance of this potentially fatal flight regime.

(d) Syllabus of flight instruction

(1) 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:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the helicopter.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1a: Familiarisation with the helicopter:

(A) characteristics of the helicopter, external features;

(B) cockpit layout;

(C) systems;

(D) checklists, procedures and controls.

(ii) Exercise 1b: Emergency procedures:

(A) action if fire on the ground and in the air;

(B) engine, cabin and electrical system fire;

(C) systems failures;

(D) escape drills, location and use of emergency equipment and exits.

(iii) Exercise 2: Preparation for and action after flight:

(A) flight authorisation and helicopter acceptance;

(B) serviceability documents;

(C) equipment required, maps, etc.;

(D) external checks;

(E) internal checks;

(F) seat, harness and flight controls adjustments;

(G) starting and warm-up checks clutch engagement and starting rotors;

(H) power checks;

(I) running down system checks and switching off the engine;

(J) parking, security and picketing;

(K) completion of authorisation sheet and serviceability documents.

(iv) Exercise 3: Air experience:

(A) to introduce the student to rotary wing flight;

(B) flight exercise.

(v) Exercise 4: Effects of controls:

(A) function of flight controls, primary and secondary effect;

(B) effects of:

(a) air speed;

(b) power changes (torque);

(c) yaw (sideslip);

(d) disc loading (bank and flare);

(e) controls of selecting hydraulics on/off

(f) control friction.

(C) instruments;

(D) use of carburettor heat or anti-icing control.

(vi) Exercise 5: Power and attitude changes:

(A) relationship between cyclic control position, disc attitude, fuselage attitude and air speed;

(B) flapback;

(C) power required diagram in relation to air speed;

(D) power and air speed changes in level flight;

(E) use of instruments for precision;

(F) engine and air speed limitations.

(vii) Exercise 6: Straight and level:

(A) at normal cruising power, attaining and maintaining straight and level flight;

(B) control in pitch, including use of control friction or trim;

(C) maintaining direction and balance, (ball or yawstring use);

(D) setting power for selected air speeds and speed changes;

(E) use of instruments for precision.

(viii) Exercise 7: Climbing:

(A) optimum climb speed, best angle or rate of climb from power required diagram;

(B) initiation, maintaining the normal and maximum rate of climb, levelling off;

(C) levelling off at selected altitudes or heights

(D) use of instruments for precision.

(ix) Exercise 8: Descending:

(A) optimum descent speed, best angle or rate of descent from power required diagram;

(B) initiation, maintaining and levelling off;

(C) levelling off at selected altitudes or heights;

(D) descent (including effect of power and air speed);

(E) use of instruments for precision.

(x) Exercise 9: Turning:

(A) initiation and maintaining medium level turns;

(B) resuming straight flight;

(C) altitude, bank and co-ordination;

(D) climbing and descending turns and effect on rate of climb or descent;

(E) turns onto selected headings, use of gyro heading indicator and compass;

(F) use of instruments for precision.

(xi) Exercise 10: Basic autorotation:

(A) safety checks, verbal warning and look-out;

(B) entry, development and characteristics;

(C) control of air speed and RRPM, rotor and engine limitations;

(D) effect of AUM, IAS, disc loading, G forces and density altitude;

(E) re-engagement and go-around procedures (throttle over-ride or ERPM control);

(F) vortex condition during recovery;

(G) gentle and medium turns in autorotation;

(H) demonstration of variable flare simulated engine off landing.

(xii) Exercise 11a: Hovering:

(A) demonstrate hover IGE, importance of wind effect and attitude, ground cushion, stability in the hover and effects of over controlling;

(B) student holding cyclic stick only;

(C) student handling collective lever (and throttle) only;

(D) student handling collective lever, (throttle) and pedals;

(E) student handling all controls;

(F) demonstration of ground effect;

(G) demonstration of wind effect;

(H) demonstrate gentle forward running touchdown;

(I) specific hazards for example snow, dust and litter.

(xiii) Exercise 11b: Hover taxiing and spot turns:

(A) revise hovering;

(B) precise ground speed and height control;

(C) effect of wind direction on helicopter attitude and control margin;

(D) control and co-ordination during spot turns;

(E) carefully introduce gentle forward running touchdown.

(xiv) Exercise 11c: Hovering and taxiing emergencies:

(A) revise hovering and gentle forward running touchdown, explain (demonstrate where applicable) effect of hydraulics failure in the hover;

(B) demonstrate simulated engine failure in the hover and hover taxi;

(C) demonstrate dangers of mishandling and over-pitching.

(xv) Exercise 12: Take-off and landing:

(A) pre-take-off checks or drills;

(B) look-out;

(C) lifting to hover;

(D) after take-off checks;

(E) danger of horizontal movement near ground;

(F) danger of mishandling and overpitching;

(G) landing (without sideways or backwards movement);

(H) after landing checks or drills;

(I) take-off and landing crosswind and downwind.

(xvi) Exercise 13: Transitions from hover to climb and approach to hover:

(A) look-out;

(B) revise take-off and landing;

(C) ground effect, translational lift and its effects;

(D) flapback and its effects;

(E) effect of wind speed and direction during transitions from or to the hover;

(F) the constant angle approach;

(G) demonstration of variable flare simulated engine off landing.

(xvii) Exercise 14a: Circuit, approach and landing:

(A) revise transitions from hover to climb and approach to hover;

(B) circuit procedures, downwind and base leg;

(C) approach and landing with power;

(D) pre-landing checks;

(E) effect of wind on approach and IGE hover;

(F) crosswind approach and landing;

(G) go-around;

(H) noise abatement procedures.

(xviii) Exercise 14b: Steep and limited power approaches and landings:

(A) revise the constant angle approach;

(B) the steep approach (explain danger of high sink rate and low air speed)

(C) limited power approach (explain danger of high speed at touch down);

(D) use of the ground effect;

(E) variable flare simulated engine off landing.

(xix) Exercise 14c: Emergency procedures:

(A) abandoned take-off;

(B) missed approach and go-around;

(C) hydraulic off landing (if applicable);

(D) tail rotor control or tail rotor drive failure (briefing only)

(E) simulated emergencies in the circuit to include:

(a) hydraulics failure;

(b) simulated engine failure on take-off, crosswind, downwind and base leg;

(c) governor failure.

(xx) Exercise 15: First solo:

(A) instructor's briefing, observation of flight and debriefing;

(B) warn of change of attitude from reduced and laterally displaced weight;

(C) warn of low tail, low skid or wheel during hover, landing;

(D) warn of dangers of loss of RRPM and overpitching;

(E) pre-take-off checks;

(F) into wind take-off;

(G) procedures during and after take-off;

(H) normal circuit, approaches and landings;

(I) action if an emergency.

(xxi) Exercise 16: Sideways and backwards hover manoeuvring:

(A) manoeuvring sideways flight heading into wind;

(B) manoeuvring backwards flight heading into wind;

(C) combination of sideways and backwards manoeuvring;

(D) manoeuvring sideways and backwards and heading out of wind;

(E) stability and weather cocking;

(F) recovery from backwards manoeuvring (pitch nose down);

(G) limitations for sideways and backwards manoeuvring.

(xxii) Exercise 17: Spot turns:

(A) revise hovering into wind and downwind;

(B) turn on spot through 360°:

(a) around pilots position;

(b) around tail rotor;

(c) around helicopter geometric centre;

(d) square and safe visibility clearing turn.

(C) rotor RPM control, torque effect, cyclic limiting stops due to CG position and wind speed and direction.

(xxiii) Exercise 18: Hover OGE and vortex ring:

(A) establishing hover OGE;

(B) drift, height or power control;

(C) demonstration of incipient stage of vortex ring, recognition and recovery (from a safe altitude);

(D) loss of tail rotor effectiveness.

(xxiv) Exercise 19: Simulated EOL:

(A) the effect of weight, disc loading, density attitude and RRPM decay;

(B) revise basic autorotation entry;

(C) optimum use of cyclic and collective to control speed or RRPM;

(D) variable flare simulated EOL;

(E) demonstrate constant attitude simulated EOL;

(F) demonstrate simulated EOL from hover or hover taxi;

(G) demonstrate simulated EOL from transition and low level.

(xxv) Exercise 20: Advanced autorotation:

(A) over a selected point at various height and speed;

(B) revise basic autorotation: note ground distance covered;

(C) range autorotation;

(D) low speed autorotation;

(E) constant attitude autorotation (terminate at safe altitude);

(F) 'S' turns;

(G) turns through 180° and 360°;

(H) effects on angles of descent, IAS, RRPM and effect of AUM.

(xxvi) Exercise 21: Practice forced landings:

(A) procedure and choice of the forced landing area;

(B) forced landing checks and crash action;

(C) re-engagement and go-around procedures.

(xxvii) Exercise 22: Steep turns:

(A) steep (level) turns (30° bank);

(B) maximum rate turns (45° bank if possible);

(C) steep autorotative turns;

(D) faults in the turn: balance, attitude, bank and co-ordination;

(E) RRPM control and disc loading;

(F) vibration and control feedback;

(G) effect of wind at low level.

(xxviii) Exercise 23: Transitions:

(A) revise ground effect, translational lift and flapback;

(B) maintaining constant height, (20-30 ft AGL);

(C) transition from hover to minimum 50 knots IAS and back to hover;

(D) demonstrate effect of wind.

(xxix) Exercise 24: Quick stops:

(A) use of power and controls;

(B) effect of wind;

(C) quick stops into wind;

(D) quick stops from crosswind and downwind terminating into wind;

(E) danger of vortex ring;

(F) danger of high disc loading.

(xxx) Exercise 25a: Navigation:

(A) flight planning:

(a) weather forecast and actuals;

(b) map selection and preparation and use;

(1) choice of route:

(2) controlled airspace, danger and prohibited areas;

(3) safety altitudes and noise abatement considerations.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance.

(d) flight information:

(1) NOTAMs, etc.;

(2) radio frequencies;

(e) helicopter documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form (where appropriate).

(B) departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in controlled or regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(c) maintenance of height or altitude and heading;

(d) revisions of ETA and heading:

(1) 10° line, double track and track error and closing angle;

(2) 1 in 60 rule;

(3) amending an ETA.

(e) log keeping;

(f) use of radio;

(g) use of navaids (if fitted);

(h) minimum weather conditions for continuation of flight;

(i) in-flight decisions;

(j) transiting controlled or regulated airspace;

(k) uncertainty of position procedure;

(l) lost procedure.

(C) arrival and aerodrome joining procedure:

(a) ATC liaison in controlled or regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures.

(e) parking;

(f) security of helicopter;

(g) refuelling;

(h) closing of flight plan (if appropriate);

(i) post-flight administrative procedures.

(xxxi) Exercise 25b: Navigation problems at low heights and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles and other aircraft);

(C) difficulties of map reading;

(D) effects of wind and turbulence;

(E) avoidance of noise sensitive areas;

(F) actions in the event of encountering DVE;

(G) decision to divert or conduct precautionary landing;

(H) bad weather circuit and landing;

(I) appropriate procedures and choice of landing area;

(J) precautionary landing.

(xxxii) Exercise 25c: Radio navigation:

(A) use of GNSS:

(a) selection of waypoints;

(b) to or from indications and orientation;

(c) error messages;

(d) hazards of over-reliance on the use of GNSS in the continuation of flight in DVE.

(B) use of VHF omni range:

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) OBS;

(d) to or from indications and orientation;

(e) CDI;

(f) determination of radial;

(g) intercepting and maintaining a radial;

(h) VOR passage;

(i) obtaining a fix from two VORs.

(C) use of ADF equipment: NDBs:

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) orientation relative to the beacon;

(d) homing.

(D) use of VHF/DF:

(a) availability, AIP and frequencies;

(b) RTF procedures and ATC liaison;

(c) obtaining a QDM and homing.

(E) use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilots responsibilities;

(d) secondary surveillance radar (if transponder fitted):

(1) transponders;

(2) code selection;

(3) interrogation and reply.

(F) use of DME:

(a) station selection and identification;

(b) modes of operation: distance, groundspeed and time to run.

(xxxiii) Exercise 26: Advanced take-off, landings and transitions:

(A) landing and take-off out of wind (performance reduction);

(B) ground effect, translational lift and directional stability variation when out of wind;

(C) downwind transitions;

(D) vertical take-off over obstacles;

(E) running take-off;

(F) cushion creep take-off;

(G) reconnaissance of landing site;

(H) running landing;

(I) zero speed landing;

(J) crosswind and downwind landings;

(K) steep approach;

(L) go-around.

(xxxiv) Exercise 27: Sloping ground:

(A) limitations and assessing slope angle;

(B) wind and slope relationship: blade and control stops;

(C) effect of CG when on slope;

(D) ground effect on slope and power required;

(E) right skid up slope;

(F) left skid up slope;

(G) nose up slope;

(H) avoidance of dynamic roll over, dangers of soft ground and sideways movement on touchdown;

(I) danger of striking main or tail rotor by harsh control movement near ground.

(xxxv) Exercise 28: Limited power:

(A) take-off power check;

(B) vertical take-off over obstacles;

(C) in-flight power check;

(D) running landing;

(E) zero speed landing;

(F) approach to low hover;

(G) approach to hover;

(H) approach to hover OGE;

(I) steep approach;

(J) go-around.

(xxxvi) Exercise 29: Confined areas:

(A) landing capability and performance assessment;

(B) locating landing site and assessing wind speed and direction;

(C) reconnaissance of landing site;

(D) select markers;

(E) select direction and type of approach;

(F) circuit;

(G) approach to committed point and go-around;

(H) approach;

(I) clearing turn;

(J) landing;

(K) power check and performance assessment in and out of ground effect;

(L) normal take-off to best angle of climb speed;

(M) vertical take-off from hover.

(xxxvii) Exercise 30: Basic instrument flight:

(A) physiological sensations;

(B) instrument appreciation:

(a) attitude instrument flight;

(b) instrument scan.

(C) instrument limitations;

(D) basic manoeuvres:

(a) straight and level at various air speeds and configurations;

(b) climbing and descending;

(c) standard rate turns, climbing and descending, onto selected headings.

(E) recoveries from climbing and descending turns;

(F) recoveries from unusual attitudes.