

**AMC1 FCL.740.A(b)(1)(ii) Revalidation of class and type ratings**

ED Decision 2020/005/R

**CONTENT OF THE REFRESHER TRAINING**

Training flight items should be based on the exercise items of the proficiency check, as deemed relevant by the instructor, and depending on the experience of the candidate. The briefing should include a discussion on TEM with special emphasis on decision-making when encountering adverse meteorological conditions or unintentional IMC, as well as on navigation flight capabilities.

**FCL.745.A Advanced UPRT course – aeroplanes**

Regulation (EU) 2024/2076

- (a) The advanced UPRT course shall be completed at an ATO and shall comprise at least:
- (1) 5 hours of theoretical knowledge instruction;
  - (2) preflight briefings and postflight debriefings; and
  - (3) 3 hours of dual flight instruction with a flight instructor for aeroplanes FI(A) qualified in accordance with point [FCL.915](#)(e) and consisting of advanced UPRT in an aeroplane qualified for the training task. Flight time that does not include advanced UPRT but serves to go to or return from the UPRT training area shall not count towards those 3 hours.
- (b) Upon completion of the UPRT course, applicants shall be issued with a certificate of completion by the ATO.

**AMC1 FCL.745.A Advanced UPRT course – aeroplanes**

ED Decision 2019/005/R

**COURSE OBJECTIVE AND CONTENT****COURSE OBJECTIVE**

- (a) The objective of the course is for the pilot under training:
- (1) to understand how to cope with the physiological and psychological aspects of dynamic upsets in aeroplanes; and
  - (2) to develop the necessary competence and resilience to be able to apply appropriate recovery techniques during upsets.
- (b) In order to meet the objective as specified in point (a), the course should:
- (1) emphasise physiological and psychological effects of an upset and develop strategies to mitigate those effects;
  - (2) be delivered in a suitable training aircraft in order to expose trainees to conditions that cannot be replicated in an FSTD; and
  - (3) employ recovery techniques that are suitable for the aircraft used for training in order to support the training objectives. In order to minimise the risk associated with potential negative transfer of training, the recovery techniques used during the course should be compatible with techniques typically used for transport category aeroplanes.

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**THEORETICAL KNOWLEDGE**

- (c) Theoretical knowledge instruction supports the objectives of the course and should include the following:
- (1) a review of basic aerodynamics typically applicable to aeroplane upsets in transport category aeroplanes, including case studies of incidents involving potential or actual upsets.
  - (2) aerodynamics relevant to the aeroplane and exercises used in the practical training, including differences to aerodynamics as referred to in point (1);
  - (3) possible physiological and psychological effects of an upset, including surprise and startle effect;
  - (4) strategies to develop resilience and mitigate startle effect; and
  - (5) memorising the appropriate procedures and techniques for upset recovery.

**FLIGHT INSTRUCTION**

- (d) Flight instruction should include:
- (1) exercises to demonstrate:
    - (i) the relationship between speed, attitude and AoA;
    - (ii) the effect of g-load on aeroplane performance, including stall events at different attitudes and airspeeds;
    - (iii) aerodynamic indications of a stall including buffeting, loss of control authority and inability to arrest a descent;
    - (iv) the physiological effects of different g-loads between -1 and 2.5G; and
    - (v) surprise and the startle effect;
  - (2) training in techniques to recover from:
    - (i) nose high at various bank angles;
    - (ii) nose low at various bank angles;
    - (iii) spiral dives;
    - (iv) stall events; and
    - (v) incipient spin; and
  - (3) training to develop resilience and to employ strategies to mitigate the startle effect.

**COURSE COMPLETION**

- (e) The course is considered to have been satisfactorily completed if the trainee is able to successfully:
- (1) apply strategies to mitigate psychological and physical effects;
  - (2) recognise upsets;
  - (3) apply correct recovery techniques from upset scenarios as specified in point (d)(2).

## GM1 FCL.745.A Advanced UPRT course – aeroplanes

ED Decision 2019/005/R

### UPSET RECOVERY TRAINING EXERCISES

#### GENERAL

- (a) The objective of this GM is to provide instructors with further guidance on the conduct of the various upset recovery exercises, which requires instructor performance beyond that experienced in normal operations.
- (b) Instructors should:
- (1) ensure that the risk mitigation measures determined by the ATO are strictly adhered to;
  - (2) continuously assess the performance of the student to ensure that the training objectives of the upset recovery exercises are achieved;
  - (3) understand that all-attitude/on-aeroplane upset recovery exercises serve primarily as resilience-builder. In other words, the training serves mainly human-factor training objectives and not only flying skills training;
  - (4) understand the differences between all-attitude UPRT and aerobatics training;
  - (5) have knowledge and understanding of how:
    - (i) on-aeroplane and FSTD UPRT complement each other; and
    - (ii) to ensure that negative transfer of training from small aeroplanes to heavier transport category aeroplanes is avoided. This may be achieved by observing UPRT in an FSTD, especially in a type-specific FFS; and
  - (6) have knowledge and understanding of the upset prevention theoretical knowledge and flight instruction elements taught during the CPL(A) and ATPL(A) training courses to ensure continuity and consistency in delivering UPRT.
- Note: Instructors should be aware that the safety and potential human factor implications of poor upset recovery instructional technique or misleading information are *more significant* than in any other areas of pilot training.
- (c) In order to increase the applicant's resilience related to the handling of aeroplane upsets, the advanced UPRT course needs to include the development of confidence and competence in recognising and recovering safely from upsets under the presence of the real human factors. Such confidence building is specifically addressed by:
- (i) successfully overcoming natural stress response (startle and surprise); and
  - (ii) performing critically important counter-intuitive actions.
- Advanced UPRT therefore considers pitch attitudes, bank angles, AOA/airspeeds, sideslip and g-loads, none of which are normally experienced during routine operations.
- (d) Aeroplanes used in this course should be:
- (1) appropriately certified and operated by the ATO in a manner that takes into account the effects of repeated training manoeuvres on airframe fatigue life; and
  - (2) provide sufficient safety margins to cater for student and instructor errors.
- (e) This course complements UPRT in FSTDs by providing exposure to psycho-physiological conditions, which cannot be delivered by the motion systems of today's qualified FSTDs. At completion of the course, the student should pilot to be able to:

- (1) recognise and confirm the upset-situation;
- (2) manage stress response;
- (3) apply the correct recovery strategy timely and effectively;
- (4) stay within the defined training envelope;
- (5) stabilise the flight path after recovery; and
- (6) become competent and confident in recovering from upsets.

**SPECIFIC EXERCISES**
**(f) Exercise 1 — Nose HIGH recovery**

<b>Exercise 1</b>	
Recovery from <b>Nose HIGH</b> upsets at various bank angles	
(1) Training objectives	The student pilot should: (i) recognise and confirm the Nose HIGH situation (AOA, attitude, energy, trends); (ii) announce 'Nose High'; and (iii) apply the correct recovery strategy.
(2) Training tasks	The student pilot should: (i) regain situation awareness; (ii) recognise and analyse AOA, pitch, bank, energy state and trends; (iii) note natural and synthetic indications for AOA, attitude, and energy; (iv) manage human factors, stress response (startle and surprise, counter-intuitive actions); (v) take manual control; (vi) identify and apply the Nose HIGH recovery strategy; (vii) correct any out-of-trim condition; (viii) manage nose-down movement; (ix) manage g-load; (x) use the effects of power to assist nose-down movement; (xi) use bank to orient the lift vector as necessary; (xii) stabilise the flight path after recovery using basic pitch/power settings;
(3) Enabling objectives	The student pilot should: (i) decide if Stall Recovery or Nose HIGH recovery is applicable; (ii) perform control inputs deliberately; (iii) use up to full control deflections; (iv) avoid unnecessary low or high loads; (v) use secondary flight controls (trim/power) as necessary to support primary flight control inputs (i.e. nose-down movement); (vi) apply control inputs in the correct sequence (see Table 1, Nose-HIGH Recovery Strategy); (vii) apply counter-intuitive actions as necessary: (A) unloading; (B) power-reduction in Nose-HIGH attitude (depending on engine mounting); and (C) using bank to orient the lift vector downwards.

Note: Refer to GM1 to Appendix 9, Table 2: Recommended nose-high recovery strategy template.

(g) Exercise 2 — Nose LOW Recovery

<b>Exercise 2</b>	
Recovery from <b>Nose LOW</b> upsets at various bank angles	
(1) Training objectives	The student pilot should: (i) recognise and confirm the situation (AOA, attitude, energy, trends); (ii) announce 'Nose LOW'; (iii) apply the correct recovery strategy.
(2) Training tasks	The student pilot should: (i) regain situation awareness; (ii) recognise and analyse AOA, pitch, bank, energy state and trends; (iii) note natural and synthetic indications for AOA, attitude and energy; (iv) manage human factors, stress response (startle and surprise, counter-intuitive actions); (v) take manual control; (vi) identify and apply the Nose LOW recovery strategy; (vii) correct out-of-trim condition; (viii) decide if aircraft is stalled; (ix) manage g-load; (x) identify the correct direction to roll; (xi) roll to wings level to orient the lift vector upwards; (xii) manage power and drag; and (xiii) stabilise the flight path after recovery using basic pitch/power settings.
(3) Enabling objectives	The student pilot should: (i) perform control inputs deliberately; (ii) use up to full control deflections; (iii) avoid unnecessary low or high loads; (iv) apply control inputs in the correct sequence (see Table 2, Nose-LOW Recovery Strategy); and (v) apply counter-intuitive actions as necessary: (A) apply Stall Recovery in nose low attitude first if needed; (B) unloading instead of pulling; (C) unloading to increase roll rate; (D) avoid 'rolling-pull'; and (E) accept the priority of rolling to wings level first, before reducing power and before pulling.

Note: Refer to GM1 to Appendix 9, Table 3: Recommended nose-low recovery strategy template.

(h) Exercise 3 — Recovery from spiral dive

<b>Exercise 3</b>	
Recovery from <b>Spiral Dive</b>	
(1) Training objectives	The student pilot should: (i) recognise the spiral dive as a result of improper nose-up elevator input during a Nose LOW turning situation; and (i) apply the Nose LOW Recovery Strategy.
(2) Training tasks	The student pilot should: (i) maintain/regain situation awareness; (ii) recognise and analyse AOA, pitch, bank, energy state and trends; (iii) manage human factors, stress response (startle and surprise, counter-intuitive actions); (iv) take manual control; (v) identify and apply the Nose LOW recovery strategy; and (vi) stabilise the flight path after recovery using basic pitch/power settings.

(3) Enabling objectives	<p>The student pilot should:</p> <ul style="list-style-type: none"> <li>(i) perform control inputs deliberately and in the correct sequence;</li> <li>(ii) use up to full control deflections, if required; and</li> <li>(iii) apply counter-intuitive actions as necessary: <ul style="list-style-type: none"> <li>(A) unloading instead of pulling;</li> <li>(B) unloading to increase roll rate;</li> <li>(C) avoid ‘rolling-pull’; and</li> <li>(D) accepting the priority of rolling to wings level first, before reducing power and before pulling.</li> </ul> </li> </ul>
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(i) Exercise 4 — Stall Event Recovery

<p><b>Exercise 4</b> Recovery from <b>Stall event</b></p>	
(1) Training objectives	<p>The student pilot should:</p> <ul style="list-style-type: none"> <li>(i) recognise and confirm the situation (AOA, attitude, energy, trends);</li> <li>(ii) announce ‘Stall’;</li> <li>(iii) apply the Stall Event Recovery Strategy.</li> </ul>
(2) Training tasks	<p>The student pilot should:</p> <ul style="list-style-type: none"> <li>(i) regain situation awareness;</li> <li>(ii) recognise and analyse AOA, pitch, bank, energy state and trends;</li> <li>(iii) note natural and synthetic indications for high AOA/stall;</li> <li>(iv) manage human factors, stress response (startle and surprise, counter-intuitive actions);</li> <li>(v) recover from: <ul style="list-style-type: none"> <li>(A) approach to stall</li> <li>(B) full stall, wings level and during turn</li> <li>(C) slipping stall</li> <li>(D) skidding stall</li> <li>(E) accelerated stall</li> <li>(F) secondary stall</li> </ul> </li> <li>(vi) take manual control;</li> <li>(vii) identify and apply the Stall Event Recovery Template or the aircraft manufacturer Stall Recovery SOP;</li> <li>(viii) apply nose-down elevator input to reduce AOA;</li> <li>(ix) manage trim;</li> <li>(x) consider power reduction (if engine mounting induces a nose-up effect);</li> <li>(xi) accept altitude loss;</li> <li>(xii) identify the correct direction to roll to wings level;</li> <li>(xiii) manage power and drag;</li> <li>(xiv) manage g-load and energy to avoid secondary stall; and</li> <li>(xv) stabilise the flight path after recovery using basic pitch/power settings.</li> </ul>
(3) Enabling objectives	<p>The student pilot should:</p> <ul style="list-style-type: none"> <li>(i) perform control inputs deliberately;</li> <li>(ii) use up to full control deflections;</li> <li>(iii) apply control inputs in the correct sequence (see Table 3, Stall Event Recovery Strategy Template); and</li> <li>(iv) apply counter-intuitive actions as necessary: <ul style="list-style-type: none"> <li>(A) unloading to reduce AOA;</li> <li>(B) unloading before rolling;</li> <li>(C) power reduction if necessary;</li> <li>(D) accepting altitude loss; and</li> <li>(E) waiting for airspeed increase before loading again.</li> </ul> </li> </ul>

Note: Refer to GM1 to Appendix 9, Table 1: Recommended stall event recovery template

(j) Exercise 5 — Recovery from spin

<b>Exercise 5</b> Recovery from incipient spin	
(1) Training objectives	The pilot should: (i) recognise and confirm the spin (AOA, yaw, attitude, energy, roll, trends); (ii) apply the OEM Incipient Spin Recovery procedure.
(2) Training tasks	The pilot should: (i) be aware of the aircraft response to all possible pitch and roll control inputs and to thrust/power changes during (incipient) spin; (ii) maintain/regain situation awareness; (iii) recognise and analyse AOA, attitude, energy, yaw, roll, trends); (iv) note natural and synthetic indications for high AOA, stall, spin; (v) manage human factors, stress response (startle and surprise, counter-intuitive actions); (vi) take manual control; (vii) identify and apply the OEM Incipient Spin Recovery Procedure; (viii) manage AOA, g-load and energy to avoid secondary stall; and (ix) stabilise the flight path after recovery using basic pitch/power settings.
(3) Enabling objectives	The pilot should: (i) perform control inputs deliberately and in the correct sequence; (ii) use up to full control deflections as required by the procedure; (iii) apply counter-intuitive actions as necessary; (iv) avoid unreflected control inputs; and (v) allow time for control inputs to show results.

(k) Assessment of student performance

By collecting evidence from observable behaviours, the instructor will continuously assess whether the student meets the required competency standards under the given conditions.

**Pilot competencies and behavioural indicators in the context of the Advanced UPRT Course**

- (1) Application of procedures**
  - (i) Follows the recommended Nose HIGH or Nose LOW recovery strategy or the Stall Event Recovery Template / STALL RECOVERY SOP
  - (ii) Identifies and follows operating instructions in a timely manner
  - (iii) Correctly operates aircraft systems and equipment
  - (iv) Applies relevant procedural knowledge
- (2) Communication**
  - (i) Adheres to callouts
  - (ii) Verbalises the essential steps during the recoveries
- (3) Aeroplane flight path management — automation**  
Disconnects autopilot and autothrust/autothrottle before initiating the recovery (to be simulated if the training aeroplane is not fitted with autothrust/autothrottle)
- (4) Aeroplane flight path management — manual control**
  - (i) Detects deviations from the desired aircraft trajectory and takes appropriate action
  - (ii) Controls the aircraft using appropriate attitude and power settings
  - (iii) Contains the aircraft within the defined flight envelope
- (5) Leadership and teamwork**
  - (i) Understands and agrees with the crew's roles and objectives
  - (ii) Uses initiative and gives directions when required
  - (iii) Admits mistakes and takes responsibility
  - (iv) Communicates relevant concerns and intentions
  - (v) Gives and receives feedback constructively

- (vi) Projects self-control in all situations
- (6) Problem-solving and decision-making**
  - (i) Seeks accurate and adequate information from appropriate sources
  - (ii) Identifies and verifies what and why things have gone wrong
  - (iii) Perseveres in working through the event safely
  - (iv) Sets priorities appropriately
- (7) Situation awareness and information management**
  - (i) Identifies and assesses accurately the state of the aircraft and its systems
  - (ii) Identifies and assesses accurately the aircraft's vertical and lateral position, and its anticipated flight path
  - (iii) Anticipates accurately what could happen, plans and stays ahead of the situation
  - (iv) Recognises and effectively responds to indications of reduced situation awareness.
- (8) Workload management**
  - (i) Maintains self-control in all situations Manages and recovers from stress response (startle surprise), interruptions, distractions, variations and errors effectively
  - (ii) Reviews, monitors and cross-checks actions conscientiously
  - (iii) Verifies that tasks are completed to the expected outcome
  - (iv) Offers and accepts assistance, delegates when necessary, and asks for help early
  - (v) Manages and recovers from interruptions, distractions, variations and failures effectively