The Hashemite Kingdom of Jordan
Civil Aviation Regulatory Commission
Flight Operations Standards Directorate

المملكة الأردنية الهاشمية
هيئة تنظيم الطيران المدني
مديرية مقاييس العمليات الجوية

ADVISORY CIRCULAR

No. : AC-28-01-015
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A. SUBJECT.

Supplementary Training Program

B. PURPOSE.

This Advisory Circular provides guidance for Air Operator Certificate (AOC) holder/applicant to establish the supplementary training program to include TCAS/ACAS, terrain awareness / CFIT avoidance, cold weather operations and adverse flight condition training.

C. STATUS.

This is the Third edition of AC - 28 - 01 - 015, dated 17 December 2017, and it will remain current until withdrawn or superseded.

D. CONTENTS.

Supplementary Training Program

1. Airborne Collision Avoidance Systems (ACAS) Training Program.

1.1 The operator shall establish ACAS training program as detailed in JAA Administrative & Guidance Material, Section Four: Operations, Part Three: Temporary Guidance: Leaflets (JAR-OPS) Leaflet No. 11 guidance for operators on training programs for the use of Airborne Collision Avoidance Systems (ACAS).

1.2 The ACAS training shall be incorporated in conversion, command upgrade and recurrent training programs.

1.3 The ACAS recurrent training program - ground and flight simulator training shall be under taken every 12 months.

2. Terrain Awareness / CFIT Avoidance Training Program.

2.1 The operator shall establish terrain awareness / controlled flight into terrain avoidance training program to provide the flight crew with knowledge and operations of the GPWS / EGPWS system to include:

a. Ground Training. The ground training of the GPWS / EGPWS shall be incorporated in conversion and recurrent training programs. The training consist of:

(1) Terrain awareness procedures, including GPWS / EGPWS alerts and the avoidance of controlled flight into terrain (CFIT).

(2) Factors that may cause CFIT.

(3) The importance of maintaining horizontal and vertical situation awareness all the time.

(4) Knowledge of the capabilities and limitations of the GPWS / EGPWS on the aircraft.

(5) How to be proficient in performing the terrain avoidance maneuver required in response to a GPWS / EGPWS warning.

b. Simulator Training. The flight simulator training of the GPWS / EGPWS shall be incorporated in conversion, command upgrade and recurrent training programs. The training consist of practical training and evaluation on the use of the system and terrain avoidance procedures to include:

(1) GPWS & EGPWS activation after takeoff.

(2) GPWS & EGPWS activation during descent/approach phase

c. Recurrent Training. The terrain awareness / CFIT avoidance recurrent training program - ground and flight simulator training shall be under taken every 12 months.

3. Cold Weather Operations Training Program.

3.1 The operator shall establish cold weather operations training program to provide the flight crew with knowledge and operations procedures on the cold weather to include:

a. Ground Training. The ground training of the cold weather operations shall be incorporated in conversion and recurrent training programs. The training consist of:

(1) Essential knowledge concerning the effects of frost, ice, snow and slush on aircraft performance and handling.

(2) Basic characteristics of aircraft de- /anti-icing fluids.

(3) General techniques for removing deposits of frost, ice, snow from the aircraft surfaces and for anti-icing.

(4) De-/anti-icing procedures in general and specific measures to be performed on different aircraft types.

(5) Fluid application and limitations of hold-over time tables.

(6) The vital importance that all critical surfaces be inspected and confirmed free of contamination prior to take-off in actual icing conditions (clean aircraft concept).

(7) The properties and limitations of different types of de-icing and anti-icing fluid, and the correct application of hold-over times appropriate to each type in a variety of environmental conditions.

(8) Operational procedures applicable in actual or suspected icing conditions (on ground and in-flight).

(9) Instruction on how to recognize, from weather reports or forecasts which are available before flight commences or during flight, the risk of encountering icing conditions along the planned route and how to modify, as necessary, the departure and in-flight routes or profiles.

(10) Instruction in the operational and performance limitations or margins.

(11) Use of in-flight ice detection, anti-icing and de-icing systems in both normal and abnormal operation; and instruction in the differing intensities and forms of ice accretion and the consequent action that should be taken.

b. Simulator Training. The flight simulator training of the cold weather operations shall be incorporated in conversion, command upgrade and recurrent training programs. The training consist of practical training and evaluation on the cold weather operations to include:

(1) Pre-flight Procedures.

(2) Procedures for Deicing /Ant –icing.

(3) Takeoff from a contaminated runway.

(4) In-flight icing conditions and cockpit procedures.

(5) Post Flight procedures.

c. Recurrent Training. The cold weather operations recurrent training program - ground and flight simulator training shall be under taken every 12 months.

4. Adverse Flight Condition Training Program.

4.1 The operator shall establish adverse flight condition training program to provide the flight crew with knowledge and operations procedures on the adverse flight condition to include:

a. Wind Shear Avoidance and Recovery.

(1) Ground Training. The ground training of the wind shear avoidance and recovery shall be incorporated in conversion and recurrent training programs. The training consist of:

(a) The characteristics and causes of wind shear with emphasis on the dynamics of a microburst.
(b) The methods of predicting and detecting wind shear, which special emphasis on pilot decision making skills with respect to avoidance and reaction.
(c) The predictive wind shear function and its philosophy of operation, including any specific type procedures.

(2) Simulator Training. The flight simulator training of the wind shear avoidance and recovery shall be incorporated in conversion, command upgrade and recurrent training programs. The training consist of practical training and evaluation on the wind shear avoidance and recovery to include:

(a) Avoidance and recovery from wind shear during or shortly after takeoff.
(b) Avoidance and recovery from wind shear on approach.
(c) Responses to predictive wind shear warning during or after takeoff, and on approach to land.

(3) Recurrent Training. The wind shear avoidance and recovery recurrent training program - ground and flight simulator training shall be under taken every 12 months.

b. Contaminated Runway Operations.

(1) Ground Training - Part of performance course. The ground training of the contaminated runway operations shall be incorporated in conversion and recurrent training programs. The training consist of:

(a) Definitions and classification of wet and contaminated runways.
(b) Policies and definition pertaining to takeoff and landing on contaminated runways including precautions, braking action coefficient and limitations.
(c) Regulations pertaining to operations on contaminated runways including actual and required takeoff and landing distances, and minimum required aircraft performance.
(d) Takeoff speed calculations and aircraft configuration.
(e) The effects of runway contamination on aircraft stopping distances.

(2) Simulator Training. The flight simulator training of the contaminated runway operations shall be incorporated in conversion, command upgrade and recurrent training programs. The training consist of practical training and evaluation on the contaminated runway operations to include:

(a) Takeoff from a contaminated runway.
(b) Landing on contaminated runway.

(3) Recurrent Training. The contaminated runway operations recurrent training program - ground and flight simulator training shall be under taken every 3 years.

c. Hot Weather Operations.

(1) Ground Training- Part of performance course. The ground training of the hot weather operations shall be incorporated in conversion and recurrent training programs. The training consist of:

(a) The effect of high temperature of engine thrust.
(b) The effect of high temperature on the calculation of MTOW.
(c) The effect of high temperature on go-around performance.
(d) The effect of high temperature on brake energy.

(2) Simulator Training. The flight simulator training of the hot weather operations shall be incorporated in conversion, command upgrade and recurrent training programs. The training consist of practical training and evaluation on the hot weather operations to include:

(a) Rejected Takeoff.
(b) Engine Failure after V1.
(c) Single Engine Go-around.

(3) Recurrent Training. The hot weather operations recurrent training program - ground and flight simulator training shall be under taken every 3 years.

d. Operations Near Volcanic Ash.

(1) Ground Training. The ground training of the operations near volcanic ash shall be incorporated in conversion and recurrent training programs. The training consist of:

(a) The characteristics of volcanic ash material.
(b) The effect of volcanic ash on the aircraft structure, instruments, and engines.
(c) The method of detection of volcanic ash cloud encounter in flight.
(d) The on ground general precautions that must be applied when ash cloud passes over an airport.
(e) The flight crew procedures for actions to be taken in case of inadvertent flight into a volcanic ash cloud, with reference to specific AOM/FCOM procedures.

(2) Simulator Training. The flight simulator training of the operations near volcanic ash shall be incorporated in conversion, command upgrade and recurrent training programs. The training consists of practical training and evaluation on operations near or in volcanic with all engines flame out.

(3) Recurrent Training. The operations near volcanic ash recurrent training program - ground and flight simulator training shall be under taken every 3 years.

e. Upset Prevention and Recovery Training.

(1) Ground Training. The ground training of the upset prevention and recovery training shall be incorporated in conversion and recurrent training programs. The training consist of:

(a) Aerodynamics:

- General aerodynamic characteristics.
- Advanced aerodynamics.
- Airplane certification and limitations.
- Aerodynamics (high and low altitudes).
- Airplane performance (high and low altitudes).
- Angle of attack (AOA) and stall awareness.
- Stick shaker activation.
  - Stick pusher activation.
  - Mach effects - if applicable to airplane type
- Airplane stability.
- Control surface fundamentals - trims.
- Icing and contamination effects.
- Propeller slipstream (as applicable).

(b) Causes and contributing factors of upsets:

- Environmental.
- Pilot induced.
- Mechanical.

(c) Safety review of accidents and incidents relating to airplane upsets.

(d) G-awareness:

- Positive/negative/increasing/decreasing g loads.
- Lateral g-awareness (sideslip).
- G-load management.

(e) Energy management:

- Kinetic energy vs. potential energy vs. chemical energy (power).
- Relationship between pitch and power and performance.
- Performance and effects of differing engines.

(f) Flight path management:

- Automation inputs for guidance and control.
- Type specific characteristics.
- Automation management.
- Manual handling skills.

(g) Recognition:

- Type specific examples of instrumentation during developing and developed upset.
- Pitch/power/roll/yaw.
- Effective scanning (effective monitoring).
- Stall protection systems and cues.
- Criteria for identifying stalls and upset.

(h) Upset prevention and recovery techniques:

- Timely and appropriate intervention.
- Nose high/wings level recovery.
- Nose low/wings level recovery.
- High bank angle recovery techniques.
- Consolidated summary of airplane recovery techniques.

(i) System malfunction:

- Flight control anomalies.
- Power failure (partial or full).
- Instrument failures.
- Automation failures.
- Fly by wire protection degradations.
- Stall protection system failures, including icing alerting systems.

(j) Specialized training elements:

- Spiral dive (graveyard spiral).
- Slow flight.
- Steep turns.
- Recovery from approach to stall.
- Recovery from stall, including uncoordinated stalls (aggravating yaw).
- Recovery from stick pusher activation (as applicable).
- Nose high/high speed recovery.
- Nose high/low speed recovery.
- Nose low/high speed recovery.
- Nose low/low speed recovery.
- High bank angle recovery.
- Line oriented flight training (LOFT) or line operational simulation (LOS).

(k) Human Factors:

- Situation awareness.
  - Human information processing.
  - Inattention, fixation, distraction.
  - Perceptual illusions (visual or physiological) and spatial disorientation.
  - Instrument interpretation.
- Startle and stress response.
  - Physiological, psychological, and cognitive effects.
  - Management strategies.

- Threat and error management (TEM).

  - TEM framework.
  - Active monitoring, checking.
  - Fatigue management.
  - Workload management.
  - Crew resource management (CRM).

(2) Simulator Training. The flight simulator training of the upset prevention and recovery shall be incorporated in conversion, command upgrade, either pilots seat operations and recurrent training programs. The training exercises consists of practical training and evaluation on the upset prevention and recovery techniques to include:

(a) Timely and appropriate intervention.
(b) Recovery from stall events, in the following configurations:

- Take off configuration.
- Clean configuration low altitude.
- Clean configuration near maximum operating altitude.
- Landing configuration during the approach phase.

(c) Recovery from nose high at various bank angles.
(d) Recovery from nose low at various bank angles.
(e) Consolidated summary of airplane recovery techniques.

(3) Recurrent Training. The upset prevention and recovery recurrent training program - ground and flight simulator training exercises are covered at least every 12 calendar months, such that all the elements are covered over a period not exceeding 3 years.

f. Thunderstorm Avoidance.

(1) Ground Training. The ground training of the thunderstorm avoidance shall be incorporated in conversion and recurrent training programs. The training consists of:

(a) The effect of lighting on aircraft systems.
(b) The effect of water ingestion on engines.
(c) The effect of pressure changes altimeters.
(d) The effect of hail on the aircraft structure.
(e) Discussion of the technical background of airborne radar equipment, its operational philosophy, and techniques of use for weather detection, avoidance and mapping.

(f) Discussion of the methods of thunderstorm avoidance and recommendations with reference to the OMA and specific AOM/FCOM procedures.

(g) Discussion of specific procedures in case of inadvertent storm penetration with reference to the OMA and specific AOM/FCOM procedures.

(2) Recurrent Training. The thunderstorm avoidance recurrent training program - ground and flight simulator training shall be under taken every 3 years.

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