



Workshop CAT SET-IMC (Subpart L of Part-SPA)

CREW COMPOSITION / EXPERIENCE / PILOT TRAINING

THE NEW PROVISIONS AND THEIR IMPLEMENTATION

04.07.2017



About: Tom Hartmann (53)

- Senior Flight Operation Inspector
- Total flight time: 7500h
 - Instruction time: 2900h
- Aircraft flown: A320, C550, C560XL, PA46 DLX
- Current on: SEP, MEP, PC12, F2TH
- Instructor: FI, IRI, TRI
- Examiner: SP, MP



Where it all starts...

Commission Regulation (EU) No 965/2012

Performance class B aeroplanes

CAT.POL.A.300 General

- (a) Unless approved by the competent authority in accordance with Annex V (Part-SPA), Subpart L — SINGLE- ENGINED TURBINE AEROPLANE OPERATIONS AT NIGHT OR IN IMC (SET-IMC), the operator shall not operate a single-engined aeroplane:
- (1) at night; or
 - (2) in IMC, except under special VFR.



Purpose of the new provisions

- To allow commercial operations with SET airplanes at night or in IMC
- To ensure a minimum level of safety for this operations



Crew Composition / Experience



SUBPART L:

SINGLE-ENGINE TURBINE AEROPLANE OPERATIONS AT NIGHT OR IN INSTRUMENT METEOROLOGICAL CONDITIONS (SET-IMC)

AMC2 SPA.SET-IMC.105(c) SET-IMC operations approval

CREW COMPOSITION

- (a) Unless the pilot-in-command has a minimum experience of 100 flight hours under instrument flight rules (IFR) with the relevant type or class of aeroplane including line flying under supervision (LIFUS), the minimum crew should be composed of two pilots.
- (b) A lesser number of flight hours under IFR on the relevant type or class of aeroplane may be acceptable to the competent authority when the flight crew member has significant previous IFR experience.



Linked articles in Part-ORO

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ORO.FC.202

Single-pilot operations under IFR or at night

AMC1 ORO.FC.220

Operator conversion training and checking
→ Line flying under supervision

ORO.FC.A.250

Commanders holding a CPL(A)



Linked articles in Part-ORO

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Articles to take into account

ORO.FC.202 Single-pilot operations under IFR or at night

In order to be able to fly under IFR or at night with a minimum flight crew of one pilot, as foreseen in ORO.FC.200(c)(2) and (d)(2), the following shall be complied with:

- (a) The operator shall **include in the operations manual** a pilot's conversion and recurrent training programme that includes the additional requirements for a single-pilot operation. The pilot shall have undertaken training on the operator's procedures, in particular regarding:
 - (1) engine management and emergency handling;
 - (2) use of normal, abnormal and emergency checklist;
 - (3) air traffic control (ATC) communication;
 - (4) departure and approach procedures;
 - (5) autopilot management, if applicable;
 - (6) use of simplified in-flight documentation;
 - (7) single-pilot crew resource management.



Articles to take into account

ORO.FC.202 Single-pilot operations under IFR or at night

- (b) The recurrent checks required by ORO.FC.230 shall be performed in the single-pilot role on the relevant type or class of aircraft in an environment representative of the operation.
- (c) For aeroplane operations under IFR the pilot shall have:
 - (1) a minimum of 50 hours flight time under IFR on the relevant type or class of aeroplane, of which 10 hours are as commander; and
 - (2) completed during the preceding 90 days on the relevant type or class of aeroplane:
 - (i) five IFR flights, including three instrument approaches, in a single-pilot role; or
 - (ii) an IFR instrument approach check.



Articles to take into account

ORO.FC.202 Single-pilot operations under IFR or at night

- (d) For aeroplane operations at night the pilot shall have:
 - (1) a **minimum of 15 hours flight time at night** which may be included in the 50 hours flight time under IFR in (c)(1); and
 - (2) completed **during the preceding 90 days** on the relevant type or class of aeroplane:
 - (i) three take-offs and landings at night in the single pilot role; or
 - (ii) a night take-off and landing check.



Linked articles in Part-ORO

AMC2 SPA.SET-IMC.105(c) SET-IMC operations approval

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ORO.FC.202

Single-pilot operations under IFR or at night

AMC1 ORO.FC.220

Operator conversion training and checking
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Commanders holding a CPL(A)



Crew Composition / Experience – Articles to take into account

AMC1 ORO.FC.220

- e) Line flying under supervision (LIFUS)
 - (1) Following completion of flight training and checking as part of the operator's conversion course, each flight crew member should operate a minimum number of sectors and/or flight hours under the supervision of a flight crew member nominated by the operator.
 - (2) The minimum flight sectors/hours should be specified in the operations manual and should be determined by the following:
 - (i) previous experience of the flight crew member;
 - (ii) complexity of the aircraft; and
 - (iii) the type and area of operation.
 - (3) For performance class B aeroplanes, the amount of LIFUS required is dependent on the complexity of the operations to be performed.



Linked articles in Part-ORO

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ORO.FC.202

Single-pilot operations under IFR or at night

AMC1 ORO.FC.220

Operator conversion training and checking
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ORO.FC.A.250

Commanders holding a CPL(A)



Crew Composition / Experience – Articles to take into account

ORO.FC.A.250 Commanders holding a CPL(A)

- (a) The holder of a CPL(A) (aeroplane) shall only act as commander in commercial air transport on a single-pilot aeroplane if either of the following conditions is met:
- (1) when carrying passengers under VFR outside a radius of 50 NM (90 km) from an aerodrome of departure, he/she has a minimum of 500 hours of flight time on aeroplanes or holds a valid instrument rating; or
 - (2) when operating on a multi-engine type under IFR, he/she has a minimum of 700 hours of flight time on aeroplanes, including 400 hours as pilot-in-command. These hours shall include 100 hours under IFR and 40 hours in multi-engine operations. The 400 hours as pilot-in-command may be substituted by hours operating as co-pilot within an established multi-pilot crew system prescribed in the operations manual, on the basis of two hours of flight time as co-pilot for one hour of flight time as pilot-in command;
 - (3) when operating on a single-engined aeroplane under IFR, he/she has a minimum of 700 hours of flight time on aeroplanes, including 400 hours as pilot-in-command. Those hours shall include 100 hours under IFR. The 400 hours as pilot-in-command may be substituted by hours operating as co-pilot within an established multi-pilot crew system prescribed in the operations manual, on the basis of two hours of flight time as co-pilot for one hour of flight time as pilot-in command.



Crew Composition / Experience – Articles to take into account

ORO.FC.A.250 Commanders holding a CPL(A)

(3) when operating on a single-engined aeroplane under IFR, he/she has a minimum of 700 hours of flight time on aeroplanes, including 400 hours as pilot-in-command. Those hours shall include 100 hours under IFR. The 400 hours as pilot-in-command may be substituted by hours operating as co-pilot within an established multi-pilot crew system prescribed in the operations manual, on the basis of two hours of flight time as co-pilot for one hour of flight time as pilot-in command.



So what options in terms of crew composition are possible?



Crew Composition / Experience

Option 1



1 pilot

with at least 100 hours IFR experience

- on the relevant type or class of aeroplane
- including LIFUS

→ Implementation is straight-forward

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Crew Composition / Experience

Option 2



2 pilots

→ in case of insufficient (<100) IFR experience of the pilot-in-command on the relevant type/class

→ **Implementation is straight-forward**

→ Also see FOCAs AltMOC on multi-pilot operations on single-pilot certified aeroplanes:

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Crew Composition / Experience

Option 3



1 pilot

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*(b) A lesser number of flight hours under IFR on the relevant type or class of aeroplane may be acceptable to the competent authority when the flight crew member has **significant previous IFR experience**.*

→ Implementation leaves room for the CA



Crew Composition / Experience



Option 3 – What is acceptable?

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*(b) A lesser number of flight hours under IFR on the relevant type or class of aeroplane may be acceptable to the competent authority when the flight crew member has **significant previous IFR experience.***



Criteria:

- a) **Number** of total IFR flight hours
- b) **Recency** of the experience
- c) **Acft types**



Crew Composition / Experience



Option 3 – What is acceptable?

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significant previous IFR experience.



Criteria:

- a) **Number** of total IFR flight hours
- b) **Recency** of the experience
- c) **Acft types**



Consequence – New certification task for the CA

- Decide on what is acceptable and notify industry (e.g. website)
- Establish new process or update an existing
- Develop a way for the applicant to prove his/her previous experience (e.g. form)



Pilot Training



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TRAINING PROGRAMME

The operator's flight crew training and checking, established in accordance with ORO.FC, should incorporate the following elements:

(a) Conversion training

Conversion training should be conducted in accordance with a syllabus devised for SET-IMC operations and include at least the following:

(1) normal procedures:

- (i) anti-icing and de-icing systems operation;
- (ii) navigation system procedures;
- (iii) radar positioning and vectoring, when available;
- (iv) use of radio altimeter; and
- (v) use of fuel control, displays interpretation;

(2) abnormal procedures:

- (i) anti-icing and de-icing systems failures;
- (ii) navigation system failures;
- (iii) pressurisation system failures;
- (iv) electrical system failures; and
- (v) engine-out descent in simulated IMC; and



Pilot Training



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- (iv) use of radio altimeter; and
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(2) abnormal procedures:

- (i) anti-icing and de-icing systems failures;
- (ii) navigation system failures;
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Pilot Training



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- (a) (1)
- (2)
- (3) emergency procedures:
 - (i) engine failure shortly after take-off;
 - (ii) fuel system failures (e.g. fuel starvation);
 - (iii) engine failure other than the above: recognition of failure, symptoms, type of failure, measures to be taken, and consequences;
 - (iv) depressurisation; and
 - (v) engine restart procedures:
 - (A) choice of an aerodrome or landing site; and
 - (B) use of an area navigation system;
 - (vi) air traffic controller (ATCO) communications;
 - (vii) use of radar positioning and vectoring (when available);
 - (viii) use of radio altimeter; and
 - (ix) practice of the forced landing procedure until touchdown in simulated IMC, with zero thrust set, and operating with simulated emergency electrical power.



Pilot Training



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- (ix) practice of the forced landing procedure until touchdown in simulated IMC, with zero thrust set, and operating with simulated emergency electrical power.

(v) engine restart procedures:

- (A) choice of an aerodrome or landing site; and
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Pilot Training



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Pilot Training



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- (a) (1)
- (2)
- (3)...

(b) Conversion checking

The following items should be checked following completion of the SET-IMC operations conversion training as part of the operator's proficiency check (OPC):

- (1) conduct of the forced landing procedure until touchdown in simulated IMC, with zero thrust set, and operating with simulated emergency electrical power;
- (2) engine restart procedures;
- (3) depressurisation following engine failure; and
- (4) engine-out descent in simulated IMC.

(c) Use of simulator (conversion training and checking)

Where a suitable full flight simulator (FFS) or a suitable flight simulation training device (FSTD) is available, it should be used to carry out training on the items under (a) and checking of the items under (b) above for SET-IMC operations conversion training and checking.



Pilot Training



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(4) engine-out descent in simulated IMC.

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Pilot Training



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- (a)
- (b)
- (c)

(d) Recurrent training

Recurrent training for SET-IMC operations should be included in the recurrent training required by Subpart FC (FLIGHT CREW) of Annex III (Part-ORO) to Regulation (EU) No 965/2012 for pilots carrying out SET-IMC operations. This training should include all items under (a) above.

(e) Recurrent checking

The following items should be included into the list of required items to be checked following completion of SET-IMC operations recurrent training as part of the OPC:

- (1) conduct of the forced landing procedure until touchdown in simulated IMC, with zero thrust set, and operating with simulated emergency electrical power;
- (2) engine restart procedures;
- (3) depressurisation following engine failure; and
- (4) emergency descent in simulated IMC.

(f) Use of simulator (recurrent training and checking)

Following conversion training and checking, the next recurrent training session and the next OPCs including SET-IMC operations items should be conducted in a suitable FFS or FSTD, where available.



Pilot Training



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(4) emergency descent in simulated IMC.

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Pilot Training



Consequence?

- Do not produce any **real** emergency out of emergency training
- LIFUS: Complexity of the operations must be evaluated
- Other challenges?

→ Implementation leaves room for the CA



Pilot Training



Additionally:

pilots with low experience should receive specific and detailed briefings to prepare for LIFUS. These briefings should include a description of the:

USE OF EQUIPMENT

- FD symbols (single cue, cross bars etc);
- AP/FD modes, emphasizing the role and importance of FMA monitoring;
- map displays (including range selection and north up or track up);
- NAV set up and the use of primary source information;
- common R/T practices, as applicable;
- limitations of the use of non-certified equipment/features;
- standardization of before take-off and before approach briefings;
- expected normal and emergency communications



Pilot Training



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Maybe new elements in the OM B



Pilot Training



...and also cover:

SINGLE PILOT OPS

- Single Pilot psychology, decision making, communications and limitations
- Single Pilot task, resource and workload management and personal organization
- Single Pilot operation and management of the FMS including ECL and Charts
- Differences between MP and SP Abnormal and Emergency procedures
- Emergency Phraseology
- SP operations in icing conditions



Pilot Training



For commercial SET-IMC operations with two pilots:
Multi-pilot operations on single-pilot certified aeroplanes



FOCA AltMOC

«Multi Pilot Crew System on Single-Pilot certified Aeroplane»

- Valid for **Part-CAT** and Part-NCC
- Cockpit must be ready for multi-pilot operations
- Crew qualification
- *Contains additional single-pilot training and checking requirements!*





Summary

SET aeroplane, commercially operated in IMC by one or two pilots:

Crew Composition: multi-pilot cockpit possible (see option 2), but linked to additional requirements (experience, cockpit equipment etc.)

Experience of the PIC: Competent Authorities will have to decide on the acceptable overall IFR experience of the PIC if below 100 hours on the relevant type/class (see Option 3)

Pilot training is pretty straight forward but requires some additional training in the case of the multi-pilot option (option 2)

→ in CH: acc. to FOCA's AltMOC



Questions



Pictures: openclipart.org



Thank you!

