CAT SET-IMC

Commercial Operations with single-engined turbine aeroplanes in IMC or at night

together 4safety

EASA
European Union Aviation Safety Agency

Regulation for CAT SET-IMC

Regulation (EU) No 965/2012 (the Air OPS Regulation) allows the conduct of commercial air transport operations with single-engined turbine aeroplanes in IMC or at night (CAT SET-IMC), and establishes the legal framework applicable to these operations, complemented by AMC and GM adopted by the European Aviation Safety Agency (EASA).

The legal framework for CAT SET-IMC operations enabled the use of modern aeroplanes with a smaller carbon footprint. It also allowed the development of new business based on the opening of new routes which can be operated safely and efficiently only by single-engined turbine aeroplanes.

The requirements in the Air OPS Regulation meet and exceed the relevant ICAO standards, and establish a coherent framework, fully and proportionally considering the specificities of those operations.

EASA has drafted this Safety Promotion document to improve the understanding of the SET-IMC concept and its implementation by operators and authorities.

- Validation of the operational capability of the operator,
- Training items from operator reports,
- Forced landing procedure design criteria.

Validation of the Operational Capability

Objective of the SET-IMC validation flight(s)

Validation of the operational capability of the operator's procedure for the performance of IFSD safe forced landing. This includes:

- The adequate design of the IFSD procedure
- The adequate training of flight crew
- The adequate preparation of a SET-IMC flight, including the assessment of the expected weather conditions and their impact on the IFSD procedure.

Conditions under which the validation flight(s) should take place - 1

Number of approaches:

The determination of number of approaches following an IFSD is left to the operator. The number of approaches should ensure that sufficient data is gathered to demonstrate an acceptable level of safety. In any case, it is not expected that the number of approaches is limited to one.

Criteria for a successful ISFD approach and landing:

The operator is expected to have established criteria for a successful simulated IFSD approach and landing. Note: option irrespective of the success of the IFSD procedure, the go-around should always be the favoured option when performing the simulated IFSD approaches.

Use of optional equipment:

If the IFSD procedure is relying on optional equipment such as SVS, the validation flight(s) should also be performed in the most restrictive condition as defined by the dispatch condition of the MEL.

Conditions under which the validation flight(s) should take place - 2

Crew composition:

The crew composition should be representative of the one planned by the operator for its SET-IMC operations. In principle, it is expected that the flight crew part of the validation flight is not selected amongst the instructors or management pilots of the operator. Note: The crew taking part of the validation flights should be current in terms of training and checking for SET-IMC operations.

Means to simulate IMC conditions:

The selection of the adequate means to simulate IMC conditions is left to the operator. However, the use of IFR googles is highly recommended due to their effectiveness and low cost. Such means to simulate IMC conditions is designed to be used only by the pilot flying and, in any case, not by the pilot monitoring (or the additional pilot in case of planned single-pilot operations).

Use of different airfields:

The airfield(s) selected for the validation flight(s) should be representative of the landing sites planned to be selected during the planned SET-IMC operations of the operator. Note: it is expected that only aerodromes are selected for the simulated IFSD approaches. In case a landing site other than an aerodrome is selected, the Part-SERA limitations (minimum altitude) shall be considered.

In particular, if the operator intends to select aerodromes with grass runways, it is expected that some IFSD approaches are conducted on a grass runway as well. In principle, it is recommended to select several aerodromes with different characteristics for the validation flight(s). Note: The operator should make sure that ATC is informed beforehand of the simulated IFSD approaches to take place.

Weather conditions:

It is recommended, to the extent possible, to conduct IFSD approaches with various weather conditions and in particular some approaches with crosswinds to be able to further assess the flyability of the procedure and the training of the pilots.

Conditions under which the validation flight(s) should take place - 2

Simulation of an engine failure:

The procedures recommended by the manufacturer (if available) should be followed to simulate the engine failure and a realistic gliding performance. If no such procedure has been defined by the aircraft manufacturer, the operator is expected to define one and to describe it in its procedures.

Data recording:

It is expected that sufficient data is recorded by the operator during the validation flight(s) to allow an adequate assessment of its outcome. It is recommended to record as a minimum the 3D track of the flight(s), together with some of the following information:

- Date
- Time
- Flight/IFSD reference/identification
- Location
- Altitude at IFSD start
- Weight at IFSD start
- Pressure
- Temperature
- Wind
- Speed at threshold.

Note: there is no unique nor prescribed solution for the recording of data for these flights. A solution involving an EFB is one simple way to achieve this data recording.

Selection of the start altitude of the IFSD procedure:

The selection of the start altitude should be consistent with the IFSD procedure of the operator. If the operator's procedure foresees an altitude interval, both upper and lower limits of the interval should be used.

Competent Authority Actions - 1

Before the validation flights:

- Review of the operator's IFSD procedure: The operator's IFSD and forced landing procedure should be assessed against the criteria proposed in this document. Once the procedure has been positively assessed (with corrections required if needed), the competent authority should ensure that the flight crew training will be based on the validated procedure.

- Review of the proposed training programme: The operator's training programme should be assessed against the criteria proposed in this document. Once the programme has been positively assessed (with corrections required if needed), the competent authority should authorise the operator to implement it so that all flight crew part of the validation flights is trained and checked in accordance with this programme.

During:

- Observation of the implementation of the IFSD procedure: The competent authority inspector should take note of any deviation to the defined IFSD procedure so that they may be assessed after the validation flights.

- Review of the effectiveness of the training programme: The competent authority inspector should assess the capability of every flight crew (in terms of sufficient and relevant training) involved the validation flight to conduct an IFSD approach in accordance with the defined procedure.

After:

- Analysis of the recorded data: The competent authority should be provided access to all the data recorded in accordance with the established and agreed plan. This data should be reviewed and should support the 2 following evaluations (adequacy of the procedure and of the training programme).

Competent Authority Actions - 2

- Analysis of the success rate of the IFSD procedure and of its adequacy: Although there is no target success rate, it is expected that a success rate of at least 90% is achieved. In case of a lower success rate, the root causes at the origin of the failed approaches should be carefully assessed by the operator in order to determine the necessary actions to improve the probability to perform a safe forced landing. If necessary, additional validation flights may be required to be conducted to assess the impact of the actions implemented. The operator should be requested to assess all deviations to the IFSD procedure identify, determine the cause of the deviation and define the action to be taken (e.g. changes to the procedure or to the training programme).

- Analysis of the adequacy of the training programme: Based on the above analysis and on the review performed during the validation flight, the competent authority should determine if the initially validated training programme is adequate or if amendments are necessary.

- Issuance of the SET-IMC approval with potential limitations depending on the outcome of the validation flight(s): Once satisfied with the adequacy of both the IFSD procedure and the training programme, the competent authority may issue the SET-IMC approval. In cases where the low success rate could not be improved with changes to the procedure or training programme, the competent authority may nevertheless issue the SET-IMC approval but with limitations allowing to mitigate this observed low success rate, such as minimum weather conditions, requirements on the crew composition, etc.

Training Items from Operator Reports

General

- Training to be performed in an FSTD (if available and accessible) or in the aircraft.
- If performed in the aircraft, the use of IFR googles is recommended.
- Emphasis should be put on task sharing between PF and PNF (if applicable).

Initial training

- 30-45 mn procedure review with an instructor.
- 5 IFSD as PF.
- In case an FTSD is used, it is recommended that 2 of these IFSD are performed from cruising conditions.
- In the case of the use of an FSTD, the opportunity should be taken to simulate different weather conditions and environment.

Recurrent training

- Before the OPC: 2 IFSD as PF.

OPC

- 1 successful IFSD as PF.

Procedures Design Criteria

Pre-flight

- Landing site selection criteria.
- The procedure should define the optional aircraft equipment to be operative in addition to SPA.SET-IMC.110. In case of inoperative equipment, the impact on the procedure should be described. This procedure should be in line with the MEL dispatch conditions.
- Note: The procedure should be consistent with the proposal of the demonstration phase.

Forced landing procedures

The procedure should specify battery preservation actions (check the manufacturer's procedure). The flight crew should monitor the battery charging status.

The procedure should include the following:

- A time-based (with the use of a timer) or distance-based approach.
- Some control points in the approach (altitude, speed and time).
- Wind corrections (when and how to apply the wind corrections in the procedure including head/tail wind and cross wind).

If the operation is performed in Single Pilot, guidance on workload management should be included in the procedure.

If the operation is performed in Multi-Pilots, the task sharing between PF and PM should be developed.

The following cases should be envisaged in the procedure:

- Aircraft too low (e.g. postpone the flaps and gear extension) or too high.
- Aircraft too fast or too slow.

The pilot should be reminded on the following points of attention:

- Adherence to speeds to avoid risk of stall or loss of control in-flight
- Max flaps setting and min approach speed on short final
- Crew communication