

**Alternative AMC proposed by DGAC France regarding the
Use of RNAV system as a substitution means for ADF receivers for non-
equipped aircraft (CAT. IDE.A.345)**

In accordance with ARO.GEN.120 (Means of compliance) DGAC France proposes an alternative means of compliance to:

Regulation reference: Regulation (EU) N°965/2012 - Annex IV (Part-CAT) – CAT. IDE.A.345

Subject: Use of RNAV system as a substitution means for ADF receivers for non-equipped aircraft

Summary:

Existing ILS/DME or LOC/DME procedures frequently rely on the use of NDB beacon and ADF receivers at some stage, especially initial approach segment, go-around segment or holding pattern.

According to AMC2 CAT. IDE.A.345 item (d), an ADF receiver is required for those operations under IFR. However, the most recent aircraft models (A220, A350, B787) are not equipped with ADF receivers.

In practice, as an alternative to ADF receivers, operators of non-equipped aircraft may use their area navigation (RNAV) navigation capability to define waypoints and fly the concerned procedures. However, for CAT operations, this is not currently addressed by the AirOPS regulation.

Relying on the 'RNAV substitution' concept recently introduced (ED Decision 2022/012/R) in Part-NCO of AirOPS regulation and the FAA and UK CAA regulation, which makes possible the primary use of the RNAV system on conventionally-defined path segments (except during final approach segment), DGAC France established this AltMoC to expand EASA provisions on 'RNAV substitution' to CAT operations, with an implementation scope limited to ADF receivers substitution.

Implementing rules:

CAT. IDE.A.345 Communication, navigation and surveillance equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

(a) Aeroplanes operated under IFR or under VFR over routes that cannot be navigated by reference to visual landmarks shall be equipped with radio communication, navigation and surveillance equipment in accordance with the applicable airspace requirements.

[...]

(d) Aeroplanes shall have sufficient navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment shall allow safe navigation in accordance with the flight plan.

(e) Aeroplanes operated on flights in which it is intended to land in IMC shall be equipped with suitable equipment capable of providing guidance to a point from which a visual landing can be performed for each aerodrome at which it is intended to land in IMC and for any designated alternate aerodrome.

[...]

Existing Acceptable Means of Compliance:

AMC2 CAT. IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

ACCEPTABLE NUMBER AND TYPE OF COMMUNICATION AND NAVIGATION EQUIPMENT

[...]

(d) To perform IFR operations without an ADF system installed, the operator should consider the following guidelines on equipment carriage, operational procedures and training criteria.

(1) ADF equipment may only be removed from or not installed in an aeroplane intended to be used for IFR operations when it is not essential for navigation, and provided that alternative equipment giving equivalent

or enhanced navigation capability is carried. This may be accomplished by the carriage of an additional VOR receiver or a GNSS receiver approved for IFR operations.

(2) For IFR operations without ADF, the operator should ensure that:

- (i) route segments that rely solely on ADF for navigation are not flown;
- (ii) ADF/NDB procedures are not flown;
- (iii) the minimum equipment list (MEL) has been amended to take account of the non-carriage of ADF;
- (iv) the operations manual does not refer to any procedures based on NDB signals for the aeroplanes concerned; and
- (v) flight planning and dispatch procedures are consistent with the above mentioned criteria.

(3) The removal of ADF should be taken into account by the operator in the initial and recurrent training of flight crew.

[...]

DGAC France Alternative Acceptable Means of Compliance:

[...]

(d) To perform IFR operations without an ADF system installed, the operator should consider the following guidelines on equipment carriage, operational procedures and training criteria.

(1) ADF equipment may only be removed from or not installed in an aeroplane intended to be used for IFR operations when it is not essential for navigation, and provided that alternative equipment giving equivalent or enhanced navigation capability is carried. This may be accomplished by the carriage of an additional VOR receiver or a **RNAV system** approved for IFR operations.

(2) For IFR operations without ADF, the operator should ensure that:

- (i) route segments that rely solely on ADF for navigation are not flown, **except if (d)(3) applies**;
- (ii) ADF/NDB procedures are not flown;
- (iii) the minimum equipment list (MEL) has been amended to take account of the non-carriage of ADF **and its substitution by a RNAV system, if applicable**;
- (iv) the operations manual does not refer to any procedures based on NDB signals for the aeroplanes concerned; and
- (v) flight planning and dispatch procedures are consistent with the above mentioned criteria.

(3) A **RNAV system** may be used to substitute for ADF receiver equipment, without monitoring of the raw data from conventional NDB navigation aids, if the following conditions apply:

(i) **RNAV substitution for ADF receiver may be used during all phases of flight except to provide lateral guidance in the final approach segment (FAS) of an instrument approach procedure (IAP) ;**

(ii) **The RNAV system used as a substitution means for ADF receiver should meet:**

- (A) **the requirements of (E)TSO-C129/-C196/-C145/-C146 (or later equivalent standards); and**
- (B) **the requirements of CAT.OP.MPA.126(a) for RNAV 1, RNP 1 or RNP APCH as regards its installation in the aircraft.**

(iii) **Additional procedures should be established in order to:**

- (A) **ensure that any procedure and waypoints used are retrieved from a navigation database which meets the requirements of CAT.IDE.A.355;**
- (B) **verify waypoint sequence, reasonableness of track angles, and distances of any overlay procedure used;**
- (C) **apply pre-flight procedures associated with the use of RNAV system; and**
- (D) **comply with any limitation on RNAV system used to substitute for ADF receiver equipment in the aircraft flight manual (AFM).**

(iv) RNAV substitution for ADF receiver should not be applied on any procedure where RNAV substitution has been indicated as 'not authorized' by an AIP entry, a NOTice to AirMen (NOTAM) or any other aeronautical information means.

(4) The removal of ADF and the use of an RNAV system to substitute for ADF receivers, if applicable, should be taken into account by the operator in the initial and recurrent training of flight crew.

[...]

Reasoning of the AltMoC and Assessment by DGAC demonstrating compliance to the IR(s):

The aim of this AltMoC is to allow the use of an RNAV system to substitute for ADF receiver for CAT operations when used on conventional segments (en-route, SID, STAR, initial/intermediate approach and missed approach), excluding PBN routes (which per definition do not rely on NDB) and NDB non-precision approach.

Most of the recent aircraft operated for purpose of commercial air transport are fitted with an FMS system capable of and certified for PBN operations in enroute and terminal areas. This system (or equivalent system) provides flight crew with navigation and flight planning data fully integrated within the cockpit, especially with the support of other display, alerting and flight guidance systems. It ensures the appropriate navigation performances (FTE, NSE, PDE and integrity) when it comes to substituting for the ADF receiver, as far as those NDB ground-based navaids are properly coded within the navigation database and can be used as RNAV path terminators. RNAV system being able to select the most appropriate navigation sensors (GNSS, DME-DME, IRS hybridization), overall navigation performance is expected to be better than using ADF raw data tracking flight technique.

DGAC France AltMoC to CAT. IDE.A.345(d) introduces additional conditions to expand EASA provisions on 'RNAV substitution' to CAT operations, with an implementation scope limited to ADF receivers substitution. It includes conditions on RNAV system capabilities, operational procedures, navigation database management, flight crew training and MEL.

Furthermore, this AltMoC is consistent with the current wording of AMC1 NCO. IDE.A.195(a) 'Navigation Equipment' which introduces the concept of 'RNAV substitution' within the Annex VII Part-NCO.

By consequence, those new provisions are considered to grant a sufficient level of compliance demonstration to IR CAT. IDE.A.345 for the use of an RNAV system as an alternative to ADF receiver.

Formal statement by DGAC: Date January 21st 2025	<p>'This AltMoC has been assessed by DGAC and it establishes compliance with the IR(s)'</p> <p>Signature:</p> <p>Le directeur technique Navigabilité et Opérations</p>  <p>François-Xavier DULAC</p>
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