

DRAFTING GROUP TASKING FORM

EASA

TERMS OF REFERENCE

TOR Nr: AMC-20/003

Issue: 1

Date: 05 July 2004.

Regulatory reference: AMC-20 xx (new reference)

Reference documents: draft JAA TGLs XY airworthiness and operational approval for RNAV approach operations and XZ airworthiness and operational approval for RNP-RNAV approach operations

1. Subject: Airworthiness and operational approval for on-board equipment related to RNP-RNAV approach operations

2. Problem / Statement of issue and justification; reason for regulatory evolution (regulatory tasks):

As a further development of the concept of area navigation within the European region, RNP RNAV is to be implemented on instrument approach procedures supporting increased availability, enhanced safety and reduced operating minima over and above that provided from traditional non-precision and conventional RNAV approaches.

There is a need to provide guidance material for the approval of aircraft and operations when conducting RNP-RNAV Approach Operations. It relates to the implementation of area navigation within the context of the European Air Traffic Management Programme (EATMP) and should be read in conjunction with EUROCONTROL document 003-93 (), Area Navigation Equipment: Operational Requirements and Functional Requirements. The guidance is consistent with EUROCONTROL publications dealing with related operational and functional requirements and with the design of terminal airspace procedures for DME/DME and GNSS based area navigation.

Particular attention should be paid to the specificities of Helicopters.

3. Objectives:

There are strong drivers to improve the safety of approach and landing operations. CFIT and the so-called "dive and drive" non-precision approaches are common factors in aircraft accidents and incidents. The US CAST and JAA JSSI safety initiatives have both advocated Continuous Descent Procedures which have inherent in them a stabilised, constant angle approach path. With the Flight Guidance Systems on board today's modern aircraft the ability to fly these approaches with lateral and/or vertical navigation (LNAV and VNAV using either coupled autopilot or Flight Director) provides a "precision-like" capability. From an ICAO Annex 6 perspective, the term Approach with Vertical Guidance (APV) has been introduced to address these types of approach operations. Nevertheless, the issue that remains is on which sensor type the approach should be based. In this respect there are multiple possibilities, each of which offer differing degrees of accuracy. Resolving the problem is a matter of taking into account:

- Navigation infrastructure.
- Airspace needs in terms of connectivity with the other terminal procedures i.e. P-RNAV or a conventional Arrival and transition,
- Whether the approach procedure is stand-alone or is there to serve as a back up for an ILS procedure i.e. an overlay.
- The ATC service provision.
- Maintaining accessibility to the airport for all users. Linked to this, aircraft types using a particular airport and their equipment capability.
- Cost and availability of possible upgrade paths.
- Certification costs.

- Terrain and obstacle assessment.
- Procedure design compatibility in terms of likely minima i.e. no worse than today's procedures.

ICAO PANS-OPS provides procedure design criteria for RNAV/Baro VNAV based on DME/DME and B-GNSS. In the lateral sense it also provides RNP-RNAV criteria for RNP values equal to 0.3 NM. Taking into account the factors above, Europe has decided to implement two distinct RNAV approach types:

- RNAV based on an underlying infrastructure of DME/DME, GPS (or eventually the Galileo constellation), EGNOS and/or GBAS augmentation
- RNP-RNAV for those aircraft so certified and based on the same infrastructure as above

The criteria (both procedure design and certification) will take account of the fact that aircraft with different flight guidance capabilities will want to fly the procedures. Therefore, there will have to be a means of distinguishing (in both the design and the charting) between the approach being flown with or without Baro VNAV. At some point in the future, consideration will also have to be given to aircraft equipped with a geometric VNAV capability, although this does not change the basic types of approach as VNAV is a subset of both RNAV and RNP-RNAV.

From a certification perspective, the JAA has identified two Temporary Guidance Leaflets addressing RNAV (TGL XY) and RNP-RNAV (TGL XZ) approach operations respectively.

The TGL XY criteria covers both the multi-sensor RNAV and stand-alone GNSS navigation systems including TSO C-129 () receivers. This will allow granting of approvals for the various infrastructure and airport types to be encountered in a pure RNAV environment. For example, a final approach segment following a P-RNAV arrival and transition and the "T" or "Y" type of initial approach procedure more common at regional or small airfields outside of busy terminal airspace. The TGL XZ criteria is based around the RTCA DO-236()/EUROCAE ED-75() MASPS, thereby requiring containment integrity, containment continuity, MASPS functionality and display of Estimated Position Uncertainty (EPU).

4. Specific tasks and interface issues (Deliverables):

Finalize NPA for AMC-20 based on the two JAA draft TGLs

Interface with JAA Operations Sectorial Team as the proposals is a means of compliance to JAR-OPS: final draft to the Agency will be co-coordinated with JAA

Interface with EUROCONTROL: final draft to the Agency will be coordinated with EUROCONTROL

5. Working Methods: (in addition to the applicable EASA procedures)

The initial meeting should be held early enough so as to allow to meet the task within the required timescale;

Meetings shall be held at the Agency's head office or at the central JAA depending where the Agency support to the group is provided.

6. Time scale, milestones:

The draft EASA NPA should be delivered **before 31 November 2004.**

7. Composition:

Proposed Chairman: Mr Burtenshaw (CAA-UK)

Proposed Secretary:

Members:

- Mr Ackland (AIA-Boeing)
- Mr Davidson (EUROCONTROL)
- Mr Ullveter (LFV-Sweden)
- Mr Delibes (Airbus)
- Mr Lissone (EUROCONTROL)
- Mr Nakamura (AIA-Boeing)
- Mr Rabiller (DGAC-F)
- Mr Shand (British Airways)