

### APV/Baro-VNAV JOB AID

#### APPLICATION TO CONDUCT APV/Baro-VNAV OPERATIONS

#### 1. Introduction

This Job Aid was developed to provide air operators, and inspectors with guidance on the process to be followed in order to obtain an RNP APCH approval using Barometric VNAV flown to an LNAV/VNAV decision altitude. It should be used as an aid for the approval process but frequent reference to the ICAO PBN Manual and CAAF SD-PBN (Operations Approval) will be required. The Attachment to Volume II of CAAF SD-PBN (Operations Approval) contains guidance on the implementation of APV/Baro-VNAV.

#### 2. Purpose of the Job Aid

- 2.1 To give operators and inspectors information on the main APV/Baro-VNAV reference documents.
- 2.2 To provide tables showing the contents of the application, the associated reference paragraphs, the place in the application of the operator where APV/Baro-VNAV elements are mentioned and columns for inspector comments and follow-up on the status of various elements of APV/Baro-VNAV.

#### 3. Actions Recommended for the Inspector and Operator

- 3.1 At the pre-application meeting with the operator, the inspector reviews the “basic events of the APV/Baro-VNAV approval process” described in Section 1 of this Job Aid, in order to provide an overview of the approval process events.
- 3.2 The inspector reviews this Job Aid with the operator in order to establish the form and content of the APV/Baro-VNAV approval application.
- 3.3 The operator uses this Job Aid as a guide to collect the documents of the APV/Baro-VNAV application.
- 3.4 The operator inserts in the Job Aid references showing in what part of its documents are the APV/Baro-VNAV elements located.
- 3.5 The operator submits the Job Aid and the application to the inspector (with the required documents).
- 3.6 The inspector indicates in the Job Aid whether an item is in compliance or needs corrective action.
- 3.7 The inspector informs the operator as soon as possible when a corrective action by the operator is required.
- 3.8 The operator provides the inspector with the revised material when so requested.
- 3.9 The CAAF provides the operator with the operational specifications or a letter of authorization, as applicable, when the tasks and documents have been completed.

#### SECTION 1 - INFORMATION ON THE IDENTIFICATION OF AIRCRAFT AND OPERATORS

NAME OF THE OPERATOR:

is applying for APV/BARO

| Aircraft manufacturer, model, and series | Aircraft Registration<br>(required only if installed equipment varies between model and series) | List relevant make and model of related lateral and vertical navigation equipment |
|------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                          |                                                                                                 |                                                                                   |
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|                                          |                                                                                                 |                                                                                   |

DATE OF PRE-APPLICATION MEETING

DATE ON WHICH THE APPLICATION WAS RECEIVED

DATE ON WHICH THE OPERATOR INTENDS TO BEGIN RNP APCH OPERATIONS

## SECTION 2 – OPERATOR APPLICATION (ITEMS AND DOCUMENTS)

| Item | Title of document                                                                                                                                                                                                                                                                                                                                                                                   | Indication of inclusion by the operator | Comments by the Inspector |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------|
| 1    | <b>Airworthiness documents showing aircraft eligibility for APV/Baro-VNAV.</b><br>AFM, AFM revision, AFM supplement, or Type certificate data sheet (TCDS) showing that the navigation system is eligible for APV/Baro-VNAV; or.<br>Manufacturer statement - Aircraft with a manufacturer statement documenting compliance with the performance and functional requirements of the ICAO PBN Manual. |                                         |                           |
| 2    | <b>Aircraft is modified to meet APV/Baro-VNAV standards</b><br>Documentation on aircraft inspection and/or modification, if applicable.                                                                                                                                                                                                                                                             |                                         |                           |

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| 3 | <b>Maintenance programme</b><br>Maintenance procedures for APV/Baro-VNAV systems - the list of references of the document or programme.                           |  |  |
| 4 | <b>Minimum equipment list (MEL) if applicable</b> showing provisions for APV/Baro-VNAV systems.                                                                   |  |  |
| 5 | <b>Training</b> programme for flight crews, and flight dispatchers, and maintenance personnel as applicable.                                                      |  |  |
| 6 | <b>Operating policies and procedures</b> including relevant section of Operations Manuals and checklists attached to the application, applicable to APV/Baro-VNAV |  |  |
| 7 | <b>Navigation database</b><br>Details of the navigation data validation programme.                                                                                |  |  |

### SECTION 3 – GUIDE FOR DETERMINING APV/Baro-VNAV AIRCRAFT ELIGIBILITY

| Item | Topics                                                                                                                                                                                        | Reference paragraphs<br>ICAO Doc 9613<br>Vol II Attachment | Location in the Documents<br>of the operator | Comments |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------|----------|
| 1    | <b>Aircraft eligibility</b>                                                                                                                                                                   |                                                            |                                              |          |
|      | VNAV barometric capability - An aircraft is eligible for Baro-VNAV operations when the AFM or AFM supplement indicates that the VNAV system has been approved under AC 20- 129 or equivalent. | 4.3.1                                                      |                                              |          |
| 2    | <b>Aircraft Systems</b>                                                                                                                                                                       |                                                            |                                              |          |
|      | <b>Lateral navigation</b><br>GNSS navigation system certified for approach; or a) Multi-sensor system using IRS/GNSS; or<br>b) RNP systems approved for RNP 0.3 or lower                      | 4.6, Note 5                                                |                                              |          |

|      | <b>Vertical navigation</b><br>a) Serviceable VNAV equipment<br>b) VNAV system certified for Barometric VNAV approach operations;<br>c) Equipped with integrated LNAV/VNAV system with accurate source of barometric altitude; and<br>d) VNAV altitudes and procedure information from a navigation database with integrity though quality assurance                                                                                                         | 4.6, Note 5                                                |                                              |          |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------|----------|
| 3    | <b>Functional requirements</b>                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                            |                                              |          |
| (a)  | <b>Required Functions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                            |                                              |          |
|      | The navigation system must provide the capability to continuously display to the pilot flying, on the primary flight instruments for navigation of the aircraft, the aircraft position relative to the vertically defined path. The display must allow the pilot to readily distinguish if the vertical deviation exceeds +30 m/–15 m (+100 ft/–50 ft).                                                                                                     | 4.14                                                       |                                              |          |
| Item | Topics                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reference paragraphs<br>ICAO Doc 9613<br>Vol II Attachment | Location in the Documents<br>of the operator | Comments |
|      | User Interface (Displays and Control)<br>Display resolution (readout) and entry resolution for vertical navigation information                                                                                                                                                                                                                                                                                                                              | 4.13                                                       |                                              |          |
|      | Altitudes and/or speeds associated with published procedures must be automatically extracted from the navigation database upon selecting the approach procedure.                                                                                                                                                                                                                                                                                            | 4.8                                                        |                                              |          |
|      | The navigation system must have the capability to load and modify the entire procedure(s) to be flown, based upon ATC instructions, into the RNAV system from the on-board navigation database. This includes the approach (including vertical angle), the missed approach and the approach transitions for the selected airport and runway. The navigation system should preclude modification of the procedure data contained in the navigation database. | 4.10                                                       |                                              |          |
|      | The aircraft must display barometric altitude from two independent altimetry sources, one in each pilots' primary field of view.                                                                                                                                                                                                                                                                                                                            | 4.15                                                       |                                              |          |
| (b)  | <b>Recommended Functions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                            |                                              |          |

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|  | Temperature compensation: Capability to automatically adjust the vertical flight path for temperature effects. | 4.19 |  |  |
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#### SECTION 4 - PROCEDURES FOR APV/BARO-VNAV OPERATIONS

|   |                                                                                                                                                        |      |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|--|
| 1 | <b>Cold temperature limitations/corrections</b><br>Operator procedures to ensure the limiting temperatures for the use of Barometric VNAV are observed | 4.19 |  |  |
| 2 | <b>Altimeter setting</b><br>Operator procedures for altimeter setting.                                                                                 | 4.18 |  |  |
| 3 | <b>Manufacturer requirements</b><br>Operator procedures to comply with any instructions or procedures identified by the manufacturer.                  | 4.17 |  |  |