

Instrument Flight Procedures Panel (IFPP)

Presented by John Langa Tembo

EXECUTIVE SUMMARY

The International Civil Aviation Organization's (ICAO) Instrument Flight Procedures Panel (IFPP) convened its first meeting of the 17th cycle from February 26 to March 8, 2024, in Dubai, UAE. The IFPP Panel is a specialized body within ICAO dedicated to the development and upkeep of flight procedures SARPs and guidance material, such as Doc 8168, Docs 8697, 9905, and 9906. Its primary objectives include enhancing safety, increasing terminal airspace capacity and utilization, improving airport/heliport accessibility in all weather conditions, and facilitating more efficient transitions to/from en-route airspace.

In this 17th cycle, the panel's focus is primarily on maintaining existing Instrument Flight Procedures Design (IFPD) criteria while also addressing emerging capabilities such as Performance-Based Navigation (PBN), automation utilization, quality assurance, and environmental considerations in instrument flight procedures (IFP).

To effectively meet these objectives, the IFPP Panel has organized into several workgroups:

PBN and New Procedures: This group is tasked with developing procedures and criteria related to PBN implementation and the introduction of new flight procedures.

Maintenance and Implementation of Criteria: Responsible for maintaining and implementing IFPD criteria, ensuring consistency and adherence to international standards.

Helicopters: Focused on addressing specific considerations and requirements for helicopter operations within instrument flight procedures.

Integration: This group works towards the seamless integration of various elements within IFP, ensuring efficiency and safety in airspace utilization.

Quality Assurance: Tasked with implementing mechanisms to ensure the quality and reliability of IFP, minimizing errors and enhancing overall safety.

The IFPP's first meeting in the 17th cycle marks the beginning of collaborative efforts to advance the safety, efficiency, and environmental sustainability of instrument flight procedures worldwide. Through the coordination of its workgroups and engagement with relevant stakeholders, the panel aims to achieve significant progress in fulfilling its mandate over the course of the cycle.

1. INTRODUCTION**1.1. Panel Structure and Meetings**

This report details the activities of the 17th cycle IFP Panel. In this cycle, two work group meetings and two panel meetings have been planned as follows.

- IFPP 17-1 Working Group 26 February–08 March 2024 Dubai UAE
- IFPP 17-2 Working Group 21 October – 1 November 2024 ICAO HQ, Montreal
- IFPP 17-3 Working Group 17-28 March 2025 (Lima Peru TBC)
- IFPP/18 Panel Meeting 27 October – 7 November 2025 ICAO HQ, Montreal

The IFPP Panel comprises the following workgroups.

- PBN and new procedures
- Maintenance and implementation of criteria
- Helicopters
- Integration
- Quality Assurance

2. DISCUSSION

2.1. PBN AND NEW PROCEDURES

RNP AR Departures

A discussion was held if there are any other ideas to provide obstacle protection other than what the USA does at the moment. Such discussion was already held in Interlaken and both times that discussion stalled into silence. The meeting agreed that the responsible WG should find a lasting solution in the next meeting.

Real PBN

The outcome of the meeting discussion is that there is a benefit in departing from the BV value concept and substituting it with a multiplier-based expert judgment. The whereabouts of the multiplier was discussed extensively without reaching an agreement, and the "can the expert judgement be supported by data and to what extent" was re-tabled yet again.

PBN to/from LOC

The meeting discussed and proposed adding a sentence to state that PBN to/from LOC is possible. The discussion started by acknowledging that when the PBN to/from xLS criteria was developed, the question was on the table and the consideration was that if the PBN-xLS criteria will be available, together with the criteria already existing in PANS-OPS enough guidance would be available to design the LOC procedure. It was agreed in the meeting that if there are other Members/Advisors aware of such requests or issues, then the way forward could be to create criteria for the transition, but in that case, a broader range of combinations should be catered for.

2.2. Maintenance and Implementation of Criteria

SBAS Criteria Modernisation IFPP

In the meeting, the panel discussed the development of new criteria for SBAS with a final offset of up to 15°. Given the current absence of a secretary for the panel, the IFPP/17-1-WP/1b-005 status of the Job Card remains unknown, although there is an assumption that it will be accepted by the ANC. The panel

agreed to formulate a solution addressing this topic in conjunction with PBN work group.

Cold Temperature Corrections

The topic was initially introduced during IFPP/16-2, highlighting inconsistencies in cold temperature corrections across documents and specifically addressing the issue of applying temperature corrections in the intermediate segment of approach procedures using BaroVNAV. A WP presented to the meeting proposing the first PfA related to a new Job Card on cold temperature corrections, which was created during IFPP/16. The paper underwent thorough discussion, with initial suggestions for modifications provided. Some participants raised concerns about the potential complexity of the proposal for pilots. It was decided to present the slightly updated WP to the panel to gather additional input. The plenary is requested to provide feedback to the MWG.

Departure Bank Angle

A working paper was presented proposing alternative bank angle values usable for departure turn area construction. During a discussion, it was investigated if the topic had been previously addressed in the last cycle (IFPP16_WP23_Changes to the flyby turn protection). However, it was clarified that the previous update applies to departures after 15 NM from the ARP, and the WP suggests the use of different bank angles at an earlier stage. The proposed changes in WP1B should be discussed in conjunction with the insights and information presented in Paper IP2-001. This paper recommends investigating the general use of bank angles in PANS-OPS and its potential impact on the MSD.

Obstacle Clearance Surface (OCS)

A WP presented to the meeting suggesting the correction of a current inconsistency in the OCS chapter concerning non-precision approaches for aircraft categories A and B. The group discussed the topic and expressed the view that the OCS assessment should be applicable to any approach angle. The rationale is that conducting an assessment is deemed preferable to not conducting one at all. Therefore, it was proposed to completely remove the relevant note (refer for details to the WP). An updated version of the WP will be prepared and presented to the panel during IFPP/17-2.

Harmonization of Rate of Turn Criteria IN PBN

The meeting proposed to harmonize the calculation of the rate of turn (R) throughout different criteria sets by indicating the inclusion of the wind component. It proposed to amend PANS-OPS to harmonize the calculation in PBN with the criteria outlined in Doc. 9905 to eliminate any possible inconsistency. In general, the group expressed no objections to the proposal. However, discussions arose regarding the 2 different reference systems concerning turns (RF vs. the fly-by methodology) and how the 3 %/s limit is

considered. Agreement on the PfA material to correct the inconsistency in the rate of turn calculation for RF legs in PANS-OPS compared to RNP-AR criteria. Further discussion is needed to determine whether the additional proposed changes should also be incorporated. A final working paper will be prepared for presentation at IFPP/17-2

Multiple Procedure Design Gradients on Departures IWG DP

The paper was presented to the meeting to highlight the absence of a statement in PANS-OPS regarding the possibility of using multiple increased PDGs in the design of SIDs. There may have been reasons for the current criteria, mainly related to enabling acceleration segments. Further discussion involving performance engineers and the Flight Ops Panel is necessary before specific changes can be proposed. It was agreed to coordinate this topic with the FLTOPSP.

Track Guidance for Departure Routes IWG DP

Following the presentation of the WP, there was consensus that the topic requires additional discussion. Some members of the group raised objections to the complete deletion of the existing paragraph or modifying it from "shall" to "should." If the author wishes to pursue the topic further, it was agreed, that he would coordinate the development of a new proposal.

Editorial Review of PANS-OPS

The meeting discussed that any potential editorial changes noticed by the responsible WG should be reported to the panel and a WG should prepare a WP for IFPP/17-3 latest, for review and agreement by the panel.

Other Identified Work Items

The identified items, some of which are also mentioned in the new "Maintenance of Existing Criteria", include:

- Obstacle clearance in the initial missed approach phase
- Location of MAPt for offset case
- Evaluate reduction of initial width for departure protection
- Evaluate to delete the option "turn as soon as practicable"
- "Standardized method" to obstacle protection for SIDs with multiple turns
- Changes related to Version 5 of the ICAO Doc. 9613 (PBN Manual)

2.3. HELICOPTERS

IFP for Helicopter PBN Operations

Review of RNP 0.3 buffer values: This Phase 3 proposal was put on hold during the IFPP 16 cycle pending the evolution of the 'Real PBN' concept,

bringing an overall new protection concept. Effectively eliminating all buffer values from the PANS-OPS design criteria

Maintenance OF EXISTING CRITERIA

This new Job Card can be found on the Instrument Flight Procedures Panel website, under IFPP, 18 to 29 Sep 2023, IFPP/16 Meeting Documents, Existing Job Card Updates. It is proposed to close the Job Card after every panel meeting and open a new one for the subsequent cycle. Items not complete will be transferred to the new maintenance Job Card

During the HWG meeting, it was suggested and agreed the *Aeronautical Chart Manual 8697* be added to the Reference Documents, V0.3 of the JC to be updated and uploaded to the IFPP website.

Removal of HAS diagram and implementation of new promulgation requirements for improved situational awareness for helicopters: The HWG exchanged some ideas on concepts for a replacement of the Height Above Surface (HAS) diagram that would provide improved obstacle situational awareness in the transition from IFR to VFR.

Some ideas put forward were to require an inset or separate chart on the reverse, for Proceed VFR approaches. Various scenarios considered:

- 1) Inset centred around PinS/MAPt where landing locations are more than a certain distance (TBD) from the PinS/MAPt
- 2) Both PinS/MAPt and landing locations in inset.
- 3) Bearings and distances indicated due to large distances.

Retain 0.8 NM HAS-radius for obstacle identification. Add visual cues, and manmade and geographical features.

The plan is to develop a new WP for the HAS diagram, to be reviewed and discussed at the next HWG meeting.

Minimum Crossing Altitude (MCA) definition: The IWG are reviewing altitude term usages, MCA was identified to have no definition in either Vol I or II of PANS-OPS. While comparing the use of the term in both Volumes an apparent context disconnect of the term MCA was discovered. There are two clear definitions of MCA used in Vol I and II, one being a procedure altitude and the other MOCA.

The consensus was the use of MCA for helicopters is for MOCA purposes (although this can be debated and is still up for discussion). An initial definition has been tabled.

Minimum Crossing Altitude (MCA): The minimum altitude at the Initial Departure Fix (IDF) where the IFR obstacle segment begins for the IFR PinS departure segment.

The WP, *IFPP17_WP1c-002 17-1 MCA definition DRAFT V1*, will address the lack of definition in PANS-OPS Vol I and II of the term Minimum Crossing Altitude (MCA) in reference to the Helicopter Departure context. IWG will then look at the remaining MCA occurrences in Vol I and propose updates according to the context (procedure altitude or MOCA)

Height Loss (HL) reduction: The HL reduction maintenance item is to be revisited now priority items were completed in IFPP16. There are many components already noted to consider, pilot delay, undershoot, altimetry error and some work has been completed already, and test data for 3-4 sites.

HELICOPTER RNP AR

Doc 9905 3rd Edition – Helicopter RNP AR and 9905 minor edits: A presentation was made changes to the draft 9905 3rd edition doc, following the joint IWG/HWG meeting on 30 Jan 2024. HWG approved the changes, with minor edits. An option of reducing the $t=15$ sec for the Transitional Distance calc to $t=5$ sec for helicopters was tabled and discussed, the whole concept was debated.

2.4. INTEGRATION

PBN and IWG Joint Session – PBN Turn Protection for Flyby. Robie presented an error found in a paper presented and endorsed at IFPP 16 regarding turn protection for flyby turns. There was an inadvertent deletion of criteria that should still be currently allowed. It is a criteria that allows turns of up to 10° at the FAF as a flyby. Robbie asked for all states to comment on this topic in the State Letter so hopefully, it can get corrected before publication.

An additional inconsistency was identified where a turn is less than 30° , a flyby, and the circular arc method is used. In the climbing phase, it can only begin after passing 15nm from the ARP, but this 15nm restriction does not exist for fly-over turns, thus it appears to be inconsistent. It was recalled in the meeting that this may be due to the thought that an accelerating phase has a higher chance of overshooting. It was mentioned in the meeting that there was a EUROCONTROL study of 100,000+ aircraft/flights that helped prove this is acceptable. The study was not readily available for review but would be provided at a later date.

One member commented that aircraft guidance in the final approach can vary significantly enough that a turn at the FAF may create challenges with some aircraft to capture the final approach. This may lead to non-engagement of final approach guidance, descent on the slope too late as one may not be aligned with the final approach course, etc.

Members expressed concerns and mentioned that any changes to be completed after the State Letter and before publication should be kept to a minimum as it could balloon. It was agreed that this should be done as the ANC may see too many changes and too large of changes and could reject it, requiring the items to be worked in another cycle.

Action Item: More options to be circulated for further discussion at IFPP 17-2.

PBN and IWG Joint Session – RNP AR SIDs. Another WP was presented with proposed updates to the RNP AR Manual (DOC 9905). Within the proposed updates is allowing the use of an RF leg at DER. This topic was previously discussed at IFPP 16-2 in Interlaken based on a paper from EUROCONTROL. In that meeting, it was decided that the use of an RF at the DER was acceptable for RNP AR SIDs only.

The current criteria states that the nominal climb starts at 5m above the DER, but this would result in a turn below 400ft. This proposal would adjust the

nominal climb starting position to be placed at a location more suitable for the aircraft and operators that may fly the AR SID. It was identified by those in the room that generally speaking very few locations they are aware of could potentially benefit from such criteria. The FAA has some criteria regarding this topic, and it was suggested there is a need to harmonize the criteria between the FAA and ICAO.

Action Item: The meeting noted the discussion points and will look into using the FAA criteria when updating DOC 9905 and it will be presented again at IFPP 17-2

One member mentioned that there may still be an opportunity to amend the current required minimum distance for turns from the DER when the path terminator is other than RF. Frankfurt currently has RNAV 1 SIDs that turn earlier than the current stated minimum distance.

Action Item: The meeting agreed to prepare a WP to be presented at the next meeting for further discussion.

PBN SID and STAR Charting – WP2-002. Kleber presented an update to his Working Paper regarding PBN SID and STAR charting. The paper discussed the need to create PBN SID and STAR specimen charts for DOC 8697 and what elements should be placed on the specimen charts. It was identified there is a need for such charts as many states will apply various ways and means of depicting information and PBN requirements on PBN SID and STAR charts. By creating specimen charts states will be able to have a better reference on how to depict PBN SID and STARs.

When discussing equipment requirements, it was suggested to state when only a single sensor type is required to use the term “only” instead of “required” as this was confusing to crews as they were not sure what the DME/DME possibility was. However, the group was reminded that this would require changes in PANS-OPS as the term “required” is currently used.

Some members further suggested there should be no need to state the sensor requirements when RNAV 1 is used as it is always possible to use GNSS or DME/DME. Patrice, however, mentioned that all possible sensor requirements be placed on the charts as it adds more clarity to the crews as to what is possible. No decision was reached, so additional discussion would be required on this topic.

The paper also proposes not combining RNP 1 and RNAV 1 procedures on the same chart. The procedures should be separated and on separate charts. Kyle mentioned that if this is done is also to create new identifiers for the procedures as it is not possible for the vast number of FMSs to determine what is RNP or RNAV as a data provider may add the RNP values to the individual segments and the FMS manufactures will then see this as an RNP procedure, even if RNAV 1 is possible. The recommendation of not combining RNP 1 and RNAV 1 procedures on the same chart should be better clarified in PANS-OPS.

Additionally, the paper explored hybrid procedures. The paper recognized the need for guidance similar to that for approach procedures to be applied to SID/STARs. Moreover, it was suggested that the PBN requirements box should detail the navigation specifications required for specific segments, particularly when the requirement doesn't encompass the entirety of the procedure.

Action Item: The meeting agreed to create specimen charts based on feedback received and to update the working paper based on feedback received as well as with specimen charts.

Track Keeping on SIDs at YSSY Information Paper

An information paper was presented regarding some aircraft not maintaining the expected track of a procedure. The procedure in question is the KAMPI 6 SID at YSSY which was recently re-designed and published in Nov 2023. On the RIC, KADOM, and WOL transitions, there are cases where the aircraft are shortcutting the flyby turn. In these cases, it was identified the aircraft was “bypassing” the waypoint. URGIS is one example where the bypass occurs with a particular aircraft type.

The procedure is designed in accordance with DOC 8168 minimum segment requirements, but these appear to be too small as DO-236D calculates these minimum segments differently. After discussions with the FMS manufacturer via an operator, it was determined that the minimum segment length for this FMS type is a bit higher than what DOC 8168 suggests.

The conclusion of the discussion was a proposal to the meeting to think about updating DOC 8168 minimum leg distance between fixes. This may also require the need to look into the bank angle requirements as well as the aircraft may not always bank with 15 or 25 deg.

Action Item: The group to continue the discussions in the next meeting.

Omnidirectional Departures:

The meeting discussed proposing a naming method for omnidirectional departures based on a paper from EUROCONTROL. Currently, there is no guidance in 8168 regarding how to name or identify omnidirectional departures. In order to file a flight plan using one of these departures there is a need to have the procedure named and identified or else the flight planning system will reject the flight plan. The meeting discussed an idea to use what EUROCONTROL suggests for European states by naming the ODP based on the airport and using the 4-character ICAO code as the computer code of the procedure. A concern was raised about potential duplications with other waypoint/route identifications.

Action Item: The topic to be further discussed at the next meeting.

2.5. Quality Assurance

No progress report.

3. CONCLUSION

3.1. I sincerely wish to thank my MA, IFATCA and my employer for their unwavering support.

4. RECOMMENDATIONS

4.1. It is recommended that this report be accepted as an information paper.

5. REFERENCES

5.1. ICAO IFPP Job cards and Working Papers

--END--