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TITLE: ICAO Instrument Flight Procedures Panel (IFPP

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EXECUTIVE SUMMARY

This report outlines the activities of the ICAO Instrument Flight Procedures Panel (IFPP) during its ongoing 17th work cycle, covering the period from the last IFATCA Conference to date. During this period, two IFPP meetings were convened: IFPP 17-2, held from 21 October to 1 November 2024 at ICAO Headquarters in Montreal, Canada, and IFPP 17-3, held from 17 to 28 March 2025 in Toulouse, France. Due to work obligations, only the IFPP 17-3 meeting was attended in person.

The report focuses on the key developments, updates and outcomes from all four working groups: Performance-Based Navigation (PWG), Maintenance (MWG), Integration (IWG), and Helicopter (HWG). Highlights include the endorsement of Real PBN protection models, significant advances in SID/STAR Transition concepts, refinements to cold temperature corrections, and updates to helicopter-specific criteria. Several working papers have reached maturity and it is anticipated that the final panel meeting of this cycle will culminate in the completion of the current work program and the initiation of new job cards in the 18th cycle.

These developments are aligned with ICAO's strategic goals to enhance safety, harmonize global procedure design standards, and support performance-based operations worldwide.

1. INTRODUCTION

The Instrument Flight Procedures Panel (IFPP) is a specialized ICAO technical body tasked with developing and maintaining criteria related to instrument flight procedures, ensuring global harmonization and performance-based enhancements. The panel supports the ICAO Strategic Objectives of Aviation Safety, Capacity and Efficiency, and Environmental Protection. The 17th cycle continues to address the assigned job cards across all meetings—IFPP 17-1 to IFPP 17-4—ensuring continuity in panel deliberations and steady advancement toward criteria development and harmonization.

2. DISCUSSION

Collaborative discussions across working groups were held, particularly around topics with overlapping implications, such as the Real PBN protection concept and helicopter height loss criteria. This report captures the substantive progress made in

each group, incorporating inputs from all related working papers, including those that elaborate on subtopics, providing a cohesive narrative of the IFPP's evolving work.

2.1. PERFORMANCE-BASED NAVIGATION WORKING GROUP (PWG)

Real PBN Concept and Criteria (WP1a-001)

One of the most significant developments at IFPP 17-2 and IFPP 17-3 was the advancement of the *Real PBN* protection model, which seeks to harmonize procedure design criteria by transitioning from legacy buffer-based protection areas to a fully performance-based approach grounded in Total System Error (TSE) multipliers. The traditional approach of adding a fixed buffer value on top of 1.5x TSE has been found to introduce inconsistencies—particularly where more accurate navigation sensors result in unnecessarily wide protection areas.
The Real PBN model proposes a shift to a multiplier-based methodology, aligning more closely with statistical modelling and operational performance. A Laplace distribution model, derived from Eurocontrol studies based on hundreds of thousands of terminal area flights, informed the new containment assumptions.
As a result, the following multipliers were agreed upon:

- **2.5× TSE** for **RNP values < 1.0 NM**
- **2.0× TSE** for **RNP values ≥ 1.0 NM**

This change represents a major step in aligning with the principles of PBN, allowing procedure protection areas to truly reflect required performance rather than legacy sensor distinctions. The proposal includes changes to Doc 8168 Vol II and Vol III and has reached a mature stage for endorsement. It is especially relevant for both fixed-wing and helicopter operations, as it facilitates harmonization of protection widths across navigation specifications.

RNP AR Departures (WP1a-002)

The working paper presented for RNP AR departures proposes significant enhancements to Doc 9905, notably the **integration of helicopter-specific RNP AR procedures** alongside fixed-wing guidance. The decision to consolidate both within a single update recognizes overlapping criteria and ensures a consistent application of the RNP AR concept.

Key improvements include:

- Introduction of **helicopter height loss values** within the RNP AR framework
- Aligned departure and missed approach splay criteria based on Real PBN logic
- Enhanced procedural availability in obstacle-dense terrain environments

This dual-update structure also anticipates contingencies: if the helicopter height loss update (WP1c-008) faces delays or rejection, the associated changes in WP1a-002 can be held back, maintaining document integrity.

Evolution of the RNP AR Concept

Ongoing refinements were made to the existing Job Card for RNP AR procedures. Amendments include clarifications on path terminators, charting references, and helicopter-specific adaptations. The panel acknowledged that these changes must remain in alignment with evolving Real PBN criteria to prevent future discrepancies.

PBN to/from LOC (Localizer)

Although not a formal working paper, the PWG engaged in a technical discussion on the possibility of enabling PBN transitions to/from LOC approaches. The group revisited prior considerations, including whether the existing PBN-xLS framework sufficiently supports such transitions. It was agreed that broader combinations should be explored, and criteria developed if Member States report specific needs.

This discussion highlighted a key challenge in the PBN evolution: ensuring that increased procedural flexibility does not outpace standardization. A decision was made to collect State-level feedback before initiating new criteria development.

✅ **Summary of PWG Achievements:**

- Mature endorsement of the Real PBN protection model with clear statistical justification
- Comprehensive RNP AR update (fixed-wing and helicopter) now consolidated
- Advancement of helicopter height loss values under the Real PBN umbrella
- Opening dialogue for LOC-PBN transition harmonization

2.2. MAINTENANCE WORKING GROUP (MWG)

Cold Temperature Corrections (WP1b-001) – Job Card IFPP.028.01

A key topic addressed by the MWG was the need to improve the clarity and consistency of cold temperature correction guidance in PANS-OPS Volumes I, II, and III. The existing language in PANS-OPS has led to misinterpretations, particularly around what constitutes a "procedure altitude" and when pilots are required to apply corrections.

The working paper presented by Eurocontrol received broad support following its earlier presentation to the FLTOPSP. It includes:

- A **clear distinction** between procedure altitude and MOCA (Minimum Obstacle Clearance Altitude)
- Clarification that corrections should be applied to **“all procedure altitudes”**, eliminating the ambiguity of the previously used term “any procedure altitude”
- Recommendations to include **MOCA indications** on profile views in approach charts to improve pilot situational awareness
- Encouragement for designers to ensure the **entire Final Approach Segment (FAS)** is protected up to the cold temperature limit published on charts

Importantly, it was agreed that no correction is needed if the corrected altitude still satisfies MOCA requirements. This new clarity reduces pilot workload, particularly on APV Baro-VNAV procedures in cold conditions, and helps prevent unnecessary avoidance of such procedures in cold weather.

The paper also includes a Proposal for Amendment (PfA) to update the associated material in Volumes I through III. These updates are expected to improve global harmonization and operational safety.

SBAS Criteria Modernization – Job Card IFPP.018.04

While not discussed in depth during IFPP 17-3, the SBAS criteria modernization work—initially endorsed at IFPP 17-2—was noted in the MWG’s report. An impact assessment was prepared and forwarded to the IFPP panel for final review.

The proposal allows for **SBAS-based approaches with offsets up to 15°**, better reflecting operational needs and satellite navigation capabilities. Although no new PfA was introduced in this cycle, the topic remains active and is expected to progress further in Cycle 18.

Terminal Area Fix Criteria (Job Card IFPP.032.01)

Work continued improving the criteria for terminal area fixes, with the goal of better aligning design standards with operational practices. Key goals of the revision include:

- Elimination of ambiguity in terminal fix placement and definition
- Enhanced flexibility in route transitions between en-route and terminal segments
- Harmonization with PBN charting updates (Doc 8697)

Although no final proposal was ready during IFPP 17-3, the working group is expected to present an updated draft during Cycle 18. This topic is closely related to the SID/STAR transitions concept discussed by the IWG.

Revision of MVA Criteria – Job Card IFPP.034.01

The MWG acknowledged that the development of new criteria for Minimum Vectoring Altitude (MVA) would be postponed until the next cycle. Nevertheless, the group undertook preliminary work by:

- Collecting and analyzing **national practices** for MVA determination
- Proposing the development of a dedicated paragraph within PANS-OPS to reflect this evolving subject

The group emphasized the importance of ensuring that future MVA guidance aligns with Surveillance Requirements (SRE) and procedural design logic already contained in Doc 8168, Vol II.

✅ **Summary of MWG Achievements:**

- Cold Temperature Corrections paper matured, with updates proposed for Volumes I–III
- MOCA charting enhancements recommended to improve vertical situational awareness
- Progress made on terminal fix and MVA updates, with formal proposals expected in Cycle 18
- SBAS criteria modernization reviewed post-endorsement

2.3. INTEGRATION WORKING GROUP (IWG)

SID/STAR Charting Enhancements (WP2-002) – Job Card IFPP.012.04

A major accomplishment of the IWG was the continued development and refinement of **charting standards for PBN SID and STAR procedures**, with the goal of updating ICAO Doc 8697 (Aeronautical Chart Manual). The enhancements aim to:

- Ensure consistent **identification of PBN procedures** (e.g., RNAV 1, RNP 1, RNP AR)

- Standardize the **PBN box** on charts, especially regarding **sensor limitations** (e.g., “GNSS required”)
- Clearly depict **altitude and speed constraints** at waypoints in line with PANS-OPS Volume II requirements
- Introduce improved **specimen charts** for SID and STAR procedures based on PBN, including:
  - ✓ RNAV 1 SID
  - ✓ RNP 1 STAR
  - ✓ RNP AR SID (under development)

One of the challenges identified is the inconsistent use of “Critical DME” labelling across various States. The IWG recommends ensuring that such designations are always charted when applicable—especially for DME/DME navigation—thus enhancing pilot awareness and system readiness in case of sensor limitations.

The group also discussed minor discrepancies between Doc 8168 and Doc 8697 charting guidelines and proposed harmonized updates to both documents. STAR chart examples now mirror SID formats to reduce confusion and streamline publication.

This work supports both human factors and system-level improvements, particularly in high-density or mixed-sensor environments.

SID/STAR Transitions Concept (WP2-005) – Job Card IFPP.014.03

A major highlight of the meeting was the detailed presentation of the **SID and STAR Transitions** concept. This aims to introduce a formal structure into ICAO documentation using the **ARINC 424** data model as a foundation. The concept has been widely used operationally, but until now lacked ICAO-level guidance.

Key elements of the proposal include:

- Splitting SID and STAR procedures into **three components**:
  - ✓ **En-route Transitions**
  - ✓ **Common Routes**
  - ✓ **Runway Transitions**
- Enabling **modular procedure design**, significantly reducing chart clutter and the number of procedure names
- Providing **examples** of real-world implementation:
  - ✓ **Montreal (CYUL):** One STAR (OMBRE 1) serves three runways and three entry points using transitions
  - ✓ **Rome (LIRF):** Demonstrated how inconsistent naming (e.g., SOSAK9B and RIFFI9G) can confuse pilots
  - ✓ **Munich (EDDM):** Highlighted inconsistent use of “RNAV Transition” in Europe

The IWG’s proposed model solves these challenges by ensuring:

- Harmonized publication using ARINC 424 logic
- Logical naming conventions aligned with ICAO Annex 11 and Doc 8697

- Compatibility with modern Flight Management Systems (FMS), where transitions are often automatically loaded based on runway and STAR selections

This concept allows for better scalability, particularly in complex TMA environments. It also improves **ATC phraseology**, with clear expectations on route components (e.g., “Cleared DAVID1 via MICHL, RWY09L”).

The PfA for this concept includes updates to:

- ICAO Doc 8168 (Volumes I and II)
- ICAO Doc 8697 Aeronautical Chart Manual

These updates are being prepared for panel-level review at IFPP 17-4.

✅ **Summary of IWG Achievements:**

- Advanced SID/STAR charting standards and specimen charts for inclusion in Doc 8697
- Developed clear PBN box guidance and clarified sensor limitations (e.g., Critical DMEs)
- Proposed modular SID/STAR Transitions framework based on ARINC 424 logic
- Reduced chart clutter, improved coding consistency, and enhanced FMS compatibility

2.4. HELICOPTER WORKING GROUP (HWG)

Alignment with Real PBN – Job Card IFPP.004.05

The HWG's work was closely coordinated with the PBN Working Group, particularly in relation to the **Real PBN protection concept**. The helicopter-specific criteria, especially for **RNP 0.3**, are being revised to phase out traditional buffer-based protections and fully align with the **multiplier-based approach** introduced for fixed-wing operations.

Under this job card, the HWG:

- Reviewed protection widths under the Real PBN model for all phases of flight, including:
  - ✓ En-route
  - ✓ Terminal
  - ✓ Final approach
  - ✓ Missed approach
  - ✓ Departures (including PinS and non-PinS contexts)
- Analyzed the impact of adopting **2.5× TSE for RNP <1.0 NM**, and **2.0× TSE for RNP ≥1.0 NM**
- Found that the Real PBN model results in **smaller protection areas** than current helicopter-specific buffers, particularly in missed approach and departure segments
- Noted that these improvements could expand helicopter access to terrain-constrained aerodromes while maintaining or enhancing safety

The HWG agreed to keep this job card open until full endorsement of the Real PBN model, as it underpins several other proposed updates.

Height Loss Reduction (WP1c-008)

A key milestone achieved at IFPP 17-2 and 17-3 was the **endorsement of updated helicopter height loss values**, intended to replace outdated figures in Doc 9905. These new values reflect modern aircraft performance and simulation data and will enable:

- Increased **procedure availability**, especially in mountainous or obstacle-dense environments
- More efficient design of RNP AR departures and missed approaches
- Seamless integration with the Real PBN protection model

The working paper was presented and endorsed without modifications. It will be advanced to the panel at IFPP 17-4 for final approval

Baro-VNAV for Helicopters –WP1b-009 (Referenced in HWG Report)

The HWG also reviewed a proposal to remove references to **CAT H** from Doc 8168, Part III, Section 3, Chapter 2. The term "CAT H" is no longer aligned with ICAO's overarching helicopter classification, and its removal is intended to:

- Improve clarity for **Baro-VNAV helicopter procedures**
- Align vertical path design with broader PBN provisions
- Support Baro-VNAV operations in low-visibility environments and complex terrain

Minor amendments to Figure IV-1-3 and related narrative content were also proposed. The HWG endorsed these edits and agreed to move forward with a full PfA for IFPP 17-4 review.

Chart Manual Reference and Maintenance Tasks

The HWG also supported a proposal to **add ICAO Doc 8697 (Aeronautical Chart Manual)** as a reference in helicopter-related job cards and charting guidance. This ensures that:

- Helicopter procedure charts adhere to the same visual and data consistency as fixed-wing procedures
- Designers have a single, harmonized set of charting expectations when implementing helicopter-specific approaches, missed approaches, and departures

In addition to the major updates above, several **maintenance tasks** were proposed for panel endorsement:

- Update height loss values in Doc 9905
- Finalize editorial refinements to Baro-VNAV procedure narratives
- Clarify legacy references to CAT H and outdated helicopter design assumptions

These efforts will be incorporated into the IFPP 18 work cycle where needed.

✅ **Summary of HWG Achievements:**

- Endorsed reduced helicopter height loss values for RNP AR departures and missed approaches
- Integrated helicopter protection areas with Real PBN multiplier-based logic
- Advanced Baro-VNAV clarity by proposing the removal of CAT H references
- Reinforced use of Doc 8697 to standardize helicopter charting practices

3. CONCLUSION

From the last IFATCA Annual Conference, the IFPP has made positive strides in ICAO's efforts to evolve global instrument procedure criteria. Major advances were achieved across all four working groups, with several proposals reaching maturity and now pending endorsement at the 17-4 panel meeting. This cycle emphasized improved clarity, harmonization, operational efficiency, and safety through:

- Adoption of **Real PBN protections** using statistical TSE multipliers
- Rationalized and modular **SID/STAR Transitions**
- Improved **cold temperature correction criteria** and MOCA awareness
- Helicopter-specific updates to height loss, Baro-VNAV, and charting

The outcomes reflect the dedication of the IFPP Panel members and advisors to continuous improvement, global collaboration, and performance-based thinking.

Next IFPP Meetings

- IFPP 17-4 Panel Meeting: 28 October – 6 November 2025, ICAO HQ, Montreal, Canada
- IFPP 18-1 Panel Meeting: 16 – 27 March 2026 (TBN)

4. RECOMMENDATIONS

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

5. REFERENCES

ICAO IFPP Job Cards and Working Papers as referenced in each discussion point.