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# Global developments related to ATM And SAR

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# Outline

- ICAO Global Events
- ICAO Documents
- Coming soon



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## Global ICAO Events related to ATM and SAR (2017 – 2018)

- RPAS/2 Symposium (Montreal, Canada, 19-21 September 2017)
- ICAO ATFM Global Symposium 2017 (Singapore, 20-22 November 2017)
- GANIS/2 and SANIS/1 (Montreal, Canada, 11-15 December 2017)
- ICAO APAC/MID Regional Safety Management Symposium (Singapore, 23-26 April 2018)
- ICAO EUR/MID/AFI Cybersecurity in Civil Aviation (Bucharest, Romania, 7-9 May 2018)
- RPAS/3 and Drone Enable/2 Symposiums (Chengdu, China, 10-14 September 2018)
- ICAO Thirteenth Air Navigation Conference (Montreal, Canada, 9-19 October 2018)



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# **New ICAO Documents in support of ATM and SAR**

- **Doc 9971 - Manual on Collaborative Air Traffic Flow Management (Published)**
- **Doc 10084 - Civil Aircraft Operations Over Conflict Zones (Published/under review)**
- **Doc 10056- Manual on Air Traffic Controller (Published Sep. 2017)**
- **Doc 10063 - Manual on Monitoring the Application of Performance-based Horizontal Separation Minima (Published 2017)**
- **Doc 10019 - Manual on Remotely Piloted Aircraft Systems (RPAS) (AMDT)**
- **Doc 10056 - Competency-based Training and Assessment (Published 2017)**
- **Doc 10037 - Global Operational Data Link (GOLD) Manual (Published in 2017)**



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# New ICAO Documents in support of ATM and SAR

- **Doc 10088 - Manual on Civil/Military Cooperation (will be published soon)**
- **Doc 9731 - IAMSAR Manual volumes I, II, III (AMDT in 2019)**
- **Doc 9869 - PBCS Manual (AMDT)**
- **Doc 10039 - SWIM Manual (update in 2019)**
- **Doc (New) - TBO Concept (in 2019)**
- **Doc 9432 - Manual of Radiotelephony (AMDT 2020)**
- **Doc 9965 - Flight and Flow — Information for a Collaborative Environment (AMDT 2020)**



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Highlight on some  
provisions coming  
soon





# Doc 4444 – PANS ATM (Nov 2018)

## Effect of Turn Types:

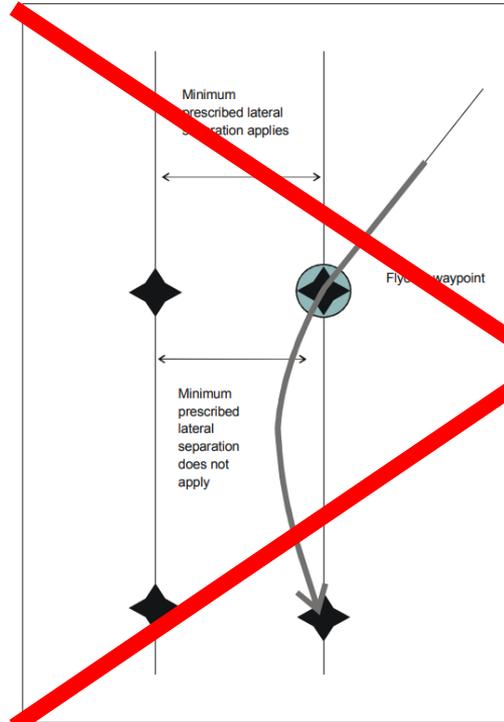


Figure 5-1. Turn over flyover waypoint (See 5.4.1.1.4)

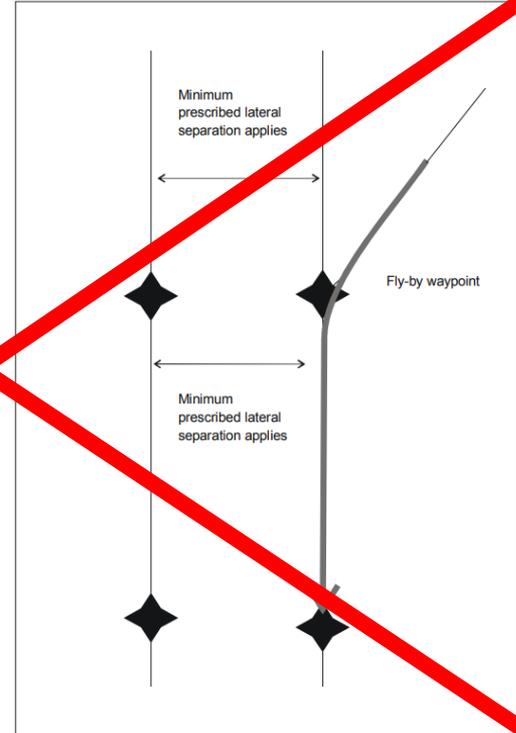
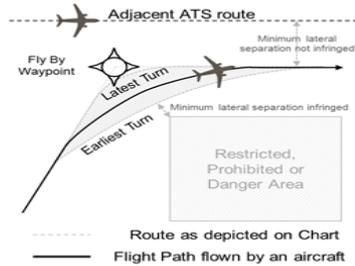
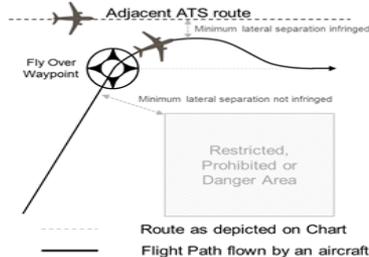


Figure 5-2. Turn at fly-by waypoint (See 5.4.1.1.4)



Fly By Turns

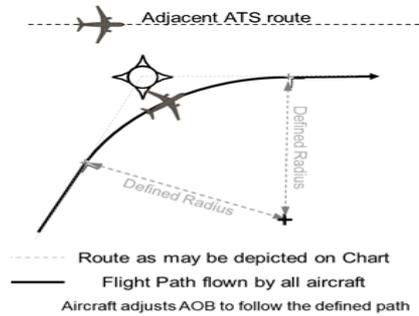
Aircraft will calculate a turn radius and angle of bank (AOB) subject to performance characteristics, airspeed, altitude, angle of turn and wind conditions. Aircraft determine to initiate the turn, prior to the waypoint, based on the calculated radius – this may be up to 20 NM before the waypoint. There will be variation in the paths because each aircraft calculates its own turn radius (indicated by the grey area in the figure within which the flight path of the aircraft will be located). This variation becomes more apparent at higher altitudes and greater turn angles. The controller can expect the aircraft track to be on the inside of the waypoint.



Flyover Turns

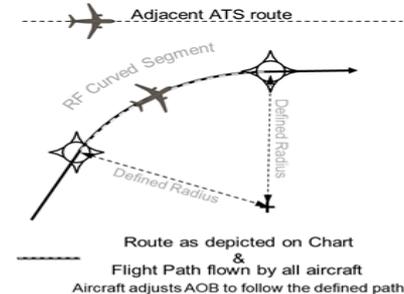
Aircraft will come to the overhead of the waypoint before initiating the turn onto the next leg. Therefore, if the minimum prescribed lateral separation is applied, it will be infringed as the aircraft manoeuvres onto its next leg. The controller can expect the aircraft track to be on the outside of the waypoint.

Figure 5-1. Turn over flyover waypoint and Turn at fly-by waypoint (See 5.4.1.1.4)



Fixed Radius Transition (FRT)

An FRT for published enroute RNP ATS routes has a turn radius specified by the airspace planner. Approaching the waypoint, the FMC/FMS will calculate the arc centre and will initiate the turn at a point at which the flight path is perpendicular to the radius which links the point to the calculated centre. This turn type should provide highly consistent and repeatable turn performance.



Radius arc to a Fix (RF)

The RF for Instrument Flight Procedures (IFP) is a curved route segment that has been designed with a published radius and arc centre. Aircraft will initiate the turn at the waypoint defining the start of the curved segment and will follow the published route until the next waypoint. This turn type should provide highly consistent and repeatable turn performance.

Figure 5-2. Fixed Radius Transition (FRT) and Radius arc to a Fix (RF) Turn (See 5.4.1.1.4)



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# Pronunciation of numbers

Annex 10 Vol 2 AMDT – (State Letter 028/2018)

Use of hundred / thousand in some cases ~~(00/000)~~





## Remote ATS

- New PANS-ATM provisions
  - Redefinition of OTW (Out of the Window)
    - Can include use of a visual surveillance system (VSV) (specifically approved)
  - Obligations
    - VSV shall have appropriate level of reliability, availability and integrity (as any surveillance system)
    - Link capabilities of a system – service provided (do not expect a controller with a webcam to provide Cat III services)



## Update IAMSAR Manual (2019)

- Additional guidance on
  - Multiple aircraft SAR operations
  - Mass rescue Operations (MRO)
  - Use of cell phone localization capabilities in location operations
  - Updated self assessment questionnaire on SAR



## Update IAMSAR Manual (II)

- Additional guidance on
  - SAR in areas remote from SAR facilities
  - Medical guidance and medical information exchanges
  - Global Aeronautical Distress and Safety System
  - ...



# Update to the GOLD Manual (Doc 10037)

## ➤ Improved and/or additional guidance on :

- Use of CPDLC for departure clearance (DCL) and SID/STAR clearances
- CPDLC procedure for synchronizing active route with that in the flight plan
- Next data authority/address forwarding failure procedure
- CPDLC message failure procedures
- New capabilities and services introduced by Baseline 2
- Additional guidance for ANSP to plan, test and trial data link implementation



## PBCS Implementation Support

- **Developed a PBCS operational authorization guide** – summary of the PBCS Manual and other State regulatory documents available on the ICAO PBCS website ([www.icao.int/airnavigation/pbcs](http://www.icao.int/airnavigation/pbcs))
- **Developed a means (PBCS Charter)** to facilitate necessary coordination and cooperation among the stakeholders involved in the PBCS implementation



# Update to the PBCS Manual (Doc 9869)

## ➤ Improved and/or additional guidance on :

- Operational authorization for aircraft operators
- Communication services providers compliance
- PBCS monitoring (collection, filtering and use of monitoring data)
- Improved safety requirements in the existing RCP/RSP specifications
- New RCP specification to support domestic data link application



# Global Concept Documents

## ➤ Global TBO Concept (Doc xxxx)

- Draft Concept will be made available for the 13<sup>th</sup> Air Navigation Conference and the concept will be finalized in alignment with the next edition of the GANP/ASBU
- A dedicated website to explain the concept is being built ([www.icao.int/airnavigation/tbo](http://www.icao.int/airnavigation/tbo))

## ➤ Global A-G SWIM Concept

- Draft concept will be incorporated in the SWIM Manual (Doc 10039) and published in 2019.



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# Amendment to Annexes 2, 15, PANS-ATM and Doc 9965 (FF-ICE Manual)

- Drafted based on a comprehensive analysis on constraints and limitations of FPL 2012
- Support transition to the implementation of a new flight planning mechanism on a voluntary basis, but in a standardized manner
- Accommodate the co-existence of ICAO flight plan 2012 and FF-ICE





## FF-ICE Provisions

- **Requirements concerning flight plans remain the same**
- **Amendment required** to allow the changes or flexibility brought by the introduction of FF-ICE
  - use of global unique flight identification (GUFID)
  - use of additional service for pre-departure negotiation and coordination between aircraft operators and ATM service providers
  - Expanded scope in the content of flight plan information
  - More flexible means of exchanging the flight plan information



# FF-ICE Provisions

(Proposed applicability date of Nov 2020)

## Annex 2 Annex 15

(Refer to the Note below)

### No change

- Flight plan content
- Completion of a flight plan
- Changes to a flight plan
- Closing a flight plan

### Amendment

- Definition of terms
- Flight plan submission
- Definition of terms
- Contents of AIP, ENR 1.0 flight planning

## PANS-ATM (Doc 4444)

### No change

Acceptance of a flight plan

### Amendment

- Air traffic flow management
- Flight plan form
- Submission of a flight plan

### New

- Planning service
- Content of FF-ICE message
- FF-ICE message exchange
- Use of GUIFI
- Communication requirement
- flight data exchange models

## Doc 9965 Volume II (Implementation Guidance)

- Implementation considerations (ATFM, Network/Technology, Transition, Publication)
- Submission, update and cancellation of flight plan
- Information exchange (Arrival, Departure, Request, Route and Trajectory)
- Translation between FPL2012 and FF-ICE
- Procedure Diagrams & Scenarios
- Flight exchange model and data conventions

## Doc 9965 Volume I (Concept)

Concept of Operation  
during the entire phases of a flight



## FF-ICE Provisions

- For proper collection, assessment and documentation of the evolving needs for additional flight plan information, **“New Flight Plan Content Evaluation Worksheet/Template”** has been prepared for use by ICAO expert groups and planning and implementation regional groups (PIRGs)



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THANK YOU