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GLOBAL AIR NAVIGATION DEVELOPMENTS

MIDANPIRG/19-RASG-MID/9 Meeting

Riyadh, Saudi Arabia, 14 – 17 February 2022

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ICAO Technical Officer, ATM

Outline

- CDM-ATM Simplified procedure
- CDM/ATFM
- Civil-Military Cooperation
- Phraseology
- Wake Turbulence and WTER
- FF-ICE and COMS
- New Procedures in PANS-ATM
- SAR and GADSS

Simplified Procedure for Air Traffic Management
Collaborative Decision Making and Sharing of Information

The simplified CDM-ATM procedure provides for:

Effective collaborative platform for ANSPs in order to carry out cross-border coordination taking into consideration the circumstances that would have impact on traffic flows. This includes going into or recovering from contingency situations.

Lockdown is **ENDing** and these folks should be accommodated again safely and efficiently when back to normal operations.

CDM-ATM Levels of Implementation

National level

where no ATFM system is in place, a National Collaborative Decision Making (CDM) Committee should be established to coordinate the ATM issues (en-route and terminal).

Cross-border Coordination

Communication and exchange of operational information in real-time basis forms the backbone of CDM. It might be accomplished via telephone calls, web conferences, e-mail messages, or automated data exchange system.

Multi States Conference Calls

Instead of having one-to-one daily conferences, several States may decide to organize joint teleconferences

CDM-ATM Levels of Implementation

Regional Level

ICAO Regional Offices consolidate the inputs received from their relevant States or Group of States as well as those provided by the airspace users and share it as required for regional/inter-regional consideration through the CCT framework or any other mechanism for discussion and agreement on necessary ATM measures to mitigate the identified challenges.

Regional Offices organize periodic teleconferences, as deemed necessary, (preferably on weekly or bi-weekly basis) with States and Organizations concerned. During these regional discussions, the relevant ICAO State Letters as well as the matters reported by States and the challenges reported by airspace users should be addressed.

Recovery Phase:

In preparation for the recovery phase, adequate time for the ***gradual return*** should be anticipated taking into consideration the following:

- ✓ ATC capability to handle again an increased amount of traffic
- ✓ status of aerodromes facilities and CNS/ATM infrastructure;
- ✓ availability of adequate number of ATC staff
- ✓ availability of required ANS personnel supporting ATM operations
- ✓ agreement on ATM measures to ensure a safe, smooth and orderly return of air traffic
- ✓ development of regional transition plans for the resumption of normal operations in coordination with all regional stakeholders that should be based on the data provided by airlines and ANSPs

Air Traffic Flow Management (ATFM)

ATFM is demand/capacity balancing

PANS-ATM: ATFM service shall be implemented for airspace where traffic demand at times exceeds the defined ATC capacity.

New Standard: In order to support the ATFM service, the appropriate ATS authority shall determine, disseminate and periodically review the declared capacity for control areas, control sectors within a control area, and for controlled international aerodromes as determined by the State.

Operational Capacity, which is an update to the declared capacity based on prevailing circumstances will be covered in PANS-ATM

CDM/ATFM what's new?

New Standard in Annex 11: States shall ensure that an ATFM service is established with the objective of contributing to a safe, orderly and expeditious flow of air traffic and to support [illegible] border collaboration.

New Recommendation: ATFM service[illegible]mented on the basis of multilateral agreem[illegible]ake provision for common procedures, com[illegible]capacity determination and common method[illegible]xchange.

Long Term Global Objective is CDM/ATFM Network of the Networks

Doc 9971: Manual on…

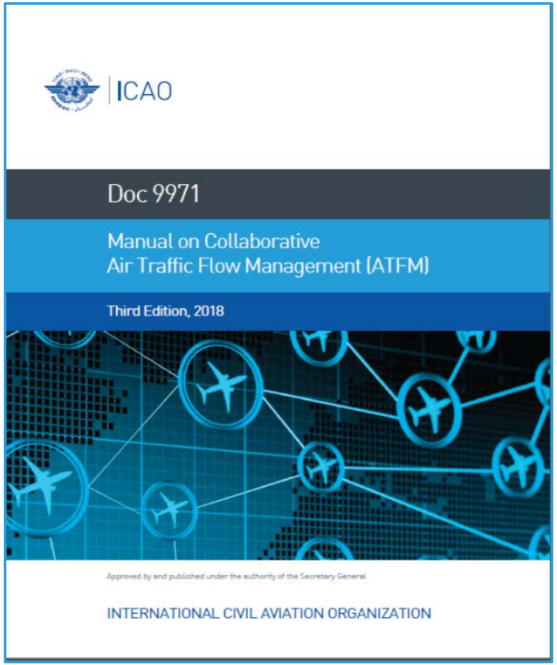
Doc 9971 was published in 2012 (3rd Edition in 2018)

Part 1 – Collaborative Decision Making (CDM)

Part 2 – Air Traffic Flow Management (ATFM)

Part 3 – Airport CDM (A-CDM)

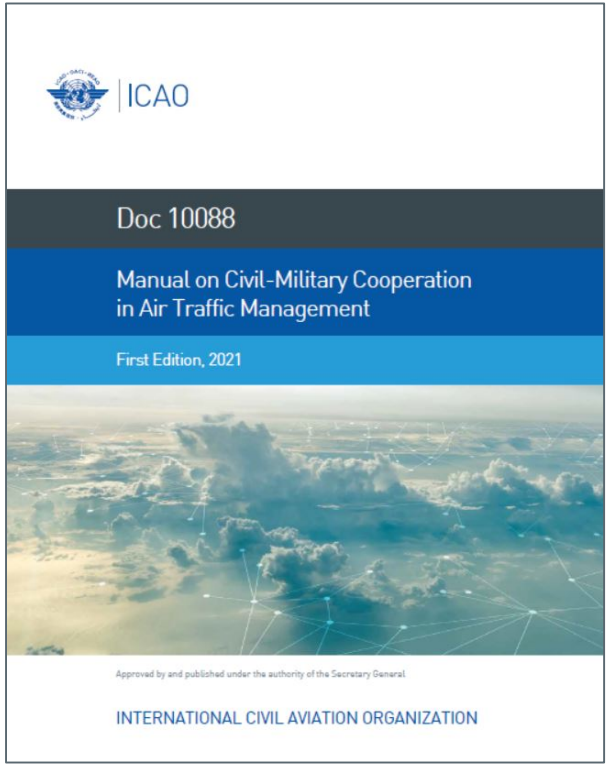
New Part 4: Operational Handbook



The ICAO 11th Global ATFM Symposium is planned for Q3/Q4 2023 (Venue and dates TBD)

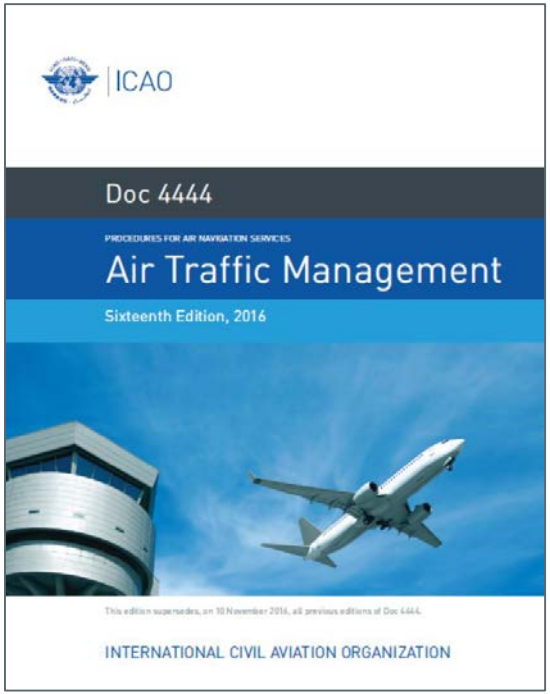
Civil-Military Cooperation

- The new Manual on Civil-Military Cooperation in ATM (Doc 10088) provides information and guidance on the establishment of a framework for civil-military cooperation and coordination to enhance and optimize the management and use of the airspace, and to achieve and strengthen the trust between civil and military.
- It also serves as reference for authorities and units responsible for establishing and implementing the processes and procedures that will facilitate civil-military collaboration, cooperation and coordination.
- The new manual supersedes (Cir. 330).
- Civil-Military Cooperation Workshops will be conducted to roll out the new guidance.



PANS-ATM: Amended Phraseology

- ✓ Applicable 5 November 2022
- ✓ concerning terminal approach phraseology.
- ✓ consequential to the approach procedure charting and identification requirements contained in PANS-OPS, Doc 8168.
- ✓ With the advent of approach procedures such as GLS and RNP approaches, the amended phraseology used for instrument approach clearances are intended to specify the identification of various approach procedures.
- ✓ Update of *Manual of Radiotelephony* (Doc 9432) is in progress.



Wake Turbulence (Provisions applicable since Nov 2020)

To address runway capacity constraints at major airport hubs through the reduction of applicable separation minima for arrivals and departures through alternative wake turbulence aircraft grouping and the related separation minima associated.

It also addresses long-standing issues related to the uneven implementation of Airbus A380-800-related procedures by adding a new wake turbulence aircraft category.

The proposal also updates and incorporates related procedures to facilitate a globally harmonized implementation by States and industry alike.

This will be supported by a new Manual on Implementation of Wake Turbulence Separation Minima (Doc 10122), which will include required guidance for implementation.

Wake turbulence encounter reporting (WTER)

The new WTER PORTAL was developed to facilitate data collection, storage and analysis, of wake turbulence occurrences.

From the global perspective, the WTER offers the opportunity for a more diverse and representative dataset of wake encounters which would provide the quantitative validation necessary to support future work related to wake turbulence.

At the national level, States would be able to analyze their wake encounter risk evolution to support any wake turbulence separation implementation, or procedure development.

Data analysis should support post-implementation monitoring and safety risk assessment as an important aspect of enhanced wake turbulence separation (eWTS) implementation.

States are encouraged to integrate the WTER submission as part of their States existing wake turbulence reporting procedure and benefit from the analytical tools.

States will be invited to nominate focal points to access and provide data to the WTER portal.

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Ongoing work on “FICE” AND “ATS COMS”

Operational

ACAS	Airborne Collision Avoidance System (ACAS)	Operational
ACDM	Airport Collaborative Decision Making	Operational

Information

AMET	Meteorological information	Information
DAIM	Digital Aeronautical Information Mangement	Information
FICE	Flight and Flow Information for a Collaborative Environment (FF-ICE)	Information
SWIM	System Wide Information Management	Information

CNS technology and services

ASUR	Surveillance systems	Technology
COMI	Communication infrastructure	Technology
COMS	ATS Communication service	Technology
NAVS	Navigation systems	Technology

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ASBU-FICE & COMS Elements

FICE

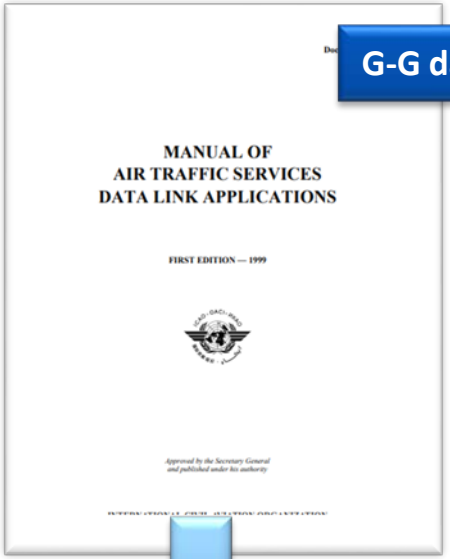
FICE-B0/1	Automated basic inter facility data exchange (AIDC)	Information	
FICE-B2/1	Planning Service	Information	
FICE-B2/2	Filing Service	Information	
FICE-B2/3	Trial Service	Information	
FICE-B2/4	Flight Data Request Service	Information	
FICE-B2/5	Notification Service	Information	
FICE-B2/6	Publication Service	Information	
FICE-B2/7	Flight information management service for higher airspace operations	Information	
FICE-B2/8	Flight information management service for low-altitude operations	Information	
FICE-B2/9	Flight information management support for inflight re-planning	Information	
FICE-B3/1	Flight information management services for enhanced trajectory operations	Information	
FICE-B4/1	Integrated flight information management system for end-to-end global flight planning	Information	
FICE-B4/2	Real-Time Participation of operators in flight information	Information	

COMS

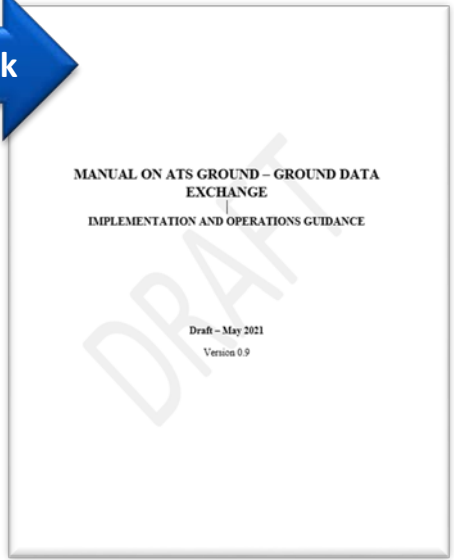
COMS-B0/1	CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace	Technology
COMS-B0/2	ADS-C (FANS 1/A) for procedural airspace	Technology
COMS-B1/1	PBCS approved CPDLC (FANS 1/A+) for domestic and procedural airspace	Technology
COMS-B1/2	PBCS approved ADS-C (FANS 1/A+) for procedural airspace	Technology
COMS-B1/3	SATVOICE (incl. routine communications) for procedural airspace	Technology
COMS-B2/1	PBCS approved CPDLC (B2) for domestic and procedural airspace	Technology
COMS-B2/2	PBCS Approved ADS-C (B2) for domestic and procedural airspace	Technology
COMS-B2/3	PBCS approved SATVOICE (incl. routine communications) for procedural airspace	Technology
COMS-B3/1	Extended CPDLC (B2 incl. Adv-IM and dynamic RNP) for dense and complex airspace	Technology
COMS-B3/2	Extended ADS-C (B2 incl. Adv-IM and dynamic RNP) for dense and complex airspace	Technology

Guidance on Data Link Operations

A-G data link



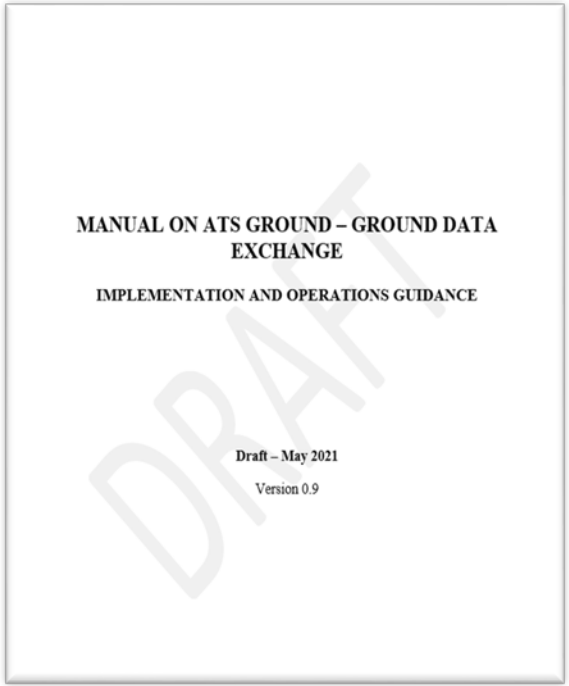
G-G data link



As the Manual on ATS G-G data exchange is published, Doc 9694 will be made “Obsolete”

G-G Data Link

1st Edition, 2022/2023



- **General guidance**
  - Flight data processing system
  - Automated interface and applications
  - AIDC Messages
- **Harmonization framework for AIDC implementation**
- **AIDC performance monitoring and validation**
- **AIDC training and Implementation**
  - Appendix A Sample LoA
  - Appendix B Sample AIDC Interoperability Test

In addition, AIDC provisions in the PANS-ATM are being reviewed to identify areas for amendment necessary for the globally harmonized implementation of AIDC

GOLD Manual

1st Edition, 2017

Chapter 1
Overview of Data Link Operations

Chapter 2
Administrative provisions related to data link operations

Chapter 3
Controller and radio operator procedures

Chapter 4
Flight crew procedures

...

Appendix B
Regional/State-specific information

2nd Edition, 2022/2023

Chapter 1
Overview of Data Link Operations
- Existing capabilities and **additional B2 capabilities**

Chapter 2
Implementation Considerations
(Planning, trial/ operational implementation and safety assessment)

Chapter 3
Operational Procedures
(organized by operational scenarios)

Removed

What is FF-ICE ?

Flight and **F**low – **I**nformation for a **C**ollaborative **E**nvironment

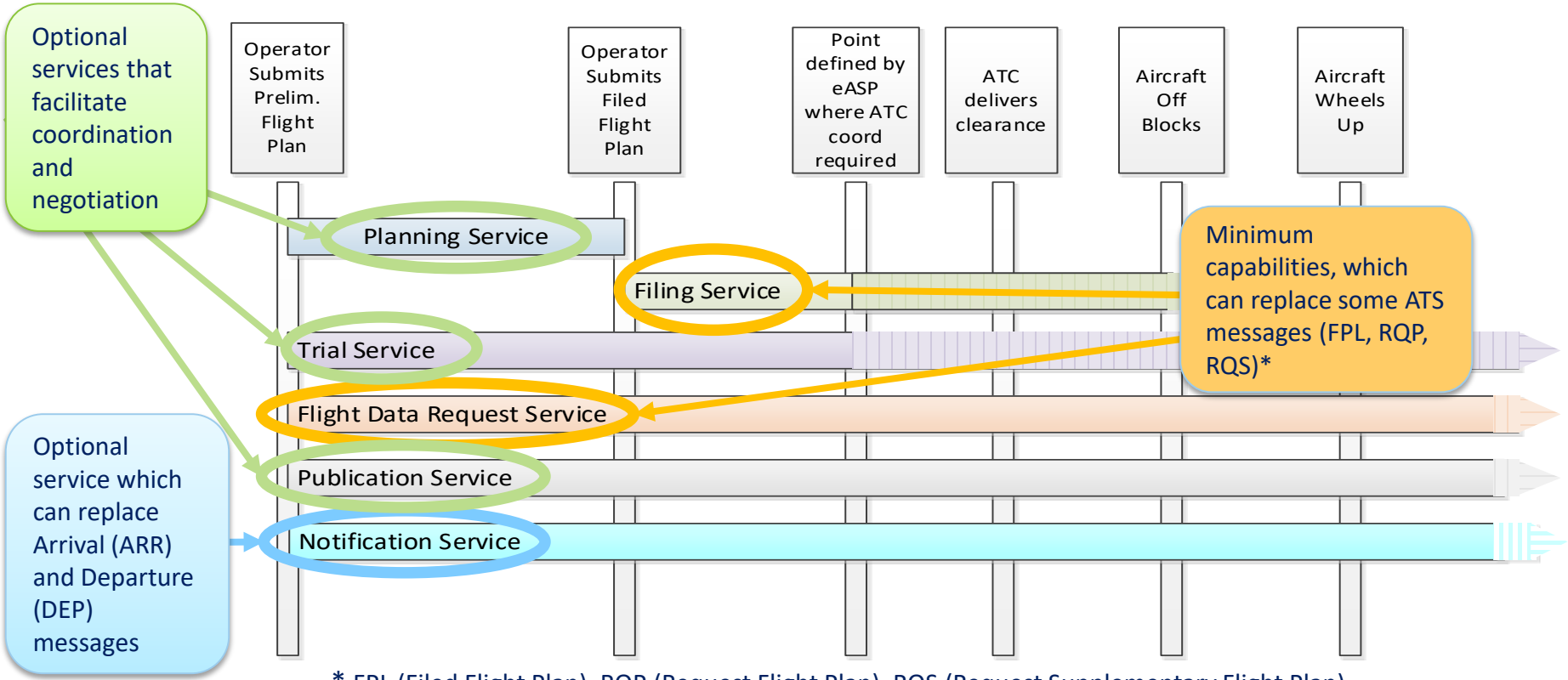
Information necessary for planning, coordination, and notification of flights **exchanged** in a **standardized format between members of the ATM community**, including those involved in flight operations and aerodrome operations

Why FF-ICE ?

Address limitations and constraints of the current flight planning mechanism

Enable transitioning to a fully collaborative environment where a flight trajectory is shared and optimized during all phases of a flight

FF-ICE Services

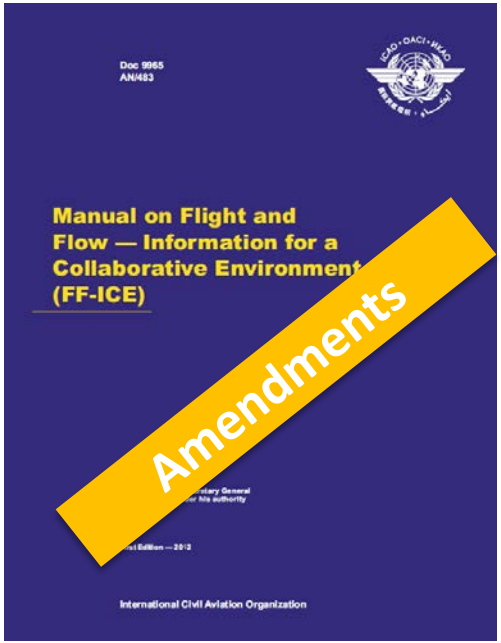


* FPL (Filed Flight Plan), RQP (Request Flight Plan), RQS (Request Supplementary Flight Plan)

Amendment of ICAO provisions

Among all provisions concerning “flight plan” or “flight planning”

Doc 9965 Amendments



- **Volume I Concept (Updated)**
- **Volume II Implementation Guidance (New)**
  - Implementation considerations including transition strategy
  - Air traffic flow and capacity management
  - Information management and technology
  - Mixed-mode and transition
  - State publications, training,
  - GUFI and flight plan association
  - Recommended means &procedures and for each FF-ICE service
  - Route and trajectory as well as other new data items
  - Information and data exchange model
  - Content of FF-ICE messages
  - Logic rules, association checks, GUFI constructions, translation guidance

Transition strategy

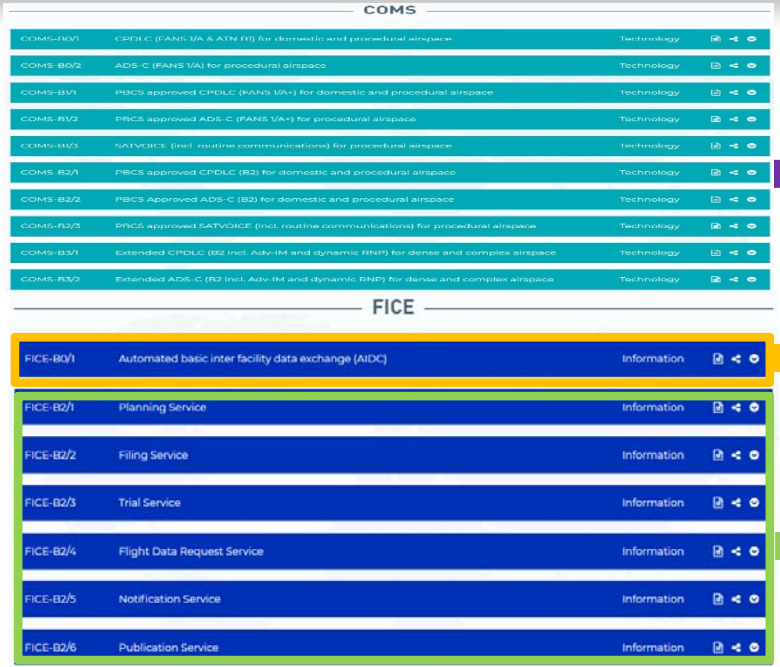
Sun-setting FPL2012

Global

(With a target date of mandate)

Regional

Local/national



a) 2nd Edition of the *Global Operational Data Link (GOLD) Manual* will be published in 2022/2023

b) Doc 9694 *Manual on ATS Data Link Applications* will be superseded by a new ICAO Manual to be published in 2022/2023

c) Proposed amendments to relevant Annexes, PANS and guidance are under development and subject to State consultation in 2022

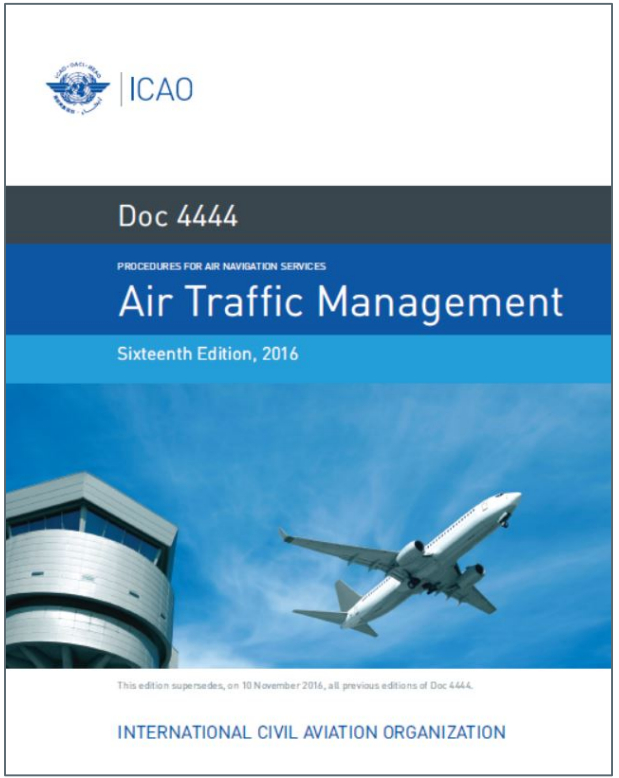
d) A notional sunset date for FPL2012 is being considered together with a transition strategy

States are encouraged to:

a) consider the benefits of implementing FF-ICE services

b) commence discussions to transition to implementing minimum capabilities of FF-ICE

New (as of Nov 2020) Oceanic Contingency Procedures, and Some New Parallel Runway Separations



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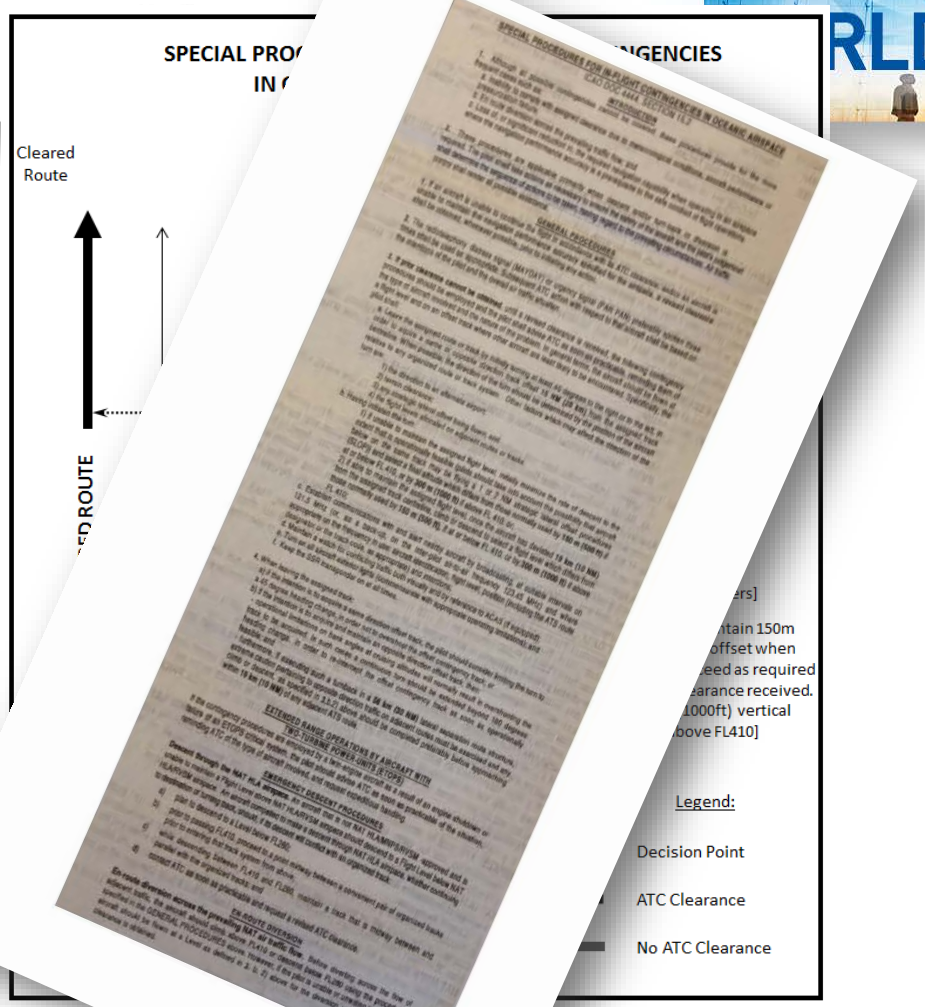
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Decision Point
ATC Clearance
No ATC Clearance

Applicable 28 November 2024

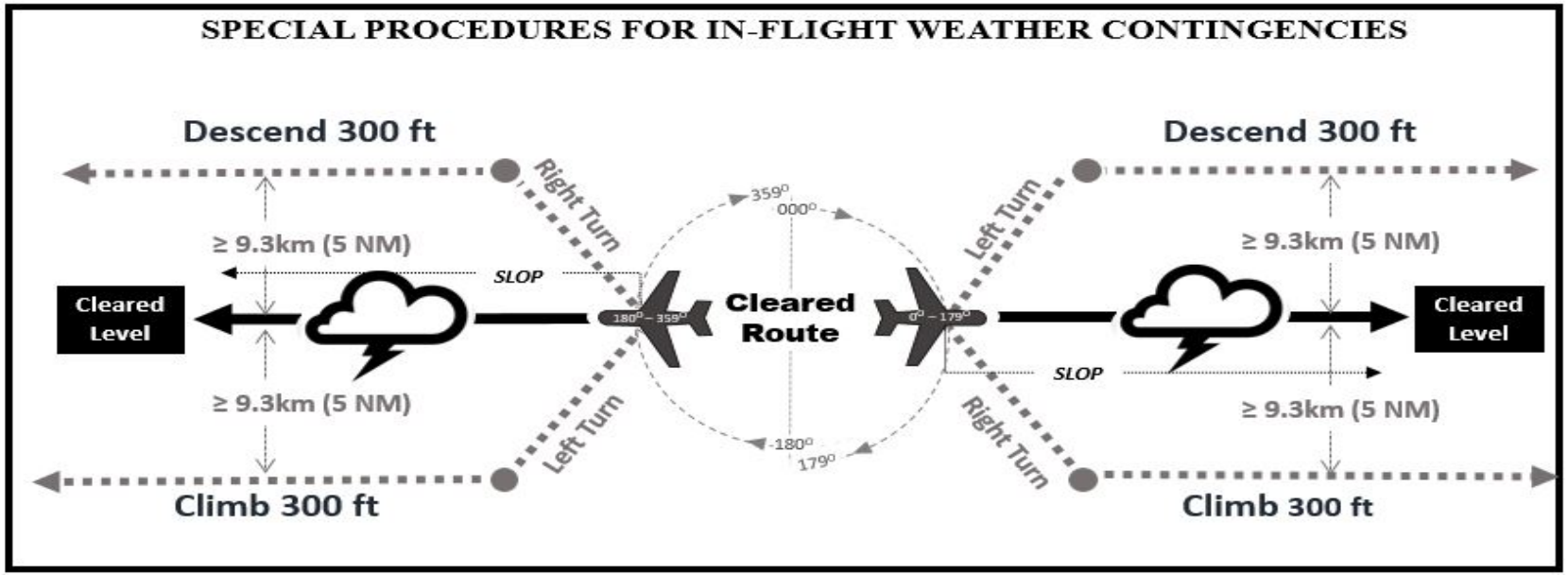

Figure 15-2. Visual guide for weather deviation procedures if a revised ATC clearance cannot be obtained (PANS-ATM, 15.2.4.3 refers)

Radio Communication Failure (RCF)

The amended radio communication failure provisions will take into account recent improvements in technology such as ADS-B surveillance and new innovations in areas such as remotely piloted aircraft system (RPAS) operations. Additionally, it would also ensure alignment between the related provisions in Annex 2 and PANS-ATM.

The work would include amendments to Annex 2, Annex 10, Vol II, PANS-ATM and Doc 9432.

RNP AR APRCH use in Parallel Approaches

Now, if an RNP AR APCH is used, an aircraft can be considered established ***before*** the final approach, so you can give away vertical separation against the adjacent approach before the aircraft turns onto final.

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ESTABLISHED ON RNP AR APCH

6.7.3.5.1 In addition to the requirements specified under 6.7.3.2, for the purposes of applying 6.7.3.2.5 b), an aircraft conducting an RNP AR APCH procedure is considered to be established for the entire approach procedure after the IAF/IF provided that:

a) the aircraft confirms that it is established on the RNP AR APCH procedure prior to a designated point, the location of such point to be determined by the appropriate ATS authority;

b) the designated point shall be positioned on the RNP AR APCH to ensure the applicable horizontal separation minimum (e.g. 5.6 km (3 NM)) from the adjacent approach procedure (Figure 6-6 refers). The designated point may normally be coincident with the IAF; and

c) to facilitate the application of the procedure, the designated point shall be readily apparent to the approach and monitoring controllers. The designated point may be depicted on the situation display.

6.7.3.5.2 Appropriate wake turbulence separation shall be applied between aircraft on the same approach.

6.7.3.5.3 If, after reporting that it is established on the RNP AR APCH procedure, the aircraft is unable to execute the procedure, the pilot shall notify the controller immediately with a proposed course of action, and thereafter follow ATC instructions (e.g. break-out procedure).

Note.— Break-out procedures are described in Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) *(Doc 9643).*

6.7.3.5.4 In circumstances where a break-out procedure becomes necessary during the application of the independent parallel approach procedure (for example, an aircraft penetrating the NTZ), the controller may issue climb and/or heading instructions to an aircraft established on an RNP AR APCH.

6.7.3.5.5 To supp

Note: — Guidance on obstacle assessment is provided in the Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) *(Doc 9643).*

6.7.3.5.6 Break-out procedures shall be prescribed in the AIP and local instructions.

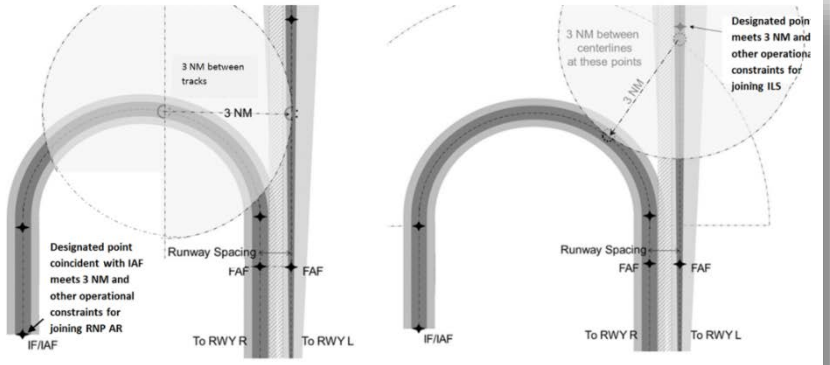
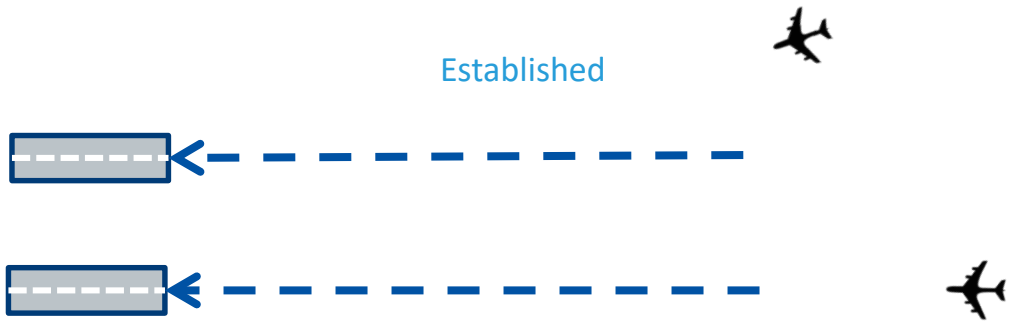


Figure 6-6. 'Established on RNP AR APCH' Concept

(RNP AR APCH/Precision approach with 3 NM Separation minimum example)

Edition 2 of the SOIR (Doc 9643) is now issued, and provides additional guidance


Established

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10 Degree Departure Separation

6.7.2.2 REQUIREMENTS AND PROCEDURES FOR INDEPENDENT PARALLEL DEPARTURES

Independent IFR departures may be conducted from parallel runways provided:

a) the runway centre lines are spaced by a minimum distance of 760 m (2 500 ft) (see Annex 14, Volume I);

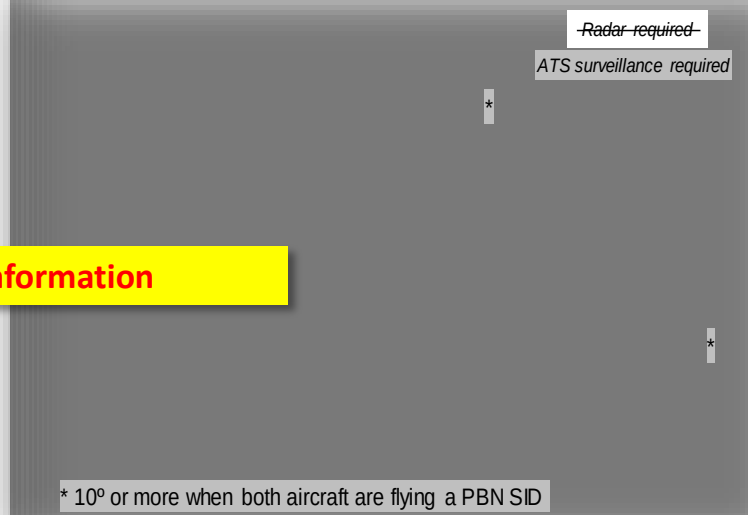
b) the nominal departure tracks diverge by at least:

1) 15 degrees imm
2) 10 degrees whe
   i) both aircraft are flying an RNAV or RNP instrument departure; and
   ii) the turn commences no more than 3.7 km (2.0 NM) from the departure end of the runway;

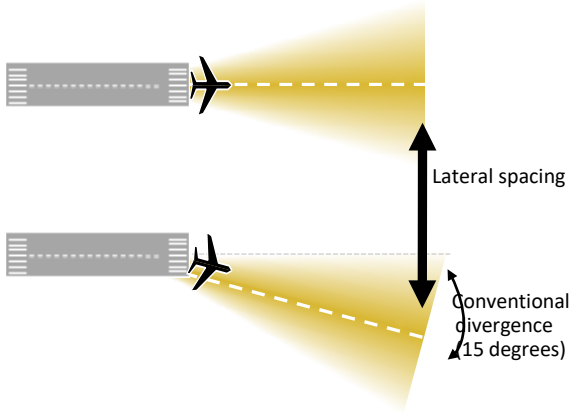
c) a suitable ATS surveillance ~~radar~~ system capable of identification of the aircraft within 1.9 km (1.0 NM) from the end of the runway is available; and

d) ATS operational procedures ensure that the required track divergence is achieved.

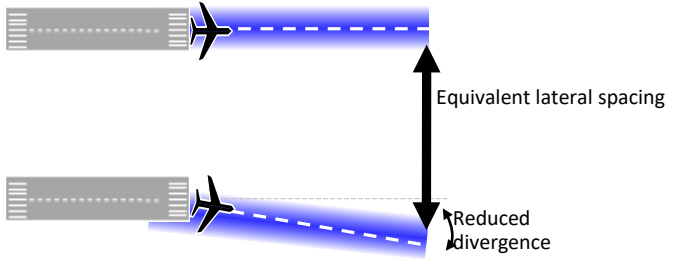
Circular 350 has been issued to provide additional information



Conventional Departures



PBN Departures



Search and Rescue (SAR) and GADSS Update

- ✓ Autonomous distress tracking (ADT) equipage deadline approaches – 1 Jan 2023.
- ✓ The location of an aircraft in distress repository (LADR) to ensure they receive notification on the location of an aircraft in distress in a timely manner is under development.
- ✓ The OPS Control Directory (https://www4.icao.int/opsctrl), a centralized contact details database, has been established to facilitate contact between air traffic services (ATS) units and operators, thereby supporting them in meeting their obligations to establish coordination in a timely manner when an aircraft is in distress.

- Amended provisions to Annexes 11 and 12, applicable 28 November 2024, to support the implementation of the GADSS concept and facilitate contact between ATS units, air operators and rescue coordination centres (RCCs) using the up-to-date contact details in the OPS Control Directory.
- The changes to the alert phase in Annex 11 is to cover the specific scenario where the operating efficiency of the aircraft has been impaired but the extent a forced landing is likely could not be determined.
- The new provisions in Annex 12 requires the RCCs to subscribe and maintain access to location of an aircraft in distress repository (LADR) to ensure they receive notification on the location of an aircraft in distress in a timely manner.
- Proposal for amendment of Annex 12 under review by Air Navigation Commission – provisions related to drift measurement, responsiveness of SAR points of contact (SPOC), safety of SAR personnel at accident sites, conduct of exercises, procedures to be followed when intercepting a distress transmission, and methods for allowing other States to assist in SAR operations. Envisaged applicability November 2026.

Action by the meeting

The meeting is invited to:

a) encourage States to consider the updated ICAO provisions into their planning process; and take necessary measures to ensure timely implementation;

b) request the relevant sub-groups to address the need for regional actions ensuring effective implementation and monitoring of the amended provisions and procedures.

c) note that ICAO is ready to provide required guidance and support for the implementation including the organization of workshops and training sessions as deemed necessary in collaboration with interested International Organizations.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MEXICO CITY
(NORTH AMERICA AND CARIBBEAN)
DAKAR
(WESTERN AND
CENTRAL AFRICA)
BANGKOK
(ASIA-PACIFIC)
NAIROBI
(EASTERN AND
SOUTHERN AFRICA)
LIMA
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THANK YOU!