

PBN oversight

PBN and OPS Regulation



OPS regulation - 3 LEVELS of regulatory requirements

ICAO level

Chicago Convention

- Annex 6 Operation of Aircraft
- PBN Manual - Doc 9613



European level

European Aviation Safety Agency - EASA

- Created in 2003
- IR-OPS New regulation for the technical surveillance of the airlines (date of application : 2014)



National – French level

Internal methods : Manuel du contrôle technique transport public MCT TP – CAT
inspector's manual a guide to perform the surveillance

OPS regulation - ICAO & European Regulation

In 2014 IR OPS is replacing EU OPS and addresses both Commercial Air Transport and General Aviation

	ICAO SARPS	FRANCE/European Regulation
Commercial Air Transport General Aviation Helicopter	Annex 6 part I Annex 6 part II Annex 6 part III	IR AIR OPS (EASA)

Through the provision of national regulations, States are expected to **implement** and **enforce** Standard and Recommended practices (SARPs) contained in the Annexes to the Convention. [Doc OACI 9734 Safety Oversight Manual - 2.2.4]

PBN and OPS regulation - Overview

1. OPS regulation

1. ICAO Annex 6 articles relative to PBN
2. IR OPS part SPA requirements relative to PBN
3. Other IR OPS requirements

2. PBN Operational Approval process in France

7.2 Navigation equipment

7.2.2 For operations where a navigation specification for **performance-based navigation** has been prescribed, an aeroplane shall, in addition to the requirements specified in 7.2.1:

- a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s); and
- b) **be authorized by the State of the Operator** for such operations.

*Note.— Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in the **Performance-based Navigation Manual (Doc 9613)**. This document also contains a comprehensive list of references to other documents produced by States and international bodies concerning navigation systems*

PBN and OPS regulation - ICAO Annex 6 part I – OPS SPECS

APPENDIX 6. AIR OPERATOR CERTIFICATE (AOC)

3. Operations specifications for each aircraft model

Special limitations ⁸ :				
SPECIAL AUTHORIZATIONS	YES	NO	SPECIFIC APPROVALS ⁹	REMARKS
Dangerous goods	<input type="checkbox"/>	<input type="checkbox"/>		
Low visibility operations				
Approach and land				
Take-off				
RVSM ¹² <input type="checkbox"/> N/A				
ETOPS ¹³ <input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>	Maximum diversion time ¹⁴ : _____ minutes	
Navigation specifications for PBN operations ¹⁵	<input type="checkbox"/>	<input type="checkbox"/>		16
Continuing airworthiness	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	17	
Other ¹⁸	<input type="checkbox"/>	<input type="checkbox"/>		

15. Performance-based navigation (PBN): one line is used for each PBN specification authorization (e.g. RNAV 10, RNAV 1, RNP 4), with appropriate limitations or conditions listed in the "Specific Approvals" and/or "Remarks" columns.

16. Limitations, conditions and regulatory basis for operational approval associated with the performance-based navigation specifications (e.g. GNSS, DME/DME/IRU). Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in the Performance-based Navigation (PBN) Manual (Doc 9613).

- **Annex 6 part II**

Chap 2.5.2.2 For operations where a navigation specification for **performance-based navigation** has been prescribed, an aeroplane shall, in addition to the requirements specified in 2.5.2.1 :

- a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s); and
- b) **be authorized by the State of Registry for such operations.**

*Note.— Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in the **Performance-based Navigation Manual (Doc 9613)**. This document also contains a comprehensive list of references to other documents produced by States and international bodies concerning navigation systems.*

PBN and ops regulation - ICAO Annex 6 part III Helicopters

- **Annex 6 part III**

Chap 5.2.2 For operations where a navigation specification for **performance-based navigation** has been prescribed, a helicopter shall, in addition to the requirements specified in 5.2.1:

- a) be provided with navigation equipment which will enable it to operate in accordance with the **prescribed navigation specification(s)**; and
- b) **be authorized** by the State of the Operator for such operations.

Note.— *Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in the **Performance-based Navigation (PBN) Manual (Doc 9613)**. This document also contains a comprehensive list of references to other documents produced by States and international bodies concerning navigation systems.*

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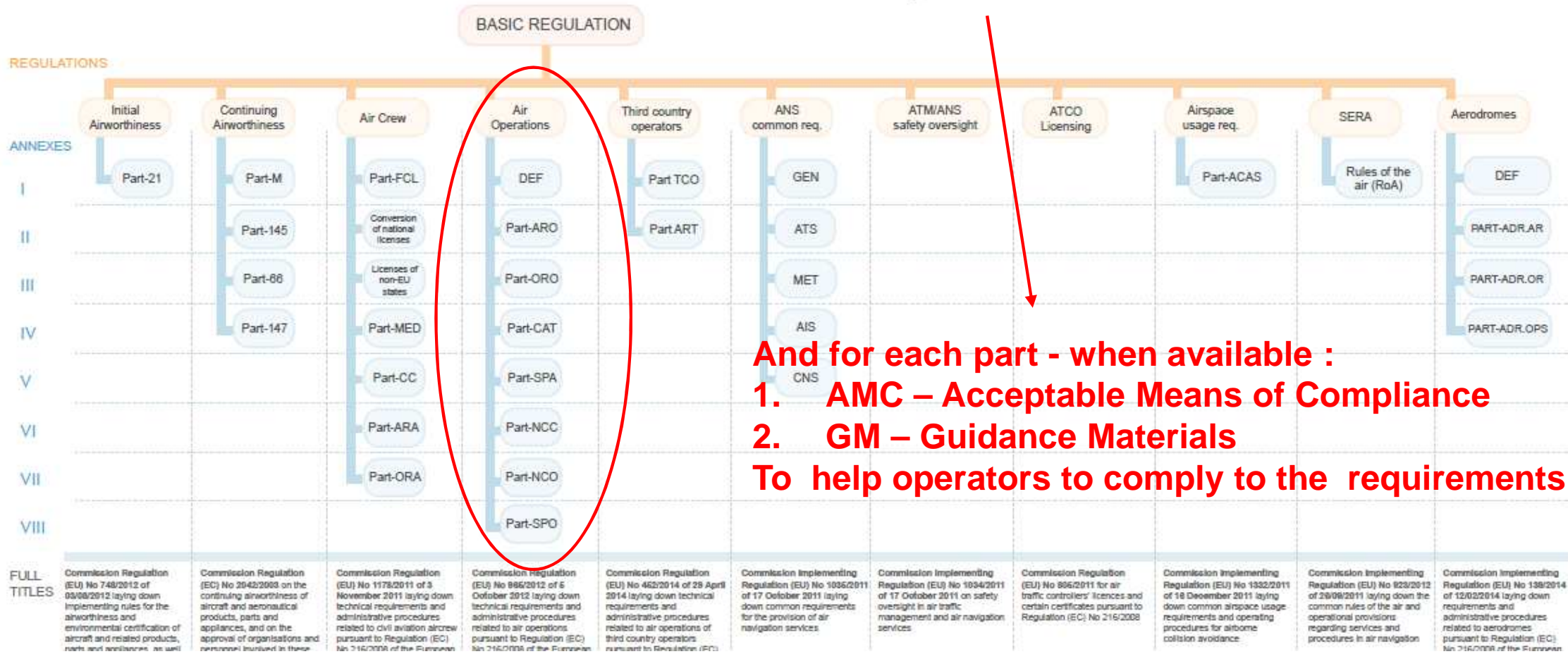
3. EASA and PBN : next steps

EASA regulations structure

Regulations Structure

Each Part to each implementing regulation has its own Acceptable Means of Compliance and Guidance Material (AMC/GM). These AMC and GM are amended along with the amendments of the regulations. These AMC/GM are so-called 'soft law' (non-binding rules), and put down in form of EASA Decisions. A comprehensive explanation on AMC in form of questions and answers can be found on the FAQ section of the EASA website.

Furthermore, Certification Specifications are also related to the implementing regulations, respectively their parts. Like AMC/GM they are put down as Decisions and are non-binding.

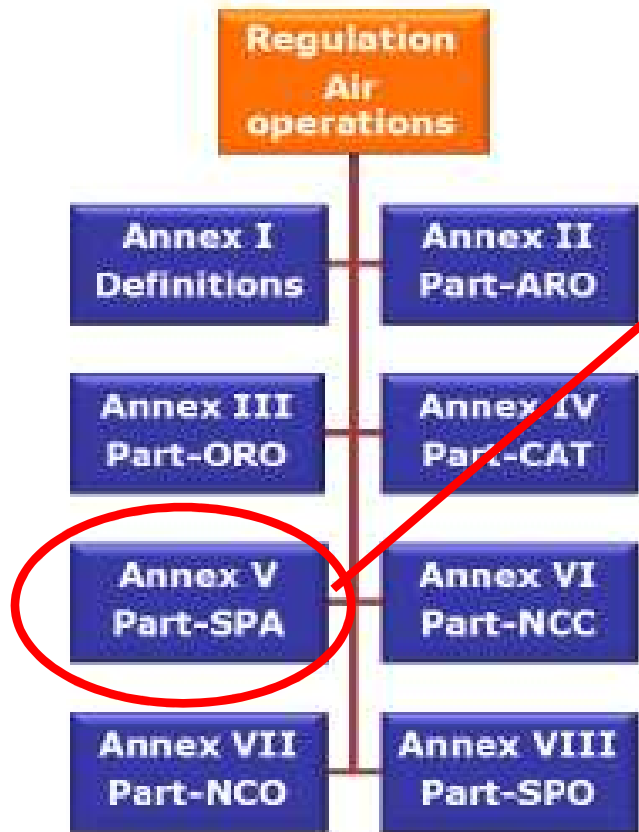


And for each part - when available :

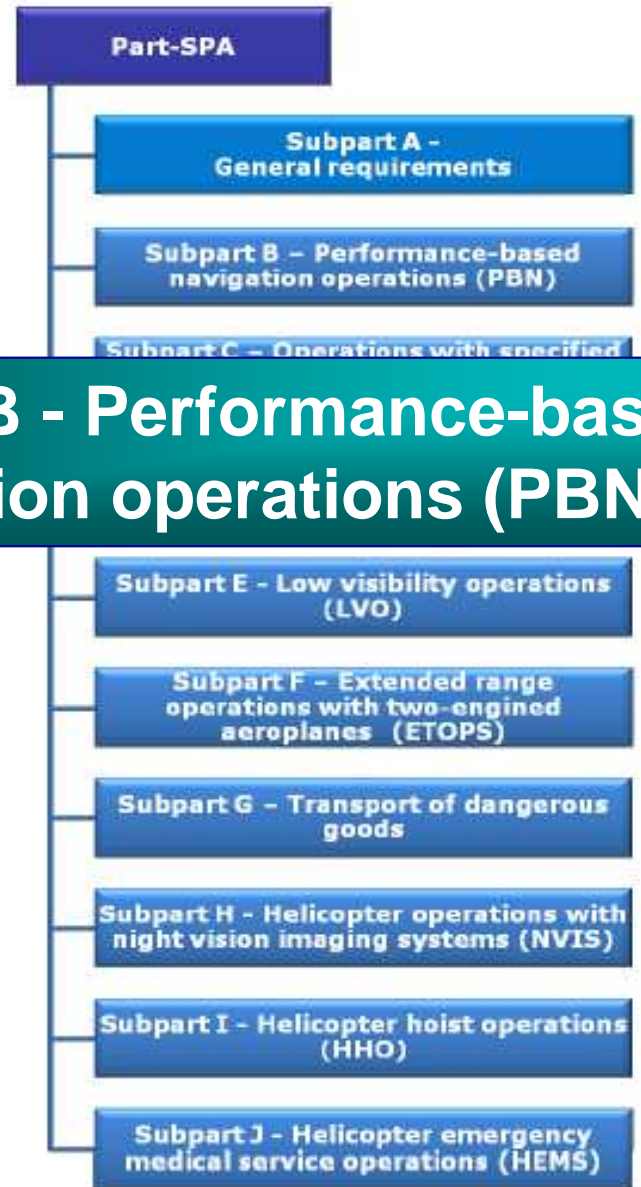
- 1. AMC – Acceptable Means of Compliance**
- 2. GM – Guidance Materials**

To help operators to comply to the requirements

Special approvals in IR Air Operations
(ref. Opinion 04-2011):



Subpart B - Performance-based navigation operations (PBN)



SPA.PBN.100 PBN operations

Aircraft shall only be operated in designated airspace, on routes or in accordance with procedures where performance-based navigation (PBN) specifications are established if the operator has been granted an approval by the competent authority to conduct such operations.

No specific approval is required for operations in area navigation 5 (RNAV5) designated airspace.

SPA.PBN.105 PBN operational approval

To obtain a PBN operational approval from the competent authority, the operator shall provide evidence that:

- a) the relevant airworthiness approval of the RNAV system has been obtained;
- b) a training programme for the flight crew members involved in these operations has been established;
- c) operating procedures have been established specifying:
 1. the equipment to be carried, including its operating limitations and appropriate entries in the minimum equipment list (MEL);
 2. flight crew composition and experience requirements;
 3. normal procedures;
 4. contingency procedures;
 5. monitoring and incident reporting;
 6. electronic navigation data management.

GM1 SPA.PBN.100 PBN operations

- Introduction of PBN - RNAV and RNP
- Introduction of ICAO Doc 9613 Performance-Based Navigation (PBN) Manual
- Introduction of the AMC / TGL per Nav specs

PBN and OPS regulation - IR OPS part SPA – GM1 (2/2)

Table 1: Overview of PBN specifications

	FLIGHT PHASE								
	En-route		Arrival	Approach				Departure	EASA AMC
	Oceanic/ Remote	Continental		Initial	Intermediate	Final	Missed		
RNAV10	10								AMC 20-12
RNP 4	4								To be developed
RNAV 5		5	5						AMC 20-4
RNAV2]		2	2					2	To be developed
RNAV1 (P- RNAV)			1	1	1		1	1	To be developed
BASIC-RNP 1			1	1	1		1	1	To be developed
RNP APCH (LNAV & LNAV/VNAV)				1	1	0.3	1		AMC 20-27
RNP APCH (LPV)						0.3	1		AMC 20-28
RNP AR APCH				1-0.1	1-0.1	0.3-0.1	1-0.1		AMC 20-26

PBN and OPS regulation - IR OPS

part ARO - AUTHORITY REQUIREMENTS FOR AIR OPERATIONS

PBN approval belong to the special approval and have to be mentioned in Operational Specifications attached to the AOC

SECTION II — APPROVALS

ARO.OPS.200 Specific approval procedure

- (a) Upon receiving an application for the issue of a specific approval or changes thereof, the competent authority shall assess the application in accordance with the relevant requirements of Annex V (Part-SPA) and conduct, where relevant, an appropriate inspection of the operator.
- (b) When satisfied that the operator has demonstrated compliance with the applicable requirements, the competent authority shall issue or amend the approval. The approval shall be specified in the operations specifications, as established in Appendix II.

EASA FORM 138 Issue 1

APPENDIX II

OPERATIONS SPECIFICATIONS (subject to the approved conditions in the operations manual)				
Issuing Authority Contact Details				
Telephone ¹ : _____; Fax: _____;				
E-mail: _____				
AOC#:	Operator Name ² : Dba Trading Name	Date ³ :	Signature:	
Operations Specifications#:				
Aircraft Model ⁴ :				
Registration Marks ⁵ :				
Commercial operations <input type="checkbox"/>				
Area of operation ⁷ :				
Special Limitations ⁸ :				
Specific Approvals:				
	Yes	No	Specification ⁹	Remarks
Dangerous Goods	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Low Visibility Operations			RVR ¹¹ : m CAT ¹⁰ ... RVR: m DH: ft	
Take-off	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Approach and Landing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Take-off	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
RVSM ¹²	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	
ETOPS ¹³	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	
Navigation specifications for PBN Operations ¹⁵	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		¹⁶
Minimum navigation performance specification	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Helicopter operations with the aid of night vision imaging systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Helicopter hoist operations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Helicopter emergency medical service operations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Cabin crew training ¹⁷	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Issue of CC attestation ¹⁸	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Continuing airworthiness	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	¹⁹	
Others ²⁰				

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2. PBN Operational Approval process

3. EASA and PBN : next steps

PBN and OPS regulation – IR OPS and Navigation Database

Part CAT – Commercial Air Transport

CAT.IDE.A.355 Electronic navigation data management

- (a) The operator shall only use electronic navigation data products that support a navigation application meeting standards of integrity that are adequate for the intended use of the data.
- (b) When the electronic navigation data products support a navigation application needed for **an operation for which Annex V (Part-SPA) requires an approval**, the operator shall demonstrate to the competent authority that the process applied and the delivered products meet standards of integrity that are adequate for the intended use of the data.
- (c) The operator shall continuously monitor the integrity of both the process and the products, either directly or by monitoring the compliance of third party providers.
- (d) The operator shall ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aeroplanes that require it.

PBN and OPS regulation – IR OPS and Navigation Database

AMC1 CAT.IDE.A.355 Electronic navigation data management

ELECTRONIC NAVIGATION DATA PRODUCTS

- (a) When the operator of a complex motor-powered aeroplane uses a navigation database which that supports an airborne navigation application as a primary means of navigation, the navigation database supplier should hold a Type 2 letter of acceptance (LoA), or equivalent.
- (b) If this airborne navigation application is needed for an operation requiring a specific approval in accordance with **Annex V (Part-SPA,)**, the operator's procedures should be based upon the **Type 2 LoA acceptance process.**

PBN and OPS regulation – IR OPS and Flight Crew

ORO.FC.105 (extract)

Route and Aerodrome Competence Qualification

(c) The pilot-in-command/commander or the pilot, to whom the conduct of the flight may be delegated, shall have had initial familiarisation training of the route or area to be flown and of the aerodromes, facilities and procedures to be used. This route/area and aerodrome knowledge shall be maintained by operating at least once on the route or area or to the aerodrome within a 12 month period.

AMC 1.ORO.FC.105 (extract)

criteria for categorisation of the aerodromes (A, B or C) (complexity of the procedure ...)

different level of familiarization / knowledge in accordance with the aerodrome category.

Cat B aerodrome => special briefing

Cat C aerodrome => instructions in a FSTD

Overview

1. OPS regulation
2. PBN Operational Approval process
 - DGAC Procedure
 - General method
3. EASA and PBN Next steps

PBN Operational approval process – DGAC Procedure DSAC Civil Aviation Safety Directorate

Where ?

At Paris headquarters: Central Entity (DSAC-EC)

In charge of ?

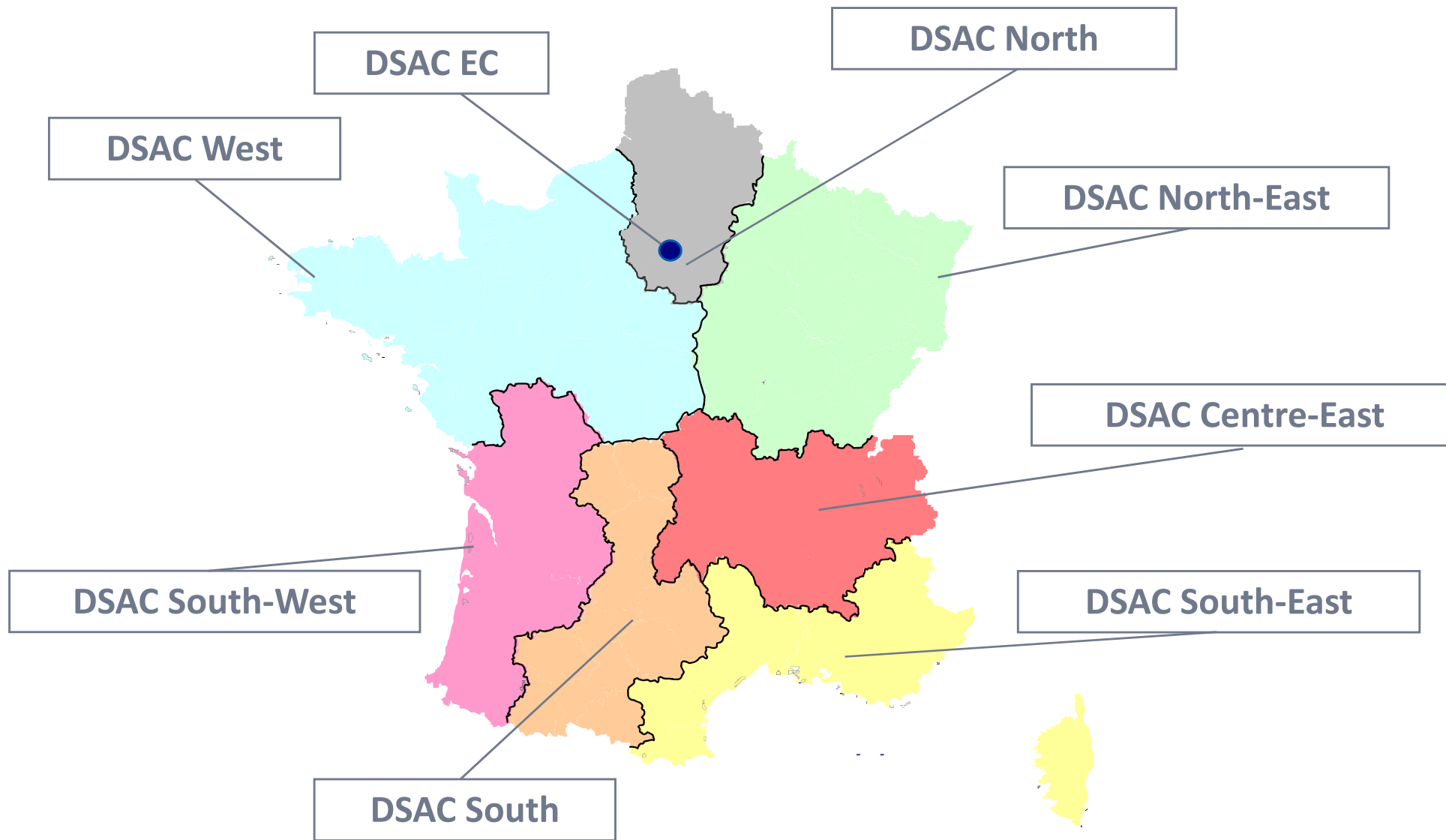
discharging some of its duties, the central DSAC relies on decentralised Regional Civil Aviation Safety Directorates (DSAC-IR)

and

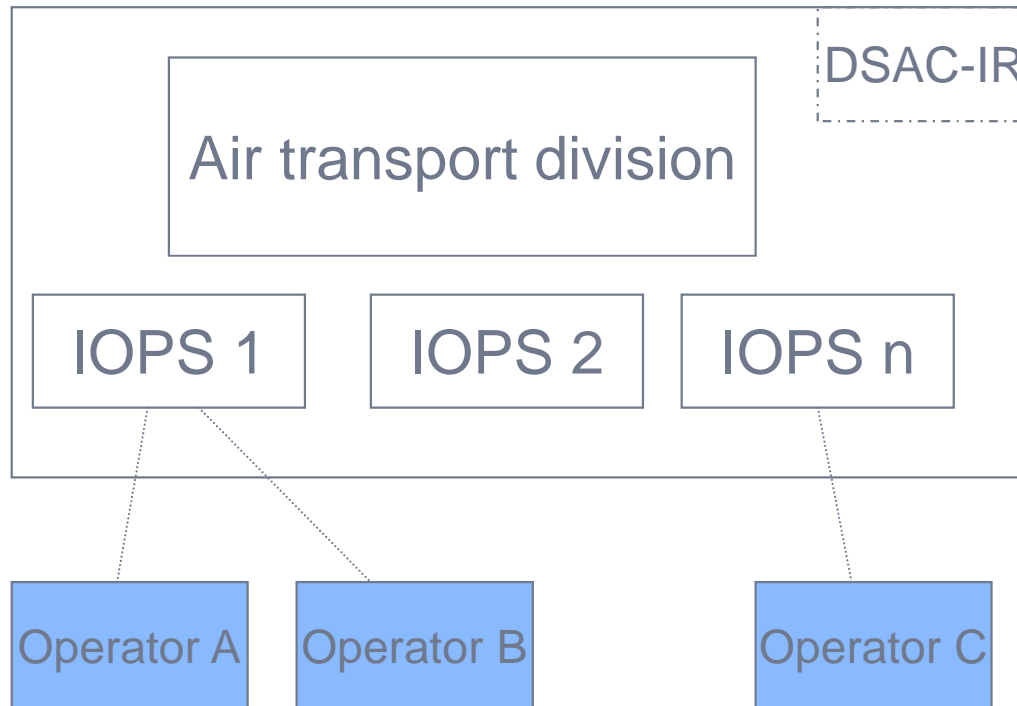
AIR FRANCE AOC oversight



PBN Operational approval process – DGAC Procedure



PBN Operational approval process – DGAC Procedure



ICAO DOC 8335 : Manual of Procedures for Operations Inspection, Certification and Continued Surveillance

ICAO Doc 8335 : “9.6.1: It is essential that inspections be conducted to a common standard. Inspections, therefore, should be carried out in accordance with established methods and criteria so as to eliminate discrepancies due to variations in procedure and the experience of individual inspectors. The development of a manual for inspectors containing detailed inspection procedures and techniques, will promote standardization.”

Inspectors' manual : main objectives:

- Homogenize the certification and supervision process
- Improve transparency of the organization
- Improve coordination between the different actors
- Improve consistency of the whole process
- Provide guidance materials for the inspectors

PBN Operational approval process – DGAC Procedure Inspectors' manual



- Ch 0 Foreword
- Ch 1 International and national context
- Ch 2 Organization of operations departments
- Ch 3 Air operator certificate
- Ch 4 Approvals and acceptances
- Ch 5 Continued supervision of air operators
- Ch 6 Exemption and operational directives
- Ch 7 Foreign airlines
- Ch 8 Personnel training and accreditation

PBN ops approval process – DGAC Procedure Inspectors' manual

 DIRECTION GENERALE DE L'AVIATION CIVILE	MANUEL DU CONTROLE TECHNIQUE TP	Ss-chap IV.5 annexe 2.4	Page : 1/6
	EXPLOITANT FRANCAIS - APPROBATIONS/ACEPTATIONS GUIDE RNAV	Ed 2 Rèv 2	Amendement 20

AUTORISATION PBN (RNAV ET RNP)

Introduction

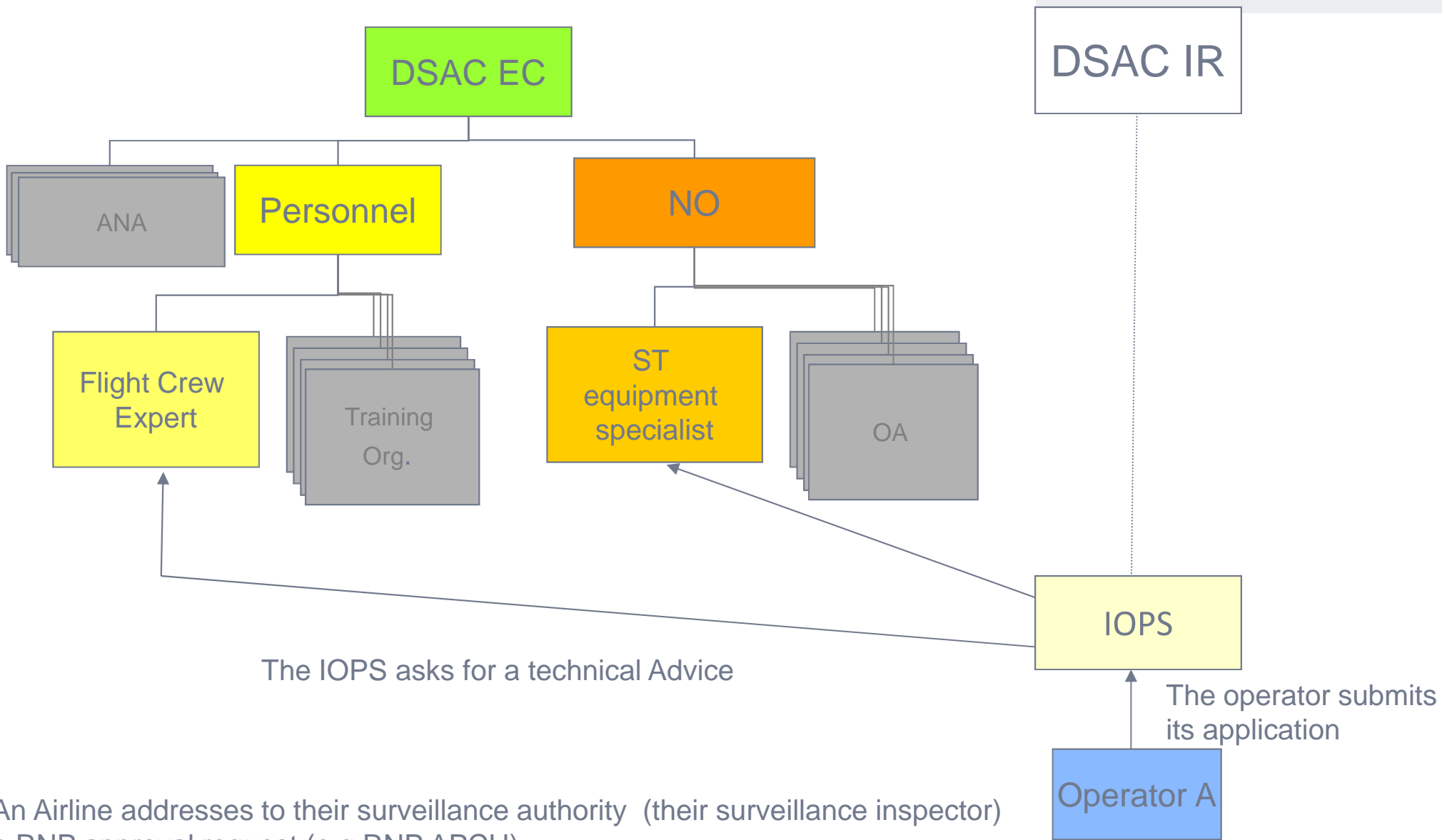
Ce chapitre a pour but de guider les inspecteurs OPS dans l'instruction des demandes d'approbation opérationnelle PBN.

- Le PBN est un manuel de l'OACI dont le but est de définir et d'harmoniser les spécifications de navigation.
- Une Spécification de Navigation** est l'ensemble des exigences portant sur l'aéronef et l'équipage pour supporter les performances opérationnelles requises dans un espace aérien défini. Il y a deux types de spécifications de navigation : les spécifications de navigation RNAV et les spécifications de navigation RNP.
 - RNP X: Spécification de navigation avec exigence d'une fonction d'alerte et de contrôle de la performance de l'aéronef.
 - RNAV X: Spécification de navigation sans exigence de fonction d'alerte et de contrôle de la performance de l'aéronef.
 - "X" fait référence à la précision latérale de navigation en Nm (95% du temps de vol)

Phase d'application (type d'espace aérien)	Précision de navigation	Identifiant des exigences de navigation (Situation courante)	Identifiant des spécifications de navigation du PBN (Normalisation)
Océanique / Continentale	10	RNP 10	RNAV 10
	4	RNP 4	RNP 4
En Route et continentale	5	BRNAV	RNAV 5
En route, continentale et Terminale	2	USRNAV type A	RNAV 2
Terminale	1	PRNAV USRNAV type B	RNAV 1
	1	N/A	Basic RNP 1
	0.3	RNAV (GNSS)	RNP APCH

- Inspectors' manual chapter 4 contains the PBN approval procedures and guidelines which make reference to the AMC 20-XX (eg AMC 20-12, AMC 20-27, ...).

PBN ops approval process – DGAC Procedure Inspectors' manual



The IOPS asks for a technical Advice

The operator submits its application

An Airline addresses to their surveillance authority (their surveillance inspector) a RNP approval request (e.g RNP APCH)



End of the presentation

Thank you for your attention – Any question ?

