

PBN – AIR OPS (“EASA-OPS”)

AOC OPS Seminarium

Solna 2017-11-23

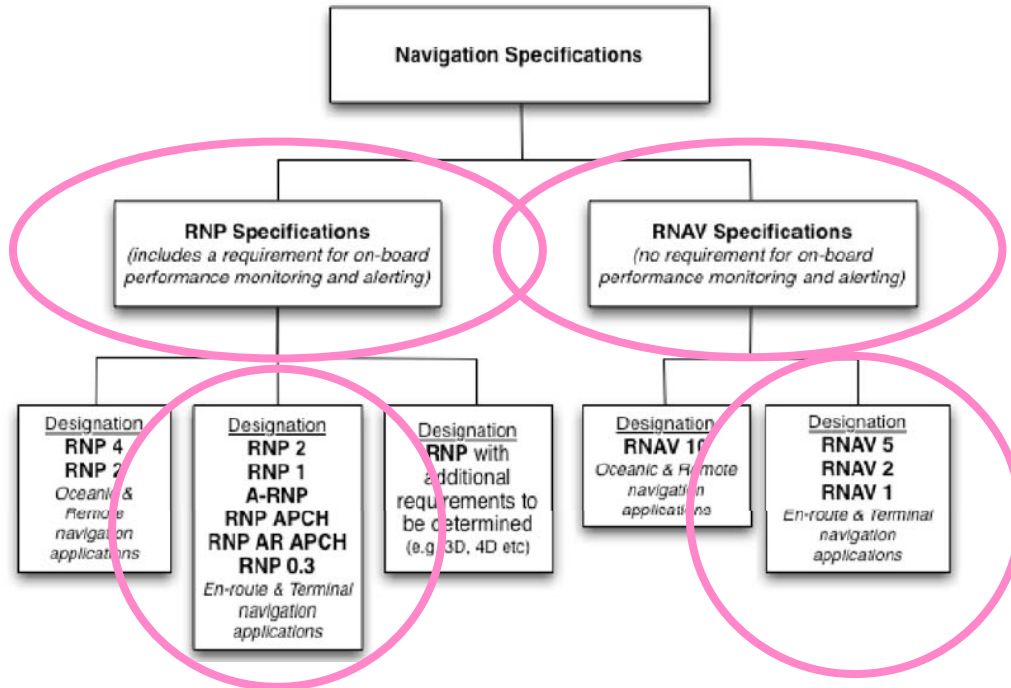
Jan Thell

Sektionen för flygbolag

PBN

- **Från specialtillämpningar till standardtillämpningar**
 - För att möjliggöra förändringen genomförs ändringar i flera olika EU/EASA regler
 - FCL (R1178/2011) – Certifikat
 - OPS (R965/2012) – OPS
 - AUR (R1332/2011) – Infrastruktur

PBN – RNAV – RNP



PBN – Infrastruktur – RNP APCH

➤ Sverige

- APV procedurer ska enligt ICAO vara publicerade senast 2016...
- TS har föreskrifter som kräver publicering av APV procedurer vid flygplats med instrumentbana
 - (TSFS 2015:1 – *Transportstyrelsens föreskrifter och allmänna råd om användning och utformning av luftrum och flygprocedurer*)
- **En instrumentflygplats ska ha en APV procedur till varje banriktning med instrumentinflygning senast 2016....**

PBN – Infrastruktur – RNP APCH

Flygplat s	Bana	Typ	Flygplats	Bana	Typ
ESGG	03/21 AR 21	LNAV/VNAV LNAV/VNAV, LNAV	ESNZ	12/30	LNAV/VNAV, LNAV
ESGJ	01/19	LPV , LNAV/VNAV, LNAV	ESSA	01R/26 AR	LNAV/VNAV
ESMQ	34	LNAV/VNAV, LNAV	ESSV	03	LNAV/VNAV, LNAV
ESNQ	03	LNAV/VNAV, LNAV	ESTA	32	LNAV/VNAV, LNAV
ESNS	10/28	LNAV/VNAV, LNAV	ESUD	15	LPV , LNAV

PBN – Infrastruktur – RNP APCH

➤ EU

- Airspace Usage Requirements (AUR) – Subpart PBN
 - Transition of runway ends providing today **non-precision approaches - 2020**
 - Transition of runway ends providing today **precision approaches - 2024**
 - Transition of the associated **SIDs and STARs, where such routes are used – 2024**
- New rules **to be voted** in Single Sky Committee....

PBN – Applications – EUR

- Aktuelle PBN specifikationer inom EUR
 - **ENR**
 - **RNAV 5 (B-RNAV)**
 - **SID/STAR**
 - **RNAV 1 (P-RNAV) / RNP 1**
 - **APCH (APV)**
 - **RNP APCH** (RNP 0,3 NM in final approach)
 - **RNP AR APCH** (RNP less than or equal to 0.3 NM or fixed radius turns (RF))

PBN – FCL

- Ändrade FCL regler
 - Certifikatregler (FCL) R1178 – krav på teoretisk och praktisk kunskap om PBN för alla med en instrumentbehörighet (IR)
 - Ändringsförordning **R2016/539** till **R1178/2011**
 - Baserat på NPA 2013-25
- Från och med den 25:e augusti 2017 **är det möjligt att examineras** för PBN-behörighet som ett tillägg till IR-behörigheten

PBN – OPS

- Ändrade OPS regler
 - Avsikten med de förändrade reglerna är att **minska den administrativa bördan för operatörer och myndigheter – med bibehållen säkerhetsnivå**
 - Flygdrift (OPS) – kraven på specialtillstånd (SPA) slopas för merparten av de PBN specifikationer som finns tillgängliga i dag
 - Ändringsförordning **R2016/1199** till **R965/2012**
 - Baserat NPA 2013-25

PBN – OPS

- Ändringsförförordning R1199 till R965
 - Gällande från den **25 augusti 2016**
 - **Nya/ändrade IR till Part DEF, ARO, CAT, SPA, NCC, NCO och SPO**
- EASA har publicerat AMC/GM till R1199
 - ED Decision 2016/014/R—2016/021/R
 - **Nya/ändrade AMC/GM till Part DEF, ARO, ORO, CAT, SPA, NCC, NCO och SPO**

PBN – OPS

- Endast krav på tillstånd (Part SPA) för *Complex navigation specifications PBN operations*
- *Complex navigation specifications PBN operations*
 - SPA.PBN.100 PBN operations
 - (a) An approval is required for each of the following PBN specifications:
 - **(1) RNP AR APCH; and**
 - **(2) RNP 0.3 for helicopter operation**

PBN – OPS

- Tillstånd till *Complex navigation specifications PBN operations* ska framgå av Ops. Spec.

Specific Approvals:	Yes	No	Specification ⁽⁹⁾	Remarks
Dangerous Goods	<input type="checkbox"/>	<input type="checkbox"/>		
Low Visibility Operations			CAT ⁽¹⁰⁾	
Take-off			RVR ⁽¹¹⁾ : m	
Approach and Landing	<input type="checkbox"/>	<input type="checkbox"/>	DA/H: ft RVR: m	
RVSM ⁽¹²⁾ <input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>		
ETOPS ⁽¹³⁾ <input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>	Maximum Diversion Time ⁽¹⁴⁾ : min.	
Complex navigation specifications for PBN operations ⁽¹⁵⁾	<input type="checkbox"/>	<input type="checkbox"/>		⁽¹⁶⁾
Minimum navigation performance specification	<input type="checkbox"/>	<input type="checkbox"/>		

PBN – OPS

➤ PBN kompetenser i Attachment

Flight Crew ATQPs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ORO.FC.A.245	
Flight Crew Procedures for flight crew to operate on more than one type or variant.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ORO.FC.140	
Flight Crew Training and checking programmes, general	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ORO.FC.145	
Flight Crew Training and checking programmes/competences, PBN Type: RNAV 5: A/C type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ORO.FC.145	
Flight Crew Training and checking programmes/competences, PBN Type: RNAV 1: A/C type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ORO.FC.145	

PBN – R965

- Nya/ändrade regler som berör operatörer med AOC
 - Fokus på ORO/CAT/SPA....

PBN – R965 – ORO

- **Amended – AMC1 ORO.FC.230 Recurrent training and checking**
- (1) **OPC** – (i) Aeroplanes – Where applicable, operator proficiency checks should include the following manoeuvres as pilot flying:
 - (A) rejected take-off....
 - (B) take-off with engine failure between V1 and V2....
 - (C) ~~precision instrument~~ **3D approach operation to minima** with, in the case of multi-engine aeroplanes, one-engine-inoperative;
 - (D) ~~non-precision~~ **2D approach operation to minima**;
 - (E) at least one of the 3D or 2D approach operations should be an RNP APCH or RNP AR APCH operation;.....

ICAO New Approach Classification

New Approach Classification							
Domain	Document	Aspect					
Approach Operations	Annex 6	Classification	Type A ($\geq 250'$)		CAT I ($\geq 200'$)	CAT II ($\geq 100'$)	CAT III ($<100'$)
		Method	2D	3D			
		Minima	MDA/H	DA/H*			
Approach Runways	Annex 14	M(DA/H) \geq VMC	Non Instrument RWY				
		M(DA/H) $\geq 250'$ Visibility=1 000m	Non Precision Approach RWY				
		DA/H $\geq 200'$ Visibility ≥ 800 m or RVR ≥ 550 m	Precision Approach RWY, Category I				
		DA/H $\geq 100'$ RVR ≥ 300 m	Precision Approach RWY, Category II				
		DA/H $\geq 0'$ RVR ≥ 0 m	Precision Approach RWY, Category III (A, B & C)				
System Performance Procedures	Annex 10 PANS-OPS Vol. II	NPA	NDB, Lctr, LOC, VOR, Azimuth, GNSS				
		APV		GNSS/Baro/SBAS			
		PA		ILS, MLS, SBAS, GBAS			

* For guidance on applying a continuous descent final approach (CDFA) flight technique on a non-precision approach procedures refer to PANS-OPS (Doc. 8168) Vol. I Section 1.7

PBN – R965 – CAT OP

- **New IR CAT.OP.MPA.126 Performance-based navigation**
- The operator shall ensure that, when performance-based navigation (PBN) is required for the route or procedure to be flown:
 - (a) **the relevant PBN navigation specification is stated in the AFM or other document** that has been approved by the certifying authority as part of an airworthiness assessment or is based on such approval; and
 - (b) **the aircraft is operated in conformance with the relevant navigation specification and limitations in the AFM or other document** referred above.

PBN – R965 – CAT OP

- **New AMC1—7 CAT.OP.MPA.126 Performance-based navigation**
 - PBN OPERATIONS
 - MONITORING AND VERIFICATION
 - MANAGEMENT OF THE NAVIGATION DATABASE
 - DISPLAYS AND AUTOMATION
 - VECTORING AND POSITIONING
 - ALERTING AND ABORT
 - CONTINGENCY PROCEDURES

PBN – R965 – CAT OP

- **Amended IR**
 - **CAT.OP.MPA.135 Routes and areas of operation — general**
 - **CAT.OP.MPA.175 Flight preparation**
- **New AMC**
 - **AMC1 CAT.OP.MPA.135 Routes and areas of operation — general**
 - RNAV 10
 - **AMC1–2 CAT.OP.MPA.175 Flight preparation**
 - FLIGHT PREPARATION FOR PBN OPERATIONS
 - DATABASE SUITABILITY

PBN – R965 – CAT OP

- **New IR – CAT.OP.MPA.182 Destination aerodromes — instrument approach operations**
 - The operator shall ensure that sufficient means are available to navigate and land at the destination aerodrome or at any destination alternate aerodrome in the case of loss of capability for the intended approach and landing operation.

PBN – R965 – CAT OP

- **New AMC – AMC1 CAT.OP.MPA.182 Destination aerodromes — instrument approach operations**

PBN OPERATIONS

- **The pilot-in-command should only select an aerodrome as a destination alternate aerodrome if an instrument approach procedure **that does not rely on GNSS is available** either at that aerodrome or at the destination aerodrome.**
- **New GM – GM1 CAT.OP.MPA.182 Destination aerodromes — instrument approach operations – INTENT OF AMC1**

PBN – R965 – CAT IDE

- **Amended IR CAT.IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks**
 - CAT.IDE.A.345 – Point (f) is added:
 - (f) For PBN operations the aircraft shall meet the airworthiness certification requirements for the appropriate navigation specification.
- **New GM GM2—3 CAT.IDE.A.345**
 - **AIRCRAFT ELIGIBILITY FOR PBN SPECIFICATION NOT REQUIRING SPECIFIC APPROVAL**

PBN – R965 – CAT IDE

- Det är i **GM2 till CAT.IDE.A.345** man finner vägledning om/hur NAV utrustningen uppfyller kraven för en viss PBN NAV Spec.
 - Ex. GM2 CAT.IDE.A.345 – (j) RNP APCH — LNAV minima
 - (1) If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNP APCH — LNAV operations.
 - (i) A-RNP; (ii) AMC 20-27; (iii) AMC 20-28; (iv) FAA AC 20-138 for the appropriate navigation specification; and (v) FAA AC 90-105 for the appropriate navigation specification.
 - (2) Alternatively, if

PBN – R965 – CAT IDE

- Om en operatör är osäker på hur installationen uppfyller kraven för en viss PBN NAV Spec. i ett luftfartyg?!
 - ”Ring inte TS” – begär ett yttrande från TC (STC) innehavaren rörande installationen och hur den uppfyller kraven för berörd PBN NAV Spec.

PBN – R965 – SPA PBN

- **Replacement of IR – SPA.PBN.100 PBN is replaced by the following:**
 - (a) An approval is required for each of the following PBN specifications:
 - **(1) RNP AR APCH; and**
 - **(2) RNP 0.3 for helicopter operation.**
 - (b).....
- **Replacement of IR – SPA.PBN.105 PBN is replaced by the following:**
 - To obtain a PBN specific approval from the competent authority, the operator shall provide evidence that:
 - (a) the relevant airworthiness approval.....

PBN – R965 – SPA PBN

➤ **New AMC – SPA.PBN.105**

- FLIGHT CREW TRAINING AND QUALIFICATIONS — GENERAL PROVISIONS
- FLIGHT OPERATIONAL SAFETY ASSESSMENT (FOSA)
- OPERATIONAL CONSIDERATIONS FOR RNP AR APCH
- FLIGHT CONSIDERATIONS
- NAVIGATION DATABASE MANAGEMENT
- REPORTABLE EVENTS
- RNP MONITORING PROGRAMME

RNP AR APCH – ESSA/ESGG

- Ändrade krav RNP AR APCH
 - ESSA RWY 01R/26 – ESGG RWY 03/21
 - AIP AIRAC AMDT – EFFECTIVE 09NOV2017
 - 1. *The operator must have a Baro VNAV approval issued **by its Civil Aviation Authority**. (Reference to AMC 20-27).*
 - 2. *The operator must have a Special Authorization from the **Swedish Transport Agency** in order to use the RNP AR approach to RWY XX. (Reference to AMC 20-26).*
 - **Is replaced by;**
 - 1. *The operator must have an RNP AR APCH approval from the Competent Authority (State of Operator/State of Registry).*

PBN – R965 – Sammanfatning

- **ORO – AMC**

- ORO.FC.230 Recurrent training and checking

- **CAT OP – IR/AMC/GM**

- CAT.OP.MPA.126 Performance-based navigation
- CAT.OP.MPA.135 Routes and areas of operation — general
- CAT.OP.MPA.175 Flight preparation
- CAT.OP.MPA.182 Destination aerodromes — instrument approach operations

PBN – R965 – Sammanfatning

➤ **CAT IDE – IR/AMC/GM**

- CAT.IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

➤ **SPA PBN – IR/AMC/GM**

- RNP AR APCH

NAT HLA – PBN + PBCS

- Inte bara PBN....
 - **29 mars 2018** – NAT HLA
 - PBN – **RNP 4** + PBCS
 - PBC – Performance Based Communication
 - Required Communication Performance (RCP)
 - PBS – Performance Based Surveillance
 - Required Surveillance Performance (RSP) specification

NAT HLA – PBN + PBCS

- From 29 March 2018 flights will be required to indicate compliance with the **RCP 240 and RSP 180 specifications** in order to qualify for reduced lateral and/or longitudinal separation minima
- Initially, this will apply to the **OTS from FL 350 to FL 390**, but will be extended to the whole of the NAT HLA in due course....
- In the future, it is expected that RCP and RSP compliance will also be required in other airspaces....
- <https://www.icao.int/EURNAT>

SLUT – Frågor ?