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Based on the Serbia and Montenegro Air Traffic Services SMATSA llc Regulation of organisation and job description - OU/DIR No 235/28 dated 21.12.2018. with associated amendments, in accordance with defined tasks and authorisation for the job position Director of SMATSA llc, I hereby enact

This document becomes effective upon approval from Civil Aviation Directorate of the Republic of Serbia.

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****FOREWORD****

Bearing in mind that SMATSA llc is responsible for providing air navigation services in two countries - the Republic of Serbia and the state of Montenegro, two distinct but interrelated PBN transition plans were developed regarding each country in particular.

Republic of Serbia, to which this document refers to, although not yet a fully member of the EU, is a signatory of ECAA agreement meaning that EC Regulations shall be made part of its internal legal order, and PBN IR is transposed into national legislation

This is done in order to support harmonised approach on a European level, as the only recognised way to cope with the expected continuation of traffic and increasing demands on the use of available airspace.

In the creation of this document relevant NETOPS meeting working papers were concerned and used adjusted according to the specific needs and current level of SMATSA llc compliance with requirements stipulated in the PBN IR.

This document is intended to be a living document. New editions will be published on the basis of experience gained and of comments and suggestions received from the relevant stakeholders.

****EXECUTIVE SUMMARY****

SMATSA llc has developed a PBN Transition Plan in order to ensure compliance with the PBN IR[[1]](#footnote-2) enabling smooth and safe transition to the provision of services using PBN in a timely and effective manner in its AoR.

Results of conducted comparative analysis of the current operations level against published requirements, for the subject aerodromes identified in the first phase of the transition plan development, showed that in terms of en-route, TMA and approach operations SMASTA llc was in line with all objectives defined for 2020 and beyond.

After clarifications on the applicability of the PBN IR, given at EASA ATM/ANS TeB meeting held on 7th Dec 2020, four more aerodromes have been added to the list of eligible aerodromes.

Implementation of additional PBN procedures and establishment of contingency measures with transition to the minimum operation network of conventional NAVAIDs are set as primary objectives in the following period.

In that process, development of a convenient strategy for gradually moving towards the PBN only operational environment and reducing the network of conventional infrastructure to the extent appropriate for all stakeholders will be in the main focus.

Furthermore, SMATSA llc will undertake appropriate stakeholder consultation which will enable implementation of identified and confirmed transitional measures in accordance with agreed timelines. In that way airspace users will be informed about the planned changes in a timely manner and will be able to adequately equip/retrofit airborne equipment if required. In order to support that process a detailed strategic roadmap for PBN implementation is also provided within this document.

The final document, when fully completed, will describe the agreed changes to meet regulatory requirements as defined in future operational environment.

# INTRODUCTION

## Presentation of the document

### About the document

This document is developed by the Serbia and Montenegro Air Traffic Services SMATSA llc (hereinafter: SMATSA llc) in compliance with:

* Commission Implementing Regulation (EU) 2018/1048 of 18 July 2018 laying down airspace usage requirements and operating procedures concerning performance-based navigation (OJ L 189, 26.7.2018, p. 3–8), including national transposition – “Pravilnik o utvrđivanju zahteva za korišćenje vazdušnog prostora i operativnim procedurama u vezi sa navigacijom zasnovanom na mogućnostima vazduhoplova („Službeni glasnik RSˮ, broj 68/21)” (hereinafter: PBN IR) and
* Executive Director Decision 2018/013/R of 21 November 2018 issuing Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 1332/2011 and Commission Implementing Regulation (EU) 2018/1048 and repealing Decision 2012/002/R of the Executive Director of the Agency of 8 March 2012 and
* Annexes I and II to ED Decision 2018/013/R - Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 1332/2011 and Commission Implementing Regulation (EU) 2018/1048 on common airspace usage requirements and operating procedures ‘AMC & GM to AUR’ (Issue 2, 21 November 2018)

### Structure of the document

This document contains following sections:

* Section 1: Introduction - provides the structure, purpose and scope of the document and the list of all requirements arising from the PBN IR;
* Section 2: Evaluation of the operational environment - presents description of the current operational environment subject to a change according to the PBN IR requirements;
* Section 3: Compliance with the requirements - provides an analysis regarding current fulfilment of the PBN IR requirements;
* Section 4: Implementation objectives - identifies the main objectives that need to be done in future period in accordance with the PBN IR requirements;
* Section 5: Transition plan - provides a detailed plan for the fulfilment of objectives identified in the previous Section;
* Section 6: Future operational environment - provides an overview of the future state of the operational environment when all of the specified goals are met;
* Section 7: Definitions - gives a reference to definitions;
* Section 8: Acronyms and abbreviations - gives a list of all acronyms and abbreviations used in the document;
* Section 9: Appendices - gives a list of all appendices in the document;
* Appendix 1 - PBN Checklist of Implementation - presents a general compliance table in regard of the PBN IR.
* Appendix 2 - Detailed PBN implementation roadmap - gives a general overview and timeline regarding implementation of defined transitional measures.

## Purpose

The primary purpose of the document is to ensure fulfilment of the requirements stated in Article 4 of the PBN IR regarding necessary measures to ensure a smooth and safe transition to the provision of the services using PBN in a timely and effective manner.

This document is consistent with the European ATM Master Plan and the common projects referred to in Article 15a of Regulation (EC) No 550/2004 of the European Parliament and of the Council[[2]](#footnote-3).

## Scope

SMATSA llc is a provider of air traffic management/air navigation services (ATM/ANS) responsible for development, implementation and maintenance of:

* Instrument approach procedures;
* STARs and SIDs; and
* ATS routes;

within BEOGRAD ATCC Area of Responsibility, in the airspace of the Republic of Serbia (part of BEOGRAD FIR/UIR[[3]](#footnote-4)).

Aerodromes that are subject to the PBN IR are those with one or more IRE, including circling/indirect approaches (as shown in the table below).

Table 1 Aerodromes falling into the scope of the PBN IR

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Location** | **ICAO Code** | **TMA** |
| Nikola Tesla | Beograd | LYBE | TMA Beograd |
| Konstantin Veliki | Niš | LYNI | TMA Niš |
| Morava | Kraljevo | LYKV | TMA Kraljevo |
| Ponikve | Užice | LYUZ |
| Batajnica - Pukovnik-pilot Milenko Pavlović | Beograd | LYBT | TMA Batajnica |
| Vršac | Vršac | LYVR | TMA Vršac |

In the event of the appearance of new eligible aerodromes, this document will be updated accordingly.

## Entry into force and application

The following tables provide a summary of the PBN IR requirements.

originates from Annexes I and II to ED Decision 2018/013/R and gives a list of requirements by implementation timing and [[4]](#footnote-5) represents requirements in a more transparent way.

CP 1 IR[[5]](#footnote-6) requirements (AF#1 and AF#3) which supersedes the PCP IR[[6]](#footnote-7) are not considered within this document.

General PBN requirement stated in Article 3 of the PBN IR is considered fulfilled when all other requirements are met.

Table 2 Summary of the PBN IR requirements by implementation timing

|  |  |
| --- | --- |
| Implementation by 3 December 2020 | AUR.PBN.2005 points |
| RNP APCH or RNP AR to all IREs without PA, and, where required, RF legs | (1) + (2) + (3) |
| RNAV 5 for all ATS routes at or above FL150 | (6) |
| Implementation by 25 January 2024 | |
| RNP APCH or RNP AR to all IREs, and, where required, RF legs | (1) + (2) + (3) |
| For all IREs, RNAV 1 or RNP 1(+) for at least one established SID/STAR | (4) + (5) |
| For all IREs, RNP 0.3 or RNP 1 or RNAV 1 for at least one established SID/STAR for rotorcraft operations | (7) |
| RNAV 5 for ATS routes established below FL150 | (6) |
| RNP 0.3 or RNP 1 or RNAV 1 for ATS routes established below FL150 for rotorcraft operations | (7) |
| Implementation by 6 June 2030 | |
| RNAV 1 or RNP 1(+) applicable to all SIDs/STARs when established | (4) + (5) |
| RNP 0.3 or RNP 1 or RNAV 1 applicable to all SIDs/STARs for rotorcraft operations when established | (7) |
| RNP 1(+): RNP 1 specification including RF and/or vertical paths defined by constraints | |

Table 3 Summary of the PBN IR requirements by article

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **REQUIREMENTS** | | **03 DEC**  **2020** | **25 JAN**  **2024** | **06 JUN**  **2030** |
| **Article 4 and Article 7 Applicability of AUR.PBN.2005** | | | | |
| Article 4 | Transition Plan (*or significant updates)* approved *(living document)\** | x\* | x\* | x\* |
| AUR.PBN.2005 (1) or (2) or (3) | RNP APCH at IREs without Precision Approach (PA) | x |  |  |
| RNP APCH at all IREs (with PA) |  | x |  |
| AUR.PBN.2005 (4) or (5) | RNAV 1 or RNP 1(+) SID and STAR - one per IRE |  | x |  |
| RNAV 1 or RNP 1(+) for all SID and STARs |  |  | x |
| AUR.PBN.2005 (6) | RNAV 5 ATS routes at and above FL150 | x |  |  |
| RNAV 5 ATS routes below FL150 |  | x |  |
| AUR.PBN.2005 (7) | Helicopter RNP 0.3/RNAV 1/RNP 1 SID/STAR - one per IRE |  | x |  |
| Helicopter RNP 0.3/RNAV 1/RNP 1 for all SID/STAR |  |  | x |
| Helicopter RNP 0.3/RNAV 1/RNP 1 ATS routes below FL150 |  | x |  |
| **Article 5 and Article 6** | | | | |
| Article 5 | Exclusive use of PBN |  |  | x |
| Article 6 | Contingency measures | x | x | x |

\*The transition plan will have several iterations; Article 4 requires that the draft/significant updates to the plan must be approved by the competent authority prior to being implemented. The obligations in the transition plans would need to be commensurate with the target date obligations.

# EVALUATION OF THE OPERATIONAL ENVIRONMENT

## Instrument approach procedures

Status of the current approach operations is presented in the table below.

Table 4 Overview of the current approach operations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **IAPs** | | | | | | |
| **Conventional** | | | | **PBN - RNP APCH** | | |
| **PA** | **NPA** | | **Circling** | **PA** | **APV** | **NPA** |
| **LYBE** | **12** | ILS Cat IIIB (LOC) | VOR (DME) | NDB (DME) | / | LPV Cat I | LNAV/ VNAV | LNAV |
|  | **30** | ILS Cat I (LOC) | VOR (DME) | NDB (DME) | / | LPV Cat I | LNAV/ VNAV | LNAV |
| **LYNI** | **11** | / | VOR (DME) | | / | / | LNAV/ VNAV | LNAV |
|  | **29** | ILS Cat I (LOC) | VOR (DME) | | / | LPV Cat I | LNAV/ VNAV | LNAV |
| **LYKV** | **13** | / | VOR (DME) | | / | / | LNAV/ VNAV | LNAV |
|  | **31** | / | VOR (DME) | | / | / | LNAV/ VNAV | LNAV |
| **LYUZ** | **10** | / | / | | / | / | / | / |
|  | **28** | / | / | | / | / | / | / |
| **LYBT** | **12L** | ILS Cat I (LOC) | NDB (DME) | | / | / | / | / |
|  | **30R** | / | NDB (DME) | | / | / | / | / |
|  | **12R** | / | / | | / | / | / | / |
|  | **30L** | / | / | | / | / | / | / |
| **LYVR** | **01R** | / | VOR (DME) | NDB (DME) | Circling with prescribed tracks | / | / | / |
|  | **19L** | / | NDB (DME) | | Circling with prescribed tracks | / | / | / |

NOTE 1: LYBT RWY 12R/30L has been in use since 10 SEP 20 and currently there are no instrument procedures published for civil use.

NOTE 2: Currently there are no instrument procedures implemented at LYUZ RWY 10/28.

### Aerodrome Beograd – LYBE

General information about approach operations at LYBE is given in and detailed description of conventional approach procedures is presented in .

Table 5 LYBE approach operations

|  |  |  |
| --- | --- | --- |
| AD | Civil | |
| RWY | 12 | 30 |
| **NAV provided** | PBN and Conventional | PBN and Conventional |
| **IAPs provided** | PA, APV and NPA | PA, APV and NPA |
| **Primary IAP** | ILS Cat IIIB | ILS Cat I |
| **Redundancy** (fallback /backup /contingency) | Multiple redundancy is provided by means of RNP APCH procedures down to all three minima lines and additional VOR and NDB approaches which may be used on request; radar vectoring to IF | Multiple redundancy is provided by means of RNP APCH procedures down to all three minima lines and additional VOR and NDB approaches which may be used on request; radar vectoring to IF |

Table 6 Conventional approach procedures at LYBE

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **Approach Phase** | | | **NAVAIDs** | | | | |
| **Primary** | | | **Support/Backup** | |
| **LYBE** | **12** | Initial / Intermediate approach | ILS (LOC) | | VOR/DME: VAL, BGD  NDB: IA  (Radar vectoring) | | | NDB: KN | |
| VOR | | VOR/DME: VAL, BGD  NDB: IA | | | / | |
| NDB | | VOR/DME: VAL  NDB: IA, KN | | | VOR/DME: BGD  NDB: PA | |
| Final approach | ILS (LOC) | | GP/LOC: YUB  DME: YUB\* | | | DME: BGD  NDB: KN  Markers (OM, MM) | |
| VOR | | VOR/DME: BGD | | | / | |
| NDB | | NDB: KN | | | DME: BGD | |
| Missed approach | ILS (LOC) | | DME: BGD  NDB: OBR | | | VOR: BGD | |
| VOR | | DME: BGD  NDB: OBR | | | VOR: BGD | |
| NDB | | NDB: OBR | | | VOR/DME: BGD | |
| **30** | Initial / Intermediate approach | ILS (LOC) | | VOR/DME: VAL, BGD  NDB: PA  (Radar vectoring) | | | NDB: JA | |
| VOR | | VOR/DME: VAL, BGD  NDB: PA | | | / | |
| NDB | | VOR/DME: VAL  NDB: PA, JA | | | VOR/DME: BGD | |
| Final approach | ILS (LOC) | | GP/LOC: YBE  DME: BGD | | | NDB: JA  Markers (OM, MM) | |
| VOR | | VOR/DME: BGD | | | / | |
| NDB | | NDB: JA | | | DME: BGD | |
| Missed approach | ILS (LOC) | | DME: BGD  NDB: OBR | | | VOR: BGD | |
| VOR | | DME: BGD  NDB: OBR | | | VOR: BGD | |
| NDB | | NDB: OBR | | | VOR/DME: BGD | |
| **Total nb. of NAVAIDs** | | ILSs: 2 | | VOR/DMEs: 2 | | \*(ILS/)DME: 1 | NDBs: 5 | | Markers: 4 |

### Aerodrome Niš – LYNI

General information about approach operations at LYNI is given in Table 7 and detailed description of conventional approach procedures is presented in .

Table 7 LYNI approach operations

|  |  |  |
| --- | --- | --- |
| AD | Civil / Military | |
| RWY | 11 | 29 |
| **NAV provided** | PBN and Conventional | PBN and Conventional |
| **IAPs provided** | APV and NPA (PA not provided due to terrain configuration) | PA, APV and NPA |
| **Primary IAP** | Use on request | ILS Cat I |
| **Redundancy** (fallback /backup /contingency) | Multiple redundancy is provided by means of RNP APCH procedures down to LNAV/VNAV and LNAV minima and VOR approach which may be used on request | Multiple redundancy is provided by means of RNP APCH procedures down to all three minima lines and additional VOR approach which may be used on request |

Table 8 Conventional approach procedures at LYNI

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **Approach Phase** | | | **NAVAIDs** | | | |
| **Primary** | | **Support/Backup** | |
| **LYNI** | **11** | Initial / Intermediate approach | VOR | | VOR/DME: NII | | / | |
| Final approach | VOR | | VOR/DME: NII | | / | |
| Missed approach | VOR | | DME: NII  NDB: ZO | | / | |
| **29** | Initial / Intermediate approach | ILS (LOC) Z | | VOR/DME: NII | | DME: YNI\* | |
| ILS (LOC) Y | | RNP 1 (final approach transition) | | / | |
| VOR | | VOR/DME: NII | | / | |
| Final approach | ILS (LOC) Z | | GP/LOC: YNI  DME: YNI\* | | DME: NII | |
| ILS (LOC) Y | | GP/LOC: YNI  DME: YNI\* | | DME: NII | |
| VOR | | VOR/DME: NII | | / | |
| Missed approach | ILS (LOC) Z | | DME: NII  NDB: ZO | | DME: YNI\* | |
| ILS (LOC) Y | | DME: NII  NDB: ZO | | DME: YNI\* | |
| VOR | | DME: NII  NDB: ZO | | / | |
| **Total nb. of NAVAIDs** | | ILS: 1 | | VOR/DME: 1 | | \*(ILS/)DME: 1 | | NDB: 1 |

### Aerodrome Kraljevo – LYKV

General information about approach operations at LYKV is given in Table 9 and detailed description of conventional approach procedures is presented in Table 10.

Table 9 LYKV approach operations

|  |  |  |
| --- | --- | --- |
| AD | Civil / Military | |
| RWY | 13 | 31 |
| **NAV provided** | PBN and Conventional | PBN and Conventional |
| **IAPs provided** | APV and NPA | APV and NPA |
| **Primary IAP** | Use on request | Use on request |
| **Redundancy** (fallback /backup /contingency) | Multiple redundancy is provided by means of RNP APCH procedures down to LNAV/VNAV and LNAV minima and VOR approach which may be used on request | Multiple redundancy is provided by means of RNP APCH procedures down to LNAV/VNAV and LNAV minima and VOR approach which may be used on request |

Table 10 Conventional approach procedures at LYKV

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **Approach Phase** | | **NAVAIDs** | | |
| **Primary** | | **Support/Backup** |
| **LYKV** | **13** | Initial / Intermediate approach | VOR | VOR/DME: KRV | | NDB: BR |
| Final approach | VOR/DME: KRV | | NDB: BR |
| Missed approach | NDB: AD, VTN | |  |
| **31** | Initial / Intermediate approach | VOR | VOR/DME: KRV | |  |
| Final approach | VOR/DME: KRV | |  |
| Missed approach | NDB: BR | |  |
| **Total nb. of NAVAIDs** | | VOR/DME: 1 | | | NDBs: 3 | |

### Aerodrome Užice – LYUZ

As of 4 NOV 21 LYUZ operational environment has changed to non-controlled AFIS aerodrome currently with no instrument procedures published, and TMA Užice has been merged with TMA Kraljevo.

### Aerodrome Beograd – LYBT

General information about approach operations at LYBT is given in Table 11 and detailed description of conventional approach procedures is presented in Table 12.

Table 11 LYBT approach operations

|  |  |  |
| --- | --- | --- |
| AD | Military | |
| RWYs | 12L | 30R |
| **NAV provided** | Conventional | Conventional |
| **IAPs provided** | PA and NPA | NPA |
| **Primary IAP** | ILS Cat I | NDB (only) |
| **Redundancy** (fallback /backup /contingency) | Redundancy is provided by means of ILS Cat I procedures and NDB approach which may be used on request | There is no redundancy provided for NDB approach |

Table 12 Conventional approach procedures at LYBT

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **Approach Phase** | | | **NAVAIDs** | | | | |
| **Primary** | | | **Support/Backup** | |
| **LYBT** | **12L** | Initial / Intermediate approach | ILS Cat I | | GP/LOC: BTJ  DME: BTJ\*  NDB: IA | | | DME: BGD | |
| NDB | | NDB: IA  DME: BGD | | |  | |
| Final approach | ILS Cat I | | GP/LOC: BTJ  DME: BTJ\* | | | DME: BGD  Markers (OM, MM) | |
| NDB | | NDB: BT | | | Marker (OM) | |
| Missed approach | ILS Cat I | | NDB: PA | | | DME: BGD | |
| NDB | | NDB: PA | | | DME: BGD | |
| **30R** | Initial / Intermediate approach | NDB | | NDB: PA | | | DME: BGD | |
| Final approach | NDB | | NDB: PA, JA, EK | | |  | |
| Missed approach | NDB | | NDB: EK, IA | | | DME: BGD | |
| **12R** | Initial / Intermediate approach | / | | / | | | / | |
| Final approach |
| Missed approach |
| **30L** | Initial / Intermediate approach | / | | / | | | / | |
| Final approach |
| Missed approach |
| **Total nb. of NAVAIDs** | | ILS: 1 | | DME: 1 | | \*(ILS/)DME: 1 | NDBs: 5 | | Markers: 2 |

### Aerodrome Vršac – LYVR

General information about approach operations at LYVR is given in Table 13 and detailed description of conventional approach procedures is presented in Table 14.

Table 13 LYVR approach operations

|  |  |  |
| --- | --- | --- |
| AD | Civil (for own purposes) | |
| RWY | 01R | 19L |
| **NAV provided** | Conventional | Conventional |
| **IAPs provided** | NPA | NPA |
| **Primary IAP** | VOR | NDB approach followed by Circling |
| **Redundancy** (fallback /backup /contingency) | Redundancy is provided by means of VOR approach and NDB approach which may be used on request | There is no redundancy provided for NDB approach |

Table 14 Conventional approach procedures at LYVR

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **Approach Phase** | | **NAVAIDs** | | |
| **Primary** | | **Support/Backup** |
| **LYVR** | **01R** | Initial / Intermediate approach | VOR | VOR/DME: VAC | |  |
| NDB | NDB: VRA | | DME: VAC |
| Final approach | VOR | VOR/DME: VAC | |  |
| NDB | NDB: VRA | | DME: VAC |
| Missed approach | VOR | VOR/DME: VAC | |  |
| NDB | NDB: VRA | | DME: VAC |
| **19L** | Initial / Intermediate approach | NDB | NDB: VRA | | DME: VAC |
| Final approach | NDB: VRA | | DME: VAC |
| Missed approach | NDB: VRA | | DME: VAC |
| **Total nb. of NAVAIDs** | | VOR/DME: 1 | | | NDB: 1 | |







## SID and STAR routes

### TMA Beograd (LYBE)

General information about TMA operations is given in and detailed description of arrival and departure procedures is presented in .

Table 17 LYBE TMA operations

|  |  |
| --- | --- |
| RWY | 12 / 30 |
| **Radar service provided** | Yes |
| **NAV provided** | PBN and Conventional |
| **NAV specification** | RNAV 1 |
| **PBN NAV infrastructure** | GNSS only |
| **Conventional NAV infrastructure** | Based on several VOR/DME and NDB aids (only as fallback /backup /contingency) |
| **Concept of operations** | Primary procedures in use are those based on RNAV 1 specification; aircraft not equipped or not able to follow RNAV 1 routes will be subject to radar vectoring or instructed to use conventional routes |

Table 18 Conventional and PBN TMA procedures at LYBE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **SIDs** | **STARs** | |
|
| **LYBE** | **12** | **RNAV 1** / based on GNSS only | **RNAV 1** / based on GNSS only | |
| **Conventional** / based on:  VOR/DME: BGD, VAC, VAL, TPL, SMI  NDB: PA (+TPL/VAL as backup only) | **Conventional** / based on:  VOR/DME: BGD, VAL, TPL, SMI  NDB: IA, PA, OBR, KN (+VAL/TPL backup only) | |
| **30** | **RNAV 1** / based on GNSS only | **RNAV 1** / based on GNSS only | |
| **Conventional** / based on:  VOR/DME: BGD, VAC, VAL, TPL, SMI  NDB: IA, PA, OBR (+TPL/VAL as backup only) | **Conventional** / based on:  VOR/DME: BGD, VAL, TPL, SMI  NDB: PA, OBR (+VAL/TPL as backup only) | |
| **Total nb. of NAVAIDs** | | VOR/DMEs: 5 | | NDBs: 6 |

### TMA Niš (LYNI)

General information about TMA operations is given in Table 19 and detailed description of arrival and departure procedures is presented in .

Table 19 LYNI TMA operations

|  |  |
| --- | --- |
| RWY | 11 / 29 |
| **Radar service provided** | No (procedural ATC only) |
| **NAV provided** | PBN and Conventional |
| **NAV specification** | RNP 1 |
| **PBN NAV infrastructure** | GNSS |
| **Conventional NAV infrastructure** | Based on one VOR/DME and two NDB aids |
| **Concept of operations** | RNP 1 and conventional routes may be used on request on an equivalent base |

Table 20 Conventional and PBN TMA procedures at LYNI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **SIDs** | **STARs** | |
|
| **LYNI** | **11** | **RNP 1** / based on GNSS | **RNP 1** / based on GNSS | |
| **Conventional** / based on:  VOR/DME: NII  NDB: JST, ZO | **Conventional** / based on:  VOR/DME: NII | |
| **29** | **RNP 1** / based on GNSS | **RNP 1** / based on GNSS | |
| **Conventional** / based on:  VOR/DME: NII  NDB: ZO | **Conventional** / based on:  VOR/DME: NII | |
| **Total nb. of NAVAIDs** | | VOR/DMEs: 1 | | NDBs: 2 |

### TMA Kraljevo (LYKV)

General information about TMA operations is given in Table 21 and detailed description of arrival and departure procedures is presented in Table 22.

Table 21 LYKV TMA operations

|  |  |
| --- | --- |
| RWY | 13 / 31 |
| **Radar service provided** | No (procedural ATC only) |
| **NAV provided** | PBN and Conventional |
| **NAV specification** | RNP 1 |
| **PBN NAV infrastructure** | GNSS |
| **Conventional NAV infrastructure** | Based on several VOR/DME and NDB aids |
| **Concept of operations** | RNP 1 and conventional routes may be used on request on an equivalent base |

Table 22 Conventional and PBN TMA procedures at LYKV

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **SIDs** | **STARs** | |
|
| **LYKV** | **13** | **RNP 1** / based on GNSS | **RNP 1** / based on GNSS | |
| **Conventional** / based on:  VOR/DME: KRV, VAL  NDB: AD, BR, VTN (+VAL as backup only) | **Conventional** / based on:  VOR/DME: KRV, VAL, TPL (+BLC as backup only)  NDB: BR, VTN (+VAL/TPL/BLC as backup only) | |
| **31** | **RNP 1** / based on GNSS | **RNP 1** / based on GNSS | |
| **Conventional** / based on:  VOR/DME: KRV, VAL  NDB: AD, BR, LA, VTN (+VAL as backup only) | **Conventional** / based on:  VOR/DME: KRV, VAL, TPL (VOR only) (+BLC as backup only)  NDB: VTN (+VAL/BLC as backup only) | |
| **Total nb. of NAVAIDs** | | VOR/DMEs: 4 | | NDBs: 7 |

### TMA Kraljevo (LYUZ)

As of 4 NOV 21 LYUZ operational environment has changed to non-controlled AFIS aerodrome currently with no instrument procedures published and TMA Užice has been merged with TMA Kraljevo.

### TMA Batajnica (LYBT)

General information about TMA operations is given in Table 23 and detailed description of arrival and departure procedures is presented in Table 24.

Table 23 LYBT TMA operations

|  |  |
| --- | --- |
| RWY | 12L / 30R |
| **Radar service provided** | No (procedural ATC only) |
| **NAV provided** | Conventional only |
| **NAV specification** | / |
| **PBN NAV infrastructure** | / |
| **Conventional NAV infrastructure** | Based on several VOR/DME and NDB aids |
| **Concept of operations** | Use of AD only with permission issued by Ministry of Defence of the Republic of Serbia |

Table 24 Conventional and PBN TMA procedures at LYBT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **SIDs** | | **STARs** |
|
| **LYBT** | **12L** | **Conventional** / based on:  VOR/DME: SMI, VAL, TPL, BGD (DME only)  NDB: IA, PA, PV (+VAL/TPL as backup only) | | **Conventional** / based on:  VOR/DME: BGD, SMI, VAL  NDB: IA, PA, PV, POZ (+VAL as backup only) |
| **30R** | **Conventional** / based on:  VOR/DME: SMI, VAL, TPL, BGD (DME only)  NDB: IA, PA, PV (+VAL/TPL as backup only) | | **Conventional** / based on:  VOR/DME: VAL, BGD (DME only)  NDB: PA, IA, POZ (+VAL as backup only) |
| **LYBT** | **12R** | / | | / |
| **30L** | / | | / |
| **Total nb. of NAVAIDs** | | VOR/DMEs: 4 | NDBs: 6 | |

### TMA Vršac (LYVR)

General information about TMA operations is given in Table 25 and detailed description of arrival and departure procedures is presented in Table 26.

Table 25 LYVR TMA operations

|  |  |
| --- | --- |
| RWY | 01R / 19L |
| **Radar service provided** | No (procedural ATC only) |
| **NAV provided** | Conventional only |
| **NAV specification** | / |
| **PBN NAV infrastructure** | / |
| **Conventional NAV infrastructure** | Based on one VOR/DME and one NDB aid |
| **Concept of operations** | Purpose of AD:  - for flying an aircraft up to 5700 KG MTOM, for own purposes;  - air sport activities; and  - basic pilot training and training for other pilot licences |

Table 26 Conventional and PBN TMA procedures at LYVR

|  |  |  |  |
| --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **SIDs** | **STARs** |
|
| **LYVR** | **01R** | **Conventional** / based on:  VOR/DME: VAC  (NDB: VRA as backup only) | **Conventional** / based on:  VOR/DME: VAC  NDB: VRA |
| **19L** | **Conventional** / based on:  VOR/DME: VAC  (NDB: VRA as backup only) |
| **Total nb. of NAVAIDs** | | VOR/DME: 1 | NDB: 1 |







## En-route

Aircraft, other than State aircraft, operating under instrument flight rules within BEOGRAD FIR/UIR above 9500 FT ALT, shall be equipped, as a minimum, with RNAV equipment meeting RNAV 5 (B-RNAV) specification as set out in ICAO Doc 7030 – Regional Supplementary Procedures.

NOTE: RNAV 5, defined in ICAO Doc 9613 – Performance-based Navigation Manual, is equivalent to B-RNAV with regard to the navigational equipment and certification requirements. Those two terms (RNAV 5 and B-RNAV) in AIP Serbia/Montenegro are treated as equal.

SMATSA llc has implemented crossborder FRA on 24/7 basis (SECSI FRA).

Status of current en-route operations is presented in the table below.

Table 29 Overview of current en-route operations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAV application** | **Limits** | **NAV specification** | **NAV infrastructure** | **NAV back-up infrastructure** |
| **FRA\*** | FL660  FL205 | / | GNSS | VOR/DME & NDB  + Radar as required |
| **ATS routes** | FL205  MNM ALT | RNAV 5 |

\* Out of the PBN IR scope.

## Surveillance and communication services

Surveillance and communication services are currently provided in accordance with the following table:

Table 30 Overview of surveillance and communication services

|  |  |  |
| --- | --- | --- |
| **Airspace** | **SUR** | **COM** |
| ACC Beograd | Fully provided  (minimum horizontal radar separation is 5 NM) | Fully provided |
| TMA Beograd |
| TMA Niš | Not provided  (non-radar environment – procedural ATC services provided) |
| TMA Kraljevo |
| TMA Batajnica |
| TMA Vršac |

## Airborne equipment and capabilities

PBN fleet capability for 2019 flights at LYBE and LYNI is given in the table below. Statistics are prepared through Eurocontrol’s CNS Dashboard under the following conditions:

* Period: JAN – DEC 2019;
* Traffic: Arrivals only;
* Flight type: Scheduled.

Main conclusions are:

* Almost all flights are PBN approved (99% LYBE, 100% LYNI) and GNSS capable (~92% LYBE, ~100% LYNI);
* Almost all flights are RNAV 1 capable (~95% LYBE, ~98% LYNI):
* LYBE: around 70% of flight are RNAV 1 capable with all permitted sensors and around 5% of flights are non GNSS so DME/DME backup infrastructure could help in case of a reversion from GNSS;
* LYBE: approximately 20% of flights are GNSS only capable meaning that in current scenario they should be radar vectored or instructed to use conventional routes;
* RNP 1 capabilities are not so strong (~35% LYBE, ~55% LYNI):
* LYNI: this means that almost 50% of flights currently is not capable to use published RNP 1 SID and STAR routes and that they still need routes based on conventional NAVAIDs because radar vectoring is not provided;
* Great level of RNP APCH capabilities is noted (~83 LYBE, ~98% LYNI):
* LYBE: lower level probably due to ILS Cat IIIB availability;
* LPV capabilities are still at very low level for both aerodromes (<2% LYBE, <5% LYNI) – change should be expected in 2020 because RNP APCH to LPV minima are operationally available since the end of March;
* Capabilities regarding RNP AR APCH (~5% LYBE, <2% LYNI) and GBAS (<4% LYBE, 0% LYNI) are also at very low level at the moment, especially at LYNI.

Data for LYKV, LYBT, LYVR and LYUZ are not presented due to following reasons:

* LYKV – aerodrome became operational during the 2019 summer season and PBN procedures implemented on 20 JUN 19, very low level of civil traffic during the year;
* LYUZ – aerodrome for own purposes with no PBN procedures implemented, very low level of other traffic during the year (no scheduled flights);
* LYBT – military aerodrome with no PBN procedures implemented, very low level of civil traffic during the year (no scheduled flights);
* LYVR – aerodrome for own purposes (pilot training) with no PBN procedures implemented, very low level of other traffic during the year (no scheduled flights).

Table 31 PBN fleet capability at LYBE and LYNI for 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FLEET CAPABILITY** | **LYBE** | | **LYNI** | |
| Flights | Percentage | Flights | Percentage |
| **Total number of flights** | **29528** | **1611** |
| **R - PBN approved** | **29232** | **99.00%** | **1611** | **100.00%** |
| **G - GNSS** | **27146** | **91.93%** | **1607** | **99.75%** |
| **RNAV 1 – Any means (any Dx)** | **27964** | **94.70%** | **1580** | **98.08%** |
| **RNAV 1 – GNSS only (D2 only)** | **5865** | **19.86%** | **3** | **0.19%** |
| **RNAV 1 – Non GNSS (D3 or D4 and not (D1 or D2))** | **1339** | **4.53%** | **4** | **0.25%** |
| D1 - RNAV 1 all permitted sensors | 20145 | 68.22% | 1573 | 97.64% |
| D2 - RNAV 1 GNSS | 6480 | 21.95% | 3 | 0.19% |
| D3 - RNAV 1 DME/DME | 791 | 2.68% | 0 | 0.00% |
| D4 - RNAV 1 DME/DME/IRU | 1341 | 4.54% | 4 | 0.25% |
| **RNP 1 (any Ox)** | **10132** | **34.31%** | **875** | **54.31%** |
| O1 - Basic RNP 1 all permitted sensors | 9403 | 31.84% | 871 | 54.07% |
| O2 - Basic RNP 1 GNSS | 1891 | 6.40% | 330 | 20.48% |
| O3 - Basic RNP 1 DME/DME | 412 | 1.40% | 0 | 0.00% |
| O4 - Basic RNP 1 DME/DME/IRU | 228 | 0.77% | 4 | 0.25% |
| **RNP APCH – Any means (S1 or S2 or B)** | **24550** | **83.14%** | **1578** | **97.95%** |
| **RNP APCH (S1 or S2)** | **24544** | **83.12%** | **1576** | **97.83%** |
| **RNP APCH – LNAV only (S1 and not S2 and not B)** | **6541** | **22.15%** | **3** | **0.19%** |
| S1 - RNP APCH | 9820 | 33.26% | 103 | 6.39% |
| S2 - RNP APCH with BARO-VNAV | 18002 | 60.97% | 1573 | 97.64% |
| B - LPV (APV with SBAS) | 383 | 1.30% | 73 | 4.53% |
| **RNP AR APCH (T1 or T2)** | **1490** | **5.05%** | **25** | **1.55%** |
| T2 - RNP AR APCH without RF (special authorisation required) | 186 | 0.63% | 0 | 0.00% |
| T1 - RNP AR APCH with RF (special authorisation required) | 1490 | 5.05% | 25 | 1.55% |
| **A - GBAS landing system** | **985** | **3.34%** | **0** | **0.00%** |

# COMPLIANCE WITH THE REQUIREMENTS

PBN Checklist of implementation is provided within Appendix 1 of this document in order to verify compliance with the transition planning requirements.

## Implementation of IAPs

### Requirements

AUR.PBN.2005 (1) or (2) or (3):

* RNP APCH at IREs without Precision Approach (PA) by 03 DEC 2020;
* RNP APCH at all IREs (with PA) by 25 JAN 2024.

### Fulfilment

The status of compliance with the requirements of the PBN IR is presented in Table 32.

#### LYBE

All requirements have been fulfilled in accordance with the PBN IR.

As of 26 JAN 23 LYBE complete airport operations are to be transferred to the newly constructed inserted RWY 12R/30L - BCIR (Base Case Inserted Runway) until reconstruction of the existing runway is finished. After that BCIR will be uses as contingency RWY only, while published procedures will be available through the AIP SUP. Implementation of BCIR IAPs is planned in accordance with PBN IR.

#### LYNI

All requirements may be considered as fulfilled in terms of the PBN IR.

Implementation of RNP APCH to LPV minimum at LYNI RWY 11 may be considered as fulfilled because implementation is characterized as excessively difficult due to terrain after preliminary IFP design was made.

Considering low volumes of traffic at LYNI implementation of 3D approach procedure in accordance with the requirements of the RNP authorisation required (RNP AR APCH) specification is not planned.

#### LYKV, LYUZ, LYBT and LYVR

LYKV, LYUZ, LYBT and LYVR become subject aerodromes in accordance with the clarifications on the applicability of the PBN regulation, given at EASA ATM/ANS TeB meeting, held on 7th Dec 2020.

For that reason implementation of all requested RNP APCH minima (where possible) is postponed to no later than 25 JAN 2024 (the second planning period).

Exact implementation date will be determined in the following period.

#### Additional notes

Implementation of radius to fix (RF) legs currently is not considered because it is not required due to traffic density or traffic complexity on any of the subject aerodromes.

Table 32 Current level of compliance with IAPs requirements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **RWY Type** | **RNP APCHs** | | |
| **3D approach** | | **2D approach** |
| **LPV** | **LNAV/VNAV** | **LNAV** |
| **LYBE** | 12(L) | Instrument Precision Approach | Implemented on 26 MAR 2020  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 08 NOV 2018  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 30 APR 2015  **- in accordance with AUR.PBN.2005 (1)** |
| 30(R) | Instrument Precision Approach | Implemented on 26 MAR 2020  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 08 NOV 2018  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 30 APR 2015  **- in accordance with AUR.PBN.2005 (1)** |
| **LYBE BCIR** | 12R | Instrument Precision Approach | Planned for 26 JAN 2023  **- in accordance with AUR.PBN.2005 (1)** | Planned for 26 JAN 2023  **- in accordance with AUR.PBN.2005 (1)** | Planned for 26 JAN 2023  **- in accordance with AUR.PBN.2005 (1)** |
| 30L | Instrument Non-Precision Approach | Planned for 26 JAN 2023  **- late in accordance with Article 7 2** | Planned for 26 JAN 2023  **- late in accordance with Article 7 2** | Planned for 26 JAN 2023  **- late in accordance with Article 7 2** |
| **LYNI** | 11 | Instrument Non-Precision Approach | Not implemented  **- in accordance with AUR.PBN.2005 (2)**:  implementation is excessively difficult due to terrain | Implemented on 11 OCT 2018  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 17 SEP 2015  **- in accordance with AUR.PBN.2005 (1)** |
| 29 | Instrument Precision Approach | Implemented on 26 MAR 2020  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 11 OCT 2018  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 11 OCT 2018  **- in accordance with AUR.PBN.2005 (1)** |
| **LYKV** | 13 | Non-Instrument Approach | Implemented on 22 JUL 2022  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (1)** |
| 31 | Non-Instrument Approach | Implemented on 22 JUL 2022  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (1)** | Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (1)** |
| **LYUZ** | 10 | Non-Instrument Approach | **Not applicable** | **Not applicable** | Planned  TBD  **- in accordance with EASA PBN IR clarification:**  approach to RWY 28 with circling minima to allow landing on opposite runway end (RWY 10) |
| 28 | Instrument Non-Precision Approach | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** |
| **LYBT** | 12L | Instrument Precision Approach | Planned  TBD  **- in accordance with Article 7 2(b)** | Planned  TBD  **- in accordance with Article 7 2(b)** | Planned  TBD  **- in accordance with Article 7 2(b)** |
| 30R | Instrument Non-Precision Approach | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** |
| 12R | Instrument Non-Precision Approach | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** |
| 30L | Instrument Non-Precision Approach | Not planned  **- in accordance with PANS-OPS\*:**  implementation is impossible due to close vicinity of restricted area LY R8 | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** |
| **LYVR** | 01R | Instrument Non-Precision Approach | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** | Planned  TBD  **- late in accordance with Article 7 2** |
| 19L | Instrument Non-Precision Approach | Not planned  **- in accordance with PANS-OPS\*:**  implementation is impossible due to close vicinity of the state border and terrain | | Planned  TBD  **- in accordance with EASA PBN IR clarification:**  approach to RWY 01R with circling minima to allow landing on opposite runway end (RWY 19L) |

\*ICAO Doc 8168 Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS), Volume II - Construction of Visual and Instrument Flight Procedures

## Implementation of SIDs and STARs

### Requirements

AUR.PBN.2005 (4) or (5):

* RNAV 1 or RNP 1(+) SID and STAR - one per IRE by 25 JAN 2024;
* RNAV 1 or RNP 1(+) for all SID and STARs by 06 JUN 2030.

### Fulfilment

The status of compliance with the requirements of the PBN IR is presented in Table 33.

#### LYBE (TMA Beograd)

All requirements have been fulfilled in accordance with the PBN IR.

As of 26 JAN 23 LYBE complete airport operations are to be transferred to the newly constructed inserted RWY 12R/30L - BCIR (Base Case Inserted Runway) until reconstruction of the existing runway is finished. After that BCIR will be uses as contingency RWY only, while published procedures will be available through the AIP SUP. Implementation of BCIR SID/STARs is planned in accordance with PBN IR.

#### LYNI (TMA Niš)

All requirements have been fulfilled in accordance with the PBN IR.

In order to maintain air traffic safety in environment with high terrain and obstacle features and no radar service provision at LYNI (TMA Niš), SID and STAR routes with higher performance requirements than RNAV 1 navigation specification have been implemented - RNP 1 specification, including additional navigation functionalities regarding operations along a vertical path and between two fixes and with the use of:

1. An ‘AT’ altitude constraint; or
2. An ‘AT OR ABOVE’ altitude constraint; or
3. An ‘AT OR BELOW’ altitude constraint; or
4. A ‘WINDOW’ constraint.

#### LYKV, LYUZ (TMA Kraljevo), LYBT (TMA Batajnica), LYVR (TMA Vršac)

LYKV, LYUZ, LYBT and LYVR become subject aerodromes in accordance with the clarifications on the applicability of the PBN regulation, given at EASA ATM/ANS TeB meeting, held on 7th Dec 2020.

At LYKV all requirements have been fulfilled in accordance with the PBN IR.

At LYUZ, LYBT and LYVR implementation of requested SID and STAR routes (where necessary) is postponed to no later than 25 JAN 2024 (the second planning period).  
RNP 1 specification (including vertical constraints) is planned in order to maintain air traffic safety in environments with no radar service provision.

Exact implementation date will be determined in the following period.

#### Additional notes

Implementation of RF legs currently is not considered on any of the subject aerodromes.

Table 33 Current level of compliance with SIDs/STARs requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **SIDs** | **STARs** |
| **RNAV 1 or RNP 1** | **RNAV 1 or RNP 1** |
| **LYBE** | 12(L) | RNAV 1 to all SIDs Implemented on 30 APR 2015  **- in accordance with AUR.PBN.2005 (4)** | RNAV 1 to all STARs Implemented on 30 APR 2015  **- in accordance with AUR.PBN.2005 (4)** |
| 30(R) | RNAV 1 to all SIDs Implemented on 30 APR 2015  **- in accordance with AUR.PBN.2005 (4)** | RNAV 1 to all STARs Implemented on 30 APR 2015  **- in accordance with AUR.PBN.2005 (4)** |
| **LYBE BCIR** | 12R | RNAV 1 to all SIDs Planned for 26 JAN 2023  **- in accordance with AUR.PBN.2005 (4)** | RNAV 1 to all STARs Planned for 26 JAN 2023  **- in accordance with AUR.PBN.2005 (4)** |
| 30L | RNAV 1 to all SIDs Planned for 26 JAN 2023  **- in accordance with AUR.PBN.2005 (4)** | RNAV 1 to all STARs Planned for 26 JAN 2023  **- in accordance with AUR.PBN.2005 (4)** |
| **LYNI** | 11 | RNP 1 + vertical constraints to all SIDs Implemented on 17 SEP 2015  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features | RNP 1 + vertical constraints to all STARs Implemented on 17 SEP 2015  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features |
| 29 | RNP 1 + vertical constraints to all SIDs Implemented on 17 SEP 2015  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features | RNP 1 + vertical constraints to all STARs Implemented on 11 OCT 2018  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features |
| **LYKV** | 13 | RNP 1 + vertical constraints to all SIDs Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features | RNP 1 + vertical constraints to all STARs Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features |
| 31 | RNP 1 + vertical constraints to all SIDs Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features | RNP 1 + vertical constraints to all STARs Implemented on 20 JUN 2019  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with high terrain features |
| **LYUZ** | 10 | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all STARs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |
| 28 | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all STARs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |
| **LYBT** | 12L | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all STARs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |
| 30R | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all STARs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |
| **LYBT** | 12R | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all STARs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |
| 30L | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all STARs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |
| **LYVR** | 01R | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all STARs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |
| 19L | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision | RNP 1 + vertical constraints to all SIDs Planned - TBD  **- in accordance with AUR.PBN.2005 (5)**:  higher performance are required in order to maintain air traffic safety in environments with no radar service provision |

## Implementation of ATS routes

### Requirements

AUR.PBN.2005 (6):

* RNAV 5 ATS routes at and above FL150 by 03 DEC 2020;
* RNAV 5 ATS routes below FL150 by 25 JAN 2024.

### Fulfilment

All requirements have been fulfilled in accordance with details presented in the table below.

Table 34 Current level of compliance with ATS routes requirements

|  |  |
| --- | --- |
| **Vertical limits** | **ATS routes** |
| **Above FL150** | RNAV 5 spec established from route MNM ALT to FL205 within BEOGRAD FIR/UIR (in the airspace of the Republic of Serbia)  Implemented on 01 FEB 2018 in line with the SECSI FRA initiative  **- in accordance with AUR.PBN.2005 (6)** |
| **Below FL150** |

## Implementation of SID/STAR/ATS routes for rotorcraft operations

### Requirements

AUR.PBN.2005 (7):

* Helicopter RNP 0.3/RNAV 1/RNP 1 SID/STAR - one per IRE by 25 JAN 2024;
* Helicopter RNP 0.3/RNAV 1/RNP 1 for all SID/STAR by 06 JUN 2030;
* Helicopter RNP 0.3/RNAV 1/RNP 1 ATS routes below FL150 by 25 JAN 2024.

### Fulfilment

All requirements may be considered as fulfilled (or not applicable) in terms of the PBN IR because routes and procedures for rotorcraft operations have not been established at the moment and currently there is no demand for their implementation (see the table below).

Table 35 Current level of compliance with rotorcraft operations requirements

|  |  |
| --- | --- |
| **NAV Specification** | **SID / STAR / ATS routes** |
| **RNP 0.3 or**  **RNAV 1 or**  **RNP 1** | Helicopter RNP 0.3/RNAV 1/RNP 1 SID/STARs and RNP 0.3 ATS routes below FL150  Planned - TBD  **- in accordance with AUR.PBN.2005 (7)**:  Initiative for the rotorcraft operations implementation has been launched with the representatives of the helicopter units of the Serbian Armed Forces and Ministry of the Interior. |

## Exclusive use of PBN and establishment of contingency measures

### Requirements

Article 5 and Article 6:

* Exclusive use of PBN by 06 JUN 2030;
* Contingency measures for each phase of Transition Plan.

### Fulfilment

Fulfilment of Article 5 and 6 requirements is planned in accordance with the Section 5 - Transition plan. Up to that moment contingency measures are ensured through the means of procedures/routes multiple redundancy supporting all phases of operations as stated within Section 2.

# IMPLEMENTATION OBJECTIVES

## Achieved level of compliance with PBN IR

The current level of compliance with the requirements of the PBN IR within SMATSA llc AoR is as follows:

* IAPs requirements:
* LYBE, LYNI, LYKV – fully implemented;
* LYUZ, LYBT, LYVR – not implemented;
* SID/STARs requirements:
* LYBE, LYNI, LYKV – fully implemented;
* LYUZ, LYBT, LYVR – not implemented;
* ATS routes – fully implemented;
* SID / STAR / ATS routes for rotorcraft operations – not implemented.

## Planned measures

In order to make full compliance with the PBN IR the following general measures have been defined for future implementation:

* Implementation of missing SID/STAR and IAP PBN procedures and ATS routes;
* Gradual withdrawal of conventional procedures (SIDs/STARs/IAPs);
* Implementation of DME/DME network as a backup infrastructure for TMA (where possible) and en-route PBN operations in case of a reversion from GNSS;
* Implementation of contingency measures, including retention of necessary minimum operational network of conventional NAVAIDs:
* ILS Cat II and III (where available) - Will be retained in order to supplement RNP APCH procedures;
* ILS Cat I (where available) - Will be used only as contingency approach procedure in case of a reversion from GNSS;
* All DMEs (aerodrome, TMA, en-route):
* Should be modernised (if not currently) and retained in order to make DME/DME backup infrastructure to support TMA and en-route PBN operations;
* New DME installations may be expected, if required by the DME/DME coverage analysis;
* Aerodrome VORs:
* Should be modernised (if not currently) and retained as contingency approach procedures at IREs where ILS Cat I is not available;
* Will be retained as contingency NAVAIDs for TMA and en-route operations in case of a reversion from GNSS or PBN unavailability;
* Together with collocated DMEs they form the only backup solution for missed approach phase (even for initial/intermediate phase when no radar service is provided) when GNSS signal is not available;
* Aerodrome VOR/DMEs also support backup COM failure procedures and are used by airlines to define internal engine-out and other emergency procedures;
* TMA and en-route VORs:
* Identified as legacy NAVAIDs and will not be renewed (maintenance is not possible anymore);
* Will be sequentially withdrawn from operational use (GAT) in the sequence determined by their operational need;
* All NDBs and markers - Will be withdrawn from operational use (GAT);
* SIDs/STARs - Minimum one conventional SID/STAR procedure will be retained as contingency procedures in non-radar environments.

# TRANSITION PLAN

Regarding the current level of compliance with the PBN IR requirements and identified future objectives three periods for further implementation steps have been determined:

* Short-term (next 3 years);
* Medium-term (from 4 to 7 years);
* Long-term (beyond 7 years).

Transitional measures are planned to be firstly introduced at LYBE because practically there are no operational limitations existing and multiple navigation redundancy is provided in every phase of flight.

Transitional measures at other aerodromes (LYNI, LYKV, LYUZ, LYBT and LYVR) that all have some specific operational environment with no radar service provided will be introduced in the later stages.

**All transitional measures need to be yet confirmed within consultation process that shall involve all relevant stakeholders.**

shows all general transitional measures with planned implementation timing.

Detailed future operational concept planned after transition period is presented in Section 6.

Table 36 Overview of transitional measures

|  |  |  |  |
| --- | --- | --- | --- |
| **Transition period** | | **Location** | **Operational requirement** |
| Exclusive use of PBN and establishment of contingency measures |
| **Short-term** | 2020 | / | / |
| 2021 | / | / |
| 2022 | TMA Beograd -LYBE | Rationalisation of conventional SIDs/STARs |
| LYBE | Withdrawal of NDB IAPs |
| LYKV | Implementation of RNP APCH procedures down to LPV minimum and rationalisation of conventional SIDs/STARs |
| **Medium-term** | 2023 | TMA Beograd -LYBE BCIR | Implementation of RNP APCH procedures and RNAV 1 SIDs/STARs and conventional procedures |
| TMA Batajnica -LYBT | Implementation of RNP APCH procedures and RNP 1 SIDs/STARs |
| TMA Vršac -LYVR | Implementation of RNP APCH procedures and RNP 1 SIDs/STARs |
| 2024 | LYBE | Withdrawal of VOR IAPs |
| TBD | Implementation of helicopter RNP 0.3/RNAV 1/RNP 1 SID/STARs and RNP 0.3 ATS routes below FL150 |
| LYUZ | Implementation of RNP APCH procedures and RNP 1 SIDs/STARs and conventional procedures |
| 2025 | TMA Beograd - LYBE | Implementation of DME/DME backup infrastructure for RNAV 1 SIDs/STARs |
| 2026 | TMA Niš -  LYNI | Rationalisation of conventional SIDs/STARs |
| TMA Batajnica -LYBT | Rationalisation of conventional SIDs/STARs |
| **Long-term** | 2027 | TMA Beograd - LYBE | Withdrawal of all conventional procedures |
| 2028 | En-route | Implementation of DME/DME backup infrastructure for RNAV 5 ATS routes network |
| TMA Niš -  LYNI | Withdrawal of conventional procedures and introduction of contingency procedures |
| TMA Kraljevo -  LYKV / LYUZ | Withdrawal of conventional procedures and introduction of contingency procedures |
| 2029 | TMA Batajnica -LYBT | Withdrawal of conventional procedures and introduction of contingency procedures |
| TMA Vršac -LYVR | Withdrawal of conventional procedures and introduction of contingency procedures |
| 2030 | / | / |

Detailed PBN implementation roadmap presenting identified transitional measures is given in Appendix 2.

## Short-term plan

### TMA Beograd - LYBE RWY 12L/30R

* Rationalisation of conventional SIDs/STARs by 2022:
* Used by a limited number of aircraft (primary use of RNAV 1 routes);
* Only few routes in addition to radar vectoring will be retained in order to provide services to non-equipped aircraft at this stage;
* Design of these routes should be based on VOR/DME BGD only (if possible), other VORs should be withdrawn from operational use (VAC, VAL, TPL, SMI);
* All NDBs will be withdrawn from operational use for TMA GAT operations, including: JA, KN, PA, IA and OBR.

### LYBE RWY 12L/30R

* Withdrawal of NDB IAPs by 2022:
* Practically not used anymore;
* Multiple redundancy will be maintained (ILS, RNP APCH, VOR);
* NDBs considered for withdrawals are: JA, KN, PA, IA and OBR;

### LYKV RWY 13/31

* Implementation of RNP APCH LPV minimum and rationalisation of conventional SIDs/STARs by 2022:
* APCH redundancy will be maintained (RNP APCH, VOR);
* SIDs/STARs expected to be used by a limited number of aircraft;
* Only selected arrival and departure routes will be retained in order to provide services to non-equipped aircraft at this stage;
* Design of all routes should be based on VOR/DME KRV only (if possible), other VORs should be withdrawn from operational use (VAL, TPL and BLC, if still operational due to inability to maintain them);
* NDBs considered for withdrawals are: AD, BLC, BR and VTN.

## Medium-term plan

### TMA Beograd - LYBE BCIR RWY 12R/30L

* Implementation of RNP APCH procedures and RNAV 1 SIDs/STARs by 2023:
* Implementation of RNP APCH down to all three minima lines;
* Implementation of RNAV 1 SIDs/STARs.
* Implementation of conventional procedures by 2023:
* Implementation of ILS Cat III approach (only for RWY 12R);
* Implementation of VOR approaches;
* Implementation of conventional SIDs/STARs.

### TMA Batajnica - LYBT all RWYs

* Implementation of RNP APCH procedures and RNP 1 SIDs/STARs by 2023:
* Implementation of RNP APCH down to all three minima lines (where possible);
* Implementation of RNP1 SIDs/STARs (where possible).

### TMA Vršac - LYVR RWY 01R/19L

* Implementation of RNP APCH procedures and RNP 1 SIDs/STARs by 2023:
* Implementation of RNP APCH down to all three minima lines (where possible);
* Implementation of RNP1 SIDs/STARs (where possible).

### LYBE all RWYs

* Withdrawal of VOR IAPs by 2024:
* Expected not to be used anymore;
* Multiple redundancy will be maintained (ILS, RNP APCH);
* VOR/DME BGD will be retained as contingency NAVAID for approach operations.

### Various locations:

* Implementation of helicopter RNP 0.3/RNAV 1/RNP 1 SID/STARs and RNP 0.3 ATS routes below FL150 by 2024.

### TMA Kraljevo - LYUZ RWY 10/28

* Implementation of RNP APCH procedures and RNP 1 SIDs/STARs by 2024:
* Implementation of RNP APCH down to all three minima lines;
* Implementation of RNP 1 SIDs/STARs.
* Implementation of conventional procedures by 2024:
* Implementation of NDB approach (only for RWY 28);
* Implementation of conventional SIDs/STARs.

### TMA Beograd - LYBE all RWYs

* Implementation of DME/DME backup infrastructure for SIDs/STARs by 2025:
* Detailed DME/DME coverage analysis shall be undertaken;
* Analysis will show if additional DME installations are necessary to develop adequate backup infrastructure network which will certainly include: BGD, SMI, TPL, VAC, VAL and KRV DME.

### TMA Niš – LYNI RWY 11/29

* Rationalisation of conventional SIDs/STARs by 2026:
* Expected to be used by a limited number of aircraft;
* Only selected arrival and departure routes will be retained in order to provide services to non-equipped aircraft at this stage;
* Modernisation of legacy VOR NIS with new DVOR NII is completed in 2021;
* Design of all routes should be based on VOR/DME NII only (if possible), other VORs should be withdrawn from operational use (TPL and BLC, if still operational due to inability to maintain them);
* All NDBs will be withdrawn from operational use for TMA operations, including: JST, VTN, ZO, TPL and BLC.

### TMA Batajnica - LYBT all RWYs

* Rationalisation of conventional IAP/SIDs/STARs by 2026:
* Expected to be used by a limited number of aircraft;
* Only selected arrival and departure routes will be retained in order to provide services to non-equipped aircraft at this stage;
* Implementation of new Doppler VOR/DME BAA planned;
* Design of all routes should be based on new VOR/DME BAA only (if possible), other VORs should be withdrawn from operational use (BGD, VAL, TPL and BLC, if still operational due to inability to maintain them);
* All NDBs will be withdrawn from operational use for TMA operations, including: BT, EK, IA, JA and PA.

## Long-term plan

### TMA Beograd - LYBE all RWYs

* Withdrawal of conventional procedures by 2027:
* Will cover all SIDs, STARs and IAPs;
* Minimum one approach procedure will be retained as contingency procedures (RWY 12/30 ILS Cat I);
* DME/DME infrastructure and radar vectoring as backup will be provided for TMA operations.

### En-route

* Implementation of DME/DME infrastructure for ATS routes by 2028:
* Detailed DME/DME coverage analysis shall be undertaken;
* Analysis will show if additional DME installations are necessary to develop adequate backup infrastructure network which will certainly include: BGD, NII, SMI, TPL, VAL, BLC, VAC and KRV DME.
* Following aerodrome VORs shall be used as contingency NAVAIDs for en-route operations: BGD, NII, VAC and KRV.

### TMA Niš - LYNI

* Withdrawal of conventional procedures by 2028:
* Will cover SIDs, STARs and IAPs;
* Minimum one SID/STAR/approach procedure will be retained as contingency procedures (SID/STAR based on VOR/DME / RWY 11 – VOR / RWY 29 – ILS Cat I approach).

### TMA Kraljevo - LYKV / LYUZ

* Withdrawal of LYKV conventional procedures by 2028:
* Will cover SIDs, STARs and IAPs;
* Minimum one SID/STAR/approach procedure will be retained as contingency procedures (SID/STAR based on VOR/DME KRV / RWY 13/31 – VOR approach).
* Withdrawal of LYUZ conventional procedures by 2028:
* Will cover SIDs, STARs and IAP;
* Minimum one SID/STAR/approach procedure will be retained as contingency procedures (SID/STAR based on NDB UZ / RWY 28 – NDB approach).

### TMA Batajnica - LYBT all RWYs

* Withdrawal of conventional procedures by 2029:
* Will cover SIDs, STARs and IAPs;
* Minimum one SID/STAR/approach procedure will be retained as contingency procedures (SID/STAR based on VOR/DME / RWY 12L – ILS Cat I approach, 30L and 12R/30L – VOR approach).

### TMA Vršac - LYVR

* Withdrawal of conventional procedures by 2029:
* Will cover SIDs, STARs and IAPs;
* Minimum one SID/STAR/approach procedure will be retained as contingency procedures (SID/STAR based on VOR/DME / RWY 01R/19L – VOR approach).

# FUTURE OPERATIONAL ENVIRONMENT

## Instrument approach procedures

Future approach operations are planned as shown in the table below and will be enabled for use in the following way:

* Primary (RNP APCHs) and supplementing (ILS Cat II or III if available) approach procedures shall be published in AIP and made fully available 24/7 for operations planning;
* Contingency procedures shall also be published in AIP but not for planning purposes and only available by NOTAM or by ATC clearance (on pilot request - if there is no other measure to be used on tactical basis);
* All NAVAIDs (operational and contingency) shall be published with necessary information available within adequate AIP AD sections.

Table 37 Future approach operations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **IAPs** | | | |
| **NAV specification** | **NAV infra-structure** | **Ground facilities to supplement RNP APCH procedures** | **NAV contingency procedures / infrastructure** |
| **LYBE** | **12L** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | **ILS Cat III (LOC)**  based on YUB GP/LOC and DME (GP coloc.)  and VOR/DME BGD for missed approach | **VOR approach**  based on VOR/DME BGD |
| **30R** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | / | **ILS Cat I (LOC)**  based on YBE GP/LOC  and VOR/DME BGD for missed approach |
| **12R** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | **ILS Cat III (LOC)**  based on GPL/LOC YBG and DME BGD  and VOR/DME BGD for missed approach | **VOR approach**  based on VOR/DME BGD |
| **30L** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | / | **VOR approach**  based on VOR/DME BGD |
| **LYNI** | **11** | **RNP APCH**  down to LNAV/VNAV and LNAV minima | **GNSS** | / | **VOR approach**  based on VOR/DME NII |
| **29** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | **/** | **ILS Cat I (LOC)**  based on YNI GP/LOC and DME (GP coloc.)  and VOR/DME NII for missed approach |
| **LYKV** | **13** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | / | **VOR approach**  based on VOR/DME KRV |
| **31** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | **/** | **VOR approach**  based on VOR/DME KRV |
| **LYUZ** | **10** | RNP APCH to RWY 28 with circling minima to allow landing on opposite runway end (RWY 10) | The same as for RWY 28 | / | The same as for RWY 28 |
| **28** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | **/** | **NDB approach**  based on NDB UZ |
| **LYBT** | **12L** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | / | **ILS Cat I (LOC)**  based on BTJ GP/LOC and DME (GP coloc.)  and VOR/DME BAA for missed approach |
| **30R** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | **/** | **VOR approach**  based on VOR/DME BAA |
| **12R** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | / |
| **30L** | **RNP APCH**  down to LNAV/VNAV and LNAV minima | **GNSS** | **/** |
| **LYVR** | **01R** | **RNP APCH**  down to LPV, LNAV/VNAV and LNAV minima | **GNSS** | / | **VOR approach**  based on VOR/DME VAC |
| **19L** | RNP APCH to RWY 01R with circling minima to allow landing on opposite runway end (RWY 19L) | The same as for RWY 01R | / | The same as for RWY 01R |

## SID and STAR routes

Future TMA operations are planned as shown in the table below and will be enabled for use in the following way:

* Primary SIDs and STARs (RNAV 1 / RNP 1) shall be published in AIP and made fully available 24/7 for operations planning;
* Contingency procedures for LYBE **shall not** **be** published in AIP because DME/DME back up infrastructure as well as radar vectoring will be provided; contingency measures will imply only flight to or from VOR/DME BGD;
* Contingency procedures for LYNI, LYKV, LYUZ, LYBT and LYVR **shall be** published in AIP because there is no radar service provided and due to high terrain configuration at some locations; procedures shall not be available for planning purposes and shall be used by ATC clearance only (on pilot request);
* All NAVAIDs (operational and contingency) shall be published with necessary information available within adequate AIP AD sections.

Table 38 Future TMA operations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ICAO Code** | **RWY** | **SIDs/STARs** | | | |
| **NAV specification** | **NAV infrastructure** | **NAV back-up infrastructure** | **NAV contingency infrastructure** |
| **LYBE** | **12L / 30R** | RNAV 1 | GNSS | DME/DME  + Radar as required | VOR/DME BGD |
| **12R / 30L** |
| **LYNI** | **11** | RNP 1 | GNSS | / | VOR/DME NII |
| **29** |
| **LYKV** | **13** | RNP 1 | GNSS | / | VOR/DME KRV |
| **31** |
| **LYUZ** | **10** | RNP 1 | GNSS | / | NDB UZ |
| **28** |
| **LYBT** | **12L / 30R** | RNP 1 | GNSS | / | new VOR/DME BAA |
| **12R / 30L** |
| **LYVR** | **01R** | RNP 1 | GNSS | / | VOR/DME VAC |
| **19L** |

## En-route

Future en-route operations are planned as shown in the table below and will be enabled for use in the following way:

* The most operations will be performed within FRA environment;
* Extension of FRA laterally (through the involvement of additional countries in the SECSI FRA initiative) and vertically (below FL205 to the operationally required level) beyond 2030 should be expected and will subsequently affect ATS route network;
* Radar vectoring and DME/DME as a backup infrastructure will be provided;
* RNAV 5 ATS routes will be maintained in order to support operations in non-radar ATC units and to connect FRA and TMA.
* Contingency procedures/routes **shall not** be published in AIP because DME/DME back up infrastructure as well as radar vectoring will be provided; contingency measures will imply only flight to or from VOR(/DME) infrastructure;
* All contingency NAVAIDs shall be published with necessary information available within adequate AIP GEN or ENR sections.

Table 39 Future en-route operations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **NAV application** | **Limits** | **NAV specification** | **NAV infrastructure** | **NAV back-up infrastructure** | **NAV contingency infrastructure** |
| **FRA\*** | TBD | RNAV 5 | GNSS | DME/DMEs  + Radar as required | Aerodrome VORs |
| **ATS routes** | TBD |

\* Out of the PBN IR scope.

## NAVAID infrastructure

Necessary minimum operational network of conventional navigation aids within future operational environment framework is planned according to the table below.

Table 40 Future NAVAIDs minimum operational network

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Location** | **Procedure** | **Current NAVAIDs network for IFR GAT** | **Future NAVAIDs network for IFR GAT** | | |
| **In ops** | **In ops** | **Contingency** | **Not in ops** |
| **LYBE / TMA Beograd** | IAPs | GP/LOC YBE  DME YUB  GP/LOC YUB  VOR/DME BGD  VOR/DME VAL  NDB IA  NDB JA  NDB KN  NDB OBR  NDB PA  Markers x4 | GP/LOC YUB  GPL/LOC YBG  DME YUB | GP/LOC YBE  VOR/DME BGD | VOR/DME VAL  NDB IA  NDB JA  NDB KN  NDB OBR  NDB PA  Markers x4 |
| SIDs and STARs | VOR/DME BGD  VOR/DME SMI  VOR/DME TPL  VOR/DME VAC  VOR/DME VAL  NDB IA  NDB KN  NDB OBR  NDB PA  NDB TPL  NDB VAL | As DME/DME infrastructure backup:  DME BGD  DME SMI  DME TPL  DME VAC  DME VAL  +  DME KRV  DME NII | VOR/DME BGD | VOR SMI  VOR TPL  VOR VAC  VOR VAL  NDB IA  NDB KN  NDB OBR  NDB PA  NDB TPL  NDB VAL |
| **LYNI / TMA Niš** | IAPs | GP/LOC YNI  DME YNI  VOR/DME NII  NDB ZO | **/** | GP/LOC YNI  DME YNI  VOR/DME NII | NDB ZO |
| SIDs and STARs | VOR/DME NII  NDB JST  NDB ZO | **/** | VOR/DME NII | NDB JST  NDB ZO |
| **LYKV / TMA Kraljevo** | IAPs | VOR/DME KRV  NDB AD  NDB BR  NDB VTN | **/** | VOR/DME KRV | NDB AD  NDB BR  NDB VTN |
| SIDs and STARs | VOR/DME BLC  VOR/DME KRV  VOR/DME TPL  VOR/DME VAL  NDB AD  NDB BLC  NDB BR  NDB LA  NDB VTN  NDB TPL  NDB VAL | **/** | VOR/DME KRV | VOR/DME BLC  VOR/DME TPL  VOR/DME VAL  NDB AD  NDB BLC  NDB BR  NDB LA  NDB VTN  NDB TPL  NDB VAL |
| **LYUZ / TMA Užice\*\*** | IAPs | / (NDB UZ currently available but not in operational use) | / | NDB UZ | / |
| SIDs and STARs | / (NDB UZ currently available but not in operational use) | / | NDB UZ | / |
| **LYBT / TMA Batajnica** | IAPs | GP/LOC BTJ  DME BTJ  DME BGD  NDB BT  NDB EK  NDB IA  NDB JA  NDB: PA  Markers x2 | **/** | GP/LOC: BTJ  DME BTJ  VOR/DME BAA | DME BGD  NDB BT  NDB EK  NDB IA  NDB JA  NDB PA  Markers x2 |
| SIDs and STARs | VOR/DME BGD  VOR/DME SMI  VOR/DME TPL  VOR/DME VAL  NDB IA  NDB PA  NDB POZ  NDB PV  NDB TPL  NDB VAL | **/** | VOR/DME BAA | VOR/DME BGD  VOR/DME SMI  VOR/DME TPL  VOR/DME VAL  NDB IA  NDB PA  NDB POZ  NDB PV  NDB TPL  NDB VAL |
| **LYVR / TMA Vršac** | IAPs | VOR/DME VAC  NDB VRA | **/** | VOR/DME VAC | NDB VRA |
| SIDs and STARs | VOR/DME VAC  NDB VRA | **/** | VOR/DME VAC | NDB VRA |
| **En-route** | ATS routes | Only as backup:  NDB VAL  NDB VTN  VOR/DME BGD  VOR/DME SMI  VOR/DME TPL  VOR/DME VAL  VOR/DME BLC | As DME/DME infrastructure backup:  DME BAA  DME BGD  DME NII  DME SMI  DME TPL  DME VAL  DME VAC  DME KRV  + additional, if required | VOR/DME BAA  VOR/DME BGD  VOR/DME KRV  VOR/DME NII  VOR/DME VAC | VOR SMI  VOR TPL  VOR VAL  VOR/DME BLC  NDB VAL  NDB VTN |
| **Total nb. of NAVAIDs** | | *CURRENT* | *FUTURE* | | *TO BE WITHDRAWN* |
| GP/LOCs: 4  VORs: 9  DMEs: 11  NDBs: 19  Markers: 6  **TOTAL: 49** | GP/LOCs: 2 (3)1  VORs: 0 (4+1 new)  DMEs: 8 (2+1 new)  NDBs: 1  Markers: 0  **TOTAL: 11 (9+2 new)** | | GP/LOCs: 0  VORs: 5  DMEs: 1  NDBs: 19  Markers: 8  **TOTAL: 33** |

1 Contingency NAVAIDs shown in brackets.

\*\* TMA Užice will be merged with TMA Kraljevo on 04 NOV 21 (please see item 2.1.6).

## Surveillance and communication services

Surveillance and communication services in the future operational environment will be provided as shown in the following table:

Table 41 Overview of surveillance and communication services

|  |  |  |
| --- | --- | --- |
| **Airspace** | **SUR** | **COM** |
| ACC Beograd | Fully provided  (minimum horizontal radar separation is 5 NM) | Fully provided |
| TMA Beograd |
| TMA Niš | Not provided  (non-radar environment – procedural ATC services provided)  NOTE: full radar coverage available in some TMAs |
| TMA Kraljevo |
| TMA Batajnica |
| TMA Vršac |

# DEFINITIONS

For the purposes of this document definitions from Article 2 of the PBN IR shall apply.

# ACRONYMS AND ABBREVIATIONS

|  |  |
| --- | --- |
| **AFIS** | Aerodrome Flight Information Service |
| **AIP** | Aeronautical information publication |
| **ALT** | Altitude |
| **ANS** | Air navigation services |
| **ANSP** | Air navigation service provider |
| **AoR** | Area of responsibility |
| **APCH** | Approach |
| **APV** | Approach procedure with vertical guidance |
| **ATC** | Air traffic control |
| **ATCC** | Air traffic control centre |
| **ATM** | Air traffic management |
| **ATS** | Air traffic services |
| **AUR** | Airspace Usage Requirements |
| **B-RNAV** | Basic area navigation |
| **CAT** | Category |
| **DCT** | Direct |
| **DME** | Distance measuring equipment |
| **EC** | European Commission |
| **ECAC** | European common aviation area |
| **EGNOS** | European geostationary navigation overlay service |
| **ESSP** | European satellite service provider |
| **EU** | European Union |
| **EWA** | EGNOS working agreement |
| **FIR** | Flight information region |
| **FL** | Flight level |
| **FRA** | Free route airspace |
| **GNSS** | Global navigation satellite system |
| **GAT** | General air traffic |
| **IAP** | Instrument approach procedure |
| **ICAO** | International civil aviation organization |
| **IFP** | Instrument flight procedure |
| **ILS** | Instrument landing system |
| **IR** | Implementing rule |
| **IRE** | Instrument runway end |
| **LNAV** | Lateral navigation |
| **LOC** | Localizer |
| **LPV** | Localizer performance with vertical guidance |
| **MNM** | Minimum |
| **NAV** | Navigation |
| **NAVAID** | Navigation aid |
| **NDB** | Non-directional beacon |
| **NETOPS** | Network operations team |
| **NPA** | Non-precision approach |
| **PA** | Precision approach |
| **PBN** | Performance based navigation |
| **PCP** | Pilot common project |
| **RF** | Radius to fix |
| **RNAV** | Area navigation |
| **RNP** | Required navigation performance |
| **RS** | Republic of Serbia |
| **RWY** | Runway |
| **SID** | Standard instrument departure |
| **STAR** | Standard instrument arrival |
| **TBD** | To be defined |
| **TMA** | Terminal control area |
| **UIR** | Upper flight information region |
| **VNAV** | Vertical navigation |
| **VOR** | Very high frequency omnidirectional radio range |

# APPENDICES

|  |  |  |
| --- | --- | --- |
| **No.** | **Appendix Title** | **No. of pages** |
| 1 | PBN checklist of implementation | 1 |
| 2 | Detailed PBN implementation roadmap | 1 |

****APPENDIX 1 - PBN Checklist of implementation****

Table 42 PBN Checklist of implementation

|  |  |  |  |
| --- | --- | --- | --- |
| **Regulatory requirement to be shown in Transition Plan** | | **Compliance (Y/N)** | **Comment** |
| A | AUR.PBN.2005 (1) RNP APCH at IRE without PA (or der. 2 or 3) by 03 DEC 2020 | Y | Partially Implemented - see Subsection 3.1 |
| B | AUR.PBN.2005 (6) RNAV 5 at and above FL150 by 03 DEC 2020 | Y | Implemented - see Subsection 3.3 |
| C | AUR.PBN.2005 (1) RNP APCH at IRE having PA (or der. 2 or 3) by 25 JAN 2024 | Y | Partially Implemented - see Subsection 3.1 |
| D | AUR.PBN.2005 (6) RNAV 5 below FL150 by 25 JAN 2024 | Y | Implemented - see Subsection 3.3 |
| E | AUR.PBN.2005 (4) RNAV 1 or RNP 1 (+) SID/STARs one per IRE by 25 JAN 2024 (or der. 5) | Y | Partially Implemented - see Subsection 3.2 |
| F | AUR.PBN.2005 (7) Helicopter RNP 0.3 SID/STAR – one per IRE by 25 JAN 2024 | Y | Not implemented - see Subsection 3.4  (no requirements) |
| G | AUR.PBN.2005 (7) Helicopter RNP 0.3 ATS routes below FL150 by 25 JAN 2024 | Y | Not implemented - see Subsection 3.4 (no requirements) |
| H | AUR.PBN.2005 (4) RNAV 1 or RNP 1 (+) for all SID/STARs by 06 JUN 2030 | Y | Partially Implemented - see Subsection 3.2 |
| I | AUR.PBN.2005 (7) Helicopter RNP 0.3 for all SID/STAR by 06 JUN 2030 | Y | Not implemented - see Subsection 3.4  (no requirements) |
| J | Transition Plan covering compliance criteria A & B | Y | Criteria B already fulfilled, for compliance criteria A - see Section 5 |
| K | Transition Plan covering compliance criteria C, D, E, F & G | Y | Criteria D already fulfilled, for compliance criteria C and E - see Section 5  No requirements for criteria F & G exist |
| L | Transition Plan covering compliance criteria H & I | Y | For compliance criteria H - see Section 5  No requirements for criteria I exist |
| M | Exclusive use of PBN | N | Planned - see Section 5 |
| N1 | Contingency Measures in accordance with Article 6 for each phase of Transition Plan | Y | Implemented for the current phase of the Transition Plan - see Subsection 3.5 |
| N2 | Retention of minimum operational network of conventional navigation aids and related surveillance and communication infrastructure as per Article 6 | Y | Implemented for the current phase of the Transition Plan - see Subsection 3.5; Transition to the minimum operation network of conventional navigation aids (including withdrawal and rationalisation of conventional procedures) in line with criteria M is still to be done in accordance with Transition Plan defined in Section 5 |

****APPENDIX 2 - Detailed PBN implementation roadmap****

TBD

|  |
| --- |
| **END OF THE DOCUMENT** |

1. Please see item 1.1.1 [↑](#footnote-ref-2)
2. Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the single European sky (the service provision Regulation) (OJ L 96, 31.3.2004, p. 10-19) transposed into national legislative of the Republic of Serbia within Pravilnik o uslovima koje moraju da ispunjavaju pružaoci usluga u vazdušnoj plovidbi („Službeni glasnik RS", broj 26/20, 154/20 i 24/11) [↑](#footnote-ref-3)
3. As stated in the latest version of the [AIP Serbia/Montenegro](https://smatsa.rs/en/aip-2/) [↑](#footnote-ref-4)
4. Table is adopted from document - NETOPS23\_Item\_8\_4\_WP\_13\_Sample\_PBN\_Impl\_Plan\_Annex\_final [↑](#footnote-ref-5)
5. Commission Implementing Regulation (EU) 2021/116 of 1 February 2021 on the establishment of the Common Project One supporting the implementation of the European Air Traffic Management Master Plan provided for in Regulation (EC) No 550/2004 of the European Parliament and of the Council, amending Commission Implementing Regulation (EU) No 409/2013 and repealing Commission Implementing Regulation (EU) No 716/2014 [↑](#footnote-ref-6)
6. Commission Implementing Regulation (EU) No 716/2014 of 27 June 2014 on the establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan (OJ L 190, 28.6.2014, p. 19-44) [↑](#footnote-ref-7)