Subject matter and scope

Performance-based navigation distinguishes between RNAV and RNP Specifications, both of which rely on area navigation techniques which allow aircraft to operate on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these. An RNP 1 specification allows an aircraft to fly a specific path between two 3D-defined points in space; to this end, the RNP 1 specification requires a lateral performance accuracy of +/- 1NM 95% of the flight time, on-board performance monitoring, alerting capability and high integrity navigation databases.

Where ANS providers have established SID or STAR and where higher performance requirements than those of RNAV 1 are required in order to maintain air traffic capacity and safety in environments with high traffic density, traffic complexity or terrain features, they shall implement those routes in accordance with the requirements of the RNP 1 specification, including one or more of the following additional navigation functionalities:

(a) operations along a vertical path and between two fixes and with the use of:
   (i) an ‘AT’ altitude constraint;
   (ii) an ‘AT or ABOVE’ altitude constraint;
   (iii) an ‘AT or BELOW’ altitude constraint;
   (iv) a ‘WINDOW’ constraint;
(b) the radius to fix (RF) leg.

Except for the airports listed in section 1.2.1 of the Annex of the PCP Regulation, establishment of RNP1 SID or STAR is not imposed as obligatory requirement by the PBN Regulation (EU) 2018/1048 (business decision on having SID or STAR is up to an individual stakeholder). However, the PBN regulation does prescribe obligatory set of specifications to be complied with, where a stakeholder had decided to establish SID or STAR.

Individual ANSPs, airports and aircraft operators outside of the Applicability Area 1 (may implement this functionality on a voluntary basis. In this case they will need to evaluate the business case for the implementation of RNP 1 procedures according to local circumstances.

NOTE 1: System improvements for controller support tools which may be required are covered by other Implementation Objectives like ATC12.1 (MTCD, conflict resolution support info and MONA), ATC02.9 (STCA) and ATC02.8 (APW).

NOTE FOR MILITARY AUTHORITIES: It is the responsibility of each military authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the military authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to military authorities.

Applicability Area(s) & Timescale(s)

<table>
<thead>
<tr>
<th>Applicability Area</th>
<th>EU member states instrument RWY ends. Mandatory for TMAs listed in section 1.2.1 of the Annex of the PCP Regulation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicability Area 2</td>
<td>Other ECAC states instrument RWY ends, except those already listed in Applicability Area 1.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timescales:</th>
<th>From:</th>
<th>By:</th>
<th>Applicable to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>One SID and STAR per instrument RWY, where established.</td>
<td>01/01/2018</td>
<td>25/01/2024</td>
<td>Applicability Area 1</td>
</tr>
<tr>
<td>All SIDs and STARs per instrument RWY, where established.</td>
<td>07/08/2018</td>
<td>06/06/2030</td>
<td>Applicability Area 1</td>
</tr>
<tr>
<td>Locally determined number of RNP1 SID/STAR, where established.</td>
<td>07/08/2018</td>
<td>06/06/2030</td>
<td>Applicability Area 2</td>
</tr>
</tbody>
</table>

References

European ATM Master Plan

Ol step - [AOM-0603]-Enhanced Terminal Airspace for RNP-based Operations
Enablers - APP ATC 134 CTE-N08 REG-0500
Ol step - [AOM-0605]-Enhanced Terminal Operations with RNP transition to ILS/GLS/LPV
Enablers - A/C-07 BTNAV-STD-06 CTE-N01 REG-0009 REG-HNA-04

Legend: WXYZ-001 Covered by SLoA(s) in this objective WXYZ-002 Covered by SLoA(s) in another objective WXYZ-003 Objective covering the enabler WXYZ-004 Not covered in the Implementation Plan
Applicable legislation

Regulation (EU) No 716/2014 on the establishment of the Pilot Common Project
COMMISSION IMPLEMENTING REGULATION (EU) 2018/1048 of 18 July 2018 laying down airspace usage requirements and operating procedures concerning performance-based navigation

ICAO GANP – ASBUs

| B1-APTA | Optimised Airport Accessibility |

Deployment Programme

| 1.2.3   | RNP 1 Operations in high density TMAs (ground capabilities) |
| 1.2.4   | RNP 1 operations (aircraft capabilities) |

SESAR Solution

| #09 and #51 |

EPAS

| RMT.0639, RMT.0445 |

Operating Environment

| Terminal |

### Stakeholder Lines of Action (SLoAs)

<table>
<thead>
<tr>
<th>SloA ref.</th>
<th>Title</th>
<th>From</th>
<th>By</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAV03.2-REG01</td>
<td>Verify the transition plan for PBN in ANS provision</td>
<td>03/12/2020</td>
<td>06/06/2030</td>
</tr>
<tr>
<td>NAV03.2-ASP01</td>
<td>Develop an airspace concept based on designated RNP 1 SID and STAR with Radius to Fix (RF)</td>
<td>01/01/2018</td>
<td>25/01/2024</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06/06/2030</td>
<td></td>
</tr>
<tr>
<td>NAV03.2-ASP02</td>
<td>Where necessary, provide appropriate navigation infrastructure to support RNP 1 operations including the infrastructure required for GNSS reversion</td>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
<tr>
<td>NAV03.2-ASP03</td>
<td>Train air traffic controllers in RNP1 with Radius to Fix (RF) procedures</td>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
<tr>
<td>NAV03.2-ASP04</td>
<td>Implement at least one RNP1 SID and STAR with radius to Fix (RF) per instrument RWY</td>
<td>01/01/2018</td>
<td>25/01/2024</td>
</tr>
<tr>
<td>NAV03.2-ASP07</td>
<td>Implement all RNP1 SID and STAR with radius to Fix (RF) per instrument RWY</td>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
<tr>
<td>NAV03.2-ASP05</td>
<td>Develop a local safety assessment</td>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
<tr>
<td>NAV03.2-ASP06</td>
<td>Establish the transition plan for PBN in ANS provision</td>
<td>03/12/2020</td>
<td>06/06/2030</td>
</tr>
<tr>
<td>NAV03.2-USE01</td>
<td>Install appropriate RNP 1 with Radius to Fix (RF) equipment</td>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
<tr>
<td>NAV03.2-USE02</td>
<td>Train flight crews in RNP 1 TMA procedures</td>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
</tbody>
</table>

Description of finalised and deleted SLoAs is available on the eATM Portal @ https://www.eatmportal.eu/working/depl/essip_objectives

### Expected Performance Benefits

**Safety:**
Increased situational awareness and indirect benefit to both ATC and pilot through reduction of workload during RNP operations.

**Capacity:**
Increased capacity through efficient and improved systemisation of SID/STARs based on RNP 1, particularly on curved paths using Radius to Fix functionality.

**Operational Efficiency:**
Reduction in fuel burn and potential to reduce track miles through optimised TMA procedures using the Radius to Fix Functionality.

**Cost Efficiency:**
- 

**Environment:**
Emissions and noise nuisance reduced by use of optimal PBN flight procedures and routings for departure, arrival and initial approach in high density TMAs.

**Security:**
-
### Detailed SLoA Descriptions

<table>
<thead>
<tr>
<th>NAV03.2-REG01</th>
<th>Verify the transition plan for PBN in ANS provision</th>
<th>From: 03/12/2020</th>
<th>By: 06/06/2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action by:</strong></td>
<td>National Supervisory Authorities (NSAs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description &amp; purpose:</strong></td>
<td>This SLoA is mandatory only for the States subject to Commission Implementing Regulation (EU) 2018/1048 of 18 July 2018. Verify whether the draft transition plan, or the draft significant update thereof, complies with the requirements of PBN Implementing Regulation and in particular whether it takes account of the views of airspace users where appropriate, including those operating State aircraft. Inform the providers of ATM/ANS of the outcome of that verification without undue delay.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Supporting material(s):**
  
  
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)

**Finalisation criteria:** 1 - The outcome of the verification has been notified to ANSP.

<table>
<thead>
<tr>
<th>NAV03.2-ASP01</th>
<th>Develop an airspace concept based on designated RNP 1 SID and STAR with Radius to Fix (RF)</th>
<th>From: 01/01/2018</th>
<th>By: 25/01/2024 06/06/2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action by:</strong></td>
<td>ANS Providers</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description &amp; purpose:</strong></td>
<td>Develop an airspace concept, including designated RNP 1 SID and STAR procedures with Radius to Fix (RF) with a view to providing operation benefits. The airspace concept is to include non-nominal operations to accommodate reversion from RNP 1 operations. Note: The date 25/01/2024 is mandatory for TMAs listed in section 1.2.1 of the Annex of the PCP Regulation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Supporting material(s):**
  
  
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
  
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  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)

**Finalisation criteria:** 1 - An airspace concept based on RNP 1 arrival and departure procedures with Radius to Fix (RF) has been implemented.

<table>
<thead>
<tr>
<th>NAV03.2-ASP02</th>
<th>Where necessary, provide appropriate navigation infrastructure to support RNP 1 operations including the infrastructure required for GNSS reversion</th>
<th>From: 01/01/2018</th>
<th>By: 06/06/2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action by:</strong></td>
<td>ANS Providers</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description &amp; purpose:</strong></td>
<td>The RNP 1 specification requires the mandatory use of GNSS, specifically GPS. This means that the ANSPs would need to determine whether and to what extent a DME infrastructure is needed to accommodate non-nominal operations in the event of a GNSS outage requiring reversion from RNP 1 operations. Such a determination is made on the basis of several criteria, including fleet equipage with DME/DME, traffic density and complexity. This may result in a requirement to install new DME stations and/or the relocation of existing units. Note: According to ICAO standards the only appropriate basis for RNP1 procedures is GNSS. For reversion a fallback to RNAV1 operations based on DME/DME is a feasible option (see NAV03.1-ASP02). The actual fallback solution has to be chosen under local considerations.</td>
<td></td>
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</tbody>
</table>

**Supporting material(s):**
  
  
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
  
  URL: [http://www.icao.int/publications/Pages/catalogue.aspx](http://www.icao.int/publications/Pages/catalogue.aspx)
### NAV3.2 - RNP 1 in TMA Operations

**Supporting material(s):**
- EUROCONTROL - Distance Measuring Equipment Tracer (DEMETER) Tool - Version 1.0.4 / 01/2012
  - [Url](http://www.eurocontrol.int/publications/demeter-distance-measuring-equipment-tracer)
  - [Url](http://www.eurocontrol.int/sites/default/files/content/documents/navigation/ge0114-p-rnav-infrastructure-assessment-web.pdf)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)

**ATM Master Plan relationship:**
- [CTE-N01]-GPS L1/L5
- [CTE-N08]-DME Ground Infrastructure optimisation

**Finalisation criteria:**
1. Infrastructure has been assessed and modified if required to meet the requirements for RNP1 procedures.

### NAV03.2-ASP03

**Train air traffic controllers in RNP1 with Radius to Fix (RF) procedures**

<table>
<thead>
<tr>
<th>From:</th>
<th>By:</th>
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<tbody>
<tr>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
</tbody>
</table>

**Action by:** ANS Providers

**Description & purpose:** Train ATCOs in RNP1 with radius to Fix (RF) operations and new methods of managing traffic on SID/STARs to ensure safe and expeditious operations. RNP1 with radius to Fix (RF) procedures could reduce the need for radar vectors up to the FAP.

**Supporting material(s):**
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)

**Finalisation criteria:**
1. The necessary training has been given to controllers responsible for the operation of RNP1 with Radius to Fix (RF) terminal procedures.

### NAV03.2-ASP04

**Implement at least one RNP1 SID and STAR with radius to Fix (RF), per instrument RWY**

<table>
<thead>
<tr>
<th>From:</th>
<th>By:</th>
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</thead>
<tbody>
<tr>
<td>01/01/2018</td>
<td>25/01/2024</td>
</tr>
</tbody>
</table>

**Action by:** ANS Providers

**Description & purpose:** Where SID or STAR are established, design, develop and implement at least one RNP 1 arrival and departure procedures with Radius to Fix (RF), based on the airspace concept and the transition plan. Publish the procedures in the State AIP.

**Note 1:** Please note this SLoA is applicable only where higher performance requirements than those of RNAV 1 are required. Otherwise RNAV1 SID/STAR described in objective NAV03.1 are sufficient.

**Note 2:** If you implement RNP1 SID and STAR with vertical paths defined by the constraints, rather than RF, please report it in the LSSIP comment to this SLoA.

**Note 3:** The deadline of 25/01/2024 does not apply to other ECAC (non-EU member) states, in LSSIP context they should not be labelled as being “Late” against this deadline.

**Supporting material(s):**
  - [Url](http://www.eurocontrol.int/sites/default/files/publication/files/handbook-pbn-implement-2013-ed-3a.pdf)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)

**Finalisation criteria:**
1. RNP 1 arrival and departures with radius to Fix (RF) have been published in AIP and implemented.

**Note:** If you implement RNP1 SID and STAR with vertical paths defined by the constraints, rather than RF, please report it in the LSSIP comment to this SLoA.

### NAV03.2-ASP07

**Implement all RNP1 SID and STAR with radius to Fix (RF), per instrument RWY**

<table>
<thead>
<tr>
<th>From:</th>
<th>By:</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/01/2018</td>
<td>06/06/2030</td>
</tr>
</tbody>
</table>

**Action by:** ANS Providers
### NAV3.2 RNP 1 in TMA Operations

**Description & purpose:** Where SID or STAR are established design, develop and implement RNP 1 arrival and departure procedures with Radius to Fix (RF), based on the airspace concept and the transition plan. Publish the procedures in the State AIP.  
**Note 1:** Please note this SLoA is applicable only where higher performance requirements than those of RNAV 1 are required. Otherwise RNAV1 SID/STAR described in objective NAV03.1 are sufficient.  
**Note 2:** If you implement RNP1 SID and STAR with vertical paths defined by the constraints, rather than RF, please report it in the LSSIP comment to this SLoA.

**Supporting material(s):**  
  [Url](http://www.icao.int/publications/Pages/catalogue.aspx)  
  [Url](http://www.icao.int/publications/Pages/catalogue.aspx)

**Finalisation criteria:**  
1. RNP 1 arrival and departures with radius to Fix (RF) have been published in AIP and implemented.  
**Note:** If you implement RNP1 SID and STAR with vertical paths defined by the constraints, rather than RF, please report it in the LSSIP comment to this SLoA.

---

### NAV03.2-ASP05 Develop a local safety assessment

**From:** 01/01/2018  
**By:** 06/06/2030  
**Action by:** ANS Providers  
**Description & purpose:** Develop safety assessment of the changes related to the implementation of RNP 1 procedures. The tasks to be done are as follows:  
- Conduct hazard identification, risk assessment in order to define safety objectives and safety requirements mitigating the risks;  
- Develop safety assessment;  
- Deliver a safety assessment report to the NSA, if new standards are applicable or if the severity class of identified risks is 1 or 2.  
This safety assessment shall be based on fully validated/recognised method.

**Supporting material(s):**  
  [Url](http://www.eurocontrol.int/articles/safety-assessment-methodology-sam)  

**Finalisation criteria:**  
1. The safety assessment report for the changes has been developed and delivered to the NSA as necessary.

---

### NAV03.2-ASP06 Establish the transition plan for PBN in ANS provision

**From:** 03/12/2020  
**By:** 06/06/2030  
**Action by:** ANS Providers  
**Description & purpose:** This SLoA is mandatory only for the States subject to Commission Implementing Regulation (EU) 2018/1048 of 18 July 2018.  
Establish and implement a transition plan for using PBN. The transition plan shall be kept up-to-date. The transition plan shall be 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. Consult all of the following parties on the draft transition plan and the draft of any significant updates thereof and take account of their views where appropriate:  
- aerodrome operators, airspace users and representative organisations of such airspace users affected by the provision of ANS services;  
- the Network Manager;  
- ANS providers in adjacent airspace blocks.  
Submit the results of the consultation, as well as the draft transition plan, or the draft significant update thereof, for approval to the competent authority.
### Supporting material(s):
  - [Url](http://www.eurocontrol.int/sites/default/files/publication/files/handbook-pbn-implement-2013-ed-3a.pdf)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)

### Finalisation criteria:
1. The draft transition plan, or the draft significant update thereof, has been submitted to the competent authority for approval.

### NAV03.2-USE01: Install appropriate RNP 1 with Radius to Fix (RF) equipment

<table>
<thead>
<tr>
<th>Action by:</th>
<th>Airspace Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description &amp; purpose:</td>
<td>Install equipment meeting RNP1 requirements.</td>
</tr>
</tbody>
</table>
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx)
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx) |
| ATM Master Plan relationship: | JA/C-07|Flight management and guidance for RNP transition to ILS/GLS/LPV |
| Finalisation criteria: | 1 - Aircraft have been certified for both RNP 1 and Radius to Fix (RF) operations. |

### NAV03.2-USE02: Train flight crews in RNP 1 TMA procedures

<table>
<thead>
<tr>
<th>Action by:</th>
<th>Airspace Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description &amp; purpose:</td>
<td>Train flight crews in the application of RNP1 TMA procedures.</td>
</tr>
</tbody>
</table>
  - [Url](http://www.icao.int/publications/Pages/catalogue.aspx) |
| Finalisation criteria: | 1 - Training manuals have been updated to include RNP1 TMA procedures.
2 - The aircrew has been trained accordingly.
3 - The aircrew have met the regulatory requirements for RNP1 and RF transition operations. |