European Route Network Improvement Plan/ERNIP Implementation Monitoring

Monitoring Report: AIRAC 1813
6 December 2018 – 2 January 2019
European Route Network Improvement Plan (ERNIP) Implementation Monitoring

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NETWORK MANAGER
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1. INTRODUCTION

1.1 SUMMARY

This Report provides an update on the evolution of the environment indicators listed in the Network Performance Plan and plots on the progress achieved in improving airspace design and utilisation flight efficiency, in line with the improvement proposals implemented in the relevant AIRAC cycle.

This edition focuses on AIRAC 1813 (6 December 2018 – 2 January 2019).

The methodology used for assessing flight efficiency is described in WP/9 of RNDSG/64. This document can be found at: https://extranet.eurocontrol.int/ftp/?t=4df773eea3ffaea31e3d1768150125b3

1.2 ACHIEVING THE EUROPEAN TARGET

The Performance Scheme for air navigation services and network functions includes two important key performance areas and associated indicators, related to the operational performance of the European ATM network for the period 2015 - 2019.

- **Environment**
  - **average horizontal en-route flight efficiency of the actual trajectory**, defined as follows:
    - the indicator is the comparison between the length of the en-route part of the actual trajectory derived from surveillance data and the corresponding portion of the great circle distance, summed over all IFR flights within or traversing the European airspace;
    - “en-route” refers to the distance flown outside a circle of 40 NM around the airports;
    - where a flight departs from or arrives at a place outside the European airspace, only the part inside the European airspace is considered;

  This KPI is applicable at both network and Functional Airspace Block level.

  - **average horizontal en-route flight efficiency of the last filed flight plan trajectory**, defined as follows:
    - the difference between the length of the en-route part of the last filed flight plan trajectory and the corresponding portion of the great circle distance, summed over all IFR flights within or traversing the European airspace;
    - “en-route” refers to the distance flown outside a circle of 40 NM around the airports;
    - where a flight departs from or arrives at a place outside the European airspace, only the part inside the European airspace is considered;

  This KPI is only applicable at network level.

- **Capacity**
  - **minutes of en-route ATFM delay per flight**, calculated for the full year and including all IFR flights within European airspace and all ATFM delay causes, excluding exceptional events.

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1 FPL: Flight Plan data provided by NM systems; SAAM analysis carried out by NM.

DES/RAD: Traffic demand provided by NM systems; airspace environment data, profile calculations and SAAM analysis provided by NM.
For the second performance Reference Period starting on 1st January 2015 and ending on 31st December 2019, the European Union-wide performance targets will be as follows:

- **Environment target:**
  - Actual trajectory (KEA) - an average of 2.6% route extension by 2019, decreasing from 3.17% in 2012 (based on PRB measurements)
  - Last filed flight plan trajectory (KEP) - an average of 4.1% route extension by 2019, decreasing from 5.15% in 2012 (based on PRB measurements)

- **Capacity target:** average en route Air Traffic Flow Management (ATFM) delay of 0.5 minutes per flight for each year of the second Reference Period.

The ERNIP Part 2 - ARN Version 2014 - 2018/19 also responds to the targets included in the Network Performance Plan (NPP) 2015 - 2019 as described below:

- Route extension - airspace design
  - Targets:
    - achieve an improvement of the DES indicator by 0.57 percentage points between the baseline year of 2012 and 2019
- Route extension - last filed flight plan
  - Targets:
    - This is a European-wide indicator in RP2 and the NM target for RP2 is to achieve 4.1% value for KEP indicator by 2019 for the entire NM area, fully consistent with the EU-wide target, i.e. a reduction by 1.05 pp (percentage points) between the baseline year of 2012 and 2019
- Route extension - actual trajectory
  - Targets:
    - The NM target for RP2 is to achieve 2.6% value for KEA indicator by 2019 for the SES area, fully consistent with the EU-wide target

- NM direct contributions to flight efficiency savings
  - The NM objectives is that these FE direct savings will amount to 5% (2015 - 2016) and 7% (2017 - 2019) of the savings required to achieve the annual 0.15 pp reduction (or alternatively 5% of the actual KEP reduction) each year

- Increase the CDR1/2 usage
  - NM objective is to increase the CDR availability (CD-RAI) and CDR usage (CD-RAU) by 5% between the baseline year 2012 and 2019
1.3 AIRSPACE DESIGN DEVELOPMENT AND IMPLEMENTATION MONITORING

The Network Manager coordinates the following activities to achieve the required improvement in flight efficiency:

- Enhancing European en-route airspace design through annual improvements of European ATS route network, high priority being given to:
  - implementation of a coherent package of annual improvements and shorter routes;
  - improving efficiency for the most penalised city pairs;
  - implementation of additional Conditional Routes for main traffic flows;
  - full implementation of Free Route Airspace.

- Improving airspace utilisation and route network availability through:
  - actively supporting and involving aircraft operators and the computer flight plan service providers in flight plan quality improvements;
  - gradually applying route availability restrictions only where and when required;
  - improving the use and availability of civil/military airspace structures.

- Efficient Terminal Manoeuvring Area design and utilisation through:
  - implementing advanced navigation capabilities;
  - implementing Continuous Descent Operations (CDO), improved arrival/departure routes, optimised departure profiles, etc.

- Improving awareness of performance.

1.4 EXTERNAL DOCUMENT RELEASE

The latest AIRAC report is available via the EUROCONTROL Airspace design website under the sub section → ERNIP → ERNIP Implementation Monitoring → Latest monitoring report:

http://www.eurocontrol.int/articles/airspace-design

as well as via the EUROCONTROL Network Operations Monitoring and Reporting website under → European Route Network Improvement Plan - Monitoring Report:

http://www.eurocontrol.int/articles/network-operations-monitoring-and-reporting

The full list of monitoring reports is available on the EUROCONTROL Media & Info Centre website:

http://www.eurocontrol.int/publications?title=&field_term_publication_type_tid=205&year[value][year]

A copy of the AIRAC Report of the European Route Network Improvement Plan is also available via the restricted EUROCONTROL OneSky Online websites for access by other interested members of the RNDSG, ASMSG and NETOPS (see ref sub-sections under main section “LIBRARY”):

https://ost.eurocontrol.int/sites/NETOPS/SitePages/Home.aspx
https://ost.eurocontrol.int/sites/RNDSG/SitePages/Home.aspx
https://ost.eurocontrol.int/sites/ASM-SG/SitePages/Home.aspx
2. LIST OF PROPOSALS IMPLEMENTED AIRAC 1813 (6 DECEMBER 2018)

2.1 SUMMARY OF MAJOR PROJECTS IMPLEMENTED ON 6 DECEMBER 2018

During the AIRAC cycle 18 (eighteen) airspace improvement packages co-ordinated at network level were implemented. Apart from ECAC States AIP en-route publication issues, ATS route network or RAD improvements the list below provides an overview of the major enhancements implemented on 6 December 2018:

- Armenia
  - ARMFRA Free Route Airspace Yerevan ACC - Step 2.
- Bulgaria / Hungary / Romania / Slovakia
  - SEEN FRA Phase 2.
- Germany
  - Munich ACC – OASE, Phase 2.
- Maastricht UAC
  - FRAM2 - Phase 2 (Night and Weekends).
- Morocco
  - Radar approach Marrakech airport.
- Portugal
  - User-Preferred Trajectories Santa Maria FIR - Phase 1.
- UK
  - Swanwick Airspace Improvement Programme (SAIP) - Airspace Deployment 4 (AD4).
- Ukraine
  - FRAU Free Route Airspace Ukraine, Step 1 (Sc 1b) - Phase 1.

A detailed description of all improvement measures implemented 6 December 2018 is attached in Annex A. The list is an extract of the European Route Network Improvement Plan database accessible via:

https://ext.eurocontrol.int/ernip_database/Index.action

A description of the airspace changes and improvements together with an orientation map due for implementation on the relevant AIRAC cycle is provided in the RNDSG Airspace Improvements Synopsis (RAIS) via the restricted EUROCONTROL OneSky Online website for RNDSG.

The latest situation of the European route network structure is available and updated at each AIRAC cycle through the publication of Regional Electronic Charts that can be found here: http://www.eurocontrol.int/articles/eurocontrol-regional-charts
3. EVOLUTION OF PERFORMANCE INDICATORS

3.1 AIRSPACE DESIGN INDICATOR EVOLUTION

The graph below shows the yearly evolution of airspace design flight efficiency (RTE-DES\(^2\)) over the period 2007 - 2018 and its evolution until 2 January 2019. (Note: inclusion of new measurements will be done as soon as all data will become available)

![Airspace Design Indicator Evolution](image)

3.2 FLIGHT PLANNING INDICATOR EVOLUTION

The graph below shows the yearly evolution of the last filed flight plan indicator (RTE-FPL\(^3\)) over the period 2007 - 2018 and its evolution until 2 January 2019. (Note: inclusion of new measurements will be done as soon as all data will become available)

![Airspace Design Indicator Evolution](image)

3.3 ROUTE AVAILABILITY INDICATOR EVOLUTION

The impact of the civil route restrictions included in the Route Availability Document (RAD) is measured through a specific RAD indicator (RTE-RAD\(^4\)). The graph below shows the yearly evolution of the RTE-RAD indicator between January 2012 and 2 January 2019. (Note: inclusion of new measurements will be done as soon as all data will become available)

![Route Availability Indicator Evolution](image)

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2 RTE-DES (Flight Extension due to Route Network Design) This KPI will be calculated by measuring the difference between the shortest route length (from TMA exit and entry points) and the great circle distance. For this KPI the RAD will not be taken into account and all the CDR routes will be considered as open.

3 RTE-FPL (Flight Extension due to Route Network Utilisation - last filled FPL) This KPI will be calculated by measuring the difference between the route from the last filed flight plan for each flight (from TMA exit and entry points) and the great circle distance.

4 RTE-RAD: (Flight Extension due to Route Network Utilisation - RAD active) This KPI will be calculated by measuring the difference between the shortest plannable route length (from TMA exit and entry points) and the great circle distance. For this KPI the RAD will be taken into account and all the CDR routes will be considered as open.
### 3.4 FLIGHT EFFICIENCY EVOLUTION PER AIRAC CYCLE

The graph below shows the evolution per AIRAC cycle of the two main flight efficiency indicators RTE-DES and RTE-FPL over the period 2010 - 2018 and the evolution until 2 January 2019. *(Note: inclusion of new measurements will be done as soon as all data will become available)*

![Route Efficiency KPI per AIRAC cycle](image)

**Figure 4 :** Flight efficiency (DES, FPL) evolution per AIRAC cycle

The graph below shows the evolution per AIRAC cycle of the two main efficiency indicators RTE-DES and RTE-FPL in relation to the RTE-RAD indicator between January 2012 and 2 January 2019. *(Note: inclusion of new measurements will be done as soon as all data will become available)*

![Route Efficiency KPI per AIRAC cycle](image)

**Figure 5 :** Flight efficiency (DES, RAD, FPL) evolution per AIRAC cycle

The difference between the three indicators (DES, FPL, RAD) clearly indicate that additional efforts must be made to further improve the efficiency of airspace utilisation and to ensure that the indicator based on the latest filed flight plan/ FPL and the RAD indicator follow similar to the airspace design indicator/ DES.
3.4.1 EVOLUTION OF RTE-DES AND RTE-FPL INDICATORS

The current data indicates that, the average yearly route extension due to airspace design was reduced between 2009 and 2 January 2019 by 1.12 percentage points (1.16 in AIRAC 1812). The evolution of the airspace design indicator is on the right path and the contributions of the airspace design projects are key for improving flight efficiency.

The current data indicates that, the average yearly route extension based on the last filed flight plan was reduced between 2009 and 2 January 2019 by 0.68 percentage points (0.40 in AIRAC 1812).

The difference between the airspace design indicator and the last filed flight plan indicator was 1.45 percentage points in 2009 and was 1.89 percentage points beginning of January 2019 (2.21 in AIRAC 1812).

The current data indicates that the route extension due to airspace design went down to 2.31% in beginning of January 2019 (2.33% in AIRAC 1812).

The current data show that the route extension based on the last filed flight plan went further down to 4.36% in beginning of January 2019 (4.40% in AIRAC 1812).

3.4.2 EVOLUTION OF RTE-RAD INDICATOR

As shown in Figure 3 above the impact of the RAD decreased by 0.49 percentage points beginning of January 2019 compared with 2012. More actions will be required to further diminish this impact still further and to ensure that the target set in the Network Manager Performance Plan is reached.

3.4.3 BENEFITS AND ASSESSMENT OF RTE-DES AND RTE-FPL EVOLUTIONS

Despite of the airspace enhancements implemented during AIRAC 1813 and the airspace design improvements put in place since AIRAC 1713 the potential route length offered extended compared to AIRAC 1713.

This is - beside of changing traffic patterns – probably a consequence of growing number of medium and long-haul flights thus the average great circle distance having a significant increase. The additional, potential route length extension during AIRAC cycle 1813 amounts to 119 000 NMs flown more compared to the equivalent AIRAC cycle in 2017. This translates into 714 tons of fuel, or 2 380 tons of CO2, or € 595 000.

Based on the last filed flight plan indicator and as a result of the airspace design improvements put in place since AIRAC 1713 in connection with changing traffic patterns and the airline choices made, the actual losses calculated during the AIRAC cycle 1813 amount to 390 000 NMs flown more compared to the equivalent AIRAC cycle in 2017. This translates into 2 340 tons of fuel, or 7 800 tons of CO2, or € 1 950 000.

As a result of Free Route Airspace developments flight efficiency improved but not to the maximum potential as still effected by the various crises situation and airspace closed in adjacent airspace(s). Additionally network performance was strongly impacted by capacity, applied regulations, weather and industrial actions, while airspace design benefits continued to be implemented.

The losses recorded on the last filed flight plan data during AIRAC cycle 1813 compared to the equivalent AIRAC cycle in 2017 are mainly because of different flight planning/ airline choices, traffic composition and/or scenarios applied due to capacity problems in the network as well as special events as follows:

- **Overall crisis situation in Ukraine** that lead a significant number of flights to avoid the entire Ukrainian airspace moving to neighbouring countries (Turkey, Bulgaria, Romania, Poland, Slovakia, etc.); as a result of the Ukrainian crisis adjacent ACCs/ UACs were unloaded by Far Eastern traffic avoiding the Ukraine airspace leading to increased route extensions.
• **Closure of Libyan airspace** for over flights due to the security situation required procedures with impact on flight efficiency for traffic between Europe and Africa re-routed via Egypt and Tunisia (while traffic to/from Tunisia remains suppressed since the terrorist attack on 26 June 2016.)

• **Avoidance of Syrian** due to the security situation with impact on flight efficiency for traffic between Europe and Middle East and Asia re-routed via Iran and Turkey with additional impacts on the flows from the Ukrainian crisis situation.

• **Staffing and capacity issues** in Karlsruhe UAC required regulations, with impact on flight planning route extension.

• **Staffing issues** in Budapest ACC, Langen ACC, Wien ACC and Zurich ACC (due to locally reported issues) required regulations, with impact on flight planning route extension.

• **Capacity issues** in Barcelona ACC required regulations, with impact on flight planning route extension.

• **Capacity issues Maastricht UAC** due to Free Route Airspace implementation, Phase 2 (FRAM 2) and due to Swanwick Airspace Improvement Programme (SAIP) Airspace Deployment 4 (AD4) in London ACC. Both events required precautionary regulations, with impact on the network performance.

• **Upgrade to the CANAC2 ATM system** in Brussels ACC required regulations, with impact on the network performance.

• **French ATC industrial action** on 14 December 2018 required regulations in French ACCs and neighbouring states, with impact on flight planning route extension.

Figure 6 below shows the airspace unavailability and closed areas in December 2018.
Figure 7 and Figure 8 below visualise the impact of the mentioned airspace unavailability (see Figure 6 above) by comparing traffic flows in December 2013 and December 2018.

**Figure 7**: 24h traffic situation Wednesday, 18 December 2013 (flight planned)

**Figure 8**: 24h traffic situation Wednesday, 19 December 2018 (flight planned)
The comparison between the potential (RTE-DES) and actual (RTE-FPL) savings/losses related to the different parameters is depicted in the graphs below (see Figure 9 to Figure 12).

**Figure 9:** Flight Efficiency savings/losses in Thousands of Nautical Miles

**Figure 10:** Flight Efficiency savings/losses in Tons of Fuel
Figure 11 : Flight Efficiency savings/losses in CO2

Figure 12 : Flight Efficiency savings/losses in Thousands of EURO

Note: For additional information on ATFM delay that could impact on network efficiency consult the NM Monthly Network Operations Reports, accessible via: http://www.eurocontrol.int/publications?title=&field_term_publication_type_tid=207&year[value][year]=. 
3.4.4 BENEFITS AND ASSESSMENT OF RTE-RAD EVOLUTIONS

The decrease of the RAD indicator is due to improvements in airspace design and the removal of RAD restrictions. More actions will be required to ensure that the KPI based on the RAD indicator follows trends similar to the airspace design indicator/DES as well as to ensure that the target set in the Network Manager Performance Plan is reached.

3.5 FREE ROUTE AIRSPACE/ FRA EVOLUTION

FRA implementation leads to improved flight efficiency and has an economic impact in terms of fuel savings as well as notable environmental impact on climate in terms of reduced CO2 emissions.

Full Free Route Airspace implementation has taken place in Armenia, Austria, Bosnia & Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Ireland, Italy, L’viv ACC, Malta, Moldova, Portugal, Serbia/ Montenegro, Slovenia, Sofia ACC, The former Yugoslav Republic of Macedonia and all Scandinavian States (Denmark, Finland, Norway, Sweden) & Baltic States (Estonia, Latvia, Lithuania).

Partial implementation during night, week-end or based on permission to flight plan direct/ DCT between a defined set of points has already been provided in a large number of European states (see Figure 13 below).

Figure 13 : Airspace implementation towards Free Route Airspace

Until 6 December 2018 the following Area Control Centres/ ACCs in Europe have already progressed with partially Free Route Airspace Implementation: Athinai ACC, Beograd ACC, Bratislava ACC, Brest ACC, Bremen ACC, Brindisi ACC, Bodo ACC, Bordeaux ACC, Bucuresti ACC, Budapest ACC, Chisinau ACC, Finland ACC, Geneva ACC, Karlsruhe UAC, Kobenhavn ACC, Lisboa ACC, London ACC, Ljubljana ACC, Maastricht UAC, Madrid ACC (SAN and ASI sectors), Makedonia ACC, Malmo ACC, Malta ACC, Marseille ACC, Milano ACC, Minsk ACC, Munich ACC, Nicosia ACC, Norway ACC, Padova ACC, Praha ACC, Prestwick ACC, Reims ACC, Riga ACC, Roma ACC, Shannon ACC, Skopje ACC, Stockholm ACC, Tallinn ACC, Tbilisi ACC, Tirana ACC, Ukraine (individual UTAs), Vilnius ACC, Warsaw ACC, Wien ACC, Zagreb ACC and Zurich ACC (see Figure 13 above).
3.6 ASM PERFORMANCE ASSESSMENT

The FUA indicators are calculated separately for two CDR basic categories: CDR1 and CDR2. Those CDRs, defined as CDR1/2, CDR1/3 or CDR2/3, are measured over time for each category and their individual contribution is added to either CDR1 or CDR2 type reports. The method allows us to align the calculation of the indicators with the way the CDRs’ availability is presented in AUP/UUP Lists A and B respectively.

The values for each AIRAC cycle were aggregated by measuring the indicators on a daily basis. By doing this, we could differentiate between each CDR1/2, CDR1/3 or CDR2/3 routes, categorising CDR1 and CDR2 routes with the appropriate metrics.

We measure airspace utilisation with the Rate of Aircraft Interested (RAI) and Rate of Aircraft using CDRs (RAU). The first indicator shows which flights could potentially use available CDRs; the second one indicates the actual CDR uptake.

3.6.1 CDRs OVERVIEW

Figure 14 below is an ECAC map of published CDRs for the last AIRAC cycle in Q4 2018. It is worth noting the diversity of CDR categories: this is one of the consequences of establishing night routes; they are often CDR1 at night but CDR3 by day.

A similar situation may be observed for CDR1/2: CDR2 by day and CDR1 by night and at weekends.

One element that adds a significant level of complexity to the calculation of ASM performance indicators is the published timesheet or activation schedule of various categories of CDRs. The way this schedule is described in the national AIP varies significantly from State to State, and especially so when referring to the switchover from winter/summer, week/weekend and day/night time.

Regarding the basic definition of CDRs, CDR is mostly made up of several elementary segments, spatially sequenced. There are cases when this definition was modified for various reasons, leading to a change in the number of CDRs counted, although the number of elementary segments remained the same.

Figure 14: ECAC map of published CDR1, CDR2, CDR1/2, CDR1/3 and CDR2/3 for the last AIRAC (1813) of Q4 in 2018 (for visibility only CDRs above FL245 are shown).
To see the impact of the CDRs on the number of flights it is worth to compare the total IFPS traffic with the number of flights that have at least one CDR segment in their flight plan. Figure 15 below displays the values averaged by AIRAC cycle for the year 2018.

Flights interested are the maximum number of flights that could have planned on an available CDR. The graph illustrates the low impact on CDR2s and consequently the negligible impact on the final value concerning the number of aircraft interested (RAI).

Out of 31199 IFPS daily flights in average for 2018 (3.8% increase from 2017) the absolute numbers averaged for an AIRAC cycle in 2018 are:

- 9635 daily interested flights on CDR1s (7% decrease)
- 6544 daily effectively planning at least one CDR1 segment (6% decrease)
- 2978 actually flying on at least one CDR1 segment (26.4% increase)
- 263 daily interested flights on CDR2s (9% increase)
- 199 effectively planning at least one CDR2 segment (9.4% increase)
- 136 actually flying on at least one CDR2 segment (2.3% decrease)
3.6.2 FUA PERFORMANCE INDICATORS

Figure 16 and Figure 17 below show the aggregated values of the three FUA KPIs (RoCA, RAI, RAU) for the year 2018 compared with 2017 for CDR1 and CDR2.

![Graph showing CDR performance](image)

The CDRs’ availability is quantified by the RoCA indicator (rate of CDR availability – as defined by the ASM Handbook) and represents (in percentage terms) the ratio of the total opening of the CDR segment, no matter which category, in a given period.

For CDR1 the RoCA is very high in 2018 (similar as in 2017) with an average value above 97%. RAI in 2018 remains at a constant value with an increase of RAI towards the summer season and reaches a value of 74.5%. RAU shows a constant value of 25% over the entire periods in 2017 and 2018.

The AIRAC variation is shown by Figures 15 and 16, whereas averaged values (% of flights) for 2018 which could have planned (interested flights) on CDR1 and CDR2 are shown in Figures 17 and 19 below.

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5 **RoCA** (Rate of CDR availability) represents the average CDR availability according to the EAUP/EUUP related to a given time period. RoCA (in %) is calculated as the ratio of the total CDR segment opening, whatever category it may be, to the total time of days (D).

**RAI** (Rate of Aircraft Interested) represents the average number of aircraft interested in filing flight plans to take advantage of an available CDR. RAI represents (in %) the ratio of the number of flights planned on an available CDR to the number of potential users of this CDR.

**RAU** (Rate of Actual Use of CDR) represents the average number of aircraft having actually used an available CDR during a given time period. RAU represents (in %) the ratio of the number of flights (AU) having actually used an available CDR to the number of potential users (PU) of this CDR.
The situation for CDR2 in 2018 is following the same pattern as in 2017. RoCA for CDR2 in 2018 points out values from 62% up to 80%. RAI maintains an average of 75% (same as in 2017) and RAU shows a light decrease from 34% in 2017 down to 31% in 2018. However, the overall impact of CDR2 on the performance assessment is marginal considering the low number of CDR2/CDR1 versus the number of CDR1.

The indicators characterising the utilisation of the available CDRs are represented by the Rate of Aircraft Interested (RAI) for flight planning using available CDRs and the Rate of Actual Use of CDR (RAU).

Figure 18 shows the percentage of flights averaged for 2018, which could potentially have made use of CDR1 in their flight plans (interested flights). The percentage of flights interested on CDR2s
is shown in Figure 19. For CDR1, 25.5% of the flights did not make use of a CDR1, so missing an opportunity (26.1% in 2017). The percentage of flights missing planning opportunities on CDR2s in 2018 is slightly lower, with a figure 24.9%, similar as in 2017 (24.7%).

Figures 20 and 21 below represent the percentage of flights averaged for 2018 which actually flew on a CDR. For CDR1 there were 74.9% of flights which did not fly on CDR1 compared with 74% in 2017. The number of flights which did not fly on CDR2 increased in 2018 (68.6%) in comparison to 2017 (60.6%).

Figure 22 and 23 below show the proportion between CDR1 and CDR2 in terms of numbers. CDR1 type represents 83% of all CDRs available for planning. Concerning the actual use of CDRs the share is 95% for the CDR1 and only 5% for CDR2 actually flown.

The data originated from NM data warehouse, the utilization of FIND together with other internally developed tools allowed to get a comprehensive view of the evolution for the major FUA KPIs used for ASM performance reporting. The increased complexity of CDR environment requires additional effort to carry out the adequate assessment.
The analysis shows that the CDR1s offer a much better stability and predictability than CDR2s in terms of airspace management. CDR1s have a positive impact on flight planning and the usage of the available opportunities in terms of airspace management.

There is a gap between the available options offered by CDRs availability and the actual flight planning activity: 74,9% for CDR1 and 68,6% for CDR2 of the interested flights do not use the available CDRs.

In 2018 the Free Route Airspace developments has extended (FRA Germany, SECSI FRA) and covers meanwhile significant areas in ECAC, with further expansion in 2019. As a result the route network including CDRs in these areas has no more relevance.

Therefore the analysis of CDR utilisation vis-à-vis planning and actual usage is strongly influenced by the actual routing opportunities offered through Free Route Airspace together with the direct flight planning options/ DCTs offered. The way forward in a realistic ASM performance measurement is to move from CDR availability and usage to airspace availability directly linked to FUA structures (TSA, TRA) with related availability.

Note: The ASM Performance Assessment for Q1 2018 is included for AIRAC 1804. The ASM Performance Assessment for Q2 and Q3 2018 is included for AIRAC 1810.
ANNEX A: DETAILED LIST OF PROJECTS IMPLEMENTED 6 DECEMBER 2018

The following table presents detailed information about each of the improvement proposals developed within the RNDSG and implemented during the relevant AIRAC cycle. The description of the proposals is based on the information available from different sources (e.g. AOs, ANSPs and EUROCONTROL). The table includes:

- Proposal ID number:
  A reference number to identify each proposal allowing tracing at which RNDSG it was initiated.

- Project Name:
  Dedicated Name and Phase/ Step of the improvement project.

- Description:
  A detailed description of the planned improvement proposal.

- Objective:
  A brief description of the purpose of the enhancement measure.

- Implementation Status:
  The implementation status defined as Proposed, Planned, Confirmed or Implemented.

- Project Group:
  The Functional Airspace Block Group (FAB), Regional Focus Group (RFG), Sub-Group (SG) or any other Project Group(s) involved directly or indirectly by the proposed enhancement measure.

- Project Category:
  The nature of the proposed enhancement measure defined through Project Categories (e.g. Airspace Structure, ATC Sectors, ATS Routes, Free Route Airspace, TMA etc.).

- States and Organisations:
  The States and/or Organisations involved directly or indirectly by the proposed enhancement measure.

- Originator(s):
  The States and/or Organisations who have originated the proposal.

- Comments:
  The conditions and/or pre-requisites which have to be met in order to implement the proposal or any other relevant comment(s).

Note: The list of implemented changes for this AIRAC cycle does not claim to be complete. For the correctness and verification of the relevant aeronautical information consult official State AIP publications. The data from this document should not be used for operational purpose.
<table>
<thead>
<tr>
<th>Proposal ID</th>
<th>Impl. Status</th>
<th>State(s) &amp; Org.</th>
<th>Comments</th>
</tr>
</thead>
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<td>83.030b / 21.003b</td>
<td>Implemented 06 DEC 2018</td>
<td></td>
<td>• ‘Double AIRAC procedure’ for AIRAC AIP AMDT publication required for implementation (ICAO Annex 15 refers).</td>
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<td>Project Group: ARMY</td>
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<td>• ATS Route Network available.</td>
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<td>87.036d</td>
<td>Implemented 06 DEC 2018</td>
<td></td>
<td>Linked with the expansion of MUAC Night FRA to Night and Weekends.</td>
</tr>
<tr>
<td></td>
<td>Project Group: FAB EC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proposal Category: Free Route Airspace</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Originator(s): BEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>89.076</td>
<td>Implemented 06 DEC 2018</td>
<td></td>
<td>• Based on an input by CFSPs (REF WP 7 of RNDSG 88), DFS and skyguide discussed a possible re-designation of ATS routes that are used for DEP LSZH to the north (Y180, Z114, T150, T902, Y161, T726, Z94, UZ94, UZ301, UZ302, Z739, T711, T358, Y162, UZ380, T894, T890 &amp; Z1, Z3, Z4, Z5).</td>
</tr>
<tr>
<td></td>
<td>Project Group: FAB EC</td>
<td></td>
<td>• The proposal would eliminate the double-designations to a large extend.</td>
</tr>
<tr>
<td></td>
<td>Proposal Category: Free Route Airspace</td>
<td></td>
<td>• The modifications would require the adaptation of approx. 5 RAD restrictions.</td>
</tr>
<tr>
<td></td>
<td>Originator(s): CHE DEU</td>
<td></td>
<td>• Before a decision for implementation is made, a clear and positive feedback from all major CFSPs is required (feedback from</td>
</tr>
</tbody>
</table>
## European Route Network Improvement Plan (ERNIP) – Implementation Monitoring
### Monitoring Report

**AIRAC 1813 (6 December 2018 – 2 January 2019)**

<table>
<thead>
<tr>
<th>Proposal ID</th>
<th>Impl. Status</th>
<th>State(s) &amp; Org.</th>
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<tbody>
<tr>
<td>94.062</td>
<td>Implemented 06 DEC 2018</td>
<td>CHE</td>
<td>Connectivity issue temporarily fixed by DCT allowance. Lower and Upper Limits of L856 will be FL075 and FL195, respectively.</td>
</tr>
</tbody>
</table>

### 4. Project Name: ATS Route Improvement

**Description:**
To delete and replace the allowed DCT RAVED - ROMIR with the following adaptation to the ATS route network - the minimum usable level on ATS route L856 segment AKABI - ROMIR is lowered from FL140 to FL80.

**Objective:**
To replace a temporary DCT segment with an ATS Route adaptation.

### 5. Project Name: Munich ACC - OASE Phase 2

**Description:**
To re-design Munich Sector Group East and change the lateral position of In- and Outbound flows for Berlin/ EDDB/DT and Frankfurt/ EDDF as follows:
1. L87 - route extended by one segment;
2. L604 - re-alignment and merge of UL604 with L604 – UL604 will be deleted;
3. T170 - new waypoint RUNEN between VAGAB and GAPLA;
4. T171 (to be confirmed available for ED) - new route for ARR EDDF;
5. Txxx - new designator covering traffic of former T173;
6. T173 - to be deleted;
7. T177 - new alignment;
8. Tyyyy - new designator for traffic inbound EDDB/DT (ex T200);
9. T200 - to be deleted;
10. T201 - re-aligned;
11. T202 - realigned;
12. T212 - route extended by one segment;
13. T213 (to be confirmed available for ED) – new route for ARR EDDB/DT;
14. Yzzz(FRA1) - new route for DEP EDDF;
15. Y235 - to be deleted;
16. Y263 - to be deleted;
17. Zzzz(BER1) - new route for traffic EDDB/DT;
18. Zyyyy(BER2) - new route for traffic DEP EDDB/DT;
19. Zxxxx(BER4) - new route for traffic ARR/DEP EDDB/DT;
20. Z20 - new waypoint LUNIS between BUROK & MAG;
21. Z92 - new waypoint MAXAN between MAG & IRKOX.
European Route Network Improvement Plan (ERNIP) – Implementation Monitoring  
Monitoring Report AIRAC 1813 (6 December 2018 – 2 January 2019)

<table>
<thead>
<tr>
<th>Proposal ID</th>
<th>Impl. Status</th>
<th>State(s) &amp; Org.</th>
<th>Comments</th>
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<tbody>
<tr>
<td>94.046</td>
<td>Implemented 06 DEC 2018</td>
<td>DEU</td>
<td>Preparation of project Langen 2.0 Related proposals: • 87.037a • 87.037b</td>
</tr>
<tr>
<td>94.048</td>
<td>Implemented 06 DEC 2018</td>
<td>DEU</td>
<td>DEU</td>
</tr>
<tr>
<td>94.044</td>
<td>Implemented 06 DEC 2018</td>
<td>DEU</td>
<td>DEU</td>
</tr>
<tr>
<td>94.047</td>
<td>Implemented 06 DEC 2018</td>
<td>DEU</td>
<td>T733 will be deleted. Segments SUL - EMKIL - USETI will be deleted.</td>
</tr>
</tbody>
</table>

Objective: To further improve the airspace structure while reducing the number of crossings in the area concerned between Munich ACC, Bremen ACC, Langen ACC and Karlsruhe UAC.

Proposal ID: 94.046

Project Name: ATS route improvement Langen ACC

Description: To replace T911 segments ROLIS - FFM - UBENO by ROLIS - ETARU (EDDF) - RUDUS - XIDOD.

Objective: To further improve the ATS route network and flight planning options in Langen ACC.

Proposal ID: 94.048

Project Name: Re-designation of ATS routes in Germany

Description: To change waypoints, harmonise route alignments and eliminate existing double designation of ATS routes where possible, affecting Z131, L132, UL132, L986, N858.

Objective: To reduce calculation time and complexity for flight planning software by simplifying ATS route designation in Germany.

Proposal ID: 94.044

Project Name: Re-designation of ATS routes Tirol area

Description: To remove the 'U' prefix, harmonise route alignments and eliminate existing double designation of ATS routes where possible, affecting T106, T101, T102, UL607, L608, UL608, M726, UM726, M736, UM736, M738, UM738, N871, UN871, P66, UP66, L173, UL173, L725, UL725, UL856, N606, UN606, Y106, Y107, Y108.

Objective: To reduce calculation time and complexity for flight planning software by simplifying ATS route designation in Germany.

Proposal ID: 94.047

Project Name: Re-Designation of ATS route for connection to LSZR, EDNY

Description: T733 will be deleted. Segments SUL - EMKIL - USETI will be deleted.
<table>
<thead>
<tr>
<th>Proposal ID:</th>
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<th>Impl. Status:</th>
<th>State(s) &amp; Org.</th>
<th>Comments:</th>
</tr>
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<tbody>
<tr>
<td><strong>Project Name:</strong> 5LNC replacement by Germany</td>
<td>Implemented 06 DEC 2018</td>
<td>DEU</td>
<td>Originator(s): DEU</td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>To replace existing 5LNC LENGI into AMRUP (Y715, UN491).</td>
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<tr>
<td><strong>Objective:</strong></td>
<td>To further simplify the existing RDs within Germany and avoid duplicate use.</td>
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<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
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<th>Impl. Status:</th>
<th>State(s) &amp; Org.</th>
<th>Comments:</th>
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<tbody>
<tr>
<td><strong>Project Name:</strong> 5LNC removal by United Kingdom</td>
<td>Implemented 06 DEC 2018</td>
<td>GBR</td>
<td>Originator(s): EUROCONTROL</td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>To consider possible 5LNC removal from one of the ATS routes of the crossing waypoints published on both ATS routes: a. OKAMA - L/UL602 / UM604; - Removed Entirely b. TOLSA - L602; c. KUBAX - Y70; d. BEKMO - Y70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Objective:</strong></td>
<td>To simplify the ATS route network within London FIR/UEIR and Scottish FIR/UEIR.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- Two of these 5LNCs are crossings of upper unidirectional ATS routes and do not have connections with lower airspace unless allowed via DCT filing. The other two are also part of lower ATS routes.
- Most of the possible undesired, even illogic, turns are not acceptable by the ACCs and unavailable by RAD restrictions.
- Waypoints might continue to stay as crossings but published on only one of the ATS routes which will not allow undesired turns and RAD restrictions will be withdrawn.
- Possible 5LNC removal from one of the ATS routes should also be considered in view of ATC procedures and usage in case of vectoring and resuming navigation to the relevant ATS route or waypoint.
- Currently all crossing points part of UK ATS route network are under consideration by NATS.
- High Seas Coordination (Serial no: EUR/NAT 18/08-HS-HOL-GBR) • Circulation letter ref: EUR/NAT 18-0555.TEC of 09 November 2018 - deadline on 23 November 2018. • Approval letter ref: EUR/NAT 18-
### European Route Network Improvement Plan (ERNIP) – Implementation Monitoring

**Monitoring Report AIRAC 1813 (6 December 2018 – 2 January 2019)**

**Proposal ID:** 93.020a

**Project Name:** Swanwick Airspace Improvement Programme (SAIP) - Airspace Deployment 4 (AD4)

**Description:**

1. To establish westbound parallel RNAV 1 ATS routes from MUAC into UK Airspace to be utilised dependent on destination.
2. To re-align the following eastbound ATS routes to more accurately reflect where aircraft are routinely tactically vectored such that they can be flight planned and fuelled for (changes in bold):
   a. L980 ORTAC - and U designator prefix removed;
   b. M20 re-designated as M40 and routeing RINIS – IDESIS – SABER – TERKO - NILON - UMBUR;
   d. L179 Removal of U and extend below FL245 from LAM to CPT to replace a DCT;
   e. L608 SUMUM - LOGAN - CLN – then replaces M189 CLN – UNGAP (but STOAT removed);
   f. M189 ….CLN – GASBA;
   g. L610 Removal of U;
   h. P49 XAMAN - IDESIS - LAPRA (replaces current M20 between IDESI & LAPRA);
   j. Q295 CPT - BPK - TOTRI - MATCH - BRAIN - PAAVO - SOMVA (realigned route providing short cut to SOMVA);
   l. Q63 KOPUL - CPT (replacement of DCT);
   m. L620 Removal of U and removal of waypoint ARTOV;
   n. P44 BRAIN – DAGGA - CLN - RATLO - PIXAM - SOMVA (replaces portion DAGGA CLN) previously provided by Q295;
   o. M94 extended CLN – TOVGU – ODUKU (facilitate future EGLC CLN SID Truncation);
   q. N866 …DIGSU – GASGU (removes dog legs via BPK and IPRIL);
   r. L602 TOLSA and OKAMA removed;

**Project Category:** Airspace Structure

**Originator(s):**

GBR
NLD
BEL

**State(s) & Org.:**

GBR
NLD

**Comments:**

Airspace Deployment 4 (AD4):
- Introduction of new and revised ATS routes and revised STARs, for westbound traffic through LAC Sector 13 and 14 and LTC East.
- Revised SID and ATS routes for eastbound traffic via LAC Sector 12.
- New COPs to replace GORLO. North to south these are NOGRO, ABNED and GALSO.
- RNAV1 traffic will be split between these COPs depending on destination.
- RNAV5 traffic will not be able to enter UK airspace via these COPs.
- Gatwick CLN SID will be truncated north of DET.
- ATS route structure to exit UK airspace via REDFA, SOMVA and LEDBO will be enhanced to reduce track miles.

**Related proposals:**

- 93.020b
s. Y70 KUBAX and BEKMO removed;
t. N57 HEIDI removed;
u. (U)M185 ....OCK – KOBBI – BPK...
v. Y803 SANDY & DVR removed;
w. UL18 Truncated at MID;
x. P144 extended south to MATCH to replace DCT MATCH – DIGSU.

**Objective:**
To systemise ATS route structure to provide capacity benefits to Clacton/CLN Sector Group and rationalisation of eastbound routes aimed at shortening track mileage and associated fuel uplift.

<table>
<thead>
<tr>
<th>Proposal ID:</th>
<th>71.048c</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Name:</strong></td>
<td>Radar approach Marrakech airport</td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>To introduce radar approach (MSSR mode S and Primary radar approach) for Marrakech (GMMX) Ménara airport.</td>
</tr>
<tr>
<td><strong>Objective:</strong></td>
<td>To further improve airspace organisation around Marrakech (GMMX) Ménara airport.</td>
</tr>
<tr>
<td><strong>Proposal ID:</strong></td>
<td>87.036b</td>
</tr>
<tr>
<td><strong>Project Name:</strong></td>
<td>FRAM2 - Phase 2</td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>To expand to NIGHT and Weekends existing Night Free Route Airspace above FL245 within the Maastricht UAC AoR.</td>
</tr>
<tr>
<td><strong>Objective:</strong></td>
<td>To further improve the Free Route Airspace operations within Maastricht UAC.</td>
</tr>
<tr>
<td><strong>Proposal ID:</strong></td>
<td>93.020b</td>
</tr>
<tr>
<td><strong>Project Name:</strong></td>
<td>ATS Route Improvement Amsterdam FIR</td>
</tr>
</tbody>
</table>
| **Description:** | To implement the following ATS route segments:
  a. M40/UM40 RINIS - LUSOR - NOGRO - IDRID, even;
  b. Q63/UQ63 GALSO - AMRIV - MOMIC - SUNUM, even;
  c. Z344/UZ344 AMRIV - ABNED, even. |
<p>| <strong>Objective:</strong> | To further improve the ATS route structure in Amsterdam FIR. |</p>
<table>
<thead>
<tr>
<th>Proposal ID</th>
<th>Impl. Status</th>
<th>State(s) &amp; Org.</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 84.058a     | Implemented  | PRT            | Related proposals:  
- 64.030  
- 68.002  
- 84.058b |
| Project Name: User-Preferred Trajectories Santa Maria FIR/ Phase 1  
Description: To replace the existing random flight procedures by User-Preferred Trajectories procedures within Santa Maria FIR.  
Objective: To further improve the airspace utilisation and flight planning options within Santa Maria FIR. |
| 90.034      | Implemented  | SVK            | 'Double AIRAC procedure' for AIRAC AIP AMDT publication required for implementation (ICAO Annex 15 refers).  
- NM will support the States in addressing FRA connectivity issues - en-route and terminal.  
- HUN: ATS Route Network removed.  
- ROU: ATS Route Network available.  
- BGR: ATS Route Network available.  
- SVK: ATS Route Network removed. |
| Project Name: SEEN FRA Phase 2  
Description: To implement Night Cross-border FRA between Hungary, Romania, Bulgaria and Slovakia (9500FT/ FL105/ FL175/ FL245 - FL660).  
Objective: To allow more efficient flight planning. |
| 71.040b / 16.026b | Implemented  | UKR            | 'Double AIRAC procedure' for AIRAC AIP AMDT publication required for implementation (ICAO Annex 15 refers).  
- Night FRA Kyiv, Night FRA Dnipro and Night FRA Odesa – 20:00 - 05:00 (21:00 - 04:00) UTC, (may be changed by NOTAM publication in order to meet specific operational requirements).  
- ATS Route Network available. |
| Project Name: FRAU Free Route Airspace Ukraine, Step1 (Sc 1b) - Phase 1  
Description: To implement H24 Free Route Airspace within ACC L’viv from FL275 to FL660.  
Objective: To implement FRA Concept and further improve flight efficiency within Kyiv UIR. |
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ANNEX B: ACRONYMS AND TERMINOLOGY

1. The following ISO-3 coding of States is used in the column States and Organisation:

<table>
<thead>
<tr>
<th>ISO-3</th>
<th>Country</th>
<th>ISO-3</th>
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<tbody>
<tr>
<td>ALB</td>
<td>Albania</td>
<td>IRN</td>
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<td>Bosnia and Herzegovina</td>
<td>LVA</td>
<td>Latvia</td>
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<td>CHE</td>
<td>Switzerland</td>
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<td>Moldova, Republic of</td>
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<td>Ukraine</td>
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MUAC | Maastricht UAC
2. BLUMED FAB, DANUBE FAB and FAB CE proposals referenced in proposal number box are coded with a unique identification number abbreviated as BM or DN or CE, respectively, following by four digits (XXXX) (example BM0001 or DN0001 or CE0001).

3. The content of each proposal is an indication of State’s intention to implement the relevant airspace improvement but don’t represent a copy of any official publication. For the correctness and verification of the relevant aeronautical information consult official State AIP publication. The data from this document should not be used for operational purposes.
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