

Performance Review Body Monitoring Report 2022

Annex III – Safety report

The 2022 monitoring consists of five reports:

1. PRB Monitoring Report 2022
2. Annex I – Member States' factsheets
3. Annex II – Member States' detailed analysis for experts
- 4. Annex III – Safety report**
5. Annex IV – Investments report

October 2023

COPYRIGHT NOTICE AND DISCLAIMER	© European Union, 2023 This report has been prepared for the European Commission by the Performance Review Body of the Single European Sky (PRB). This report is produced by the European Aviation Safety Agency (EASA). Reproduction is authorised provided the source is acknowledged. However, neither the European Commission, nor any person acting on its behalf, may be held responsible for the use which may be made of the information contained in this publication, or for any errors which may appear, despite careful preparation and checking.
------------------------------------	---

TABLE OF CONTENTS

1	ABOUT THE DOCUMENT	2
1.1	<i>Background</i>	2
1.2	<i>Overview of safety KPIs and associated targets for RP3</i>	3
1.3	<i>Safety performance review</i>	5
1.4	<i>Verification Process of Effectiveness of Safety Management</i>	6
1.5	<i>COVID-19</i>	6
2	SAFETY PERFORMANCE ANALYSIS	7
2.1	<i>ANS-Related Accidents and Serious Incidents</i>	7
2.2	<i>Effectiveness of Safety Management for ANSPs</i>	9
2.3	<i>Safety Performance Indicators</i>	11
3	NETWORK MANAGER	19
3.1	<i>Effectiveness of Safety Management – Network Manager</i>	20
3.2	<i>Over-deliveries</i>	20
3.3	<i>Top safety risks in the Network</i>	21
4	SUMMARY OF OBSERVATIONS	22

1 ABOUT THE DOCUMENT

- 1 The PRB Monitoring Report 2022 examines the performance of air navigation services (ANS) in Member States of the Single European Sky (SES). The SES area comprises EU Member States, Norway, and Switzerland (hereafter defined as Member States).
- 2 The PRB Annual Monitoring Report 2022 is complemented by five annexes to the Union-wide report with a detailed analysis of performance at local levels:
 - Annex I – Member States’ factsheets;
 - Annex II – Member States’ detailed analysis for experts;
 - Annex III – Safety Report (this document);
 - Annex IV – Investments; and
 - Annex V – Traffic light system assessment of environmental performance.
- 3 This “Annex III – Safety Report” provides a detailed review of air navigation services’ and network functions’ safety performance in 2022. It uses data submitted by Member States and the Network Manager subject to the provisions of the SES performance scheme in RP3 (as laid down in Article 1 of Commission Implementing Regulation (EU) No 2019/317¹). Therefore, it covers the 27 EU Member States, Norway, and Switzerland.
- 4 This Annex was prepared by the European Union Aviation Safety Agency (EASA) in support to the Performance Review Body (PRB) of the Single European Sky.
- 5 The first section provides an introduction to the safety KPA and a brief reminder of the safety key performance indicators (SKPIs) and associated RP3 targets as well as the safety performance indicators (SPIs). It also describes the process and methods used to collect data from various sources in order to create the review of safety performance in later sections.
- 6 The second chapter presents and analyses in detail the achieved performance in the SKPIs and SPIs during 2022. It also provides a comparison of safety performance against targets where applicable.
- 7 The third chapter provides an assessment of the SKPIs and PIs applicable to the Network Manager’s network functions during 2022.
- 8 The fourth and final chapter provides a summary of the safety performance achieved and observations regarding performance in 2022.

1.1 Background

- 9 The performance and charging scheme was created to improve the European air transport system in four key performance areas: safety, environment, capacity, and cost-efficiency. Commission Regulation (EU) No 691/2010² established the principles of the scheme and the provisions of initial implementation during RP1, which ran from 2012 to 2014. RP1 was considered a transitional period during which safety was monitored without targets.
- 10 Commission Regulation (EU) No 390/2013 introduced additional SKPIs with associated targets that were defined in Commission Implementing Decision 2014/132/EU.
- 11 For RP3 (2020 – 2024) the legal framework was again revised through Commission Regulation (EU) 2019/317. The new performance and charging scheme’s safety KPA was streamlined based on an EASA report who aimed to reduce the safety reporting burden while maintaining effective safety performance monitoring. EASA updated the supporting material for the measurement of the SKPIs.³
- 12 Commission Regulation (EU) 2019/317 promulgated a single SKPI for RP3, namely the Effectiveness of Safety Management (EoS_M), which applies to ANSPs. Because of the pandemic, the Commission revised the RP3 targets in Commission Implementing Decision 2021/891/EU; but the target for EoS_M remained unchanged as defined in Commission Implementing Decision 2019/903/EU.

¹ Commission Implementing Regulation (EU) 2019/317 laying down a performance and charging scheme in the single European sky.

² Commission Regulation laying down a performance scheme for air navigation services and network functions and amending Regulation (EC) No 2096/2005 laying down common requirements for the provision of air navigation services.

³ EASA RP3 Safety Supporting materials (Parts A, B, C): https://webgate.ec.europa.eu/eusingslesky/sites/default/files/rp3_safety_-_supporting_material_part_b_skpi_spi_final.pdf.

1.2 Overview of safety KPIs and associated targets for RP3

- 13 A single SKPI is used to set targets for ANSPs for RP3 by Regulation (EU) 2019/317: The **Effectiveness of Safety Management**. At a service provision level, the EoS_M measures an air navigation service provider's ability to manage an effective Safety Management System (SMS). The EoS_M SKPI was developed based on the CANSO Standard of Excellence measurement tool, which is based on the SMS framework of ICAO. It was adapted to meet the needs of the performance and charging scheme.
- 14 The EoS_M considers five management objectives of a Safety Management System: Safety Policy and Objectives, Safety Risk Management, Safety Assurance, Safety Promotion and Safety Culture and measures the level of maturity for each of these objectives between level A and D (D being the best). The maturity is determined by assessing questionnaires that ANSPs complete and submit to their NSAs for verification.⁴
- 15 The performance and charging scheme introduced five additional safety performance indicators (SPIs) which are for monitoring purposes only i.e. do not have associated targets that ANSPs must achieve. These are as follows:
- SPI1a: **Rate of runway incursions (RIs) with a safety impact at Member State level**. SPI1a captures the total number of RIs with a safety impact that occurred at regulated airports in a Member State divided by the total number of IFR and VFR airport movements. It includes all RIs that have been reported under Commission Regulation (EU) No 376/2014 irrespective of the main contributor of the occurrence i.e. individuals, air operators, aerodromes, or ANSPs. As such, this indicator is aggregated at Member State and Union-wide levels.
 - SPI1b: **Rate of separation minima infringements (SMIs) at Member State level**. SPI1b captures the total number of separation minima infringements with a safety impact that occurred within the airspace of all air traffic service units in a Member State. It is calculated as the total number of SMIs with a safety impact that occurred in a Member State's airspace divided by the total number of controlled IFR flight hours within the respective airspace. It includes all SMIs that were reported under Commission Regulation (EU) No 376/2014 irrespective of the main contributor of the occurrence i.e. airspace users, or ANSPs. As such, this indicator is aggregated at Member State and Union-wide levels.
 - SPI1c: **Rate of runway incursions (RIs) with ATS/CNS contribution at local (airport) level**. SPI1c is calculated as the total number of RIs with a safety impact that have any contribution from air traffic or CNS services at a specific airport divided by the total number of IFR and VFR movements at that airport.⁵ It includes only a subset of RIs that have been reported under Commission Regulation (EU) No 376/2014 i.e. only those RIs which an ANSP was identified as having a direct or indirect contribution in causing. This indicator aims to capture trends in RIs that are under the influence of the ATC provider at the airport concerned and thus is aggregated at the airport level only.
 - SPI1d: **Rate of separation minima infringements (SMIs) with ATS/CNS contribution at ANSP level**. SPI1d is calculated as the total number of SMIs with a safety impact that have any contribution from air traffic or CNS services divided by the total number of controlled IFR flight hours within the air navigation service provider's controlled airspace. It includes only a subset of SMIs that have been reported under Commission Regulation (EU) No 376/2014 i.e. only those SMIs which an ANSP was identified as having a direct or indirect contribution in causing. This indicator captures all SMIs that occurred in the airspace where an ANSP provides its ATC services and thus is aggregated at the ANSP level.

⁴ https://webgate.ec.europa.eu/eusinglesky/sites/default/files/rp3_safety_-_supporting_material_part_c_skpi_spi_final.pdf.

⁵⁵ Occurrences with safety impact should be understood as those occurrences that may represent a risk to aviation. The way to identify these types of occurrences is using the safety risk grade red or amber in the European Risk Classification Scheme (ERCS) matrix when applied to SMIs and RIs, and the ground severity classification A, B, or C after applying the risk analysis tool (RAT) to SMIs and RIs with ATS/CNS contribution.

- SPI2: **Application by the ANSPs of automated safety data recording systems.** SPI2 captures whether or not ANSPs use automated safety data recording tools to improve the gathering of occurrence data (SMI and RIs) and analysis by the organisations' SMS.

17 Table 2 shows the Union-wide targets for the EoSM SKPI as defined in Implementing Decision 2021/891/EU.⁶

16 An overview of all SKPIs and SPIs used in RP3 is presented in Table 1.

SKPI and SPIs	Target level
Effectiveness of Safety Management (EoSM) for ANSPs	Union-wide and local
Rate of runway incursions (RIs) with a safety impact at State level	None
Rate of separation minima infringements (SMIs) at State level	None
Rate runway incursions (RIs) with ATS/CNS contribution at local (airport) level.	None
Rate of separation minima incursions (SMIs) with ATS/CNS contribution occurred under control of an ANSP	None
Application by the ANSPs of automated safety data recording systems where available, which shall include, as a minimum monitoring of SMIs and RIs.	None

Table 1 – A list of the safety KPIs and PIs applicable in RP3.

Effectiveness of Safety Management (EoSM)		2020	2021	2022	2023	2024
ANSP level	Union-wide target for Safety Risk Management Objective					D
	Union-wide target for all other MOs ⁷					C

Table 2 – RP3 target for Effectiveness of Safety Management (EoSM). The target is set for the last year of RP3 only.

⁶ Commission Implementing Decision of 2 June 2021 setting revised Union-wide performance targets for the air traffic management network for the third reference period (2020-2024) and repealing Implementing Decision (EU) 2019/903 (2021/891/EU).

⁷ EoSM contains five management objectives or objectives: safety policy and objectives, safety risk management, safety assurance, safety promotion and safety culture. Safety risk management is targeted separately while the other four management objectives are targeted as a group.

1.3 Safety performance review

- 18 The safety performance review is based on data submitted by Member States. Through their NSAs, ANSPs submit Performance Monitoring Reports (PMRs) to the European Commission (EC) by 1st June of each year. This enables EASA and the PRB to monitor Member States' safety performance against their performance plans and targets. ANSPs are also required to annually complete and submit EoSM questionnaires to their NSA for verification. This is done before NSAs submit their PMRs, and it provides the European Commission with verified EoSM data. NSAs summarised verified EoSM data in their final PMRs.
- 19 These templates, together with the PMRs, were assessed by the PRB, PRU, and EASA resulting in the preparation of this annex.

Data Sources to Populate Performance Indicators

- 20 Two main data sources were used to gather safety data concerning the EoSM SKPI. These two sources are:
- Questionnaires that were completed by ANSPs and the NM concerning their EoSM. EASA did not verify ANSP responses to the questionnaires as this was the responsibility of NSAs who have oversight authority. The NSA verification process relied on cross-referencing evidence that is reported with the results of ANSPs' oversight activities. However, EASA did verify the NM's responses as oversight authority.
 - SPI1a, SPI1b, SPI1c, SPI1d, and SPI2 were computed using information gathered from the submitted PMRs. This data was taken directly from what Member States reported in their PMRs without further verification against the occurrences reported in the European Central Repository (ECR), as foreseen by the RP3 safety supporting material.
- 21 For the calculation of the indicators related to SMI and RI (SPI1a, SPI1b, SPI1c, and SPI1d), RP3 safety supporting material requires that occurrences data reported in the ECR under Commission Regulation (EU) No 376/2014 is used. ANSPs and NSAs should ensure that the information provided through the ECR reporting contains the

information needed to compute the performance indicators for monitoring SMIs and RIs. EASA would extract the information needed to calculate the SPIs which are then sent to Member States for verification and elaboration in their PMRs.

- 22 However, so far in RP3 EASA has not been able to extract data from the ECR containing all needed information to compute the SPIs. A significant part of occurrences extracted from ECR did not contain information on severity and risk, as required to compute the SPIs. Member States had to extract the occurrences from their own national databases with no further involvement from EASA.
- 23 For the calculation of the indicators related to SMI and RI (SPI1a, SPI1b, SPI1c, and SPI1d), the occurrences that should be used in the computation of the different rates are only those that have a "safety impact". Whether an occurrence has a safety impact or not should be determined by NSAs using the common European Risk Classification Scheme (ERCS), and by ANSPs using the severity classification using the Risk Analysis Tool (RAT).⁸ This information was barely found encoded in the ECR's occurrences.
- 24 Nevertheless, the delegated act that regulates the application of ERCS entered into force as from 1st January 2023, so the application of it was voluntary during 2022. ANSP's use of the RAT was close to 100% at the end of RP2, but its use is not mandated in RP3. Because EASA has not been able to verify the data submitted, this report relies on the correct application of the ERCS and RAT by NSAs and ANSPs.
- 25 It is likely that some have not applied the ERCS and RAT resulting in greater subjectivity in ANSP and NSA interpretations of what constitutes an occurrence that had a safety impact. Nevertheless, this does not invalidate the analysis, but it should be taken into consideration when interpreting the data. At least one Member State (Sweden) declared that it was not able to identify occurrences that had a safety effect. In the last year of RP3, Member States should ensure that both, the RAT severity and the ERCS risk score are encoded for each occurrence to allow EASA to compute independently the SPIs. Otherwise, they will have to

⁸ See EASA RP3 Safety supporting materials Part B (https://webgate.ec.europa.eu/eusinglesky/sites/default/files/rp3_safety_-_supporting_material_part_b_skpi_spi_final.pdf).

extract and submit the occurrences used in the computation of the SPIs themselves.

Exposure Data

26 The indicators for monitoring the SPIs related to occurrences are normalised using the following exposure data:

- RIs are normalised by the number of IFR and VFR movements at an airport. It is calculated as the sum of take-offs and landings performed under IFR and VFR rules at an airport. NSAs included these figures in their PMRs.
- SMIs are normalised by the number of controlled flight hours in the controlled airspace of an ANSP. It is measured as hours of flight under IFR rules that are under the separation control of ANSPs. The Network Manager is best placed to consistently report this for European ANSPs. Since some ANSPs provide cross-border services, the measure of flight hours is based on two different measurements depending on the indicator. The indicator in paragraph (b) of Section 1 of Commission Implementing Regulation (EU) No 2019/317 is calculated using flight hours within the Member States' boundaries, while the indicator in paragraph (d) of Section 1 of the same regulation is calculated using flight hours controlled by a given ANSP.

1.4 Verification Process of Effectiveness of Safety Management

27 The EoSM indicator is measured by the verified responses to questionnaires completed by ANSPs,

which results in a double metric: a numerical score and a maturity level.⁹ Each of the 28 questions is scored between 1 and 4 based on the achieved maturity level (A with 1 and D with 4). The sum of the scoring of each question is normalised to be between 1 and 100 (100 being the best). Table 3 provides a brief description of the requirements to reach each maturity level. ANSPs select the maturity level that best describes their organisation and provide evidence in support of the level selected.

28 NSAs verify the evidence submitted and cross-check it with the results of their oversight processes. If necessary, the level of maturity and score is corrected. The resulting maturity levels and score are submitted in the PMRs. The scoring and levels should be determined in accordance with the supporting material published in the ESSKY web portal (EASA RP3 safety supporting materials Parts A¹⁰, B¹¹, C¹²).

1.5 COVID-19

29 In 2022 aviation experienced a significant recovery from the COVID-19 pandemic. Travel restrictions were progressively removed and air travel demand initiated a steady recuperation. A total of 8.3 million IFR movements were managed within the Single European Sky airspace which represents 83% of the levels of 2019.

Level A - Informal Arrangements	Level B - Defined	Level C - Managed	Level D - Assured
SMS processes and/or requirements have not been agreed at the organisation level; they are either not routinely undertaken or depend on the individual assigned to the task.	SMS processes and/or requirements are defined but not yet fully implemented, documented or consistently applied.	SMS processes and/or requirements are fully documented and consistently applied.	Evidence is available to provide confidence that SMS processes and/or requirements are being applied appropriately and are delivering positive, measurable results.

Table 3 - Generic principles for each implementation level.

⁹ The content of these questionnaires is provided in Appendix 1 to AMC2 SKPI and Appendix 1 to AMC3 SKPI of ED Decision 2014/035/R.

¹⁰ https://webgate.ec.europa.eu/eusinglesky/sites/default/files/rp3_safety_-_supporting_material_part_a_skpi_spi_final.pdf.

¹¹ https://webgate.ec.europa.eu/eusinglesky/sites/default/files/rp3_safety_-_supporting_material_part_b_skpi_spi_final.pdf.

¹² https://webgate.ec.europa.eu/eusinglesky/sites/default/files/rp3_safety_-_supporting_material_part_c_skpi_spi_final.pdf.

2 SAFETY PERFORMANCE ANALYSIS

- Rate of accidents and serious incidents remained at similar level as in 2021.
- 16 ANSPs out of 36 achieved the EoS targets on all management objectives for RP3 in 2022. The remaining 20 ANSPs are expected to meet them by the end of RP3.
- Ten ANSPs reported using some form of automated safety data recording systems for SMIs, with four of them using them for RI too.

2.1 ANS-Related Accidents and Serious Incidents

- 30 This section presents a review of ANS-related accidents and serious incidents, as defined by ICAO Annex 13, covering the ten years period from 2013 to 2022. The scope of the review includes commercial air transport (CAT) fixed-wing aeroplanes above 2,250 kg maximum take-off mass and covers the 27 EU Member States, Norway, and Switzerland. The data uses information from EASA's Occurrence Database.¹³
- 31 This analysis is not required by the Commission Implementing Regulation (EU) No 2019/317, but it brings added value to the performance review of safety as it provides an overview of the ANS related accidents and serious incidents at Union-wide level.¹⁴
- 32 Figure 1 (next page) shows the number of accidents and serious incidents with a contribution by ANS per year alongside a rate of accidents and serious incidents calculated using the number of flight hours performed within the EU. 'ANS contribution' means that at least one ANS factor was in the causal chain of events leading to the occurrence, or at least one ANS factor potentially increased the level of risk, or it played a role in the occurrence encountered by the aircraft.
- 33 The rate of accidents and incidents with ANS contribution is an appropriate metric to directly measure the performance of the ANSs safety system, and it shows a remarkable safety record. In the ten-year period analysed, all accidents reported were non-fatal, with the last one recorded in 2018. The data shows a decreasing trend in the
- rate of accidents and serious incidents in this period with a plateau reached in the last six years.
- 34 Six serious incidents were registered in 2022 related to several causes, but all around airports: aircraft landed on a wrong RWY, aircraft landed on an occupied RWY, two unsafe clearances that resulted in runway incursions, an ATC action that resulted in an unestablished approach and a runway excursion.
- 35 This suggests that, overall, safety issues with ANS contribution have improved since the introduction of the performance and charging regulation, even though there is no evidence of a causal effect. This observation should thus be taken cautiously due to the low number of events considered.

¹³ The EASA's occurrence database collects accidents and serious incidents reported to EASA by Accident Investigation Authorities worldwide and is augmented by other information collected by EASA. It captures the following: accidents & serious incidents within EASA Member States (all mass categories); accidents to aircraft with MTOM > 2250kg (worldwide); serious incidents to aircraft with MTOM > 5700kg (worldwide).

¹⁴ Note that the final investigation reports for some accidents and incidents may be delayed more than two years, particularly when the investigation is complex. This may have an impact on the update of some graphics in future publications, or with respect some graphics of past publications.

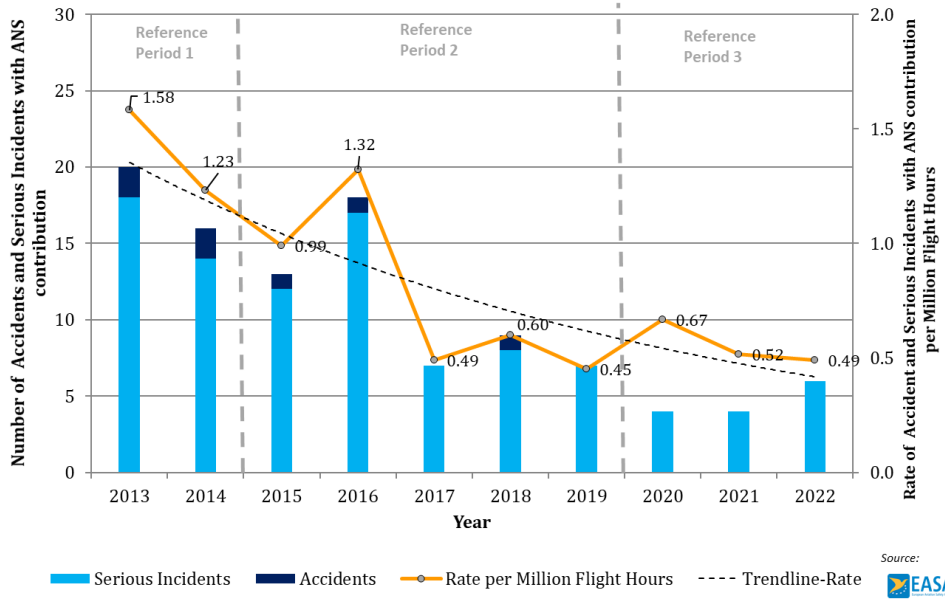


Figure 1 – ANS contribution accidents and serious incidents (2013-2022).

2.2 Effectiveness of Safety Management for ANSPs

- 36 This section reviews the safety performance as measured by the EoSM SKPI for ANSPs.
- 37 In RP3 the EoSM for ANSPs is measured using a revised set of questions to determine the minimum level of maturity for each management objective compared to RP2. Furthermore, the levels of maturity were rescaled for RP3. Level D in RP3 required a higher level of rigour and increased responsibilities than in RP2 under the change management process as contained in Regulation (EU) 2017/373.
- 38 36 ANSPs are included in the scope of the performance scheme in RP3 including MUAC over the airspace of Belgium, Luxembourg, Netherlands, and Germany. In addition to the main en-route ANSPs, there are six ANS providers at terminal or approach airports included, namely SKYWAY (former Ferronats) in Spain, Port Lotniczy Bydgoszcz and Warmia i Mazury Ltd in Poland, and ACR, ARV - Arvidsjaur and SDATS in Sweden.
- 39 Figure 2 shows the EoSM results achieved by ANSPs in 2022. The analysis shows that:

- 18 out of 36 ANSPs achieved the 2024 RP3 target level D for safety risk management.

- 27 out of 36 ANSPs achieved the 2024 RP3 target level C for all other MOs (the four management objectives other than safety risk management).
- 16 out of 36 ANSPs achieved the 2024 EoSM targets for RP3 in full.
- 40 The average EoSM score achieved by all ANSPs is 89. The minimum score achieved by an individual ANSPs is 69, while the maximum EoSM score is 100, which is already achieved by seven ANSPs.
- 41 18 ANSPs reported achieving level 'D' for the safety risk management objective, however EASA standardisation visits showed that several ANSPs had difficulties in properly implementing the new change management process in Commission Regulation (EU) 2017/373, which also embeds a risk assessment process.

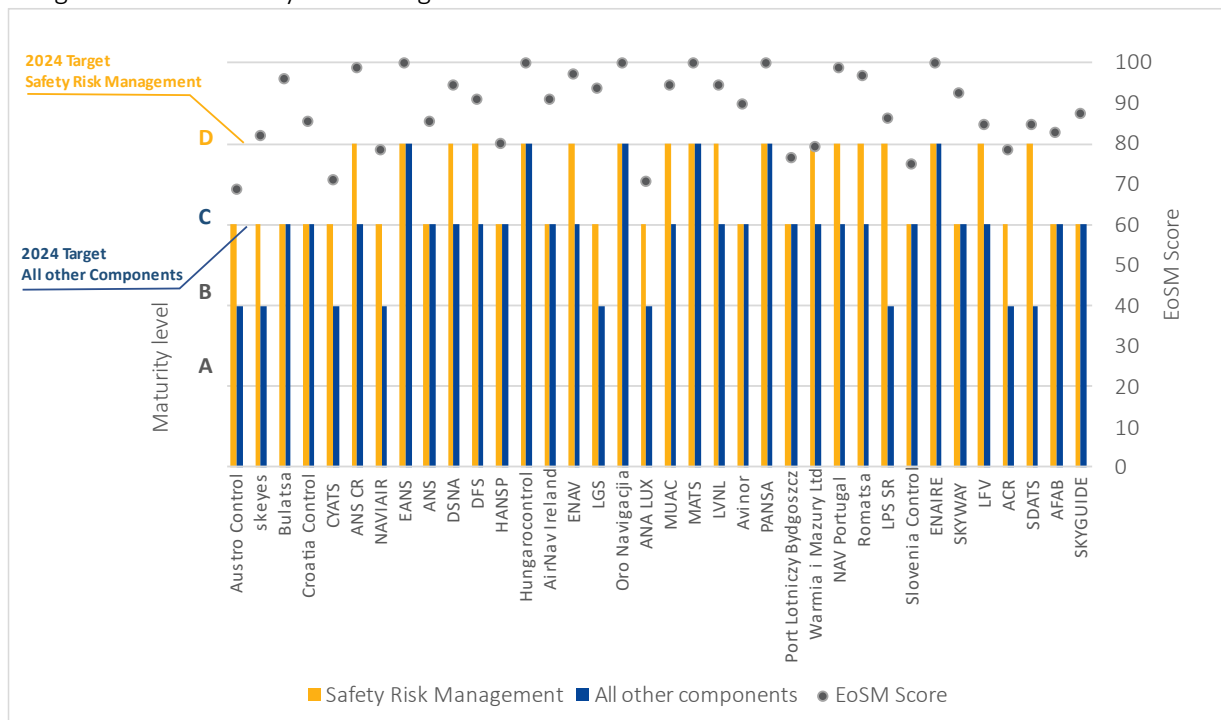


Figure 2 – 2022 ANSP EoSM responses for risk management and other MOs. Safety risk management has a target of level D in 2024 and the other management objectives (MOs) have a target level C in 2024.

42 Figure 3 shows ANSPs' aggregated responses to the EoSM questionnaire per management objective. It reveals that safety risk management must improve the most to achieve the 2024 target level D (improvement in 39 questions needed). For the other management objectives, safety policy & objectives is in need of most improvement to achieve the 2024 target level C (improvement in ten questions needed).

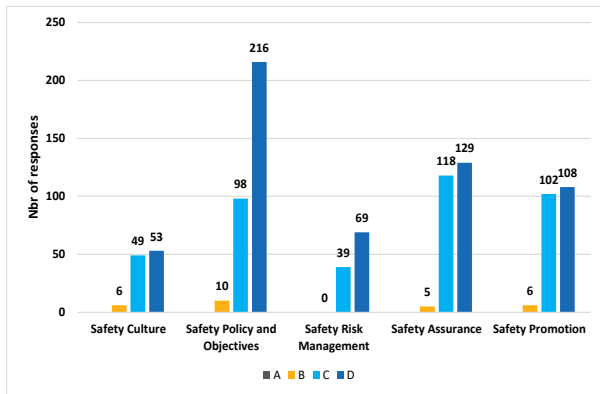


Figure 3 – ANSP's aggregated EoSM responses per management objective. The target response for risk management is level D while it is level C for the other management objectives.

43 Figure 4 shows the maturity levels achieved by the ANSPs in each management objective. 18 ANSPs did not reach the target level D for the safety risk management objective, five ANSPs did not reach the safety culture management objective, while four ANSPs did not reach the safety policy & objectives, assurance promotion management objectives, respectively.

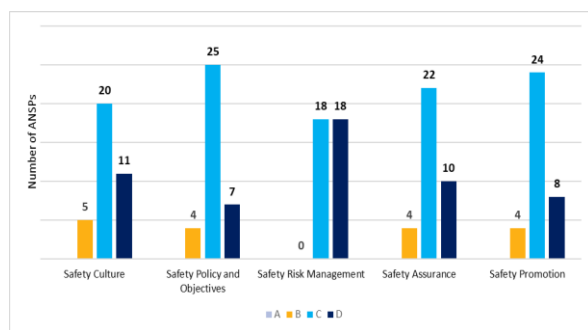


Figure 4 - Number of ANSPs achieving various EoSM levels per objective. The target response for risk management is level D while it is level C for the other management objectives.

44 The EoSM questionnaire was supplemented with a new management objective in RP3 that aimed to capture how ANSPs manage interdependencies and trade-offs between safety and other business objectives i.e. how the organisation assigns and distributes resources to ensure safe provision of

ATS. This objective is not targeted in RP3 and not included in the EoSM scoring.

45 Figure 5 shows that most of ANSPs are at maturity levels C and D for this supplemental management objective. There is room for improvement since two ANSPs are at level B. This is particularly important after the pandemic when the pressures to trade-off resources towards other business objectives of the organisation are intensified due to loss of traffic and revenues in such period.

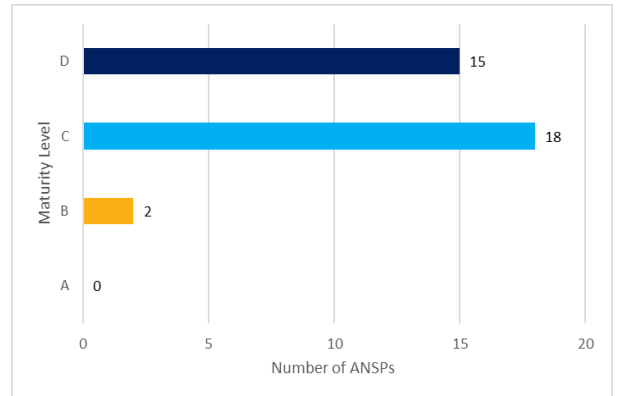


Figure 5 – Number of ANSPs per achieved maturity level in the management of interdependencies management objective.

46 Figure 6 depicts the number of ANSPs that have achieved maturity levels on or above the targets compared with the planned maturity levels in the Performance Plans. For the safety risk management objective, the achieved levels were better than ANSPs planned. 11 ANSPs planned to achieve the safety risk management target in 2022, but 18 ANSPs ended up achieving the targets. The reason is difficult to explain, but the ANSPs may have been conservative in their plans or the NSA may have applied less rigor in verifying ANSPs responses.

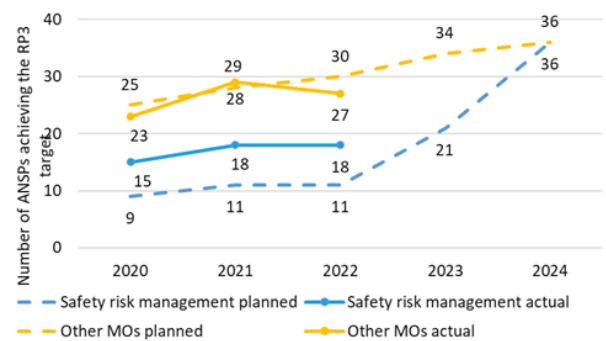


Figure 6 – Planned and actual performance on EoSM - Number of ANSPs on or above targets.

47 During the remainder of RP3, the cumulative standardisation data will show which Member States are performing a less rigorous verification of ANSP responses. Maturity levels will be cross-checked against EASA standardisation data to ensure verification of ANSPs’ responses is completed properly.

2.3 Safety Performance Indicators

48 This section describes the 2022 safety performance as measured by the safety performance indicators (SPIs) as defined in section 1.2.

Rates of separation minima infringement and runway incursion occurrences

49 As described in section 1.2, four SPIs are used to capture the rates of separation minima infringements and runway incursions per number of flight hours controlled by ACCs and airport movements respectively at regulated airports. The most informative information that can be derived from these SPIs is the evolution of the metrics across several years. However, only three years of RP3 are available, and a like for like comparison with respect to previous years is not ideal since the occurrences captured by the SPIs in RP2 were different in scope. In RP2, the number of occurrences monitored included all types of occurrences regardless of the level of associated risk and severity. In RP3, only SMIs and RIs with a safety impact are monitored. In addition, two of the SPIs aim to capture occurrences that have an ATS/CNS contribution and the airports included in the Performance Plans are also different.

50 Furthermore, benchmarking of rates between ANSPs and Member States is not advisable since there are additional factors that may influence the results that are unrelated to ANSPs; i.e. differences in the reporting culture, differences in interpretation of occurrence definitions, use of different

51 tools, or interpretation of results. The identification of occurrences that have ATM/CNS contribution is not a straightforward exercise and is subject to interpretations and subjective judgement that can differ from one ANSP and NSA to another. The limitations described in section 1.3 must be taken into consideration.

Union-level view

52 Table 3 lists the average number of SMIs per 100,000 controlled flight hours in Union-wide airspace and also the average Union-wide number of RIs per 100,000 airport movements. The absolute numbers of each type of occurrences are also provided.

Occurrence	Union-wide Rate ¹⁵	Number of Occurrences
SPI1b: SMI	8.95	1124
SPI1a: RI	4.2	487

Table 3 – Union-wide rates of all SMIs and RIs (with safety impact) in 2022.

53 Figure 7 (next page) provides an overview of the SMI with safety effect, both in absolute numbers and rates per 100,000 controlled hours in the SES airspace. It includes the indicator that considers the SMI with ANS contribution too (SPI1d). In addition, the figure shows the trend in 2022 compared with 2021 values.

54 The increase in traffic levels in 2022 has naturally resulted in an increase of SMI occurrences of all types, namely regardless the factors involved, including those with ANS contribution, by 62.4% and 55.7%, respectively. However, the rates have experienced a small decrease of 0.9% and 2.5%, respectively.

55 Figure 8 (next page) provides an overview of the RI with safety impact, both in absolute numbers and rates per 100,000 movements at the airports included in the Member States’ Performance Plans. It includes the indicator that considers RIs with ANS contribution too (SPI1c). In addition, the figure shows the trend in 2022 compared with 2021 values.

56 The increase in traffic levels in 2022 has not resulted in an increase of the indicators of all types of RIs. The rate of RIs of all types decreased by 31.1% while the rate of RIs with ANS contribution increased by 5.8%. Similarly, while the number of RIs decreased (by 14.4%), the number of RIs with ANS contribution increased by 43.8%. It seems that at Member State level, the management of risks associated to RIs of all types showed improvement. Such trend is not observed in the

¹⁵ Number of occurrences of certain type per 100.000 exposure unit, i.e. airport movement in the case of RIs rates or IFR controlled hours in case of SMIs rates.

indicators of RIs with ANS contribution. This should be deeper investigated by ANSPs.

With regard SPI1c and SPI1d (the rates of occurrences, i.e. RIs and SMIs, that only consider occurrences with ANS/CNS contribution), the rates experienced opposite trends. While the rate of SMIs decreased by 2.5%, the rate of RI increased by 5.8%. The values for SMIs and RIs rates were 6.65

and 1.28, respectively. The proportion of occurrences with ANS contribution over the occurrences of all types are higher in the SMI case than in the case of RI, suggesting that ANSPs have greater influence and managerial control of ensuring separation between aircraft in the airspace than in preventing the incursionary presence of an aircraft, vehicle, or person on the runway of an airport.

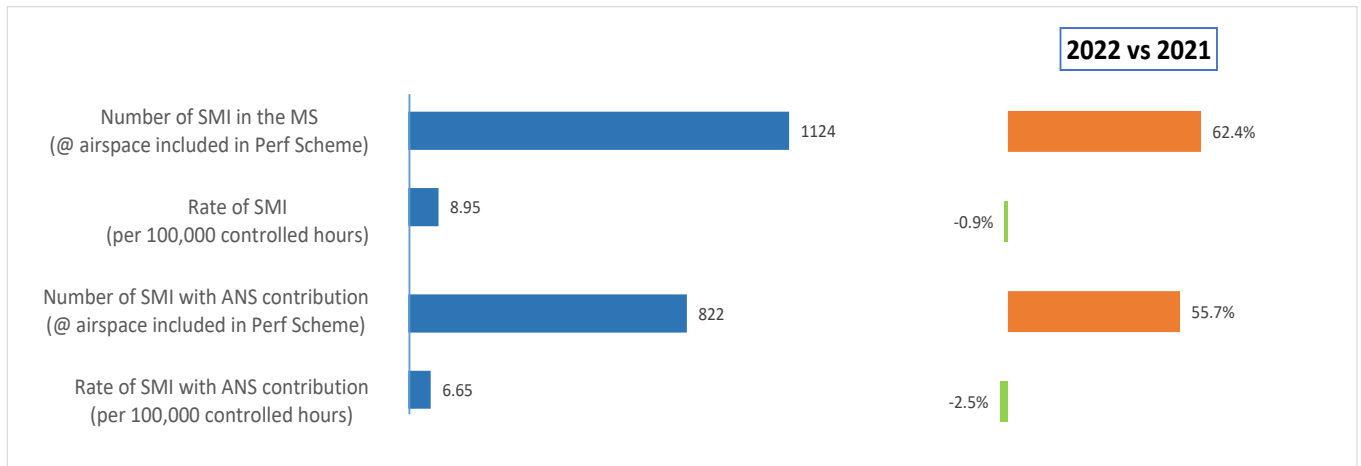


Figure 7 – Number and rates of SMIs with safety impact in the airspace where the Performance Scheme applies aggregated at Union-level in 2022 and their trend when compared with 2021 values. Rates are calculated by 100,000 controlled hours.

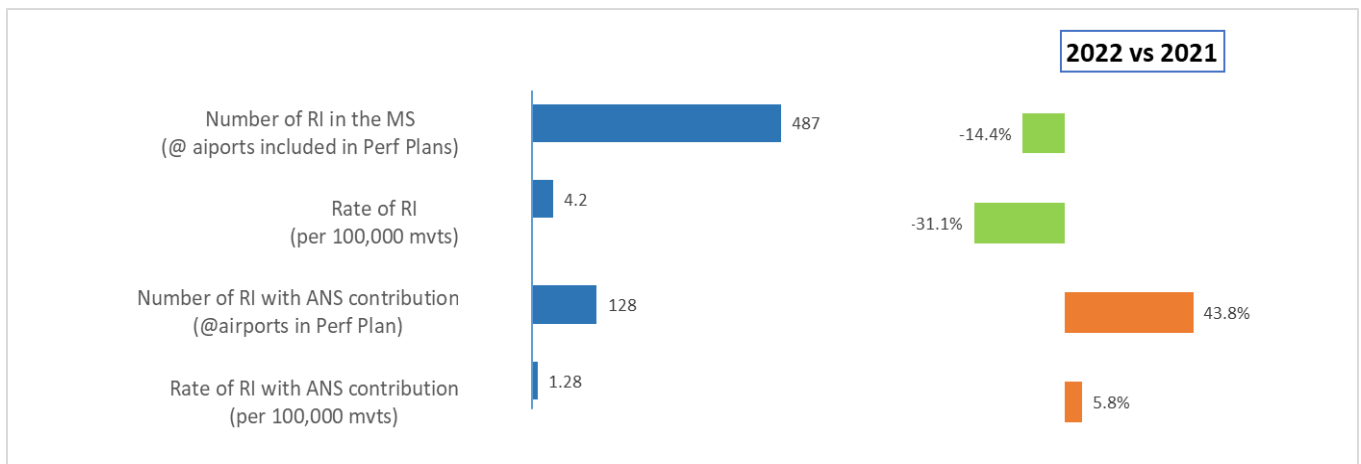


Figure 8 – Number and rates of RIs with safety impact at the airports included in the Performance Plans aggregated at Union-level in 2021 and their trend when compared with 2020 values. Rates are calculated by 100,000 movements at those airports.

Local-level view

- 57 Figure 9 illustrates the rates of SMIs with safety impacts that occurred within the airspace included under the responsibility of each Member State. The rate is reported as the number of occurrences per 100,000 controlled flight hours.
- 58 The highest rate occurred in Luxemburg (22.6). Because the number of controlled hours is very small in its airspace, any small increases in absolute number of occurrences results in very significant changes in the rate, as it has been the case in 2022. LU has reported training of new ATCOs completed together with a new simulator. ANA (Luxemburgish ANSP) will monitor the ATCO refresher training to make special emphasis on SMI early detection, avoidance and recovery to reduce current rate.
- 59 On the opposite side, three Member States (Denmark, Malta, and Slovakia) reported no SMIs within their airspace.
- 60 Bulgaria and Netherlands are missing in the graph as no data was submitted by either of them, missing their reporting obligations.
- 61 Sweden declared it was not able to identify occurrences with safety impacts and thus reported all types of SMIs regardless of the associated safety risk. This means that the number of SMIs is higher than what the indicator intends to measure and not comparable to other Member States.

- 62 Ireland, Lithuania and Slovenia reported that they use Acceptable Level of Safety Performance (ALoSP) targets in its indicators.
- 63 Serval States (Portugal, Spain, Slovenia, Croatia, Belgium) reported that SMI is a safety area addressed in their State Safety Plans, and part of monitoring, periodic safety promotion and training efforts.
- 64 Most of States reported the processes established by NSAs to oversee ANSP performance and their safety management system, as a measure to keep control over the SMI indicators.

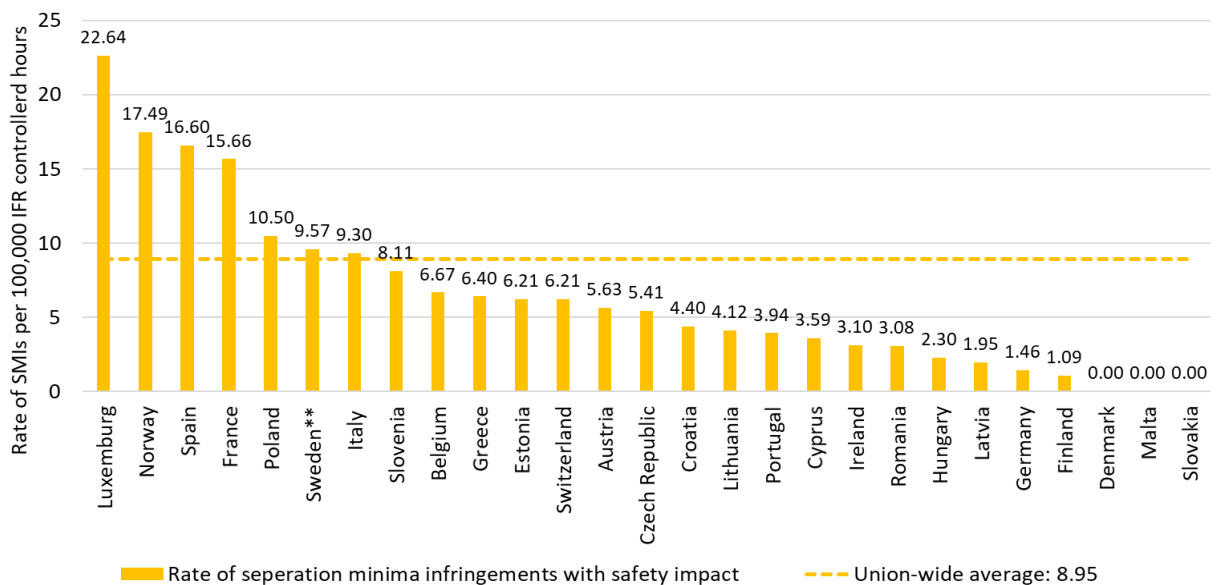


Figure 9 – Rates of separation minima infringements with safety impact by State. **Member States reporting all SMIs (not limited to those with safety effects).

- 65 Figure 10 illustrates the rates of RIs with safety impact that occurred at the airports included in the performance plans (grouped by Member State). The rate is reported as the number of occurrences per 100,000 airport movements. The highest rate occurred in Sweden (26.9), followed by Spain (9.9), although Sweden declared it was not able to differentiate occurrences that had a safety impact and therefore reported all types of RIs regardless of the associated safety risk. This means that the number of RIs in Sweden is higher, and so the rate is not comparable to other Member States.
- 66 Some Member States are not shown in the figure. Bulgaria, Cyprus, Croatia, Lithuania, Slovenia and Slovakia did not include any airport in their performance plans and so are not obliged to report RIs. Netherlands did not submit any occurrence figures, despite its obligation to report.
- 67 Three Member States (Sweden, Spain, Greece) reported the RIs at all airports within their territory, not exclusively those included in their Performance Plans, which may influence on why two of

these Member States show the highest rates in the graph.

- 68 Seven Member States (Switzerland, Romania, the Netherlands, Latvia, Estonia, Belgium and Poland) reported that Local Runway Safety Teams (LRSTs) are established at their airports, and that runway incursions are safety areas addressed in their State Safety Plans, and part of periodic safety promotion efforts. Other specific measures to reduced RI were reported as effective, e.g.:

- Czech Republic has implemented stop bars for crossing runways, which has proved as a very effective mitigating measure;
- Croatia and Slovenia have adopted the EUROPEAN Action Plan for Prevention of Runway Incursions;
- Lithuania has adopted Acceptable and Tolerated levels of safety for the 2021-2025 period and;
- Specific ATCO training focused on GA traffic has been organised in Malta.

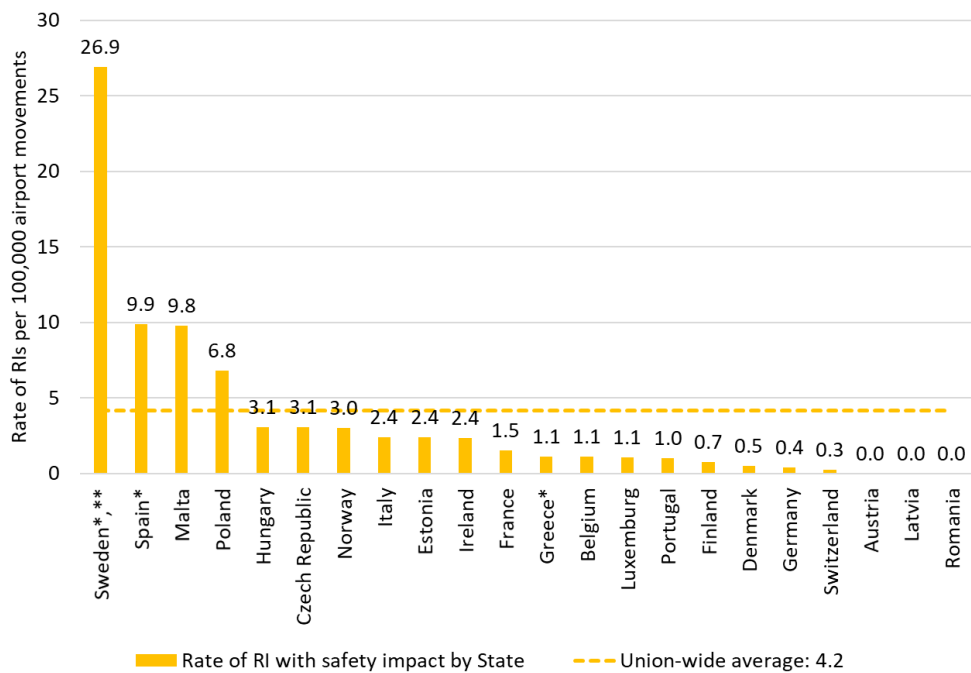
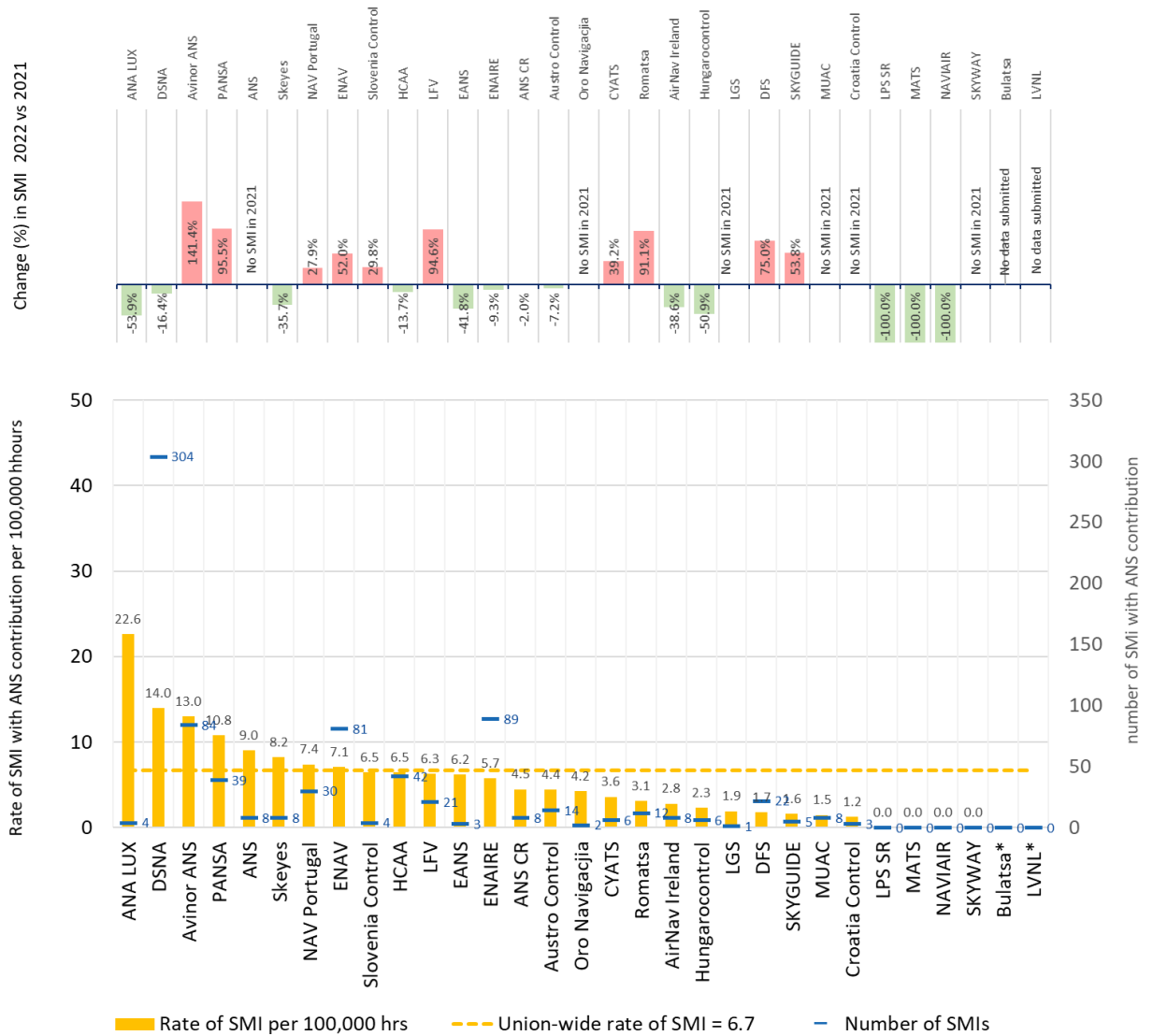


Figure 10 – Rates of runway Incursions with safety impact by State. *Member States reported RIs at all airports (not limited to airports in their performance plans). **Member States reported all RIs (not limited to those with safety effects).

69 Figure 11 shows the rates of SMIs and absolute number of SMIs that had an ATS/CNS contribution to the occurrence. The change in the rate value with respect to 2021 is also represented as a percentage. Only 25 ANSPs reported SMIs which had an ATS/CNS contribution.

70 Note the highest rate of SMIs was in ANA LUX airspace (22.6 SMIs per 100,000 flight hours), but with a very low absolute number of occurrences (4 SMIs). The rate decreased by 53.9% with respect to 2021.



(*) MS did not submit data on its supervised ANSP

Figure 11 – Rate of separation minima infringements with ATS/CNS contribution by ANSP.

- 71 The highest number of SMIs with ANS contribution occurred in DSNA's airspace (304), but the high number of controlled hours results in a lower rate (14), despite being well above the Union average and the second highest. The rate decreased by -16.4 % with respect to 2021. DSNA should continue to assess occurrences and risk mitigate them according to their SMS, if necessary.
- 72 Other ANSPs with high rates and that experienced a high increase in the last year are ANA LUX and Avinor. For both it is noted that the number of controlled hours is relatively low, hence the sensitivity of the rate to variations in the number of SMIs is high. Their EoSM maturity levels are below target and with room for improvement. Both should carefully monitor SMIs in the coming years, while improving the maturity of their SMS to achieve the EoSM target, looking into the reasons contributing to this rate and take appropriate mitigating actions, if necessary.
- 73 Figure 12 (next page) depicts the rates of RIs and absolute number of RIs that had an ATS/CNS contribution per airport. Out of 146 airports included in the performance plans, 57 airports reported RIs that had any ATS/CNS contribution. The 89 airports included in the performance and charging scheme that reported no RIs are not shown in the figure. The majority of airports reported one or two RIs. This makes the rate of runway incursions at airports with a low number of movements very susceptible to variations in the number of occurrences. For example, within the top ten airports with the highest rates of runway incursions, nine had fewer than 30,000 airport movements (represented in the figure with (*)). To illustrate this fact, the airport with the highest rate of runway incursions (EPLL) had only 3,549 movements and four RIs.
- 74 Airports with significant higher traffic figures with highest rates of RIs are GCLP (Gran Canaria) with 8.1 RI per 100.000 movements, followed by LEMG (Málaga) and ENZV (Stavanger) with 6.8 and 5.8 per 100.000 movements, respectively. LEMG uses

an automatic recording tool to identify RIs, which may have an effect on the number of reported events. ENAIRE, SKYWAY and Avinor who are responsible for the provision of ANS services at GCLP, LEMG, and ENZV, respectively, have a good record in the EoSM questionnaire in managing safety risks (maturity C or D). Nevertheless, these providers should consider looking into the reasons contributing to these rates and take appropriate mitigating actions, if necessary.

- 75 Table 4 provides the changes in the rate of RI with ANS contribution at the top 20 airports with the highest rates values in 2022 when compared with 2021 values of the rate. Among them, EPRZ (Rzeszow) and LMML (Malta Int) experienced the largest rate reduction.

EPLB (Lublin)	No RI in 2021
EPZG (Zielona Gora)	No RI in 2021
EPSY (Olsztyn-Mazury)	No RI in 2021
EPLL (Lodz - Lublinek)	-72.7%
EPBY (Bydgoszcz)	-61.6%
EPWR (Wroclaw-Strachowice)	49.4%
LFMI (Istres-Le Tubé)	No RI in 2021
EPPO (Poznan - Lawica)	-63.8%
GCLP (Gran Canaria)	No RI in 2021
EPRZ (Rzeszow - Jasionka)	-236.0%
LEMG (Málaga)	-24.1%
LFBE (Bergerac-Roumaniére)	No RI in 2021
ENZV (Stavanger)	67.2%
LFRN (Rennes-Saint-Jacques)	No RI in 2021
LKPR (Prague)	-26.7%
EDDW (Bremen)	No RI in 2021
EPMO (Warszawa - Modlin)	No RI in 2021
LPPD (Ponta Delgada)	No RI in 2021
EPWA (Warsaw)	23.6%
LMML (Malta International)	-214.8%

Table 4 – Changes in the rate of RI with ANS contribution at the top 20 airports with the highest rates values in 2021.

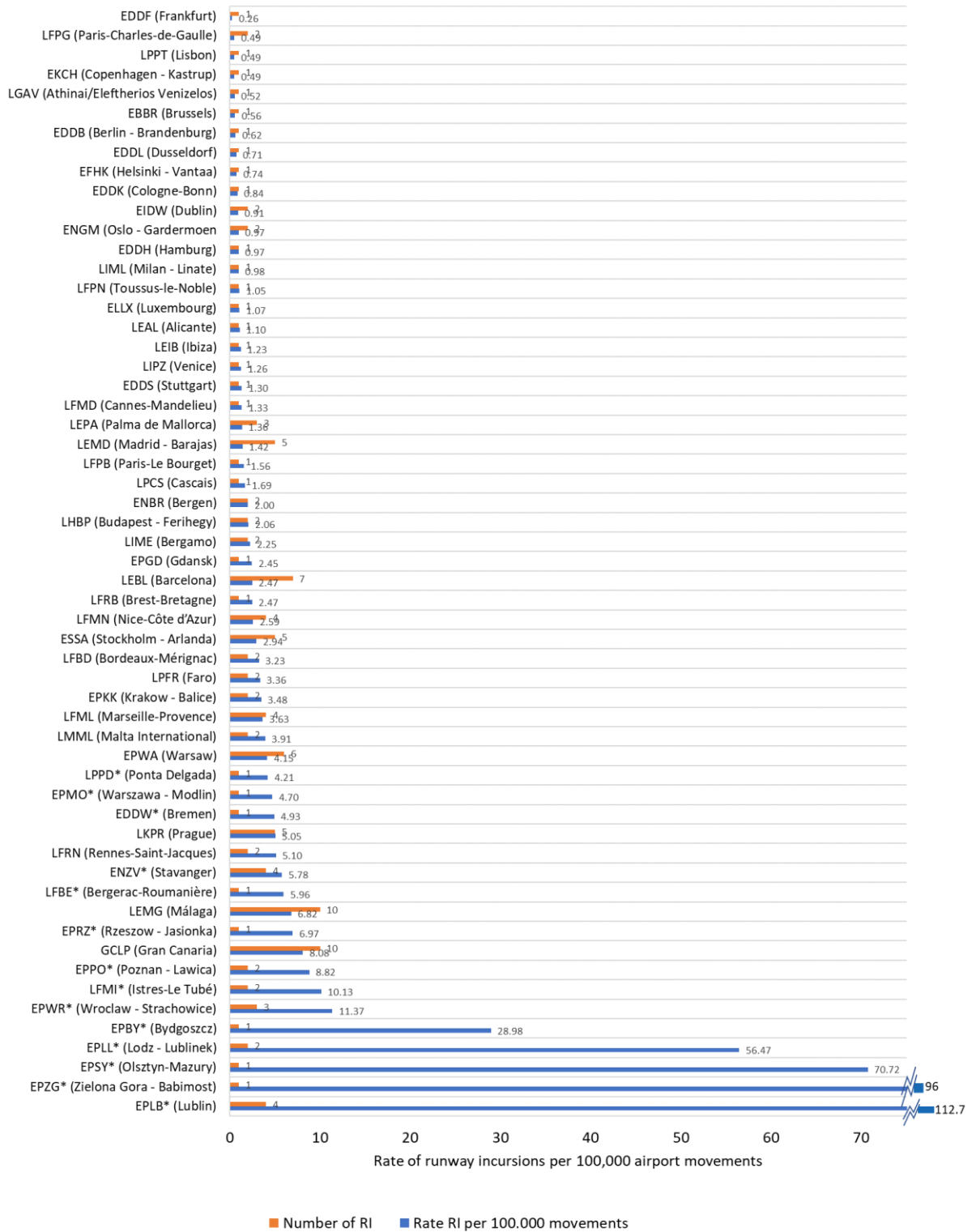


Figure 12 – Rate of runway incursions with ATS/CNS contribution by airport. *Airports with less than 35.000 movements.

Automated Safety Data Recording Systems

- 76 This SPI captures the use of automated safety data recording systems (ASDRS) for detecting, recording, analysing, or reporting SMIs and RIs by ANSPs.
- 77 No changes have been reported concerning additional use of ASDRS by the ANSPs. As in 2021, ten ANSPs (Croatia Control, ANS CR, Hungarocontrol, LGS, LPS SR, DSNA, LVNL, MUAC, Skyguide, and ENAIRE) reported the use of some type of ASDRS.
- 78 All ten of these ANSPs use automated safety data recording systems to detect SMIs. Four out of these ten (ANS CR, Croatia Control, LGS and ENAIRE) collect information on RIs too. BULATSA has reported nothing this year, but in RP2 reported use of these tools to detect both SMIs and RIs. Note that ENAIRE uses a tool to detect RIs in Málaga and ANS CR does the same at three airports (Ruzyně, Mošnov, and Tuřany).
- 79 ORO Navigacija reported that they are at the last stages of implementation. Austrocontrol reported that implementation is in progress, but has been delayed due to COVID cost savings program. AirNav Ireland reported that it is testing such a system but implementation has not been achieved yet. It can be concluded that the use of automated safety data reporting tools is still not widely implemented among ANSPs.
- 80 In some cases, the automated safety data recording tool used is the ASMT tool developed by Eurocontrol. Three ANSPs reported using in-house developed tools.
- 81 Among the ANSPs that provided a definition of the events that trigger the automatic detection of events for further analysis, it is observed that the parameters used were not harmonised. This is not surprising as the use of the tool and the associated processes differ among ANSPs.
- 82 For example, four ANSPs (Croatia Control, Hungarocontrol, DSNA, and MUAC) use a vertical separation of 800 feet to trigger SMI events and a horizontal parameter slightly below the standard separation. One ANSP (ANS CR) reported different triggering parameters for the ACC and TWR. Another ANSP (ENAIRE) triggers the detection of SMIs when the separation is 50% of the standard separation provided in its controlled airspace, both horizontally and vertically, and only for FL above FL100. It is apparent that the event

definition seems to serve a different purpose for each ANSP.

- 83 The ANSPs that use these ASDRS reported that:
- Data captured by the tools are used in support of risk management processes, but serve many purposes. ANSPs mentioned as main uses: General statistics, Hot Spot identification, safety and trends analysis, analysis of occurrences, debriefings, monitoring risks and confirmation hazards are sufficiently mitigated, monitoring of the safety criteria set in the safety assessment of functional system changes and, identification of occurrences. Use of ASDRS for identification of occurrences has only been reported by two ANSPs.
 - Data are treated by dedicated safety expert departments, applying just culture principles.
 - Data gathered are not always regularly disseminated within the organisations, but used in an ad-hoc manner by specific groups (e.g. from use exclusively by the safety expert group or disseminated to specific groups such as system designers). In some other instances, the information is disseminated within the safety unit of the ANSP. Several, but not all ANSPs share the information with the NSA.
 - No obstacles to using ASDRS were identified by most ANSPs. Some ANSPs reported issues such as the definition of safety data (to interpret them properly) or how to visualise them in order to provide a clear and understandable picture. No ANSP has reported issues with operational staff accepting the use of automated tools.
- 84 The same conclusions about the use of ASDRS can be drawn as last year: the implementation is to some extent limited and it does not include a harmonised definition of the events that trigger the capture of occurrences as it may serve different purposes in each ANSP. In addition, even when these tools are implemented, in most cases their use seems to be dedicated to operational analysis (e.g. identification of hotspots) and not to complement occurrence reporting.

3 NETWORK MANAGER

- The NM achieved the target level in 2022 in all components of the EOSM but the Risk Assessment area.
- The NM over delivery indicator increased significantly in 2022 compared to 2021, in line with the increased in the number of ATFM regulations. Mitigating actions are in place.

- 85 In accordance with Commission Regulation (EU) 2019/317, the Network Manager must draw up a Network Performance Plan (NPP) containing performance targets for the NM functions covering all key performance areas, consistent with the Union-wide performance targets.
- 86 The NPP for RP3 was reviewed considering the changed economic and operating context after the COVID-19 pandemic, and was approved by the Commission in May 2022.¹⁶
- 87 The safety key performance indicators included in the NPP are presented in the Table 5 and Table 6.
- 88 These indicators are assessed in terms of the functions and tasks of the Network Manager; however, the distinction between NM activities and other

EUROCONTROL activities is not always evident, which complicates the evaluation of the degree of accomplishment for some of the targets and objectives of the NM. This is specifically the case for the activities in the area of safety management, where activities to support operational stakeholders achieve safety performance targets are performed by the NM and the Network Management Directorate/other EUROCONTROL units.

- 89 The safety performance monitoring reported here is based on the Performance Report 2023 submitted by NM to the PRB in July 2023 and feedback received from EASA after verifying the EoS questionnaires, as oversight authority of the NM.

Key Performance Indicators	NM Target
EoS The minimum level of the effectiveness of safety management	Improving its own management system to reach at least Level C in the safety management objectives (MOs) 'safety culture', 'safety policy and objectives', 'safety assurance', and 'safety promotion' and Level D in the safety management objective 'safety risk management' for its own Safety Management System in line with the RP3 EU-wide targets

Table 5 – NM KPIs in NPP 2020-2024.

NM Performance Indicators		NM Internal Objective
Over-deliveries	The ATFM over-deliveries (OVD) above the capacity limits of a sector declared by the air navigation service provider where ATFM regulations are imposed	Reduction of over-deliveries
Top risks	Top 5 Operational safety risks and priorities	Identification of Network operational safety risks (including for its own operations)

Table 6 – NM PIs in NPP 2020-2024.

¹⁶ [Commission Implementing Decision \(EU\) 2022/785 of 17 May 2022 approving the revised Network Performance Plan for the third reference period of the Single European Sky performance scheme \(2020-2024\).](#)

3.1 Effectiveness of Safety Management – Network Manager

- 90 The NM applied the questionnaire for the measurement of the EoSM, as it is defined for ATS providers, with slight adaptation of the questionnaire due to NM nature of services. EASA identified the requirements included in the EoSM questionnaire that were not applicable to NM, and applied the adjustments to the questionnaire, in particular in the areas of safety policy and objectives and safety risk management. The EoSM questionnaire for the NM was sent to EASA for verification and justifications provided by NM were cross-checked with the results of the continuous oversight performed by EASA.
- 91 The minimum level achieved for any question related to a Management Objective is the minimum level achieved in all safety areas addressed by each question that are contained in that Component, which is determined by the responses to the EoSM questionnaires.
- 92 Table 7 shows consolidated 2022 EoSM results of NM, after EASA verification. The NM achieved the target level in all components of the EoSM, but the Safety Risk Assessment. Achievement of the targets at the end of RP3 is feasible without excessive organisational efforts.

EoSM component	Maturity
Safety Culture	C
Safety Policy and Objectives	C
Safety Risk Management	C
Safety Assurance	C
Safety Promotion	C

Table 7 – NM’s EoSM achieved levels per objective in 2022. The target for risk management is level D while it is level C for the other management objectives.

- 93 Figure 13 shows the aggregated responses of EoSM questionnaire applied to the NM (marked from Level A to Level D) distributed per each EoSM Component. Only one question with level C is below target in the area of Safety Risk management.

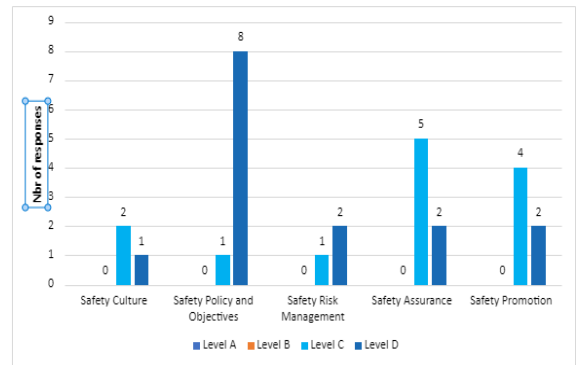


Figure 13 – EoSM’s aggregated EoSM responses per management objective.

3.2 Over-deliveries

- 94 Figure 14 illustrates the evolution of the over-deliveries (OVD) during RP2 (2015-2019) and the RP3. The over-delivery indicator decreased significantly in 2020, but increased back to pre-pandemic levels. In 2022, the OVD reached 11.5%. This increase was influenced by the increase in the number of ATFM regulations and the higher proportion of the capacity and staffing regulations (over other types such as industrial actions that tend to result in fewer over-deliveries).

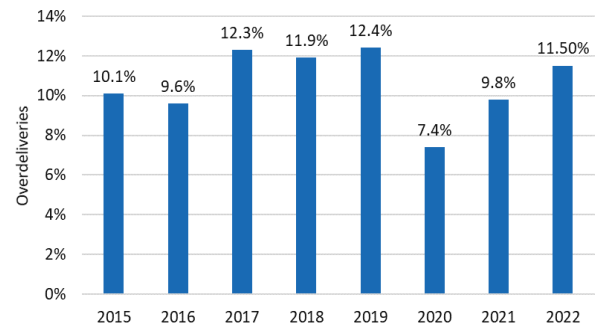


Figure 14 – Over-deliveries indicator (combined ENR and ADR) since the beginning of RP2.

- 95 A set of actions of the NM described in the Network Strategy Plan are under implemented aiming to improve predictability or to handle more efficiently demand-capacity balancing. Among these actions, NM highlighted:
 - Actions to keep airborne flights as close as possible to the FPL,
 - Actions that reduce time deviations from the plan and
 - Capture all the flights in regulations as early as possible.

96 These actions resulted in decreasing the percentage of hourly intervals with OVD due to airspace unanticipated traffic by 0.7percentage point (pp) in 2022 over 2019; non-adherence to requested flight level (RFL) was 24.2% in 2022, an improvement of 0.4pp over 2019; and ATFM regulation anticipation time in 2022 was 346 minutes, an increase of 26 minutes over 2019.

3.3 Top safety risks in the Network

97 NM identified top 5 operational safety priorities for the network. In 2022, the same priorities of previous year were retained:

1. Controller blind spot;
2. Flight without transponder or with dysfunctional one;
3. Airborne collision avoidance system (ACAS) Resolution Advisory (RA) not followed;
4. Controlled airspace infringement;
5. Controller detection of potential RWY conflict.

4 SUMMARY OF OBSERVATIONS

- 98 A summary of observations for each section of the report are provided in this section.
- 99 There was no accident registered with ANS-contribution and no fatal accident with ANS contribution has been registered in the last ten year period, involving fix wing commercial air transport operation airplanes above 2,250 kg MTOW, in 2021. Six serious incidents with ATM-contribution were recorded in 2022, related to several causes, but all services provided around or at airports.
- 100 The number of serious incidents in 2022 slightly increased compared with 2021, but well below 2019 levels. The rates of both accidents and serious incidents were similar to recent years.
- 101 The analysis of the overall EoSM minimum maturity level achieved by ANSPs in 2022 showed that:
- 18 out of 36 ANSPs have already reached the RP3 target level D for safety risk management. This means that 50 % of ANSPs have reached the target in this objective;
 - 27 out of 36 ANSPs have already reached the RP3 target level C or better on all other MOs (the four EoSM objectives other than safety risk management). This means that 75 % of ANSPs have reached this target;
 - 16 out of 36 ANSPs achieved the EoSM targets in full for RP3. This means that 44 % of ANSPs have already reached the target of EoSM as a whole.
- 102 Although a significant proportion of the ANSPs have reached their safety target, they will still need to meet the target level at the end of the reference period. There is a risk that their level of achievement could decrease in the intervening time.
- 103 The average EoSM score achieved by all ANSPs is 89. The minimum score achieved by an individual ANSPs is 69, while the maximum EoSM score is 100.
- 104 The collective Union-wide analysis of aggregated responses of the EoSM ANSP questionnaire per objective shows that the EoSM objective with more questions under maturity levels below target and therefore needs more improvement is within the safety risk management area, despite 18 ANSPs achieved maturity level “D”.
- 105 The EoSM questionnaire was supplemented with a new objective that aimed to capture how ANSPs manage interdependencies and trade-offs between safety and other business objectives. The majority of ANSPs (18) are at maturity level C, and level D (15), so there is room for improvement to strengthen resilience, particularly given the COVID-19 pandemic. Pressures to trade-off resources towards other business objectives of the organisation due to loss of traffic and revenues may have intensified and must be carefully managed.
- 106 The rates of occurrences (SMIs and RIs) at the EU level in 2022 show an average number of 8.9 SMIs per 100,000 controlled flight hours and an average number of 4.2 RIs per 100,000 airport movements. The rate of SMI has slightly decreased (-0.9%) while the rate of RIs has decreased more significantly (-31.1 %) with respect to 2021. If the aggregation is done at Union level with the occurrences where the ANSP was identified as having a contribution, either direct or indirect, the rates are reduced to 6.65 for SMIs, and increased to 1.28 for RIs, respectively, per 100.000 exposure unit. This shows that ANSPs have greater influence and managerial control of ensuring separation between aircraft in the airspace than in preventing the incursionary presence of an aircraft, vehicle or a person on the runway of an airport.
- 107 At the local level, the following rates of occurrences were monitored:
- Rates of RIs with a safety impact that occurred at the airports of a Member State included in the performance and charging scheme showed a maximum in Malta (29.8 RIs per 100,000 movements), which is significantly lower compared to the 2021 reporting period, and three Member States (Austria, Latvia and Romania) reported no RI at their airports. Note that smaller airports are more susceptible to variations in the rate of occurrences. In addition Sweden, and Spain showed the highest rates of RIs but reported RIs at all airports in their territories (as opposed to only those covered by the performance and charging scheme);
 - Rates of SMIs with safety impacts that occurred within the airspace covered by the performance and charging scheme showed the

highest rate in Luxemburg (422.6 SMIs per 100,000 controlled flight hours), which is significantly lower than in 2021. Note that the rate is more susceptible to variations due to the low number of flight hours in the State. Three Member States (Denmark, Malta and Slovakia) reported no SMIs in their airspace;

- Only 57 out of 146 airports reported RI occurrence that had ATS/CNS contributions. The majority of these airports reported one or two RIs, and only a handful of them reported 3 or more RIs. Within the top ten airports with the highest rates of RIs with ATS/CNS contributions, nine had fewer than 35,000 airport movements (the low number of airport movements makes the rate of occurrences highly susceptible to variations with the number of occurrences). The airport with greater than 80,000 movements and highest rate of RI occurrences was GCLP-Gran Canaria (8.1 RIs per 100,000 movements) followed by LEMG-Málaga (6.1 RIs per 100,000 movements) followed by LKPR-Prague (5.1);
- 25 ANSPs reported SMIs with ATS/CNS contribution while the other ANSPs reported no SMIs. The highest rate was experienced by ANA Lux (22.6 SMIs per 100,000 flight hours), which results from a very low absolute numbers of occurrences (4 SMIs). It was followed by DSNA (14), with the highest number of SMIs (304), and Avinor (13) with 84 SMIs.
- Note that in the previous reporting period LVNL had the highest rate of SMIs and one of the highest absolute numbers of occurrences, but they have not submitted SMI data this year. Bulatsa did not submit data for 2022 either.

108 Ireland, Lithuania, and Slovenia reported that they use Acceptable Level of Safety Performance (ALoSP) targets in the SMI and RI related indicators.

109 Ten Member States reported that their ANSPs used some type of automated safety data recording system in 2022, which is the same as in 2021. It can be concluded that the use of automated safety data reporting tools is not widely implemented among ANSPs. The limited implementation does not include a harmonised definition of the events that trigger the capture of occurrences as it may serve different purposes in each ANSP. In addition, even when these tools are

implemented, in most cases their use seems to be dedicated to operational analysis (e.g. identification of hotspots) and not to always complement occurrence reporting. No ANSP reported issues of acceptance of the tools.

110 The NM achieved the target level in 2022 in all but one of the components of the EOSM: the Safety Risk Management area. Improvements are needed in the latter component in order to achieve the targets at the end of RP3.

111 The over-delivery indicator increased back to pre-pandemic levels (11.5%). This increase was influenced by the increase in the number of ATFM regulations and the higher proportion of capacity and staffing regulations.