



Acceptable Level of Safety Performance (AloSP)

Implementation guidance within the European Union framework

This document provides clarity on the concept of Safety Performance management and Safety Assurance, particularly on how it should be implemented in practice at State's and Industry level.

Revision record

Issue	Date of issue	Summary of changes
01	31 Mai 2021	Initial issue

Change Revision Summary

Paragraph no.	Description of change
	(brief description)

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1. Executive summary

ICAO Annex 19 requires the ICAO contracting states to establish the acceptable level of safety performance (ALoSP) to be achieved through their aviation State Safety Programmes (SSP). This ALoSP can be achieved through the implementation and maintenance of the SSP as well as safety performance indicators and targets showing that safety is effectively managed and built on the foundation of implementation of existing ICAO safety-related Standards and Recommended practices.

States that have embarked on the SSP implementation have encountered challenges with implementing ALoSP. Greater clarity on the concept is needed, particularly on how it should be implemented in practice at State's and Industry level.

In addition, in Europe, the context must consider the overall objectives set out in the European Plan for Aviation Safety (EPAS) stemming from Regulation (EU) 1139/2018, which focuses on a level of safety performance to be achieved at Union level.

This paper thus provides guidelines on the (acceptable) level of safety performance and its implementation at national level within the European context. It primarily addresses the Member States, but it further elaborates on the relationship between the State and the service providers¹, to collaboratively achieve defined safety objectives.

At the end of each chapter of the document, the reader can find some key messages to consider for the establishment and maintenance of the ALoSP, as well as for the oversight in a performance-based environment.

The document includes examples of implementation at EU, State, and sector level².

Note 1: This document has been developed by safety management experts from different EU Member States, based on the latest development and knowledge. It should be a living document to support the understanding of ALoSP: if you wish to enrich it, please contact safety.management@easa.europa.eu.

Note 2: A list of acronyms, definitions and terminology is proposed in [Annex 1](#).

¹ The term "service provider" as used in this document applies to any organisation required to implement SMS as defined in Annex 19.

² The terms "domain" and "sector" can be used interchangeably throughout the document.

2. Introduction

ICAO Annex 19 (A19) defines standards and recommended practices for safety management at State and service provider level. Basic principles for States and service providers' safety management concepts are quite similar. They both contain four core pillars: 1) **safety policy and objectives**, 2) **safety risk management**, 3) **safety assurance** (including monitoring and measurement of safety performance) and 4) **safety promotion**.

ICAO document 9859 - Safety Management Manual (SMM) – further details requirements, recommended practises, and guidance on interaction between the state and the service provider. One systemic “tool” for this interaction is the acceptable level of safety performance (ALoSP) concept that is one of the State's responsibilities as part of **safety assurance** (A19, chapter 3.4).

The four pillars of the State Safety Programme do not exist in isolation, but are dependent on each other, therefore difficulties in understanding or implementing one pillar, or elements thereof, may have a detrimental knock-on effect on the implementation of other elements. For example, if the safety policy and objectives are not properly set, committed to, and/or communicated to all levels of system, it weakens the system's effectiveness in managing safety. Also, if the system is not able to produce, analyse and utilise enough useful safety information, it is difficult to execute proper risk management or set risk and performance-based safety objectives.

Within this context, safety performance management has been difficult to implement, with the introduction of new State functions such as setting safety objectives and developing safety performance indicators (SPIs) and safety performance targets (SPTs). However perhaps the most problematic part is with the interpretation of what is meant by the term “acceptable” in ALoSP.

The following questions about implementation are often raised:

- Does it make sense to have an ALoSP covering the whole aviation system? Should it be specific for each sector? How to address the interfaces between the sectors?
- Is the focus on the acceptability of an aggregate ALoSP or on the acceptability of individual safety performance targets? Would an aggregate ALoSP remain acceptable while a major risk looms in one sector? In case of a magic formula for an aggregate ALoSP, what about its volatility, weighting factors, trends?
- Do all safety objectives weigh the same? What happens if one of the target levels is not met? Does it remain “acceptable” or does it become “unacceptable”? When a target level is not met, should the focus rather become: “what are you doing about it?”
- Is it not enough to have meaningful objectives and measure performance when possible?
- What are the different roles for State and service provider in managing risks and delivering an acceptable level of safety performance?
- If ALoSP is achieved, is that the end? Don't we strive for continuing safety improvements when there is a growing demand for more and cheaper air transportation? How volatile is “acceptability” over time in a continuously evolving society?

Note 3: In 2017, further challenges were also captured by the Eurocontrol guidance document [“2017 Acceptable level of safety performance \(ALoSP\) implementation in EUROCONTROL Member States”](#) , which contains a number of worthwhile recommendations and good practices to better implement an ALoSP.

The purpose of this paper is to provide some guidelines on the specific subject of ALoSP in the context of Europe, starting with a review of the current legal framework.

3. Legal framework for ALoSP

3.1 ICAO framework:

Annex 19 Standard 3.4.2.1 states that “States shall establish the acceptable level of safety performance (ALoSP) to be achieved through their State Safety Programme (SSP).” The note accompanying that Standard indicates that “An acceptable level of safety performance for the State can be achieved through the implementation and maintenance of the SSP as well as safety performance indicators (SPIs) and targets (SPTs) showing that safety is effectively managed and built on the foundation of implementation of existing safety-related Standards and Recommended Practices (SaRPs)”. In addition, the following A19 Recommendations invite the State to:

- 3.3.2.2 - ensure that the SPIs and SPTs established by service providers are acceptable to the State;
- 3.4.2.2 - develop and maintain a process to evaluate the effectiveness of actions taken to manage safety risks and resolve safety issues;
- 3.4.2.3 - evaluate the effectiveness of their individual SSP to maintain or continuously improve their overall level of safety performance.

Following the ALoSP challenges raised during the 13th ICAO Air Navigation Conference (see [AN-Conf/13-WP/116](#)), the discussion being progressed at ICAO level in 2020, also in line with the [SMICG³ recommendations](#), shows that there should be a better focus on achieving safety objectives. In its second revision of A19 to come⁴, **ICAO plans to amend Standard 3.4.2.1⁵** to amend the ALoSP concept in line with the following principles:

- Managing safety performance to meet safety objectives through associated SPIs and SPTs becomes the way forward;
- To put more focus on the importance of State’s safety objectives, ICAO also plans to elevate Recommendation 3.2.3.3 to the status of a Standard⁶;

³ [SMICG](#): Safety Management International Collaboration Group

⁴ Such a proposal should be validated by the ICAO Safety management Panel end of 2021 with the view of entering into force in 2026

⁵ Potential text in Annex 19 could become: “States shall establish safety performance indicators to measure and monitor the safety performance in the State and the progress towards achieving the State’s safety objectives”.

⁶ Potential text in Annex 19 could become: “States shall establish a safety policy and safety objectives that reflect their commitment regarding safety and facilitate the promotion of a positive safety culture in the aviation community”.

- “Acceptability” is not the goal but a driver to manage the SSP/SPAS⁷ and the associated safety performance between the State and its stakeholders towards identified safety objectives;
- It is acknowledged that some State safety objectives may be qualitative and not fully measurable;
- “Continuously maintaining or improving the safety performance associated with these safety objectives” as defined in the SSP becomes prevalent;
- The appropriate use of SPIs and SPTs to measure and monitor the State’s safety performance is the way forward;
- The SPIs and SPTs as well the associated processes established by the organisations should be acceptable to the State because of A19 Recommendation 3.3.2.2. Notably, they should be consistent and coherent with those of the State.

3.2 European Union framework:

[Regulation \(EU\) 1139/2018](#), chapter II, Article 6 states: “...*The European Plan for Aviation Safety shall specify, taking into account the objectives set out in Article 1, the Level of Safety Performance in the Union. The Commission, the Agency and the Member States shall jointly aim to achieve that level of safety performance.*” That level of safety performance should not have a binding character but should rather express the ambition of the Union and of the EU Member States (EU MS) regarding civil aviation safety⁸.

According to Articles 7 and 8 of Regulation (EU) 1139/2018, individual EU MS must take the EPAS risks and actions into consideration in their own SSP and their State Plan for Aviation Safety (SPAS). Similarly, organisations should consider the States safety objectives in their SMS and progress towards that level of safety performance. EASA and EU MS will assess the level of safety performance achieved across different aviation sectors (e.g. via SPI/SPTs) and will determine if more action is needed. Article 6 indicates that EASA, in close collaboration with Member States and relevant stakeholders, shall monitor the implementation of mitigation actions resulting from the safety risk portfolios by the parties concerned, including, where appropriate, by setting SPIs.

Note 4: The EPAS safety objectives and their revisions also consider the European Aviation Safety Programme (EASP) and the ICAO safety enhancement initiatives of the Global Aviation Safety Plan. The relationship between GASP, EPAS, SSP & SPAS, SMS is further described [here](#)⁹, as depicted in the figure below:

⁷ SPAS: State Plan for Aviation Safety – see [Regulation \(EU\) 2018/1139](#), article 8

⁸ See recital 14 of Regulation (EU) 1139/2018

⁹ <https://www.easa.europa.eu/difference-between-epas-spas-and-sms>

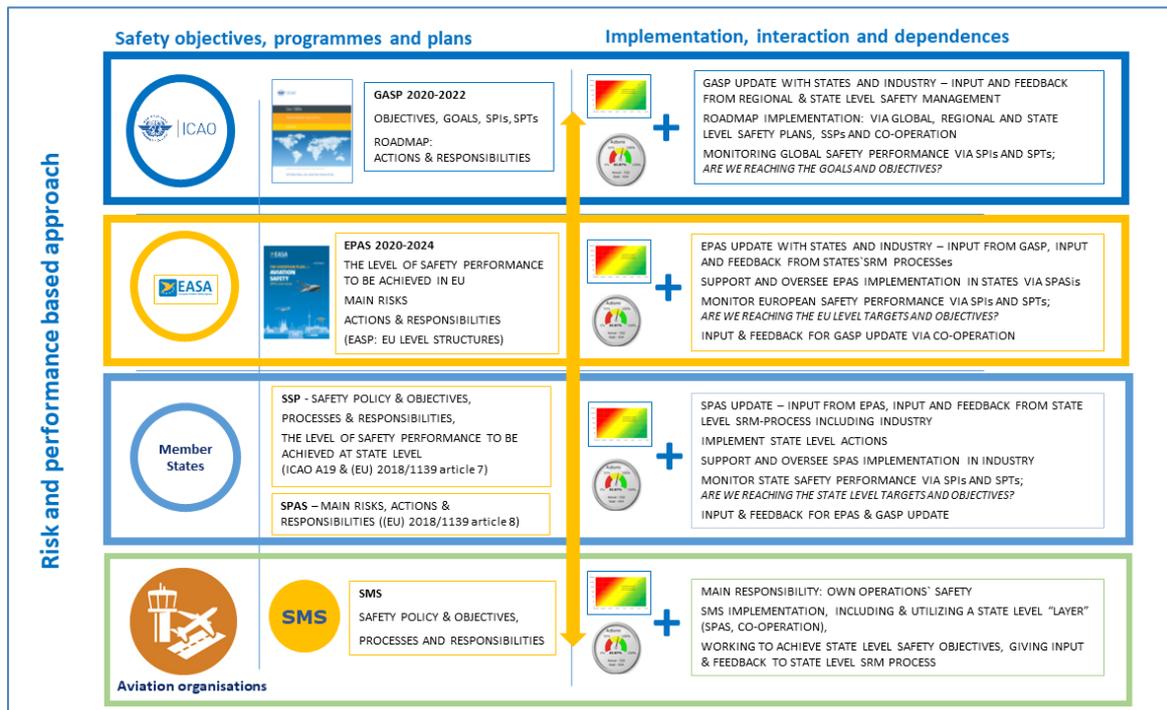


Figure 1 Relationship between GASP, EPAS, SSP and SMS

Note: please consider the latest EPAS revision available.

To summarise, in the EU context, the EPAS safety objectives and actions provide a framework for the national safety objectives in the SSP/SPAS. Accordingly, safety performance to be achieved has to be assessed at three different levels in accordance with the safety objectives and actions at EU level (EPAS), State level (SSP/SPAS) and Industry level (SMS).



- 1 - Managing safety and “continuously improving the safety performance within the State” is the way forward through setting safety objectives, implementing safety actions and monitoring safety performance at EASA, EU Member State and Service Provider level.
- 2 - “Continuously improving the safety performance within the State” is a process that involves both the State and the service providers. The level of safety performance to be achieved **expresses the ambition of the State with the support of its stakeholders.**
- 3 – Although there is a need to collectively achieve a level of safety performance at EU level as defined in the EPAS, there is enough room for the Member States to establish their own desired safety objectives through their own risk management process.
- 4 - The safety performance management process defines the level of safety performance to be achieved, which should reflect the State’s safety priorities, actions, and monitoring.
- 5 - It is acknowledged that some safety objectives may be qualitative and not fully measurable.

The rest of the document no longer uses the term ALoSP but “level of safety performance” to achieve to meet safety objectives.

The next section describes the overall safety performance management process within the EU framework. Some practical examples are available in the Annexes.

4. Safety Performance Management within the EU framework

4.1 Generic process

This paper does not intend to explain the Safety Performance Management (SPM) process.

The reader is invited to read Chapter 4 of the SMM [ICAO Doc 9859 4th Edition]; moreover the SMICG “[Guidance for Comprehensive Safety Performance Management in an SSP](#)”; and Section 4.2 of the EPAS (Volume I) in the EU context, from which some schematics are extracted in this chapter, starting with the SPM framework depicted below.

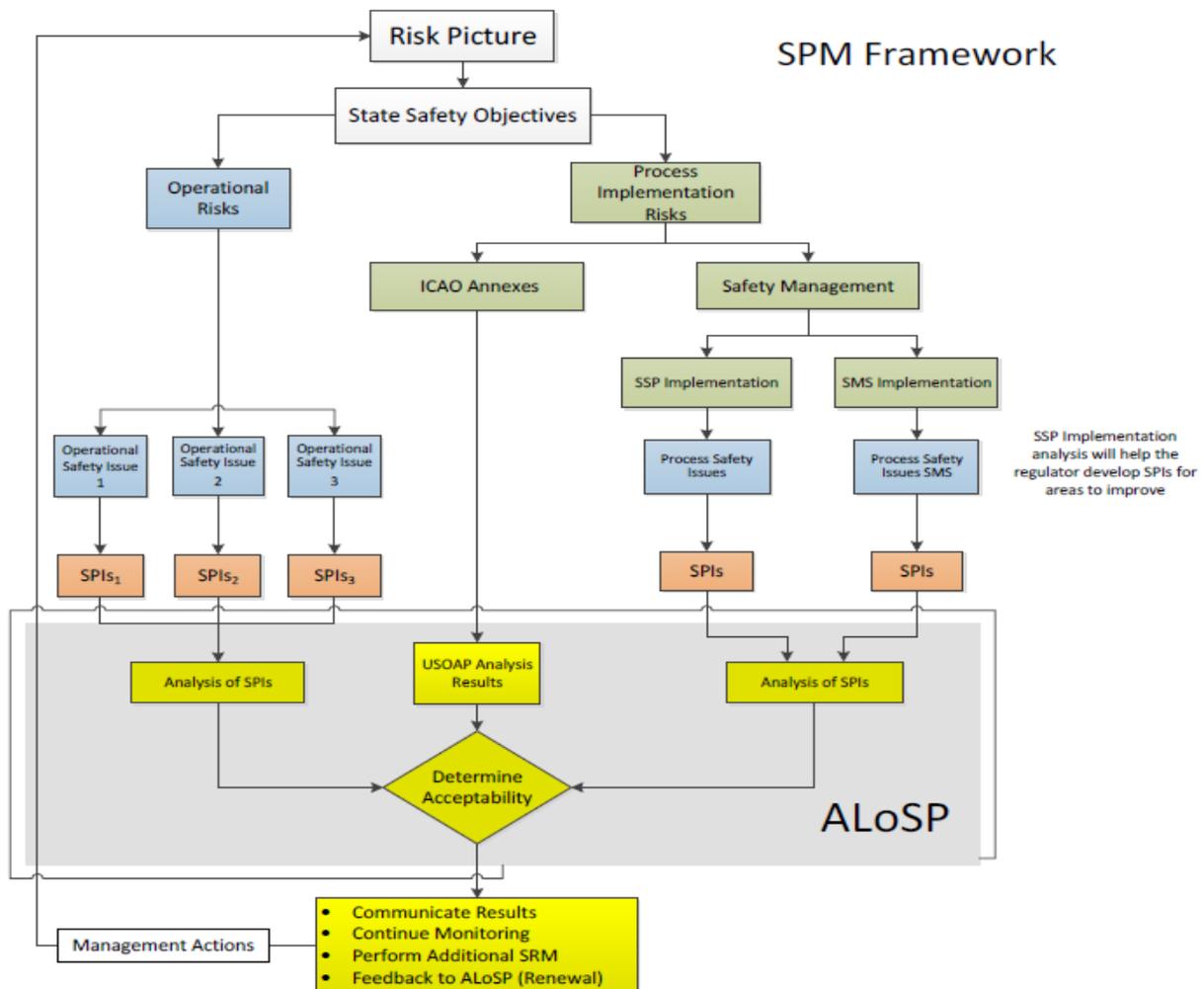


Figure 2: SPM framework by SMICG.

This SPM should consider both the Competent Authorities’ risks / operational issues and that of the Industry, arising from sector safety risk profiling at European and national level.

As part of the safety risk management and safety assurance, the effectiveness of each action associated to the mitigation of risks or operational issues, should be continuously monitored until the

safety objective, as part the SSP/SPAS, is considered “achieved” and the associated level of safety performance is considered “acceptable”, once the SPTs are met, when available. This is thus monitored through the established SPIs and SPTs. These actions can be for continuous improvement and for keeping the current safety risk controls or safety barriers or mitigation measures effectively working.

It is noted that some actions can be temporary, and the actions can be closed only when the expected outcomes are reached. The realisation of an intended improvement may also take many years (e.g. 5-10 years) or be continuous over time with no end date. The details to implement and monitor these national actions/measures and their related safety objectives are thus regularly updated and adjusted in the SPAS, when necessary.

The outcome of oversight contributes to the refinement of these details (see [section 5](#) of this document).

The SPM follows the traditional Plan-Do-Check-Act loop:

PDCA loop	What	SMICG Guidance for Comprehensive Safety Performance Management in an SSP¹⁰	Relevant section in this document
Plan	Establish risk picture and State Safety Objectives to improve the level of safety performance	Section 5	Section 4
Do	Manage operational and process implementation risks through actions to improve the level of safety performance	Sections 6-8	Section 4
Check	Determine whether the level of safety performance achieved is considered acceptable in meeting the safety objectives with the help of monitoring SPIs and SPTs	Sections 6-8	Sections 5 and 6
Act	Update risk picture based on the analysis of the level of safety performance achieved; take further actions when that level of safety performance is not considered acceptable (i.e. not meeting the safety objective and its targets).	Section 10	Sections 5 and 6

Table 1 PDCA loop and “level of safety performance”

¹⁰ https://www.skybrary.aero/index.php/Guidance_for_Comprehensive_Safety_Performance_Management_in_an_SSP

4.2 Safety Performance management process adapted to the EU legal framework

In order to better manage aviation safety risks, the EU Member State as part of its SSP and SPAS sets its national safety objectives addressing its risk picture, including the areas of greater risks or emerging risks, for which a number of actions are identified. This is supported by:

- a) Implementation of the relevant EPAS items at national level;
- b) Implementation of ATM performance scheme;
- c) Identification and implementation of the national safety objectives

a) Implementation of the relevant EPAS items; and any other appropriate items at national level

- Further analysis by the EU MS will determine which EPAS safety objectives, key risks and safety issues are relevant to the SSP/SPAS for which the MS has to take actions, based on the risk profiles of its Industry with the support of the EASA safety risk portfolios.
- The EU MS shall inform the Agency of the risks and actions identified in the EPAS that it considers not to be relevant for its national aviation safety system and the reasons thereof (see Regulation (EU) 2018/1139, article 8.2).
- The State will thus develop SPIs and SPTs associated to the safety objectives that have been retained.
- Moreover, wherever appropriate, the EU MS should consider the [European Rotorcraft Roadmap](#) (see details in [Annex 2](#) of this document) or the European [GA Roadmap 2.0](#) or the roadmap for the [safe integration of drones into all classes of airspace](#) or the [EASA artificial Intelligence Roadmap](#).

b) Implementation of ATM performance scheme

Refer to the applicable ATM EU Regulation, notably [Commission Implementing Regulation \(EU\) 2019/317](#)¹¹ of 11 February 2019 (or latest version), where Safety Key Performance Indicators (SKPI) are mandatory.

c) Identification and implementation of the national safety objectives

Whereas the consultative processes enabled via the EASA Advisory Bodies ensure that many of the safety objectives in the EPAS will also be relevant for EU MS, each MS will have its own unique risk picture. The SPM at national level should thus consider local risks or specific operational issues. Local issues cannot be necessarily captured by the EPAS or the EU safety roadmaps.

This means that the MS will establish the sector risk profiles within its industry and across domains; and determine which safety objectives are applicable to the State and its service providers. Variations in risk profiles between individual EU MS can emerge for a variety of reasons based on activity levels or local issues, including for example:

- Some northerly EU MS or mountainous countries are more prone to de-icing / anti-icing issues;

¹¹ <https://www.easa.europa.eu/regulations#regulations-skpi---safety-key-performance-indicators>

- General aviation activities may vary widely, including the use of balloon/helicopters around popular tourist spots for sight-seeing tours, level of gliding activities, level of leisure flying close to international airports or busy controlled airspace;
- National infrastructural projects such as new runways or modernizing the navigation aids at local airports with increasing traffic;
- National priorities such as procurement and recruitment for competent authorities;
- The analysis from the occurrences databases arising from the voluntary and mandatory reporting systems may reveal specific safety concerns or safety cultural issues.

Many other sources of safety intelligence could be also taken into consideration, including, but not limited to, ICAO IStars, [outcome of the EU Network of Analysts \(NoA\)](#); outcome of the EASA Data4safety¹², EASA [EOFDM](#) and [EAFDM](#) programmes on Flight Data Monitoring, accident / incidents investigation reports as well as [EASA Annual Safety Recommendations Review](#), EASA [Annual Safety Review](#) (ASR), EPAS Volume III ‘Safety Risk Portfolios’, the European Safety Promotion Network Rotorcraft ([ESPN-R](#)), SMICG “safety risk profiling”¹³ external audits and internal audits.

Note 5: Regular planning of Workshops and Working Groups meetings with industry sector representatives and experts helps to develop risk profiles per sector and identify safety issues, set up safety objectives and develop common, associated SPIs and SPTs. Such coordination and fora of exchange between State and organisations are proven valuable tools to support the set-up of the State’s safety objectives and the continuous improvement of safety.

Another example can be found in the [EASA RNO resources](#)¹⁴ with valuable material to support the identification the safety issues and set-up safety objectives during the recovery phase of the COVID-19 crisis – refer to [Annex 5](#) for more details.

4.3 Establishing SPIs and SPTs

SMICG document “Guidance for Comprehensive Safety Performance Management in a State Safety Programme”¹⁵ provides detailed guidance on the establishment of SPI/SPT to support SPM at State level. Figure 3 below is an overview of a proposed safety performance matrix, which describes a tiered approach to performance measurement.

¹²<https://www.easa.europa.eu/newsroom-and-events/news/data4safety-partnership-data-driven-aviation-safety-analysis-europe>

¹³ Will be published soon - please monitor
[https://www.skybrary.aero/index.php/Safety_Management_International_Collaboration_Group_\(SM_ICG\)#SM_ICG_Products](https://www.skybrary.aero/index.php/Safety_Management_International_Collaboration_Group_(SM_ICG)#SM_ICG_Products)

¹⁴ For instance, the following documents can be consulted: "COVID-19 safety issues portfolio", "The role of operators' management systems in the COVID-19 recovery phase" with 3 scenarios to mitigate newly identified hazards; "Management of change - role during the COVID-19 crisis".

¹⁵ https://www.skybrary.aero/index.php/Guidance_for_Comprehensive_Safety_Performance_Management_in_an_SSP

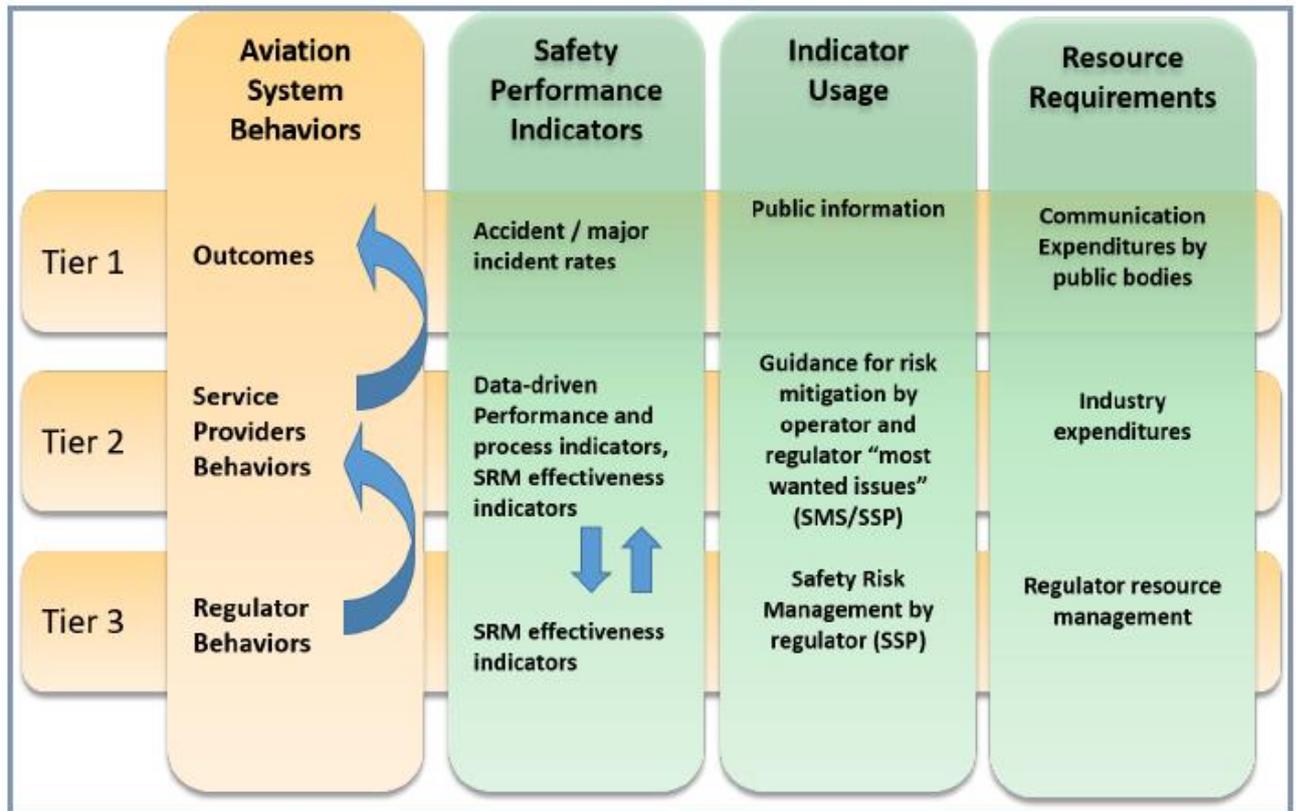


Figure 3 Operational or process safety issues (source: SMICG)

The figure 4 below proposes two different types of indicators, outcome indicators and process indicators, that may be used to measure the effectiveness of outcome-oriented actions or process-oriented actions at State level. In addition, the associated management process is described in ICAO doc 9859 (SMM) sections 8.5.5.4 and 8.5.5.5.

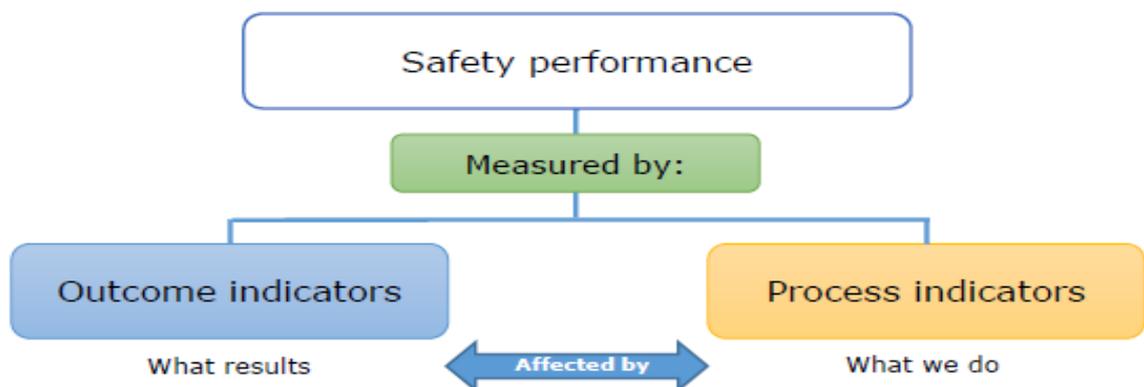


Figure 4 Measuring Safety Performance (source: SMICG)

The SPIs / SPTs should consider, but not be limited to:

- Industry safety performance;
- Industry compliance levels;
- Effectiveness of the actions taken from SPAS;
- Performance of State aviation safety agencies;

- Performance of other State agencies involved with aviation safety i.e. accident investigation, military and space;
- Performance of other States (benchmarking);
- The ownerships of the issues to monitor.

The objectives of this paper are not to explain here how the States should measure safety performance and establish SPIs and SPTs, as this is explained in detail in the SMM and SMICG guidance. Instead this paper provides practical examples of outcome and process indicators currently used in Europe. These examples are provided in [Annex 2](#) of this document.

In addition to ICAO doc.9859, the reader can also refer to the SMICG documents:

- [“Guidance for Comprehensive Safety Performance Management in an SSP”](#)
- [“Measuring SP for Service Providers”](#);
- [“A system approach to measuring SP – the regulator perspective”](#).

4.4 Establishing the level of safety performance to be achieved

In establishing safety objectives, the State is making decisions on the level of safety it is expecting to be achieved in the State. Safety objectives can be established for systemic and operational safety issues and can be set at all levels including State level, sector level and organisational level. By setting safety objectives, the State can monitor the level of safety performance and determine when the achieved level is acceptable, or when more action is needed to improve safety performance to meet the safety objectives.

The level of safety performance to be achieved (as envisaged through the current ICAO ALoSP concept) can be expressed through the establishment of SPIs and SPTs to measure safety performance to inform discussion around risks and come up with decisions and actions according to the PCDA cycle (see [Table 1](#)). When monitoring SPIs, it is important to remember that safety performance varies depending on time and the aviation sector and/or safety issue in question – every sample of safety performance is a snapshot for decision making purposes to manage safety. Different risks need to be addressed and several safety actions need to be measured and monitored. In the same vein, all risks do not weigh the same and a major risk can loom in one sector when another sector is performing well.

The acceptability of individual SPTs, when established, would be more appropriate, and easier to manage, in that, when a target level is not met, the State can take proper actions to correct that specific deviation. In other words, when checking whether the level of safety performance to be achieved has been met, the State must make safety performance management decision for a certain safety issue based on individual SPIs and SPTs, or a set of them, defined especially for that safety issue.

An aggregate ALoSP is thus not seen as the best management tool. Individual safety objectives and their associated level of safety performance to achieve should be considered. This approach would also help to better address the interfaces between domains. When safety issues are identified at the

interfaces, the State can put emphasis on actions to monitor and performance to measure, which may also require coordination between different National Competent Authorities.

Good safety management processes help to define good safety objectives and safety targets and this may require extensive efforts on defining what a good iterative process could look like for gathering data to monitor and further analyse and assess what is important for aviation safety. The EU MS must continuously analyse and decide whether the available safety information represents an accurate picture of the safety risk (including the key threats or barriers), and then adjusting as necessary how to gather the necessary information. This iterative process gives greater confidence in the safety performance indicators used to assess and analyse whether the achieved level of safety performance is acceptable or not.

Benchmarking between the EU MS may also help to identify where to invest and what to monitor. State safety partnerships are an important element (engaging also with international bodies or Industry Associations to provide comparison or assistance on specific issues, such as bird strike, drones etc).

In addition, communicating positive results promotes a stronger safety culture whereas communicating negative results reinforces accountability to make further improvements and is likely to be an indication of a positive safety culture.

By periodically assessing whether the desired level of safety performance has been achieved, it may be possible that the outcome is not purely “black or white”, thereby highlighting areas for the State on where to further invest in safety mitigations and strategies. This may also indicate that the SPIs were not appropriately defined or not suitable to measure the objectives.



1 –The State’s SSP/SPAS will not only have to consider which elements of the EPAS apply within its territory and environment: Local risks and national safety issues will have to be addressed, measured and monitored as part of the SPM process. The ATM performance scheme will also have to be taken into consideration within the overall process.

2 - The monitoring, measuring, and comparing of the level of safety performance with defined targets should be seen as a tool to help management in decision-making.

3 – The State is ultimately supported in managing safety by establishing safety objectives, measuring safety performance, monitoring the achieved safety performance level, and communicating and fostering a positive safety culture.

4 – The SPM process, including defined targets, supports the continuous improvement that leads the State to take adequate measures.

5 – Both outcome indicators and process indicators are needed, where relevant, to express the level of safety performance to be achieved. To achieve many of the national safety objectives and associated SPTs, a shared effort is required by the State and the service providers, as part of a collaborative process between the SSP/SPAS and the SMS.

6 - The State should be able to show that safety is effectively managed, supported by SPIs and SPTs that are constantly monitored to determine whether the expectations are met or where to further invest.

7 - Not reaching certain SPTs or not achieving the safety objectives tells us to do more and where to adjust resources for better mitigating safety risks and strengthening the safety risk controls barriers.

8 – Accepting the level of safety performance is not a compliance-based, but a performance-based concept, demonstrating:

- What the level of safety performance is in that State at that moment, for different sectors or for different safety-related issues;
- How far the State is from achieving the safety objectives;
- Whether the SPIs and SPTs being monitored are providing the information needed;
- Whether the agreed actions are working and delivering as planned;
- What the State does when the safety objectives are not met; and
- What the next steps are when the expected level of safety performance is met (i.e. continuous improvement)

9 – Joint effort between the State and the Industry (e.g. sharing of information, workshops) supports the continuous improvement process.



1 - “Acceptability” is volatile by nature and cannot be the ultimate goal. Conversely there is a need to continuously review the safety objectives over time to meet the aviation societal objectives, which, by definition, continuously evolve.

2 – An aggregate ALoSP for the whole aviation system in a State as “achieved” or “not achieved” is certainly not a good management tool to evaluate the achieved level of safety as it does not address areas of weaknesses or specific safety issues.

3 - The evaluation of the level of safety performance cannot only be a simple pass/fail determination. Failing to reach a target is not necessarily an indication of “non-compliance” but more an indication of “ineffectiveness” or inappropriate/invalid SPIs.

4 - A single ALoSP metric has proved elusive, as a single index of safety does not provide adequate information to take corrective actions. Not all the risks bear the same consequences and need the same level of action. A set of SPIs and SPTs that show progress towards achieving the State’s safety objectives is a better approach.

5. Relationship between safety performance and the oversight programme

5.1 Generalities

Each EU MS, in consultation with relevant stakeholders, should identify the main critical safety risks affecting its national civil aviation safety system and should set out the necessary actions to mitigate those risks across sectors or as sector specific.

By doing so, the State fine-tunes and re-orientates their near-term actions, identifies new actions to monitor, and defines what is desired, achievable, and needed at State and Service Provider level. Two main drivers in the PDCA cycle (see [Table 1](#)) can support the SPM process and consequently the evaluation of the achieved level of safety performance:

- a) Regular discussion with Industry; and
- b) The oversight programmes.

a) Regular discussion with Industry (organisations)

Regular meetings to monitor the achieved level of safety performance should be planned, such as workshops, meetings with experts etc. It also helps the State to remain alert, notably on emerging issues or degradation of safety level.

Risk-based workshops may be held at State level to help develop sector risk profiles to better understand the safety issues and related risk mitigating actions. The focus should be on the efficiency of the safety barriers and the associated mitigation measures with the identification of SMART SPIs and SPTs.

- Such workshops are also an opportunity to discuss and share safety information, identify key safety areas, and agree on common objectives between the States and their stakeholders;
- These workshops not only result in better sector safety risk profiling at State level but also help to benchmark the outcome of oversight between service providers within a sector profile for the sake of continuous improvement (see [annex 4](#)); and

The State also has an important role to play in encouraging interfaces to be correctly addressed as it does impact the overall safety performance of the system. Cross-sector risk workshops are also encouraged to address interface issues (e.g. OPS, Continuing airworthiness and Maintenance, ADR and ANSP);

- For instance, the [LUTON Safety Stack](#) supports such initiatives - a comparison between the first year of the implementation with the harmonised procedures, against the previous year without them, showed a 100% decrease in ground handling damage incidents, against a background 5% rise in traffic and a 7% rise in efficiency (on time performance).

b) Oversight activities

It is also incumbent upon the States to periodically verify, through their SPAS and oversight responsibilities duties that:

- All service providers have properly considered the State safety objectives and associated actions in their SMS;
- All service providers have identified their own safety objectives and associated actions, including SPIs/SPTs to measure and mitigate;

- All service providers have also addressed their specific risks (see ORO.GEN.200(a)³¹⁶ A19 Appendix 2, section 2), as the environment may significantly differ from one entity to another;
- Coherence between the safety objectives, mitigation actions and performance measures should be established between the State and its service providers.
 - The Service Providers' safety objectives, mitigating actions, SPIs & SPTs should consider the State level safety objectives (as described in the SSP/SPAS and their associated SPIs and SPTs), and should be acceptable to the States' competent authority (e.g. via the Management System assessment). This establishes a link with the State's SPM - top-down approach - and each entity's SPM - bottom-up approach - in a given timescale (see A19 recommendations 3.3.2.2, 3.4.1.3).
- To ensure commitment and common understanding of national level SPIs and SPTs, service providers should be given an opportunity to influence and co-operate in their creation and update process. Conversely States should consider the SPI/SPT's of individual service providers for applicability at sector level as part of the update process.
- National SPIs should be the tool to complement the safety level monitoring carried out by the organisations and are a link between safety management at State and service provider level.

The forthcoming SMICG document "Safety Oversight following implementation of SMS"¹⁷ will provide guidance on the effective oversight of the SMS implemented by the organisations.

Note 6: The agreed safety performance for each individual Service Providers participates to the establishment of the LoSP, its monitoring and achievement (see ICAO doc.9859 - SMM section 8.5.5.5).

5.2 Adapting the oversight

The safety management activities and efforts required by individual service providers will vary, with differing objectives, actions, timelines and/or targets. The State's role therefore becomes more focused on **boosting or inspiring their service providers** in increasing the effectiveness of the SMS process to improve the level of safety performance achieved.

- By definition, SSP/SPAS as well as SMS shall be commensurate with the size and the complexity of those activities and shall be consistent with the EPAS.
- The SPAS, by nature, is a dynamic document, which should be regularly updated to capture the latest safety objectives to meet and actions to take; including the safety performance based planning of oversight activities as per ARO.GEN.305 for Air OPS¹⁸.

Note: for instance, the [EASA RNO resources](#)¹⁹ and the COVID-19 safety issues portfolio help to identify the key COVID-19-related risks and drive the risk- or performance-based oversight. Further explanations are given in [Annex 5](#).

- Hazards and assessments of these associated risks may differ from one entity to another;

¹⁶ Here Regulation (EU) No.965/2012 taken as a reference

¹⁷ Will be published soon - please monitor

[https://www.skybrary.aero/index.php/Safety_Management_International_Collaboration_Group_\(SM_ICG\)#SM_ICG_Products](https://www.skybrary.aero/index.php/Safety_Management_International_Collaboration_Group_(SM_ICG)#SM_ICG_Products)

¹⁸ Or equivalent in the other domains: ARA.GEN.305 (Aircrew); ATCO.AR.C.001/005 (ATCO); ADR.AR.C.010 (ADR); ATM/ANS.AR.C.015; 21.B.221 and 21.B.431; CAMO.B.305; 145.B.305; M.B.303

¹⁹ For instance, the following documents can be consulted: "COVID-19 safety issues portfolio", "The role of operators' management systems in the COVID-19 recovery phase" with 3 scenarios to mitigate newly identified hazards; "Management of change - role during the COVID-19 crisis".

- Some entities may have more to implement due to the maturity of their safety risk management; the safety performance monitoring processes; or cultural issues. Some others may have less to achieve because their operations are less critical. Some might be less “willing or able” to comply with the rules (e.g. insufficient positive safety culture due to past cultural factors);
- Organisations must also, as part of their management of changes, proactively assess changes and ensure that the level of safety performance can be maintained and/or improved after the change is implemented (e.g. growth in activity within a limited timeframe such as “absorbing 10% more aircraft movements per year at a specific airport” or “recruiting 100 pilots to cope with the introduction of new aircraft into the fleet”).
- The State should take additional oversight actions and decisions with the organisation(s) to improve the level of safety performance:
 - when the State’s monitoring of the safety performance shows that an SPT is not met or when an alert level is triggered, or,
 - when, based on oversight activities, the State has reason to believe that an organisation may not be able to meet the safety objectives.

In section 4.2 of EPAS 2020-2024, a note was purposely added to clarify the meaning of the baseline SPIs: “It is important to note that these ‘baseline’ performance measures may be used by States to monitor sector-based performance, **they should however not be adopted as safety performance targets for individual regulated entities**. To ensure continuous improvement in safety, **regulated entities must establish their own safety performance indicators and associated targets**, in a manner **acceptable** to their competent authority (see also A19 Recommendation 3.3.2.2)

However, the level of safety performance to be achieved, as established at State level, should not be a trade-off between the State and the service provider. In addition to the establishment of the SPIs & SPTs proposed by the service provider and accepted by the State, oversight actions (targeted or not) as well as associated findings or observations in a performance-based environment, should incentivise continuous safety improvement, promoting the State safety objectives in a positive safety culture. This would further support different types of safety objectives, including for example:

- Aspirational goals such as “Zero fatalities” to push Industry in the right direction;
- Continuous improvement; and
- Targeting of risk- and performance-based oversight actions based on the assessment of the level of safety performance achieved.

In that sense, targets defined as “to be better year after year”, by comparison with the previous year can be a reasonable approach.

Therefore, the level of safety performance to be achieved may be a driver for the competent authority inspectors to adjust their oversight programme in line with ARO.GEN.305²⁰ and adjust the monitoring of the safety actions implemented by the service provider, in conjunction with the assessment of the management system (SMS). Assessing the management system (SMS) includes the evaluation of its effectiveness, which allows open discussion on safety management, safety maturity, safety

²⁰ Or equivalent in the other domains: ARA.GEN.305 (Aircrew); ATCO.AR.C.001/005 (ATCO); ADR.AR.C.010 (ADR); ATM/ANS.AR.C.015; 21.B.221 and 21.B.431; CAMO.B.305; 145.B.305; M.B.303

performance and safety improvement. More guidance on the MS assessment and the use of findings/observations can be found in the [EASA management system assessment tool](#) using the PSOE grading system [i.e. “Present”; “Suitable”; “Operating”; “Effective”].

ICAO and EASA should not oversee whether the EU MS reaches the targets but whether the process is working and effective, whether the pre-established safety objectives and its associated SPI/SPT are reasonable and suitable, whether the decisions are justified and ultimately check what the State does when the targets are not met. By doing so, the oversight drifts from compliance-based towards performance-based, focusing more on the effectiveness of the processes than just considering the achievement of the objectives themselves. The EASA SYS Phase II will focus on these aspects and assessors will be trained accordingly

Note 7: It may not be always possible to benchmark by comparison with other EU countries (e.g. too many differences from one country to another) or to compare within a sector profile (e.g. there is only one major operator within the country; and/or the collected data might not be 100% accurate). Sometimes there is no “target” available. It is thus important the State and the organisations within the States to make a joint analysis and define altogether the safety objectives and the type of oversight actions.

Finally, ICAO and EASA should not oversee whether the EU MS reaches the targets but whether the process is working and effective, whether the pre-established safety objectives and its associated SPI/SPT are reasonable and suitable, whether the decisions are justified and ultimately check what the State does when the targets are not met. By doing so, the oversight drifts from compliance-based towards performance-based, focusing more on the effectiveness of the processes than just considering the achievement of the objectives themselves. The EASA SYS Phase II will focus on these aspects and assessors will be trained accordingly



1 - The State safety objectives and its associated SPI/SPT should incentivise the organisations towards a better control of the areas of greater risks. The safety performance for each individual Service Provider through the establishment of targets constitutes an important driver for the establishment of the level of safety performance to be monitored and achieved.

2 – Achieving coherence in safety objectives between the State (i.e. SSP/SPAS) and the service providers as well as the monitoring of these objectives through the Safety Performance Management by the State and service providers as well as the risk-based/performance-based oversight will facilitate continuous improvement on the level of safety performance achieved. When the safety performance is not met, both the State and the organisation(s) should collaboratively take actions to improve the situation.

3- The level of coherence in safety objectives between the State and the service provider will differ from one organisation to another. Oversight in a Performance-Based environment will have to be tailored to the individual organisation.

4 - A culture of trust between the State and the service providers will nurture a better understanding of the level of safety performance. Dialogue and communication are an important asset. Continuous exchange of information between the State and the service providers will help to fine-tune the safety assurance and performance processes.

5 - Maturity on the level of safety performance monitoring will gain over time insofar as implementation matures and a regular exchange of meaningful information takes place between the State, the service providers, and any other trustful bodies, including other States.

6 – Service providers' understanding of, and contribution to, the level of safety performance achieved at State level should be considered in the assessment of the effectiveness of the SMS.

6. Ongoing evaluation of Safety Performance in EU Member States

The different State competent authorities involved in the SSP also have:

- Their own analysis to support the SSP safety objectives and SPAS, such as the accident investigation branch;
- Their own internal risks to manage such as the lack of competence of its staff, the pyramid of age [e.g. many inspectors close to retirement], an excessive turnover of staff, financial limitations etc.

Another generator of risks is the need for the State to evolve in a constantly changing environment. Management of changes is an important factor in the determination of the safety priorities, including for example:

- Sudden increase of traffic non-adapted to the capability of the ATC or its aerodromes;
- Innovation (e.g. eVTOL, electric aircraft, drones), digitalisation, artificial intelligence, more complex systems, deviances, pitfalls, human performance, and interfaces with automation etc.
- The COVID-19 pandemic is also an obvious illustration that the State must adapt its processes sometimes in a very dynamic manner, including oversight activities. Further details are given in [Annex 5](#).

Remaining tuned to any source of information will foster a proactive mindset to detect emerging safety issues or pitfalls. The SPM process is, by nature, dynamic and the safety objectives and associated level of safety performance to be achieved will have to be constantly re-assessed.

On a regular basis, the State reviews the appropriateness, progress and effectiveness of its SSP/SPAS safety objectives and related actions, including the monitoring of the SPIs, and SPTs. The State should thus periodically review its analysis of safety performance through its SPM. Periodically reviewing whether the actions taken under the SSP / in the SPAS are sufficient is of utmost importance.

*Note 8: A19 Recommendation 3.4.2.3 invites the State to evaluate the effectiveness of their individual SSP to **maintain or continuously improve their overall level of safety performance**.*

Within the SSP, the State must relate its ambition to the resources it is willing to dedicate to improving aviation safety. As much as possible, State Safety Performance should be monitored by proactive SPIs that do not just look at the current state of any sector but analyses trends to identify future risk areas.

For that purpose, an appropriate governance structure is needed to evaluate the currency and relevance of the determination of the acceptability of the level of safety performance achieved. The establishment of a State safety committee / SSP coordination group or forum is highly recommended as it should regularly review the State objectives together with the performance of each supporting SPI, taking into consideration its trend, its volatility and safety target's achievement. What is acceptable today might not be tolerable any more tomorrow. The collective information and history of each SPI is used to determine if the level of performance is acceptable or if the SPT's alert level should be adjusted. Some targets might be achieved whereas a new course of actions might be necessary to address unaccepted breaches of other targets or underperforming safety objectives. The political level or an unexpected event may push for a review of the overall safety objectives. Similarly, selected data to feed SPIs might be reviewed as they might not appropriately mirror the effectiveness of the safety barriers at stake. The governance structure should be satisfied that safety objectives have been met.

Note 9: This State safety committee, which generally oversees the SSP and its associated SPAS, might be the entity governing and maintaining the SSP. The SSP becomes the tool to manage aviation safety at State level and not only at the level of the competent authorities.

One counter-effect to avoid, is the dissipation of the available resources by adding too many safety actions, therefore diluting the attention to the key threats. The SPM process should enable the prioritisation of the most effective safety actions to ensure that the overall safety performance is improved [in other words, a “manageable” focus on the areas of greater risks].

Likewise, the State should not get lost with numbers and dashboards. The determination of the level of safety performance is not only a quantitative, but perhaps in many cases a qualitative analysis, which may be used to determine acceptability based on a scoring system, such as categorising safety risks via a green, amber or red traffic light analysis.

Finally, as previously mentioned, an element defining the safety performance target as “to be better year after year” by comparison with the previous year or over a period of time in a specific sector or for specific objectives can be a reasonable approach. Addressing the interfaces between the different elements that contribute to the level of safety performance analysis, or working at the interfaces of each element, will also support the improvement of the overall process. Nevertheless, this must take the context into account. A system undergoing rapid change, such as through the COVID pandemic, is inherently more risky than a stable system. As such, safety outcomes may at times worsen despite improved safety management approaches. Recognising the difference between outcome and performance is thus very important.

The bottom line for “acceptability” is the “continuous improvement” at State and service provider level and therefore EASA EPAS section 4.2 proposes the aspirational safety goal to “**achieve constant safety improvement with a growing aviation industry**”. An example of such “continuous improvement” is provided in [Annex 4](#).



1 – Safety management processes at State level must include the assessment of the internal risks within the different aviation bodies of the State and the monitoring of associated safety performance indicators. Internal and external monitoring and external oversight are key factors to assess whether the overall level of safety performance is achieved or not.

2 – Safety performance management using SPIs and SPTs is a continuous process. Attaining the targeted level of safety performance for each safety objective may not be a “one-time-exam” but a continuous effort for managing safety as the outcome of a comprehensive process.

3 – The State should establish a periodic review of the SPM process, supported by governance rules. By nature, the environment can be volatile or very dynamic; continuous monitoring becomes essential for the State to be able to swiftly react to sudden changes or emerging safety issues.

4 - The achievement of the safety objectives through the implementation of safety actions and the satisfactory monitoring of meaningful SPIs/SPTs provides confidence that the level of safety performance has been reached as intended.

5 - A State safety committee/SSP Coordination group or forum provides appropriate governance to ensure actions are taken (e.g. to re-define the safety actions, update the SPM process, select better SPIs etc) when the safety objectives are not achieved within a defined timeframe.

6 - Failing to achieve the safety objectives in a defined timeframe may not be a major concern in a performance-based environment. Of greater concern when safety objectives are not met, is failing to identify the causal and contributing factors and not taking actions to improve safety performance, with due regard to the criticality of the safety issue concerned.

7 - “To be better year after year” by comparison with the previous year or over a period of time in a specific sector or for specific objectives can be a reasonable safety target, depending on the criticality of the safety issue.

7. Conclusions

Moving to a performance-based environment through the implementation of safety performance management (SPM) will complement the compliance-based system.

Neither clear guidance, nor a magic formula (such as a predefined desired outcome), can define the level of safety performance to be achieved or its acceptability. However, complying with the intent of the SSP through a robust Safety Performance Management (SPM) process will foster better risk management capabilities within the State and Industry to improve safety. Resources will, by definition, be always limited. Striking a balance between the safety benefits and the efforts required to meet safety objectives, will be always challenging, and challenged.

The SPM, including determining the level of safety performance to be achieved as stated in Regulation (EU) 2018/1139 or an acceptable level of safety performance as stated in Annex 19, should be seen as an integral part of the SSP toolbox to measure, monitor and manage the key risks for both the State and the service providers. SPM is a comprehensive and complex process, including safety objectives and actions to improve safety performance for different sectors and safety issues, as monitored with the aid of SPIs and SPTs.

In that sense, the concept of Safety Performance disrupts the traditional mindset that we all have with “compliance”. Aviation is still primarily driven by the paradigm of “compliance”. The level of safety performance achieved cannot be simply rated as just “acceptable” or not, but is better seen as an important part of the SPM process to determine the current level of safety performance, the safety performance trends against the targets established and whether there are areas that need improvement.

Conversely, an analysis of the level of safety performance purely designed around a set of SPIs and SPTs has the potential to generate an environment of achievement or complacency, narrow hindsight and mismanagement caused, for instance, by incomplete /unreliable data sets, leading to poor decision-making on where to target safety improvements. SPM including measuring, monitoring, and managing level of safety performance is a continuous process and “acceptability” is a moving target. Even if the current achieved safety performance is at an acceptable level and safety objectives are met, it does not guarantee safety for the future. Safety performance can evolve over time. An accident can happen despite the best efforts of EU States and service providers. Also, safety objectives and the level of safety performance to aim for, need to be continuously updated and reflect the expectations of the aviation system and flying public and the balance between resources, options available and the assessed safety risks. New risks will constantly emerge from the needs of change and the rate of change is even more pronounced in the dynamic environment of today. There will always be “more to do” or “not enough achieved”. Compliance is not the goal.

What matters is that the EU MS and aviation organisations engage as much as possible to collectively mature the overall SPM process in a growing public demand for safer air transportation. By gaining experience, we will all be in a better position to assess what is acceptable, what is achievable and where the targets should be set. The level of safety performance to be achieved is not simply a fixed

target, but instead, an approach to continuously monitor the safety performance within the EU. In this case, overall continuous-improvement targets could be a reasonable approach.

Managing safety effectively by measuring, adjusting and eventually “continuously improving the safety performance within the EU State” over time are the overall objectives in a performance-based environment.

Annex 1 – Reference; definitions and acronyms; literature

Acronyms	Definition	Link
An.19	ICAO Annex 19, Edition 2	See https://www.icao.int/safety/SafetyManagement/Pages/Access%20to%20ICAO%20Annexes%20and%20Guidance%20Material.aspx
ALoSP	Acceptable Level of Safety Performance (ALoSP) – see Standard 3.4.2.1 in ICAO Annex 19.	<i>Note: EUROCONTROL has published a report commissioned by the Performance Review Commission (PRC) called “Implementation in EUROCONTROL Member States” at https://www.eurocontrol.int/publication/2017-acceptable-level-safety-performance-alosp-implementation-eurocontrol-member-states</i>
BR	Basic Regulation	
EASA	European Union Aviation Safety Agency	https://www.easa.europa.eu/home
EU	European Union	
MS NCA	Member States of the EU National Competent Authorities	
Regulation (EU) 1139/2018, chapter II	Refers to BR (Basic Regulation). In particular, the following definitions are available: “Safety Performance” (SP) means the Union's, a Member State's or an organisation's safety achievement, as defined by its safety performance targets (SPT) and safety performance indicators (SPI). “Safety Performance Target” (SPT) means a planned or intended objective for complying with safety performance indicators over a given period of time. State Safety Programme (SSP) – see article 7 State Plan for Aviation Safety (SPAS) – see article 8 European Plan for Aviation Safety (EPAS ⁱ), edition 2021-2025 or latest version , notably section 4.2 in Volume I – here EPAS – see article 6	https://www.easa.europa.eu/regulations
SaRPs	Standards and Recommended Practices are contained in A19	See more information at https://www.icao.int/safety/SafetyManagement/Pages/SARPs.aspx
RBO	Risk-Based Oversight	See more information at https://www.easa.europa.eu/docu

		ment-library/general-publications/practices-risk-based-oversight
SMM	Safety management Manual – ICAO Doc 9859 4 th Edition	See https://www.icao.int/safety/SafetyManagement/Pages/Access%20to%20ICAO%20%20Annexes%20and%20Guidance%20Material.aspx
SMICG	<p>Safety Management International Collaborative Group - made of 18 worldwide Aviation Authorities, this group of experts develop, among others, AloSP-related products such as:</p> <p>“Guidance for Comprehensive Safety Performance Management in an SSP”</p> <p>“Measuring SP for Service Providers”;</p> <p>“A system approach to measuring SP – the regulator perspective”.</p> <p>Coming “Sector Risk profile”²¹</p> <p>Coming “Safety Oversight following implementation of SMS”</p> <p>Coming “Risk-based oversight (RBO) / Performance-based oversight (PBO)”</p>	https://www.skybrary.aero/index.php/SafetyManagementInternationalCollaborationGroup_SM_ICG
SMS	Safety Management System – it addresses the service provider or the operator - see An.19 definition	
SPM	Safety Performance Management addressing the level of safety performance	As explained in Chapter 4 of this document
SSP	State Safety Programme – see A19 definition and Article 7 or Regulation (EU) 1139/2018	
SYS Phase II	Systemic inspection system by EASA; Phase II will focus on the SSP and SPAS of the MS – will be based on the ICAO SSPIA PQ	
SSPIA PQ (ICAO)	ICAO Protocol Questions addressing the assessment of an SSP as part of the USOAP activities (Universal Safety Oversight Audit Programme)	Not yet published – under finalization at https://soa.icao.int/CMAUnifyLogin/Index.aspx?ReturnUrl=%2fCMAUnifyLogin%2fStateOptions.aspx

²¹ Will be published soon - please monitor

[https://www.skybrary.aero/index.php/SafetyManagementInternationalCollaborationGroup\(SM_ICG\)#SM_ICG_Products](https://www.skybrary.aero/index.php/SafetyManagementInternationalCollaborationGroup(SM_ICG)#SM_ICG_Products)

Annex 2 – Example of “outcome” and “process” indicators supporting the measurement of the safety performance in the EU framework

As discussed in [Figure 4](#) in Chapter 4.3 of this document, the safety performance indicators and safety performance targets associated with safety objectives can be either outcome oriented or process oriented.

Outcome oriented safety objectives (operational risks) are more often expressed by Tier 1 or Tier 2 indicators or targets (i.e. operational risks see [Figures 3 & 4](#))

Typical examples are:

- High level aspiration or ambition such as “Continuously reduce the number of fatalities or accidents over a period of 5 to 10 years depending on the type of operations”; “reduce the number of GA rotorcraft accidents and serious injuries by 50% over the next 10 years” (see [Annex 3](#)); “reduce the number of incidents related to commercial aviation by 15% over period 2020- 2025 by comparison with period 2015-2020”;
- Ambition for specific operational risks such as
 - airspace infringement - reducing the number of occurrences by xx% over the next 5 years;
 - erroneous parameters at take-off - monitoring the number of reported occurrences, fixing a target with its Stakeholders through an efficient reporting systems associated with a safety promotion campaign;
 - adverse environmental conditions mismanagement such as incorrect use of meteorological radar, lack of upset detection and recovery training...
- Modernize the rotorcraft fleet by reduce the number of rotorcraft more than 30 years old by XX% within 10 years (see [Annex 3](#));

Note: SPIs/SPTs should be always monitored over a sufficient period of time.

Note 8: [EASA Annual Safety Review 2019](#), or upcoming EPAS 2021-2025 through its new Volume 3 propose safety risk portfolios for a significant number of sectors such as aeroplanes, helicopters, balloons, sailplanes, ATM/ANS, aerodromes and ground handling. Sometimes this is further split into the types of operations such as CAT, GA, commercial operations other than CAT (or specialised operations).

Process oriented safety objectives are more often related to actions; typical examples are:

- Develop a safety promotion campaign about “airspace infringement”; target the aero clubs and the GA pilot community through social media; then measure how many pilots have acknowledged etc.
- Organise SMS workshops every two years in every sector with follow-up of safety actions and the ambition to reach out the community at stake; then measure the percentage of stakeholder attendance and the percentage of stakeholders following through on workshop actions etc.

- Speed-up the modernization of the pilot training system by focused oversight actions; quantify when, where, how, what... For instance, monitor how many training programmes within the national territory have now included “Safety Awareness elements” into recurrent training for pilots’ specific dangerous manoeuvres.
- Provide training for all inspectorate staff on safety risk assessment methodologies within the next two years;
- Promote the renewal of fleets and the use of up-to-date technology and equipment, [e.g. with or without financial support to buy 8.33 kHz Radios and upgrade the PBN]; the SPIs could include fleet metrics via analysis of aircraft registers, surveys, etc.
- Reduce high-risk training scenarios in flight such as full rotorcraft autorotation with low-rotor inertia; recommend trainings to be conducted instead on simulators when the risk of training for a particular failure situation is higher than the risk of suffering that failure in operation; encourage the development of new types of simulators to better address operational light and medium helicopters (see [Annex 3](#)); then monitor the implementation of these new trainings on simulators (rate);
- Improve the level of compliance (EI) with ICAO SaRPs for which the SPI would be: reach XX% by 2025;
- Monitor and reduce the staff turnover rate at the CAA by better understanding the causal factors and mitigating them.

Note: Further SSP indicators are proposed in section 8.6.3 of the SMICG “[Guidance for Comprehensive Safety Performance Management in an SSP](#)”

The following high-level EU SPIs and SPTs should be also taken into consideration:

- Those arising from the EU ATM Performance Scheme.
- Those arising from EPAS section 4.2 as depicted below by table 3 here extracted from edition 2020-2024, for example:
 - Tier 1 indicators as captured by tables 1, 2, 3 and 4 in EPAS section 4.2 (Volume I) provide EU baseline data for aviation activities of the State;
 - Tier 2 indicators will cover the priority key operational risk areas at sector level.
Note: Tier 2 provides the number (and where available the rate) of fatal accidents and the ERCS risk level for each sector in the ASR, divided by key risk areas.

Caution: this information for prioritization may distract from the real important issues e.g. focussing on safety barriers and mitigating measures.

Table 3: Tier 1 Indicators for CAT aeroplanes, baseline figures 2011-2014 & 2015-2017

EASA-Member States accident rate		
Time period	Per 10 000 movements	Per 10 000 flight hours
4-year period [2011-2014]	0.044	0.023
2011	0.044	0.024
2012	0.048	0.026
2013	0.034	0.018
2014	0.051	0.026
3-year period [2015-2017]	0.028	not available
2015	0.031	not available
2016	0.023	not available
2017	0.030	not available

EASA-Member States fatal accident rate		
Time period	Per 10 000 movements	Per 10 000 flight hours
4-year period [2011-2014]	0.001	0.0004
2011	0.001	0.001
2012	0	0
2013	0	0
2014	0.002	0.001
3-year period [2015-2017]	0.001	not available
2015	0.002	not available
2016	0.001	not available
2017	0	not available

Accident rate by size of AOC holder (Number of movements)		
AOC holder flying activity over the analysed period	Accident rate per 10 000 movements	
	period [2011-2014]	period [2015-2017]
Band A: Less than 7 100 movements	0.17	not available
Band B: 7 100 - 35 099 movements	0.18	not available
Band C: 35 100 - 101 999 movements	0.06	0.04
Band D: 102 000 - 199 999 movements	0.04	0.03
Band E: More than 199 999 movements	0.03	0.03

Table 3 extracted from EPAS 2020-2024, section 4.2

It is recognized that all safety objectives cannot be expressed by SPIs and SPTs. A typical example is the objective to “foster a positive safety culture” for which the measurement is not easy and may require multiple safety surveys to assess if the safety objective has been achieved. Similarly, safety objectives relating to improved safety promotion may be difficult to measure as some parts of the intended audience may be difficult to reach through safety promotion actions such as safety events or brochures. That said, it may be possible to establish SPI/SPTs in respect of specific safety promotion campaigns (e.g. airspace infringement)”, such as the percentage of aero clubs or GA licensed pilots

within the territories that have been properly targeted, and that, after this campaign, the number of airspace infringements have decreased.

Annex 3 – Example of safety performance to achieve at EU level, with identified safety actions - the EASA rotorcraft safety roadmap (to be adapted at national level)

The [Rotorcraft Safety Roadmap](#) was delivered and endorsed in November 2018. The roadmap was initiated by EASA who tasked a group of external experts to develop, jointly with EASA, a set of ambitious proposals. It is now incorporated in EPAS 2020-2024.

Whereas it was recognised that “zero” accident is the only **acceptable** target from an industry perspective, the team decided that such a target is not realistic; the target of “zero” accidents would only be achievable by having no rotorcraft flights.

Overall safety objective and ambition at Union level:

The roadmap contains proposals of actions to significantly reduce the number of rotorcraft accidents and incidents. The vision of the roadmap is to ‘**achieve significant safety improvement for Rotorcraft with a growing and evolving aviation industry**’.

Recommended sector risk profiles:

- Light rotorcraft, such as, but not limited to, rotorcraft types R22/R44, H125 / AS350 and H135 / EC135 and Bell 206;
- Some sectors are more exposed to high risks than others, such as GA and Offshore sector;
- Small operators (89% of the operators in Europe have a fleet size under 5 helicopters).

Strategic objectives and SPIs:

The following objectives and SPIs are defined to deliver the vision stated above:

— **Improve overall rotorcraft safety by 50 % within the next 10 years**

Most of the accidents can be attributed to operational causes and it is recognised that influencing behaviour in the wider community is a complex process where step changes are difficult to achieve in the short term. However, for accidents caused by technical failures, an ambitious target is set to reduce the number of accidents caused primarily by technical failures by one order of magnitude.

This includes the number of serious injuries to benchmark with 2017 safety records, using the ERCS matrix.

— **Make positive and visible changes to the rotorcraft safety trends within the next 5 years**

The aim of this objective is to drive the implementation of quick wins that are identified and to rapidly progress a number of safety improvements.

The statistics show that the rate of accident has been almost constant for the last 10 years and there is on average one non-fatal rotorcraft accident per week as well as 1.3 fatal accidents per month.

— **Develop performance-based and proportionate solutions that help maintain competitiveness, leadership, and sustainability of the European industry.**

Enablers and actions

Several enablers have been identified; actions are organised in accordance with the following work-streams:

- 01 - Safety Data;
- 02 - Market based solution to incentivise safety;
- 03 - Safety Rating;
- 04 – Financial support for safety improvements;
- 05 - Training Safety;
- 06 - Training Devices and simulators;
- 07 - Continued Aviation Education;
- 08 - Safety Promotion;
- 09 – Simplification;
- 10 - Helicopter Design improvements;
- 11 - Net Safety Benefit;
- 12 - CS Modernisation.

EASA, NAAs and industry should collectively engage to implement the actions for each of the work-streams and deliver the safety improvements.

At national level, a safety analysis should be delivered and reflected in the SSP and SPAS to address this roadmap, including the continuous monitoring of the effective implementation of this roadmap and the associated oversight activities. Corrective actions should be taken if the objectives are not met.

“Improve overall rotorcraft safety by 50 % within the next 10 years” is the strategic level of safety performance to achieve at EU level. But, as it mainly addresses “the light rotorcraft community” and “small operators” and “GA or offshore, operations”, it is agreed that there will be disparity among the EU MS as to which extent it fully applies, considering their risk profiles. SPIs, SPTs and (A)LoSP at national level might be at variance, based on that risk picture.

In fine, the EASA oversight activities will ensure that the efforts developed at national level will achieve the LoSP at Union level as set up in this EU rotorcraft roadmap.

It is recognized that more needs to be done on how to better guide the MS in the implementation of the EU rotorcraft roadmap. Progress will be reported on a regular basis to the Rotorcraft Committee (R.COM) and Member State Advisory Body, such as Air Ops TeB. This was already adjusted during the [Rotorcraft and VTOL symposium 2020](#), due to the COVID-19 impact.

Annex 4 – Continuous improvement: an example of implementing a European level safety objective to State and service provider level safety management

Finnish experience; at first a summary of a national level safety management`s structure and the tools that are in use

EPAS aspirational safety goal is to achieve constant safety improvement within an aviation industry. Safety management is used as a tool for that, or in other words, we are trying to manage safety within the European aviation system - that as a part of the global aviation system. Advanced safety management requires interaction and cooperation among stakeholders, national authorities and EASA. In this interaction, particular emphasis is placed on safety information, risk-based approaches, and faster responses to identified safety threats, and the strengths of the aviation system, which must be understood and safeguarded.

To execute aviation safety management and also, to fulfil ICAO A19 and (EU) 1139/2018 Article 7 and 8 and other related EU requirements for risk and performance based approach, Finland has **published and implemented three systemic tools; the Finnish Aviation Safety Programme FASP, the Finnish Plan for Aviation Safety FPAS (FASP Annex 1) and the Finnish Aviation safety objectives and safety performance targets and indicators (FASP Annex 2)**. All can be found from Traficom`s (CAA Finland) [FASP-web pages](#).

Finnish aviation [safety policy](#), (see *FASP, Chapter 1.1*) is describing the high level goals and national commitment to aviation safety.

Strategic safety objectives and their related SPIs and SPTs – AloSP:

Strategic safety objectives (see *FASP, chapter 1.2*) and their related SPIs and SPTs (*described in FASP Annex 2*) are defined for monitoring the level of safety and the level of safety performance in Finnish aviation system. With them, Finland **has specified the acceptable level of safety performance in Finnish aviation system, in other words, defining a status which authorities and industry must work to achieve. They are also specified to get answers to questions:**

1. What is the level of safety and the level of safety performance in Finnish Aviation?
2. Are we reaching / how far we are from our safety objectives that we have specified and agreed on in different areas and sectors of aviation?
3. Are the actions that we have specified and agreed to execute to mitigate risks and to strengthen the safety barriers working in the way we planned?

The answers are used for a national level safety management`s decision making purposes for example to launch or adjust actions. Safety objectives are regularly reviewed to assess the need for update also using the help of the FASP process described later in this text; safety objectives should reflect also bigger changes in aviation industry or its operational environment.

Current safety objectives specified for Finnish aviation are:

- The safety of Finnish aviation remains at a high level. There are no aviation accidents where the reasons are caused by the Finnish aviation system.
- Continuous development of the safety performance of Finnish aviation operators in all aviation domains.

- Key threats of Finnish aviation have been identified and they are addressed in the organisations' safety management.
- Risk management in Finnish aviation is systematic, effective and in constant development.
- Finland has procedures and operating models for the management of cyber threats in aviation.
- Unmanned aviation is safely integrated about the Finnish aviation system and third parties. Unmanned aviation operators know the requirements related to their operations and are responsible for the safety of their activities. Authorities will intervene in infringing activities.
- The runway safety of Finnish aviation remains at a high level.
- Reactivity: we react actively to the deficiencies identified and implement corrective measures in the spirit of continuous improvement.
- The safety standards and procedures observed in Finnish aviation comply with ICAO standards and EU requirements.
- Safety culture in Finnish aviation is at a good level. Good safety culture is maintained and developed.

A national safety risk management process called “FASP-process”:

With the FASP-process Finland is executing a national level safety risk management with aviation industry (*described in FASP, Chapter 2.6*). The process includes safety risk workshops for each aviation sector/domain and a quarterly decision-making safety risk panel review for safety management's decision making purposes. Within that process, risk pictures / portfolios are created and maintained for fourteen different aviation domains and one for the Authority's own operations. They include threat identification, risk assessment results with main risks and fostered strengths and specified and agreed actions and their follow up.

The FASP process and the risk portfolio tool are based on the lessons learned from [the two years research project](#) in 2013-2014. When creating and maintaining risk pictures and executing proactive risk assessments, all the relevant and available safety information is used. That includes analysed occurrence information, information from oversight, studies, and other information from national and international sources and, last but not least, the deep perception and knowhow that the participants have through their work in CAA or industry. The risk portfolio forms a cumulative information database where all the decisions and the information they are based on are traceable and available for later use.

Finnish experience: an example of identified safety issues processed in national level safety management

Safety issue - safety management implementation:

EPAS includes strategic priorities on systemic safety. One of them is to improve safety by improving safety management. EPAS actions directly for that priority and targeted for member states include SSP and SPAS implementation (MST.0001 and MST.0028), promotion of SMS (MST.002) and the use

of SMS assessment tool as part of risk- and performance-based oversight (MST.0026). This is how the latter two of those have been dealt with in Finnish aviation safety management:

EPAS actions for member states, including those related to safety management aforementioned are included in [Finnish Plan for Aviation Safety FPAS](#) with a state interpretation of a national level focus area. That interpretation is done using the help of the previously mentioned FASP-process and a process for performance and risk-based operations management. The latter process is for safety assurance purposes, is used for oversight and includes the use of SMS assessment tool and a tool for assessing and maintaining organization's performance profile (see *FASP, chapter 3.2*). To improve safety management capabilities and performance in both CAA and industry, the following actions are defined in FPAS 2021-2025 (below the headlines and some background of the actions, see the details of the actions from FPAS):

- *SYS.005.1, Safety promotion in relation to safety management systems (SMS)* (EPAS reference MST.0002)
 - includes how we execute and further develop SMS related safety promotion
- *SYS.007.1, Assessment of safety management system (SMS) performance* (EPAS-reference MST.0026)
 - includes how we further develop SMS performance assessment in different sectors
- *SYS.007.2, Management of change (MoC) as part of safety management* (No EPAS reference: The action was defined based on nationally identified needs.)
 - In State safety risk portfolios risk scenarios for MoC was one of the systemic issues that was assessed. Results showed that in several aviation sectors / domains, there was a need to improve the effectiveness of management of change (MoC) as part of SMS. The theme also has come up in organization SMS assessments. The national level action was at first brought to FPAS 2018-2022, and as normal with systemic issue improvements, completing the action takes several years and improvement will occur step by step. Content of the action has been modified yearly according to monitoring of results. That monitoring includes the assessment whether the organization's SMS performance related to MoC has improved enough in different sectors.
 - MoC is a useful area to improve; it is strongly linked to organizations' risk management processes, top management decisions and on the other hand to changes in operational environment of which COVID-19 pandemic is the ultimate example. As part of oversight activities, Traficom assesses the performance of stakeholders' SMS MoC functions and internal audits. The assessment also takes into consideration how the organisation has identified and processed the changes in the operating environment and the organisation's operations caused by the COVID-19 pandemic during the pandemic itself and the recovery from it.

National level Safety objective and SPI and SPT related to SMS performance in FASP Annex 2 are below. They specify the acceptable level of safety related to SMS performance in Finnish aviation system.

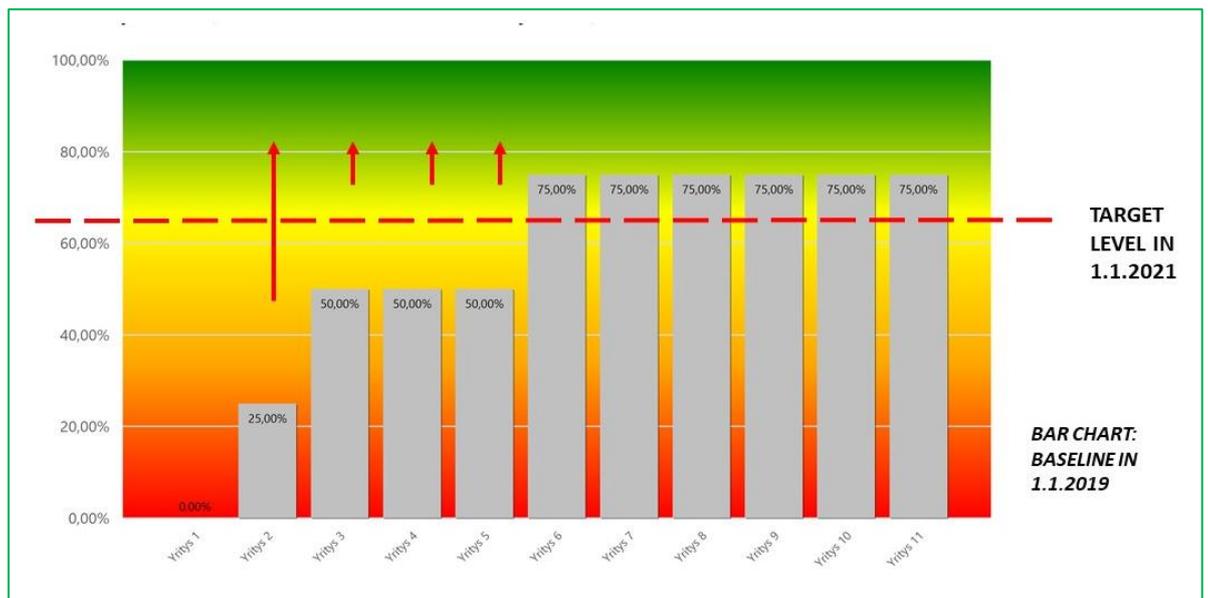
- **State level safety objective:** "*Continuous development of the safety performance of Finnish aviation operators in all aviation sectors or domains*".

- **State level SPI (SSP-SPI-1):** “Improvement of safety performance in the Finnish aviation sectors / domains and particularly in the evaluation areas of safety management defined for each sector or domain (e.g. subcontracting, risk management, management of change MoC).”

State level SPT for SSP-SPI-1: “Continuous development (defined). Improvement of performance in the evaluation areas selected for each aviation sector or domain; the evaluated organisations shall at minimum reach the defined control level by the year 2021.

Background to the target:

In the target, performance is approached from the perspective of the entire sector, for example all CAT OPS FW operators as a whole. For an individual operator, key areas to be improved may be partly or completely different from those selected for SSP-SPI-1.”



Picture above: objective is that all organisations have improved their MoC performance to or above targeted level.

Picture above explains the generic idea of how national level SPI and its related SPT has been specified to SMS performance related to MoC in Finland. The bar chart is showing the baseline in the beginning of 2019 in one aviation sector / domain (generic, not defining the actual situation in any sector). MoC performance is assessed as part of the SMS performance assessment using SMS assessment tool and the results are implemented into organization`s performance profiling tool (see FPAS action SYS.007.1 and FASP Chapter 3.2). From that profiling tool, different charts can be generated for individual organisations but also for different sectors / domains or for whole aviation industry. The CAA and organisations are working to achieve the targeted level by the defined timeline.

Finally, some practical examples what we have done to support state level implementation of SMS performance improvement includes MoC-issues:

- Safety promotion and guidance to the organisations:
 - MoC related systemic threats and risk scenarios have been discussed and processed in risk workshops (for example in ATO, CAT OPS, ANS, ADR and helicopter)

- operations sectors / domains) together with the industry during last 3 years. Results have been implemented in state level risk pictures as update and have been given to organisations for further use from that particular organization point of view.
- FASP issues implementation in oversight – guidance material for inspectors has been developed during 2019. After FPAS 2021-2025 publication in March 2021, FPAS 2021-2025 information bulletins for aviation organisations for different sectors / domains and of different topics have been published in FASP web pages to FPAS implementation.
 - Oversight
 - SMS performance in part of the oversight and is assessed during audits. MoC issues are one of the topics the Authority has been focusing on, including how the organisations have addressed FPAS action items and state level SPIs and SPTs for that particular sector.

As summary:

Many of the safety objectives for Finnish aviation system include objectives for the performance of safety management or for the performance of different areas of safety management like for example safety risk management. Concrete actions for safety plan FPAS are specified within national safety risk management process (see FASP chapter 2.6) and is utilizing the information from risk and performance-based safety assurance processes (see FASP chapter 3). Those processes include action items follow up according to information from monitoring their related national level SPIs, from re-assessing related risk scenarios after reasonable duration of action and by assessing organisations SMS performance for improvement. The main question goes back to the beginning:

1. What is the level of safety and the level of safety performance in Finnish Aviation?
2. Are we reaching / how far we are from our safety objectives that we have specified and agreed on in different areas and sectors of aviation?
3. Are the actions that we have specified and agreed to execute to mitigate risks and to strengthen the safety barriers working in the way we planned?

Annex 5 – Rapid adaptation of the safety risk management and safety assurance in a State to a dynamic situation – the COVID-19 case

The COVID-19 pandemic has been an unprecedented crisis for aviation, European traffic collapsing from 11 million flights in 2019 to less than 5 million flight in 2020²². Revenues evaporated overnight. Dozens of thousands of jobs have been lost. Organisations and services providers went or will go bankruptcy. Accountable managers had to take drastic financial measures to immediately reduce their costs or to re-orientate their activities (e.g. rapid growth of cargo operations, sanitary evacuations etc.). Pilots, air traffic controllers and maintenance engineers struggle to keep their competence up to date.

States and organisations had to review and update the existing risk portfolios to properly consider the newly identified, emerging risks, such as the management of health- and hygiene-related risks, new operational procedures, currency of crews, validity of existing risk assessments and readiness for return to normal operations after lengthy periods of inactivity etc.

EASA published a first [review of the aviation safety issues arising from the COVID-19 pandemic](#)²³; this document is continuously evolving insofar as reports, events and intelligence information are collected:

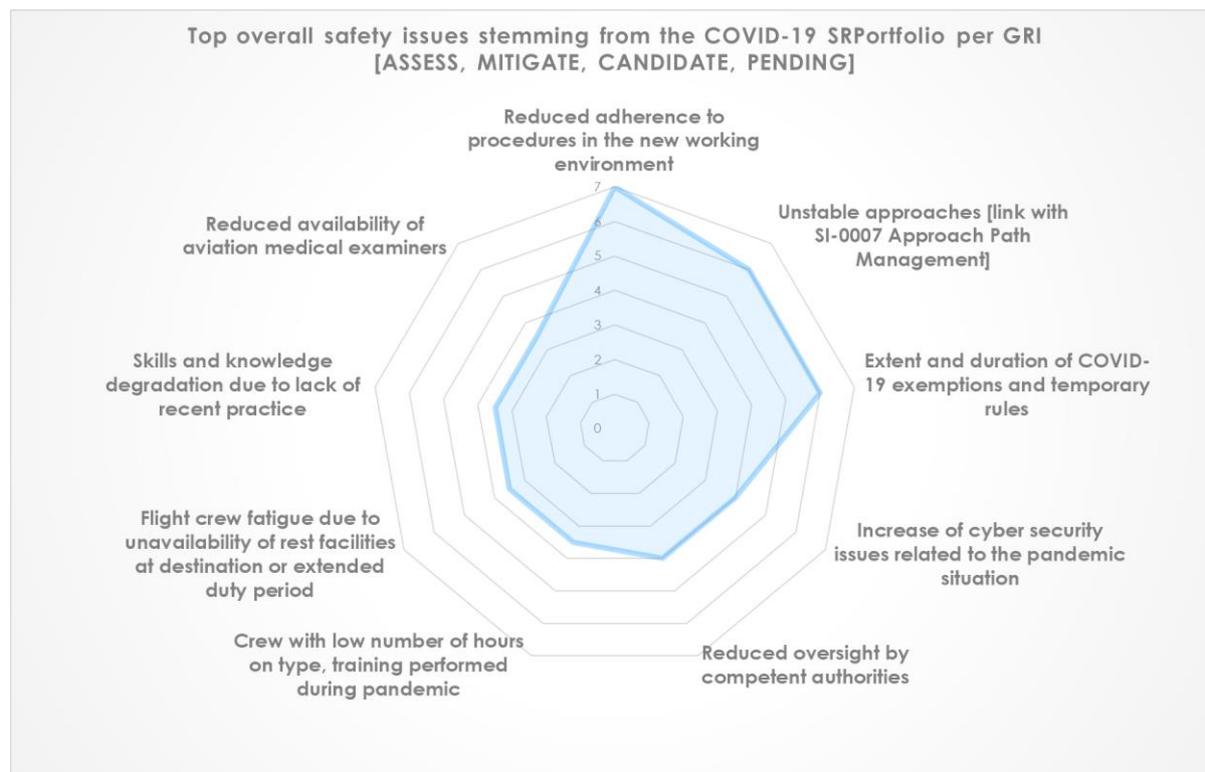


Figure 5 COVID-19 safety issues - situation as of February 2021

Although the SSP is rather a stable document addressing the governing processes to inform, maintain or improve safety at State's level, the SPAS²⁴, by nature, is the dynamic document, which should be

²² Source: <https://www.eurocontrol.int/publication/eurocontrol-five-year-forecast-2020-2024>

²³ https://www.easa.europa.eu/sites/default/files/dfu/review_of_aviation_safety_issues_from_covid-19_final_0.pdf

²⁴ See article 8 of Regulation (EU) 1139/2028 at <https://www.easa.europa.eu/regulations>

annually updated. This document should capture the latest safety objectives to be met; the new actions to be taken; the new activities to manage in order to cope with the pandemic; and, finally, the safety performance to be achieved during this sanitary crisis.

One element is the planning and the nature of the risk-based and performance-based oversight activities, which should reflect the latest safety issues to mitigate, as depicted above in the schematic. For instance, more focus on the use of flight data monitoring (FDM²⁵) should be exercised to address the combined issues of erosion of competence, exemptions from crew training and checking requirements; distance learning and virtual classroom instruction instead of training in simulators...and finally mitigate the increased risk of unstabilised approaches. COVID-19 health restrictions may also limit on-site audit oversight activities in many States, which may be overcome by use of remote oversight, including desktop audits and virtual inspections; or use of webinar to raise awareness on these emerging risks.

Note: further information are available in the [EASA RNO resources](#)²⁶.

²⁵ <https://www.easa.europa.eu/domains/safety-management>

²⁶ <https://www.easa.europa.eu/easa-covid-19-resources>