SASP 2022-2026

Federal Office of Civil Aviation FOCA

Swiss Aviation Safety Plan

Schweizerische Eidgenossenschaft
Confédération suisse
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Bundesamt für Zivilluftfahrt BAZL
Office fédéral de l'aviation civile OFAC
Ufficio federale dell'aviazione civile UFAC
Federal Office of Civil Aviation FOCA

Amendment record		
Issue	Date	Change Summary
Version 1.0	January 2022	Initial version SASP 2022 - 2026

Publication Details

Published by

Federal Office of Civil Aviation (FOCA)
Safety Risk Management, srm@bazl.admin.ch
3003 Bern

Source

In electronic form: www.bazl.admin.ch

February 2022

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List of Abbreviations

ANS	Air Navigation Service Domain
ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
ATM	Air Traffic Management
ATO	Approved Training Organisations
AVISTRAT	Swiss Aviation Airspace and Infrastructure Strategy
CAT	Commercial Air Transport
CE	Critical Elements
CFIT	Controlled Flight into Terrain
EAPPRI	European Action Plan for the Prevention of Runway Incursions
EASA	European Aviation Safety Agency
EPAS	European Action Plan for Aviation Safety
ERCS	European Risk Classification Scheme
EU	Europe
FDM	Flight Data Monitoring
FOCA	Federal Office of Civil Aviation
FTL	Flight Time Limits
GA	General Aviation
GAPPRE	Global Action Plan for the Prevention of Runway Excursions
GASP	Global Aviation Safety Plan
HRCs	High Risk Categories
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
ISMS	Information Security Management System
LFN	Low Flight Network
LOC-I	Loss of Control Inflight
MAC	Mid Air Collision
MS	Member State
MST	Member State Task
RE	Runway Excursion
RI	Runway Incursion
RMZ	Radio Mandatory Zone
RPAS	Remotely Piloted Aircraft System
SASP	Swiss Aviation Safety Plan
SMICG	Safety Management International Collaboration Group
SMS	Safety Management System
SORA	Specific Operations Risk Assessment
SPI	Safety Performance Indicator
SPT	Safety Promotion Task
SPT	Safety Performance Target
SSP	State Safety Program
UAS	Unmanned aircraft system
VFR	Visual Flight Rules

Foreword by the Director General

Switzerland is committed to further improving aviation safety and to the corresponding resourcing of activities to this end. The purpose of this national aviation safety plan is to continually reduce fatalities, and the risk thereof, by developing and adopting a national aviation safety strategy. A safe aviation system contributes to the further economic development of Switzerland and its industries. The Swiss Aviation Safety Plan (SASP) promotes the effective implementation of Switzerland's safety oversight system, a risk-based approach to managing safety and a coordinated approach to collaborations between Switzerland and other states, regions and industries. All stakeholders are urged to support and help implement the SASP as the strategy for the continuous further improvement of aviation safety.

Christian Hegner, Director General
Federal Office of Civil Aviation, 01. February 2022

1 The Swiss Aviation Safety Plan (SASP)

The Swiss Aviation Safety Plan (SASP) is the master planning document containing Switzerland's strategic direction for the management of aviation safety. It outlines the key aviation safety issues that are current in Switzerland and defines state actions to improve safety performance in connection therewith. The SASP covers a five-year period (currently 2022-2026), and is updated regularly in alignment with the EASA European Plan for Aviation Safety (EPAS), the ICAO Global Aviation Safety Plan (GASP) and the European Regional Aviation Safety Plan (EUR RASP).

1.1 The SASP and the Swiss State Safety Programme (SSP)

The Swiss State Safety Programme (SSP) specifies and describes the strategy of the Swiss civil aviation safety management system. Having an effective SSP helps to identify and mitigate national operational safety risks. The SASP is a supporting document of the SSP, and outlines the implementation of the strategy proposed and how the Swiss Federal Office of Civil Aviation (FOCA) intends to meet its corresponding responsibilities.

The SSP was created on the basis of the critical elements (CEs) of the safety oversight system. ICAO Annex 19 refers to the SSP as "no longer a framework, but rather a programme to meet the State's safety management responsibilities, which includes safety oversight" [1].

The current version of the SSP (full version in German, executive summary in English) is available online on the FOCA's website[2].

On the basis of the SSP, the FOCA has issued a Safety Policy which confirms the FOCA's task of creating the framework conditions for safe and sustainable aviation in Switzerland[3].

1.2 Safety issues and goals

The SASP addresses systemic, operational, emerging and (Switzerland-)Specific safety issues. The main goal of the FOCA is to protect Swiss residents and air travellers to and from Switzerland from aviation-related incidents and accidents.

On a systemic level the SASP addresses the following topics:

- safety management system
- safety culture.

The following operational issues are being addressed:

- mid-air collision (MAC)
- aircraft upset (LOC-I)
- terrain collision (CFIT)
- runway excursion (RE)
- runway incursion (RI)
- ground safety (including ground collision).

The (Switzerland-)Specific issues addressed are:

- low flight network (LFN)
- IFR without air traffic control.

The emerging issues are:

- unmanned aircraft systems (UASs)
- aviation cyber security.

[1] ICAO, Safety Management Manual, Fourth Edition - 2017

[2] https://www.bazl.admin.ch/dam/bazl/en/dokumente/Fachleute/Regulationen_und_Grundlagen/state-safety-program-summary.pdf.download.pdf/Executive%20Summary%20SSP_EN_e.pdf

[3] https://www.bazl.admin.ch/dam/bazl/en/dokumente/Fachleute/Regulationen_und_Grundlagen/sicherheitspolitikdesbazl.pdf.download.pdf/sicherheitspolitikdesbazl.pdf

To address all the above issues and enhance aviation safety at the national level, the Swiss Aviation Safety Plan provides a number of safety performance indicators to monitor the safety issues, and specifies corresponding actions.

1.3 SASP and EPAS

The purpose of the EASA European Plan for Aviation Safety (EPAS) is to ensure that the principles of safety management are applied within the European aviation community to continually improve safety performance. EPAS is driven by Regulation (EU) 2018/1139, which is known as the EASA Basic Regulation, to ensure the due and full application of ICAO safety management principles that are fundamental to the continuous improvement of civil aviation safety[4].

EPAS serves as the basis for the SASP, and contains actions that have subsequently been adopted in the SASP. Switzerland fulfils its member state duties here by updating a yearly EPAS questionnaire.

1.4 Operational context

There are 13 certified aerodromes[5] in Switzerland including international aerodromes and 24 heliports. Swiss airspace is classified into Classes C, D, E and G. There were an average of 1,406,427 movements per year over the 2015 to 2019 period [6] (2020 has been excluded in view of the impact of the COVID-19 pandemic on global aviation). There are currently 41 air operator certificates (AOCs) issued by the FOCA. Of these AOC holders, 18 conduct international commercial air transport operations with complex airplanes [7] and 24 are helicopter operators. The operational challenges in Switzerland include the complexity of Swiss airspace and the country's mountainous terrain

1.5 Content and structure

The SASP comprises 5 chapters and 2 annexes.

Chapter 1: Overview of the SASP and its integration into the safety environment

Chapters 2-5: Safety issues (systemic, operational, emerging, Switzerland-specific)

Annex A: State actions related to the objectives of each key risk area outlined in chapters 2-5

1.6 Development, implementation and monitoring

Responsibility for developing, implementing and monitoring the SASP rests with the FOCA.

The FOCA's Safety and Risk Management (SRM) division coordinates with the Safety Officers of all three of its Safety divisions to update and finalize the SASP document. The process for developing, implementing and monitoring the SASP is currently under review and will be updated in 2022. The new process will be used for the next version of the SASP (SASP 2023-2027).

The FOCA initiated its Strategic Portfolio Management (SPM) project in 2019 to ensure the assignment of sufficient staff to safety-relevant tasks. SPM is an ongoing and evolving project.

To ensure its continuous monitoring, the SASP is supported by the FOCA's Annual Safety Report (ASR), which includes dedicated safety risk portfolios that focus on the various operational domains in Switzerland. The ASR also monitors the implementation of the associated mitigation actions including, where appropriate, related safety performance indicators (SPIs).

[4] The difference between EPAS, SPAS and SMS | EASA (europa.eu)

[5] Eight aerodromes are ICAO-certified and five aerodromes are EASA-certified.

[6] Schweizerische Zivilluftfahrtstatistik 2020 - 4. Bewegungen - 1950-2020 | Table | Federal Statistical Office (admin.ch)

[7] list_of_aoc_holders_with_complex_airplanes.pdf

2 Systemic safety issues

Systemic safety issues are system-wide problems that affect aviation as a whole and play a role in accidents and incidents. As they underlie operational issues, improvements in these can have an implicit effect on operational causes[8].

This chapter covers the topics of **Safety management system** (Subchapter 2.1) and **Safety culture** (Subchapter 2.2). These are mainly based on regulatory requirements such as ICAO Annex 19 (monitoring of the industry's SMSs) and Reporting Regulation EU 376/2014 (requiring the adoption of a just culture and the implementation of its reporting requirements).

The subchapters each comprise the following sections:

Applicability, which outlines who is involved or affected.

Context, which describes the international, European and national contexts of the issue.

Objectives, which specifies what we want to achieve within this key area.

Safety performance indicators, which outlines how the safety issue is being monitored.

Actions, which offers an overview of the associated actions, which are specified in Annex A.

Actions related to systemic safety issues, which are not associated with a safety issue listed can be found here: A.1.1 Miscellaneous.

[8] EPAS 2016-2020, EASA

2.1 Safety management system

A safety management system (SMS) is defined as a systematic approach to managing safety, including the necessary organizational structure, accountabilities, policies and procedures[9].

Applicability

- All FOCA-supervised Swiss companies.

Context

To ensure safe operations, a systematic approach to safety is essential. ICAO Annex 19 Safety Management, which has been implemented by EASA at the European level for all aviation domains, has been developed to provide guidance on managing safety at the industry as well as the state level. ICAO Annex 19 includes the safety management system (SMS) framework and mandates the implementation of an SMS for certain organisations. Over the past few years the FOCA has compiled various documents on this topic and distributed these industrywide. The FOCA also maintains its own safety management system for its own flight services.

Objectives

The FOCA is responsible for monitoring the status of compliance with SMS requirements and the performance of the industry in SMS terms. As the entities concerned have now established safety management systems, the main focus here now lies on the effective oversight thereof.

This results in the following objectives:

- To monitor the maintenance of safety management systems by the entities required to provide these under ICAO Annex 19
- To monitor the effectiveness of the safety management systems maintained
- To ensure that the FOCA provides adequate personnel resources and training to achieve the above objectives.

Safety Performance Indicators

Measurement of SMS maturity level in accordance with R/PBO requirements and SPM Cluster I.

Actions	A.1.2 Safety management system
Open/in progress:	FOCA.01, FOCA.02.
Closed:	MST.0002, MST.0023.

[9] Safety Management Systems (SMS) and Cabin Safety (icao.int) / ICAO Annex 19 Definitions

2.2 Safety culture

An umbrella term that encompasses just culture, reporting culture and learning culture.

Applicability

- All organisations and persons within the scope of Regulation (EU) 376/2014.

Context

To assess, maintain and further improve the safety of the aviation system, it is crucial that industry as well as individuals report safety-relevant information. The more data are available, the better weaknesses can be identified and addressed. A well-functioning safety culture consists of:

Just culture: voluntarily reporting incidents to help make the system safer, in the knowledge that such incidents will not result in punishment if the error was unintentional.

Reporting culture: maintaining a well-functioning incident reporting system within which organisations and individuals have the confidence to report safety concerns without fear of blame.

Learning culture: the entire industry can learn from reported incidents and thus achieve a better safety level.

Regulation (EU) 376/2014, which is directly applicable to Switzerland, is concerned with improving aviation safety by ensuring that relevant safety information relating to civil aviation is reported, collected, stored, protected, exchanged, disseminated and analysed.

The 'just culture' concept is currently the subject of sizeable debate in Switzerland, following multiple court rulings against air traffic controllers. Various efforts are being made to further improve the framework conditions for a just culture in Switzerland, particularly at the legislative level. The FOCA is actively working on an industry-led just culture platform, and is also striving to improve the legal basis in this regard via the Swiss Federal Department of Justice.

Objectives

To ensure that reports from aviation professionals remain at a high level. The FOCA aims to provide an environment that supports the balance between full impunity and blame culture. Individuals should feel safe to report safety-relevant information and thereby contribute to a robust system.

To achieve these goals, the following objectives have been set:

- To ensure the effective adoption of Regulation (EU) 376/2014 in Switzerland
- To encourage the reporting of safety-relevant data
- To ensure the adoption of a just culture throughout the industry
- To measure the effectiveness of a just culture (where already implemented) in the industry
- To ensure the consistent application of just culture principles throughout the FOCA.

Safety Performance Indicators

There are no safety performance indicators set for this topic. In the event of non-compliance with just culture principles, the FOCA will address the issue directly with the organization concerned.

Actions A.1.3 Safety culture

Open/in progress:	FOCA.03, MST.0027, MST.0040.
Closed:	FOCA.04, MST.0025.

3 Operational safety issues

Operational safety issues a*re closely related to the events reported during operations. The relationship between this type of issue and the final outcomes or end-states can be supported by data [10].*

This chapter outlines the operational safety issues that have been identified by the FOCA. The FOCA continuously monitors its safety risk areas, which were developed on the basis of ICAO's high-risk categories of occurrences (HRCs) and EASA's key risk areas.

In the present version of the SASP, the following operational safety issues are addressed:

- airborne collision (MAC)
- aircraft upset (LOC-I)
- terrain collision (CFIT)
- runway incursion (RI)
- runway excursion (RE)
- ground safety, including ground collision.

This chapter is subdivided into the two subchapters 'Aeroplanes' (3.1) and 'Helicopters' (3.2). The following table provides an overview of which operational safety issues are addressed in which sub-chapter:

	Aeroplanes: commercial aviation	Aeroplanes: general aviation	Helicopters: commercial and general aviation
Airborne collision (MAC)	3.1.1		3.2.1
Aircraft upset (LOC-I)	3.1.2.1	3.1.2.2	3.2.2
Terrain collision (CFIT)	3.1.3.1	3.1.3.2	3.2.3
Runway incursion (RI)	3.1.5		-
Runway excursion (RE)	-	3.1.6	-
Ground safety, including ground collision	3.1.4		-

Each issue addressed comprises the following sections:

Applicability, which outlines who is involved or affected:
- commercial aviation (aeroplanes, balloons, helicopters)
- general aviation (aeroplanes, balloons, sailplanes, helicopters)
- air navigation services (ANS)
- approved training organisations
- aerodromes
- maintenance, production and design organisations.

Context, which describes the international, European and national contexts of the issue.

Focus, which describes Switzerland's focus within this key area over the duration of this plan.

Contributing factors, which details factors that have a contributory impact on the issue.

Objectives, which specifies what we want to achieve within this key area (based on our context and focus).

[10] EPAS 2012-2015, EASA

Safety performance indicators (SPIs), which outlines how the safety issue is monitored and how improvements therein are measured. So far only the title of the SPI is named here, as these are still being developed (in the normalization and determination of targets). See action FOCA.05 listed in Annex A (A.2.1 Miscellaneous).

Actions, which provides an overview of the associated actions specified in Annex A.

Actions related to operational safety issues, which are not associated with a safety issue listed can be found here: A.2.1 Miscellaneous.

3.1 Operational safety issues: aeroplanes

3.1.1 Airborne collision (MAC)

This includes collisions, airproxes and occurrences that can lead to an airborne collision, as well as resolution advisories from collision warning systems. Any type of airborne conflict is considered, regardless of aircraft type and airspace (excluding RPAS, birds and wildlife).

Applicability

- Commercial Aviation (Aeroplane, Balloon)
- General Aviation (Aeroplane, Balloon, Sailplane)
- Air Navigation Services

Context

EASA analyses have identified airborne collision as a Priority 1 key risk area in aeroplanes' commercial flight operations. Airborne collision is thus considered to pose a higher risk than runway excursions (KRA Priority 2) or aircraft upset (KRA Priority 3)[11].

One of the factors identified here at the European level is that ACAS RAs are not being followed to resolve the conflict and avoid a possible mid-air collision. Analyses of incident reports have not shown this to be a problem in Switzerland, however.

EASA is further committed to ensuring the interoperability of different iConspicuity[12] devices, to improve the visibility of non-certified traffic warning systems.

Focus

- Focus 1: separation of IFR and VFR flights with one or more uncontrolled airspace participants. This includes a currently ineffective separation of IFR and VFR flights in airspace classes where one or more traffic types may be uncontrolled (i.e. Classes D, E and G), which may result in airborne conflicts and collisions.
- Focus 2: improving airspace knowledge and situational awareness in Class D, E, and G airspace for all parties involved.

Contributing Factors

- Factor 1: communication errors between pilot and ATC
- Factor 2: ATC clearance and navigation error by pilot
- Factor 3: pilot deviation from air traffic management (ATM) procedures
- Factor 4: inadequate flight planning and preparation by flight crew
- Factor 5: airspace infringements.

[11] EASA ASR 2021

[12] *i*Conspicuity* (or inflight electronic conspicuity plus) is the inflight capability to transmit the position of an aircraft and/or to receive, process and display the positions of other aircraft in real time with the objective of enhancing pilots' situational awareness about surrounding traffic. It is an umbrella term for a range of technologies and solutions, airborne and on the ground, that can help airspace users and other stakeholders to be more aware of other aircraft in their vicinity or in a given airspace.

Objectives

- Objective 1: As it is not possible to fully resolve the issue of mixed IFR/VFR traffic within FIR Switzerland, 'hotspots' which hold particular potential for airborne collisions owing to mixed IFR/VFR traffic should be identified and risk-assessed. On the basis of this risk assessment and a subsequent risk mitigation assessment, possible mitigating actions should be implemented to reduce the numbers of situations that could develop into an airborne collision.
- Objective 2: Improve flight crew discipline in the VFR field. Airspace infringements are not a 'minor offence'.

Safety Performance Indicators

- Number of airborne conflicts and collisions (without RPAS)
- Airborne conflicts with military aircraft involved
- Airborne conflicts between IFR and VFR traffic
- Communication errors between pilots and ATC (Factor 1)
- ATC clearance and navigation errors by pilots (Factor 2)
- Pilots' deviations from ATM procedures (Factor 3)
- Inadequate flight planning and preparation by the flight crew (Factor 4).

Actions A.2.2 Airborne collision

Open/in progress:	FOCA.06, FOCA.07, FOCA.08, MST.0038.
Closed:	FOCA.30.

3.1.2 Aircraft upset (LOC-I)

An aircraft upset is an undesired aircraft state which is characterized by unintentional divergences from parameters normally experienced during operations and which might ultimately lead to an uncontrolled impact with terrain[13].

This chapter is subdivided into Commercial aviation (3.1.2.1) and General aviation (3.1.2.2).

3.1.2.1 Aircraft upset: commercial aviation

Applicability

- Commercial aviation (aeroplanes)
- Air navigation services
- Aerodromes
- Maintenance, production and design organisations.

Context

LOC-I has been identified by ICAO as a top risk in the 2020-2022 edition of its Global Aviation Safety Plan. These accidents often have catastrophic results with very few (if any) survivors. Many of their contributing factors can be categorized as aeroplane systems-induced, environmentally induced, pilot/human-induced or any combination thereof. Of the three, pilot-induced factors are the most frequently identified cause of LOC-I accidents.

EASA identifies aircraft upset or loss of control as a key risk area ranking third-highest in terms of its cumulative risk score (see ASR 2021) with regard to fatal accidents in CAT operations with aeroplanes. This includes all occurrences involving an actual or potential loss of control inflight, which includes situations where unintended deviations from the flight path have occurred. It covers only occurrences during the airborne phase of flight, which may also occur as a result of a deliberate manoeuvre. It further includes occurrences involving configuring the aircraft (e.g. flaps, slats, on-board systems etc.), the handling of technical failures and inflight icing.

For Switzerland, the commercial air transport aeroplane accidents of Halifax (1998) and Nassenwil (2000) and the recent Ju-Air accident in 2018 are examples from this category.

The majority of such incidents and accidents have one of the following main contributing factors: deviations from inflight parameters such as airspeed or horizontal and/or vertical flight path, or incorrect power or weight & balance calculations. Degraded or loss of aircraft power is a technical contributing factor.

Focus

LOC-I owing to failure or degraded monitoring of inflight parameters and performance:

- Deviation from vital inflight parameters
- Wrong aircraft configurations.

Contributing factors

- Handling of technical failures
- Aircraft configurations
- Crew resource management
- Monitoring of flight parameters and automation modes
- Approach path management
- Entry of aircraft performance data

[13] EPAS 2021-2025, EASA

- Flight planning and preparation
- Fire and smoke effects
- Adverse convective weather (turbulence, hail, lightning, ice)
- Aircraft maintenance.

Objectives

- To reduce the number of exceedances of inflight parameters
- To reduce the number of degraded performance incidents.

Safety performance indicators

- Flight parameter exceedances (deviations from intended airspeed, pitch, bank, roll)
- Stall warnings / stick shaker events.

Actions A.2.3 Aircraft upset

Open/in progress: MST.0003.

3.1.2.2 Aircraft upset: general aviation

Applicability

- General aviation (aeroplanes, sailplanes)
- Approved training organisations
- Aerodromes
- Maintenance, production and design organisations.

Context

EASA analyses of general aviation sailplane operations have identified that the "attributed risk of occurrences involving a stall or a spin and resulting in a fatality or serious injury is quite high". In general aviation aeroplane operations, aircraft upset (particularly owing to a safety issue stall/spin) is a Priority 1 key risk area[14].

Strong contributing factors here are: flight planning and preparation including mass and balance calculations and weather/route planning, inflight icing, flying in mountainous areas, inadvertent flight into IMC, the experience, training and competence of individuals, inflight decision-making and planning, inappropriate control input, turbulence etc.

Within Switzerland, accidents in the general aviation sector owing to LOC-I occur predominantly in mountainous areas. The precursors to such LOC-I accidents are mainly deviations from flight parameters owing to either human performance or the loss or reduction of engine power or the contributing factors mentioned above.

Focus

For LOC-I owing to exceedance or degraded monitoring of inflight parameters:

- Deviation from vital inflight parameters.

For LOC-I owing to failure of or degraded performance:

- Aircraft experiencing technical failures leading to degraded power or loss of control.

Contributing factors

- Inadvertent flight into IMC
- Experience, training and competence of individuals
- Pre-flight planning and preparation
- Inflight decision-making and planning
- Handling of technical failures
- Engine system reliability (propulsion and/or fuel system malfunction).

Objectives

- To reduce the number of degraded-performance incidents
- To reduce the number of loss-of-power incidents.

Safety performance indicators

- Incorrect aircraft performance data
- Flight parameter exceedances
- Engine system reliability.

[14] EASA Annual Safety Report 2021

Actions	A.2.3 Aircraft upset
Open/in progress:	FOCA.09, FOCA.10.

3.1.3 Terrain collision (CFIT)

A terrain collision is an ***occurrence in which an airborne aircraft collides with terrain without any indication that the flight crew were unable to control the aircraft prior to impact. This includes instances in which the flight crew are affected by visual illusions or a degraded visual environment[15].***

This chapter is subdivided into Commercial aviation (3.1.3.1) and General aviation (3.1.3.2).

3.1.3.1 Terrain collision: commercial aviation

Applicability

- Commercial aviation (aeroplanes)
- Air navigation services.

Context

CFIT is an inflight collision with elevated or level terrain, water or an obstacle without indication of loss of control, and has been identified by ICAO as a top risk in aviation. Accidents categorized as CFIT are events in which an aircraft is flown into terrain in a controlled manner, regardless of the crew's situational awareness. CFIT accidents often have catastrophic results when they occur, with very few (if any) survivors. The requirement for aircraft to be equipped with (enhanced) ground proximity warning systems has significantly reduced the numbers of CFIT accidents.

The accidents in Weiach (1990) and Bassersdorf (2001) were the latest accidents in this category in Switzerland. The on-board installation of (enhanced) ground proximity warning systems has had a positive impact, and has reduced the numbers of such CFIT accidents to a very low level. But the issue is still monitored continuously via the safety performance indicators below.

Focus

- Arrival or departure:
- Terrain separation deteriorating below normal requirements
- Non-precision approach (especially in instrument meteorological conditions [IMC] or at night):
- Terrain separation deteriorating below normal requirements
- Precision approach in IMC or at night:
- Terrain separation deteriorating below normal requirements
- (E)GPWS/TAWS events.

Contributing factors

- Approach path management
- Flight planning and preparation
- Experience, training and competence of flight crew
- Handling of technical failures.

Objectives

- To reduce the number of (E)GPWS/TAWS events
- To reduce aircraft operations below minimum vectoring altitude (MVA).

[15] EPAS 2021 - 2025, EASA

Safety performance indicators

- Safety issue: GPWS/TAWS events (soft and hard warnings)
- Flight crew minimum vectoring altitude (MVA) deviations
- MSAW events in combination with approaches and departures.

Actions A.2.4 Terrain collision

NIL.

3.1.3.2 Terrain collision: general aviation

Applicability

- General aviation (aeroplanes, sailplanes)
- Air navigation services
- Approved training organisations.

Context

CFIT is an inflight collision with elevated or level terrain, water or an obstacle without indication of loss of control, and has been identified by ICAO as a top risk in aviation. Accidents categorized as CFIT are events in which an aircraft is flown into terrain in a controlled manner, regardless of the pilot's situational awareness. Non-commercial light aeroplanes are not required to be equipped with ground proximity warning systems. So a very effective recovery device is absent in this domain.

CFIT accidents often have catastrophic results when they occur, with very few (if any) survivors.
EASA analyses have identified terrain collision as a top issue with a somewhat low number of risk-scored occurrences but a high aggregated European Risk Classification Scheme (ERCS) score[16].

Terrain collision has been identified as a top risk in the non-commercial aviation sector in Switzerland. The main contributor to it is inadequate flight planning (including weather analysis) that can lead to inadvertent flights into instrument meteorological conditions. This in turn is often due to the insufficient experience, training and/or competence/flying skills of the private pilots involved.

Focus

- Arrival or departure:
  - Terrain separation deteriorating below normal requirements
- Non-precision approach (especially in instrument meteorological conditions [IMC] or at night):
  - Terrain separation deteriorating below normal requirements
- Precision approach in IMC or at night:
  - Terrain separation deteriorating below normal requirements.

Contributing factors

- Inadvertent flight into IMC
- Experience, training and competence of individuals
- Pre-flight planning and preparation
- Inflight decision-making and planning
- Handling of technical failures.

Objectives

- To reduce the numbers of minimum terrain separation events
- To reduce the numbers of inadvertent flights into IMC.

Safety performance indicators

- Minimum terrain separation events
- Unintended flights into IMC.

[16] EASA Annual Safety Report 2021

Actions	A.2.4 Terrain collision
Open/in progress:	FOCA.11.

3.1.4 Ground safety including ground collision

Ground safety covers ground handling and apron management issues (aircraft loading, de-icing, refuelling, ground damage etc.) as well as (near-)collisions of aircraft with other aircraft, obstacles or vehicles while the aircraft is moving on the ground, either towed or under its own power. It does not include collisions on the runway[17].

Applicability

- Commercial aviation (aeroplanes, balloons, helicopters)
- General aviation (aeroplanes, balloons, sailplanes, helicopters)
- Aerodromes.

Context

ICAO identifies ground safety in its EUR.SPT.0008 safety action as one of the pan-European safety risk areas which need to be addressed in any state plan for aviation safety[18]. EASA supports ICAO on this in MST.0028 which requires for CAT by aeroplane a monitoring of the Ground Safety risk area[19]. Also Ground Damage, included in the Ground Safety risk area is identified as one of the 10 key risk areas in Europe[20,21].

Ground safety related events involves Swiss registered aircraft but also foreign registered aircraft on Swiss aerodromes. Predominately ground safety incidents occur within the domain of commercial aviation. In the last five years, there were no fatalities caused by a ground safety related event in Switzerland. None of the less, ground near collision events are also monitored in order to prevent a possible ground collision.

Focus

- Aircraft ground operations:
  - Incorrect presence of aircraft on the aerodrome surface other than the runway in use for landing or take off
- Aerodrome ground operations:
  - Incorrect presence of person, vehicle or equipment on the aerodrome surface other than the runway in use for landing or take off
- Aerodrome ground handling operations:
  - Aircraft significantly outside the operational mass and balance envelope
- Aerodrome ground operations:
  - Incorrect loading, fuelling, servicing or de-icing of aircraft

Contributing Factors

- Apron/Taxiway incursions
- Obstacle clearance

[17] EASA EPAS 2018 - 2022 (modified to include near-collisions)

[18] ICAO EUR RASP 2020-2022

[19] EASA EPAS 2021-2025

[20] EASA EPAS 2021-2025

[21] EASA Annual Safety Report 2020 (published in 2020)

Objectives

- To reduce the number of (near-)ground collisions between an aircraft and other aircraft, obstacles or vehicles while the aircraft is moving on the ground, either towed or under its own power.
- To reduce the number of loading-related events with the potential to negatively impact aircraft flight characteristics
- To reduce the number of cases of ground aircraft damage during servicing-related events.

Safety performance indicators

- Number of cases of aircraft damage caused or induced during ground handling operations (A/C damage during ground handling operations)
- Number of aircraft significantly outside the operational mass and balance envelope owing to ground loading events (Wrong baggage/cargo loading and documentation)
- Number of near-collisions and collisions on the ground (A/C movement error on the apron/ramp/taxiway [own-powered])
- Number of collisions or near-collisions of ground vehicles with aircraft (Wrong vehicle/equipment operation on the apron/ramp/taxiway).

Actions A.2.5 Ground safety

Open/in progress: FOCA.12, MST.0029.

3.1.5 Runway incursion (RI)

A runway incursion is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person in the protected area of a surface designated for the landing and takeoff of aircraft[22].

Applicability

- Commercial aviation (aeroplanes)
- General aviation (aeroplanes)
- Air navigation services
- Approved training organisations
- Aerodromes.

Context

ICAO has identified runway incursions as one of its high-risk categories of occurrences (HRCs). Runway incursions produce an increased risk of collision for any aircraft occupying the runway. Collision on the runway is one of the ten key risk areas identified in the EPAS.

Eurocontrol has issued its European Action Plan for the Prevention of Runway Incursions (EAPPRI) in a continuing effort to combat the problem (European Action Plan for the Prevention of Runway Incursions (EAPPRI) | EUROCONTROL).

Switzerland's focus is on runway incursions rather than runway collisions. Switzerland's air navigation service provider (ANSP) and the country's national and regional airports all report events involving violations of the protected runway safety area. The majority of these events are considered to be of low severity as they involve only the persons or vehicles entering the protected areas around a runway or the runway itself. In exceptional cases, such events involve (fixed-wing CAT or NCO) aircraft entering the protected area without approval. Such exceptional cases are considered to be of high severity.

Even though Zurich Airport's layout includes intersecting runways which pose a collision risk, runway collisions are not a focus in this SASP. Such events are monitored, however, and no high-severity events of this kind have occurred in the past few years.

Focus

- Runway incursion by persons
- Runway incursion by vehicles
- Runway incursion by aircraft.

The training, experience and competence of individuals (airport staff, passengers, pilots and visitors) are a crucial factor here. Airport installations (mainly at regional airports and at former military airfields now used for civil air traffic) should be improved wherever possible (fences, signs, markings, barriers, cameras, sensors, loudspeakers, etc.). Communications should also be improved between ATCOs and pilots (such as the use of standard voice according to language proficiency).

Contributing factors

- Stop-bar crossing deviations
- Line-up clearance deviations
- Approach clearance deviations (wrong runway selected)
- Communication by flight crew with air navigation services.

[22] GASP 2020-2022, ICAO

Objectives

- To reduce undetected occupied runways
- To reduce high-energy runway conflicts
- To reduce landings, takeoffs or runway crossings without clearance.

Safety performance indicators

- Number of stop bar crossing deviations
- Number of line-up clearance deviations
- Number of approach clearance deviations (wrong runway selected)
- Number of occurrences in context of flight crew communications with ANS.

Actions A.2.6 Runway incursion

NIL (runway safety teams).

3.1.6 Runway excursion (RE)

A runway excursion is a veering or an overrun off the runway surface[23].

Applicability

- General aviation (aeroplanes, sailplanes)
- Air navigation services
- Approved training organisations
- Aerodromes.

Context

GASP 2020-2022 identified runway excursion as one of its high-risk categories of occurrences. The term 'runway excursion' is a categorization of an accident or incident which occurs during either the takeoff or the landing phase. Contributing factors include unstabilized approaches, long landings, lateral control on the ground, runway condition and the influence of weather conditions. EASA analyses have concluded that runway excursions in general aviation aeroplane and sailplane operations lead to a high number of accidents, but still pose a lower risk than, for example, LOC-Is (which cause a lower number of accidents but pose a higher risk)[24].

To address the issue of runway excursions, Eurocontrol has launched a dedicated Global Action Plan for the Prevention of Runway Excursions (GAPPRE).

Most runway excursion accidents and incidents in Switzerland occur either at regional aerodromes or at airfields with general aviation aircraft. Compared to other accident categories, the number of runway excursions is small. But most runway excursions are categorized as accidents rather than incidents. In statistical terms, the majority of runway excursions are survivable. But the fatality risk still remains significant. The outcome of a runway excursion (e.g. whether it is survivable) depends on several factors, including the speed at which an aircraft touches down or departs from the runway end during the excursion (high-energy excursions), runway contamination and the characteristics of the aerodrome's runway-end safety area.

Focus

- Runway-end excursions (overruns)
- Runway-side excursions
- Landings beside the runway.

Contributing factors

- The experience, training and competence of individuals
- Pre-flight planning and preparation
- Inflight decision-making and planning
- Handling of technical failures
- Engine (on takeoff), brake system reliability
- Hard landings
- Deep landings.

Objectives

- To reduce the number of runway overruns
- To reduce the number of runway-side excursions.

[23] ICAO ADREP taxonomy

[24] EASA Annual Safety Report 2021

Safety performance indicators

- Safety issue: abnormal runway contact.

Actions A.2.7 Runway excursion

NIL (runway safety teams).

3.2 Operational safety issues: helicopters

3.2.1 Airborne collision (MAC)

This includes collisions, airproxes and occurrences that can lead to an airborne collision, as well as resolution advisories from collision warning systems. Any type of airborne conflict is considered, regardless of aircraft type and airspace (excluding RPAS, birds and wildlife).

Applicability

- Commercial aviation (helicopters)
- General aviation (helicopters)
- Air navigation services.

Context

EASA analyses have identified airborne collision as a Priority 3 key risk area in commercial helicopter operations. It is thus considered to pose a lower risk than terrain collision (KRA Priority 2).

One of the factors identified here at the European level is that ACAS RAs are not being followed to resolve the conflict and avoid a possible mid-air collision. Analyses of incident reports have not shown this to be a problem in Switzerland, however.

EASA is further committed to ensuring the interoperability of different iConspicuity[25] devices, to improve the visibility of non-certified traffic warning systems.

Focus

- Focus 1: separation of IFR and VFR flights with one or more uncontrolled airspace participants. This includes a currently ineffective separation of IFR and VFR flights in airspace classes where one or more traffic types may be uncontrolled (i.e. Classes D, E and G), which may result in airborne conflicts and collisions.
- Focus 2: improving airspace knowledge and situational awareness in Class D, E, and G airspace for all parties involved.

Contributing factors

- Factor 1: communication errors between pilot and ATC
- Factor 2: ATC clearance and navigation error by pilot
- Factor 3: pilot deviation from air traffic management (ATM) procedures
- Factor 4: inadequate flight planning and preparation by flight crew
- Factor 5: airspace infringements.

Objectives

- Objective 1: As it is not possible to fully resolve the issue of mixed IFR/VFR traffic within FIR Switzerland, 'hotspots' which hold particular potential for airborne collisions owing to mixed IFR/VFR traffic should be identified and risk-assessed. On the basis of this risk assessment and a subsequent risk mitigation assessment, possible mitigating actions should be implemented to reduce the numbers of situations that could develop into an airborne collision.
- Objective 2: Improve flight crew discipline in the VFR field. Airspace infringements are not a 'minor' offence.

[25] *i*Conspicuity* (or inflight electronic conspicuity plus) is the inflight capability to transmit the position of an aircraft and/or to receive, process and display the positions of other aircraft in real time with the objective of enhancing pilots' situational awareness about surrounding traffic. It is an umbrella term for a range of technologies and solutions, airborne and on the ground, that can help airspace users and other stakeholders to be more aware of other aircraft in their vicinity or in a given airspace.

Safety performance indicators

- Number of airborne conflicts and collisions (without RPAS)
- Airborne conflicts with military aircraft involved
- Airborne conflicts between IFR and VFR traffic
- Communication errors between pilots and ATC (Factor 1)
- ATC clearance and navigation errors by pilots (Factor 2)
- Pilots' deviations from ATM procedures (Factor 3)
- Inadequate flight planning and preparation by the flight crew (Factor 4).

Actions A.2.2 Airborne collision

Open/in progress: FOCA.06, FOCA.07, FOCA.08, MST.0038.
Closed: FOCA.30.

3.2.2 Aircraft upset (LOC-I)

An aircraft upset is an undesired aircraft state which is characterized by unintentional divergences from parameters normally experienced during operations and which might ultimately lead to an uncontrolled impact with terrain[26].

Applicability

- Commercial aviation (helicopters)
- General aviation (helicopters)
- Air navigation services
- Approved training organisations
- Maintenance, production and design organisations.

Context

LOC-I has been identified by EASA as a Priority 1 key risk area, with safety issues such as flight path management, systems reliability, perception and situational awareness, the experience, training and competence of individuals and obstacle see and avoid. ICAO also classifies LOC-I as a high-risk category of occurrence (HRC) in its Global Aviation Safety Plan (GASP; ICAO Doc 10004).

At the Swiss national level, precursors to LOC-I accidents predominantly occur in helicopter CAT (HEMS) operations. When a general aviation helicopter is involved in a precursor to an LOC-I, this usually involves a deviation from flight parameters such as too-high or too-low engine and rotor speed. It should be noted, however, that the data set for helicopter operations in general (regardless of operation type) is very small.

Focus

- Helicopter torque exceedance
- Helicopter RPM exceedance.

In view of the very small data set available, it is difficult to select a specific focus. But both the safety issues listed above regularly appear.

Contributing factors

- Perception and situational awareness
- Decision-making and planning
- Flight path management
- Experience, training and competence of individuals.

Objectives

- To increase safety by continuously monitoring trends and by assessing and improving risk controls for the above-mentioned safety areas.

Safety performance indicators

- Helicopter torque exceedance
- Helicopter RPM exceedance.

[26] EPAS 2021-2025, EASA

Actions	A.2.3 Aircraft upset
Closed:	FOCA.15.

3.2.3 Terrain collision (CFIT)

A terrain collision is an occurrence in which an airborne aircraft collides with terrain without any indication that the flight crew were unable to control the aircraft prior to impact. This includes instances in which the flight crew are affected by visual illusions or a degraded visual environment[27].

Applicability

- Commercial aviation (helicopters)
- General aviation (helicopters)
- Air navigation services.

Context

CFIT has been identified by EASA as a Priority 2 key risk area, with safety issues such as helicopter obstacle see and avoid and perception and situational awareness. ICAO also classifies the CFIT category as a high-risk category of occurrence (HRC) in its Global Aviation Safety Plan (GASP; ICAO Doc 10004).

Terrain collision incidents predominantly occur in commercial helicopter operations (HEMS and SPO). When a helicopter is involved in a terrain collision, this is usually a matter of aircraft handling, personnel decision-making, personnel attention and vigilance and/or misjudgement. It should be noted, however, that the data set for helicopter operations in general (regardless of operation type) is very small.

Focus

- Collision with cable or wire
- Rotor strike.

In view of the potentially serious consequences of terrain collision incidents, and based on the small data set available, the FOCA will put its focus in the next five years on collisions with cables or wires and on rotor strikes.

Contributing factors

- Perception and situational awareness
- Decision-making and planning
- Helicopter obstacle see and avoid
- Flight path management.

Objectives

- To increase safety by continuously monitoring trends and by assessing and improving risk controls for the above-mentioned safety areas.

Safety performance indicators

- Collisions with cables or wires
- Rotor strikes.

Actions A.2.4 Terrain collision

Open/in progress: MST.0031.

[27] EPAS 2021 - 2025, EASA

4 (Switzerland-)Specific safety issues

In view of the unique requirements and challenges in Switzerland, this chapter outlines the following two Switzerland-specific projects that are currently being worked on:

- Low Flight Network (4.1)
- IFR Without ATC (4.2).

The Annual Safety Report (ASR) of the FOCA lists further safety-related projects.

The FOCA has also launched its *Stay Safe* platform on social media with the aim of addressing common safety issues within general aviation. *Stay Safe* offers the pilot community the opportunity to inform themselves on safety topics and to share and exchange information. The platform's content is compiled by a mixed team of specialists within the FOCA.

The following two sub-chapters are structured as follows:

Context: this describes the context of the issue.

Focus: this describes Switzerland's focus within this key area over the duration of this plan.

Contributing factors: this details the factors that have a contributing impact on the issue.

Objectives: this specifies what we want to achieve within this key area (based on our context and focus).

Safety performance indicators: this outlines how the safety issue is monitored and how improvements in it are measured.

Actions: this provides an overview of the associated actions, which are specified in Annex A.

4.1 Low Flight Network

A network of routes in Swiss airspace at lower altitudes for IFR flights with helicopters.

Context

To enable rescue and emergency helicopter flights even in bad weather conditions, a national 'low flight network' (LFN) is being set up, and will subsequently be further expanded. The LFN consists of a route flight network and subsequent IFR approach and departure procedures (Points in Space or PinS) for landing sites such as hospitals or military facilities (see ENR 3.4, Helicopter routes). Some segments are outside of controlled airspace, and ATC service is partly provided.

There are specific requirements for the network and its users. Its use is limited to authorized operators (currently: REGA Swiss Air Ambulance and Air Force helicopters).

Focus

- Expansion of LFN routes
- Extension of the LFN network for public use

Objectives

- Safe integration and expansion of LFN routes

Safety Performance Indicators

- No specific safety performance indicators are yet in place to measure progress on this topic. Reports are being analysed, however, and appropriate measures will be taken if necessary.

Actions	A.3.2 IFR without ATC
Open/in progress:	FOCA.13. See also MST.0031.

4.2 IFR without ATC

The IFR without ATC project seeks the integration of IFR traffic without ATC guidance in Class G airspace.

Context

A pilot project entitled 'IFR without air traffic control service' was launched at Grenchen regional airport in 2017. Its aim was to accumulate experience in managing IFR arrivals and departures without air traffic control and without compromising safety. An ability to conduct IFR flights to and from airports without air traffic control could help reduce costs for regional airports, which are finding it increasingly difficult in economic terms to maintain their own air traffic control. The pilot project was terminated at the end of March 2019, for various reasons. As of now, Grenchen Airport provides air traffic control during peak hours. During off-peak hours the 'radio mandatory zone' (RMZ), which was established during the project, remains in effect. Work is continuing towards a permanent solution for 'IFR without ATC' at Grenchen and other airports.

The principles behind IFR without ATC are Regulation EU 923/2012 (SERA) and the creation of a radio mandatory zone (RMZ), SERA 6005.

Focus

- Monitoring and learning from the project at Grenchen with no active ATC (and the RMZ in force). This includes detailed documentation of the experience acquired and the lessons learnt, which can then be used to set up similar projects.
- Using the findings from the pilot project at Grenchen for similar projects
- Monitoring the application of the 'English only' rule in the RMZ, with no communication mismatches/misunderstandings/language problems.

Contributing factors

- Requirements of local flying schools (approved training organisations or ATOs) with regard to the approach to and the handling of the implementation of the RMZ
- Complaints from ATC Bern (LSZB APP): (mental) reservations and (operational) limitations
- Language proficiency, given the 'English only' rule.

Objectives

- To ensure safe IFR operations without ATC at Swiss regional airports
- To reduce the numbers of RMZ incidents (and thereby reduce the risk of mid-air collisions).

Safety performance indicators

- The number of (high-severity) occurrences related to IFR without ATC at LSZG.

Actions A.3.2 IFR without ATC

NIL.

5 Emerging safety issues

Emerging safety issues include concepts for operations, technologies, public policies, business models or ideas that might impact safety in the future, but for which insufficient data currently exist to complete typical data-driven analyses [28].

The SASP addresses the emerging safety issues of 'UAS' and 'Aviation Cybersecurity'.

5G interferences is another emerging topic that is being closely monitored. With the introduction of the new 5G mobile communications technology, new frequency ranges have been released which are close to the frequency range used by the radio altimeters in aeroplanes and helicopters. There are various reports worldwide which have investigated the potential negative influence of 5G on radio altimeters. Such a negative influence could take the form of an incorrect altitude display or even a total failure of the radio altimeter. The FOCA has issued a Safety Awareness Notification Data (SAND) to inform the aviation community about this special threat and to encourage the reporting of any incidents which can potentially be attributed to 5G interference.

Flight crew fatigue has been deleted from the emerging safety issues. The new EASA Flight Time Limitations (FTLs) have now been in force since 2016. Since their adoption, there has been no manifestation of (repeated) reports of flight crew fatigue that would indicate a systemic issue. This topic continues to be monitored, however, and will be reincorporated into the SASP should a negative trend emerge.

The following two sub-chapters are structured as follows:

Context: this describes the context of the issue.

Focus: this describes Switzerland's focus within this key area over the duration of this plan.

Contributing factors: this details the factors that have a contributing impact on the issue.

Objectives: this specifies what we want to achieve within this key area (based on our context and focus).

Actions: this provides an overview of the associated actions, which are specified in Annex A.

Reports regarding emerging safety issues are being closely monitored. However there are no safety performance indicators being used.

[28] GASP 2020-2022, ICAO

5.1 Unmanned aircraft systems (UASs)

An unmanned aircraft system (UAS) is defined as an unmanned aircraft and the equipment to control it remotely[29].

Context

The FOCA has been influential in the development of the SORA (Specific Operations Risk Assessment) methodology which has now been adopted by the EU to permit the evaluation and authorization of complex drone operations such as heavy drone operations for the transport of goods or flights beyond visual line of sight (BVLOS). Within the EU, SORA has been introduced within the framework of the new drone regulations (EU) 2019/945 and 2019/947. Although these regulations are not yet applicable in Switzerland, the FOCA has already adopted the same baseline for its approvals of complex drone operations nationwide.

The 'U-space' package has also been adopted recently at the European level. U-space is a collection of digitalized and automated functions and processes which are aimed at providing safe, efficient and fair access to airspace for the growing number of drone operations. Several associated services such as remote identification or UAS flight authorization are currently being established in Switzerland. These activities also involve the designation of 'U-space airspaces' where such services will apply.

All in all, these new services enable UASs to be identified and have their movements monitored and coordinated with those of other airspace users, which in turn also ensures the easier and more effective protection of particularly sensitive airspace areas. Since it will incorporate all the elements needed to enforce the applicable legal provisions, U-space is set to become the core instrument for ensuring the safe and controlled operation of drones, and should serve as a basis for this Europewide.

In Switzerland the Swiss U-space Implementation (SUSI) public-private partnership has been formed. SUSI will not only enable U-space to be further developed and adopted in Switzerland on the basis of European provisions and in line with its overall objectives: it will also permit further trials and demonstrations to be conducted, such as automated traffic management among the drones registered by the various service providers.

Focus

- Adoption of EU drone regulations (including the U-space package) to provide a clear legal framework for future UAS operations and ensure reciprocal recognition with other EU countries of operational approvals, including those issued by the FOCA
- Further development of the SORA methodology
- Outsourcing the evaluation and approval of low-risk operations to other qualified entities
- Implementing further mandatory U-space services and designating the first U-space airspaces.

Objectives

To adopt and maintain a risk-based approach to the authorization of complex drone operations and ensure the safe and efficient integration of drones into the existing airspace system, and thereby enable the safe and efficient coexistence of manned and unmanned aircraft.

Actions A.4.1 Unmanned aircraft systems

Open/in progress: FOCA.14, FOCA.15.

[29] Regulation (EU) 2018/1139

5.2 Aviation cyber security

Aviation cyber security may be regarded as the convergence of people, processes and technology to protect civil aviation organisations, operations and passengers from digital attacks.

Context

Protecting civil aviation from cyber security risks entails analysing information and communications technology (ICT) systems, information and key processes from the aviation safety and aviation security perspectives. The focus in such analyses is on the three aspects of the confidentiality, the integrity and the availability of the systems and information and on their criticality for the entire civil aviation domain.

The interconnectivity of the systems involved requires the adoption of a holistic viewpoint that considers the overall functions of and the information flows between their various elements. This horizontal and function-based approach provides the best possible basis for ensuring the effectiveness, the proportionality and the sustainability of the measures concerned. Wherever possible, the FOCA's solution approaches are based on existing processes, management systems, international standards and best practices from both the aviation and the information security domains.

The development and implementation of the corresponding measures are conducted in close and effective collaboration between the FOCA, the aviation industry and various bodies of the 'National strategy for the protection of Switzerland against cyber security risks' (NCS).

The FOCA is in close dialogue with Switzerland's National Cyber Security Centre (NCSC), which possesses the requisite technical expertise in information security issues and can provide additional assistance in the event of an incident. Parallel to this, the necessary know-how within the FOCA is being steadily acquired and will be further expanded over the next few years.

The FOCA also continues to cultivate its international collaborations on aviation cyber security, both within Europe and worldwide. Efforts on this front have already resulted in the approval of an ICAO Standard and Recommendation in ICAO Annex 17 (which has been applicable in its present form since 2018), an ICAO Aviation Cybersecurity Strategy and a corresponding ICAO Action Plan. From a European safety perspective, the new EASA regulation for information security management (Part-IS) is expected to enter into force in 2022.

The FOCA plays an active part in these rule-making activities, such as through its devising of the corresponding Guidance Material and Acceptable Means of Compliance (GM/AMC). This EASA regulation complements the recent update to the European aviation security framework which introduced cyber security requirements in Regulation (EU) 2019/1583.

Additional requirements have also been developed to enhance built-in cyber security from a certification viewpoint. These amendments – which were made in ED Decision 2020/006/R – reflect the state of the art in protecting products and equipment against cyber security threats. They are also intended to improve harmonization with the corresponding US Federal Aviation Administration (FAA) regulations.

The FOCA has been leading international efforts on cyber security in civil aviation since 2008. The ECAC's Study Group on Cyber Security in Civil Aviation (CYBER) has been chaired by the FOCA since 2017, and has performed valuable groundwork for ICAO, the EU and EASA in this field. The FOCA is also a founding member of the ICAO Secretariat Study Group on Cybersecurity (SSGC), which created the ICAO strategy and action plan mentioned above.

More recently, in January 2021, the FOCA joined the newly-founded Network of Cyber Analysts group, which is linked to EASA's Data4Safety programme. The purpose of this network is to analyse information security incidents that may have an impact on aviation safety. The FOCA has committed to chairing the Analysis of Incidents & Threat Intelligence sub-working group within this network.

With the aim of further improving cooperation and partnerships within the aviation community, the FOCA further joined the European Centre for Cybersecurity in Aviation (ECCSA) in June 2021.

Focus

- Aligned cyber security policies and regulations that are relevant to the safety of civil aviation and are in accordance with a risk-based functional approach
- The full integration of cyber security risks into the existing risk landscape and a proactive approach to threat intelligence for the aviation sector
- Increased awareness of and expertise in the need for appropriate and well-coordinated cyber security measures as a prerequisite for and an enabler of safety-critical systems and information.

Objectives

- To align or integrate the Information Security Management System (ISMS) with or into existing management systems
- To enhance the coordination of reporting mechanisms and incident response procedures
- To enhance the safety of civil aviation by improving its systems' resilience against cyber attacks
- To ensure an appropriate exchange between aviation safety, aviation security and cyber security expertise
- To ensure compliance with all cybersecurity-relevant regulations
- To allocate the human resources needed to fully and comprehensively address all cybersecurity-related issues within the FOCA.

Actions A.4.2 Aviation cyber security

Open/in progress: FOCA.16, FOCA.17, FOCA.18, FOCA.19.

Annex A: Actions

Annex A comprises the actions related to the safety issues outlined in the SASP.

There are various types of such actions:

FOCA actions: these are actions developed by the FOCA to address the objectives stated.

EPAS MSTs: these are the Member State Tasks (MSTs) specified in the European Plan for Aviation Safety (EPAS). These MSTs are listed in abbreviated form. The detailed actions will be found in the current version of the EPAS.

Actions from other plans: if other plans tackle a specific safety issue, these plans are mentioned in the corresponding sub-chapter.

The actions listed can have one of three statuses:

New (not started): the task has not yet been embarked on.

In progress: the task has been started but is not yet finished.

Closed: a task is classified as 'closed' if:
(1) it has been completed or
(2) it is a continuous task for which a process is now in place or
(3) it is not being implemented (in which case the reason for this will be stated beside the status).

A.1 Systemic safety issues

A.1.1 Miscellaneous	
FOCA actions	
NIL	
EPAS MSTs (open/in progress)	
MST.0001: Member States to give priority to the work on SSPs	
Objective	In the implementation and maintenance of the SSP, Member States shall include particular topics (list available in EPAS).
Deliverable	1) SSP document made available 2) SSP effectively implemented
Due Date	1) 2021 2) 2025
Status	In progress
MST.0019: Better understanding of operators' governance structure	
Objective	Member States' CAs should foster a thorough understanding of operators' governance structure. This should in particular apply in the area of group operations.
Deliverable	Guidance material
Due Date	2021 Q4 / 2022 Q1
Status	New (not started). Guidance material not yet received.
MST.0028: Member States to establish and maintain a State Plan for Aviation Safety	
Objective	Member States shall ensure that a SPAS is maintained and regularly reviewed. Member States shall identify in SPAS the main safety risks affecting their national civil aviation safety system and shall set out the necessary actions to mitigate those risks. In doing so, Member States shall consider the pan-European safety risk areas identified in EPAS for the various aviation domains as part of their SRM process and, when necessary, identify suitable mitigation actions within their SPAS. In addition to the actions, SPAS shall also consider how to measure their effectiveness. Member States shall justify why action is not taken for a certain risk area identified in EPAS.
Deliverable	SPAS established
Due Date	2021 Q4
Status	In progress
MST.0037: Foster a common understanding and oversight of Human Factors	
Objective	The task includes some preparatory activities which will be performed by EASA with the support of the Human Factor Collaborative Analysis Group (HF CAG)
Deliverable	1) Guidance for competency assessment of regulatory staff 2) Guidance for competency for trainers
Due Date	2023
Status	New (not started). Waiting for guidance and tools.

A.1.1 Miscellaneous (continued)	
MST.0039: Safety promotion to support ramp-up / safe return to operations	
Objective	Member States should manage a dedicated safety promotion campaign in support of safe ramp-up / return to operations, making use of the safety promotion campaigns and deliverables provided by EASA.
Deliverable	Guidance/training material/best practices
Due Date	2021/2022
Status	In progress
EPAS MSTs (closed)	
MST.0032: Oversight capabilities/focus areas	
Objective	a) Availability of adequate personnel in CAs b) Cooperative oversight in all sectors c) Organisations management system in all sectors
Deliverable	SPAS established
Due Date	2021 Q4
Status	Closed
MST.0033: Language proficiency requirements - share best practices, to identify areas for improvement for the uniform and harmonised language proficiency requirement implementation	
Objective	Member States should provide feedback to EASA on how the LPRI takes place, including that ATOs deliver training in English, for the purpose of harmonisation and uniform implementation.
Deliverable	Feedback on the implementation status
Due Date	Continuous
Status	Closed. Overridden by politics.
MST.0035: Oversight capabilities/focus area: fraud cases in Part-147	
Objective	Member States should focus on the risk of fraud in examinations, including by adding specific items in audit checklists and collecting data on the actual cases of fraud. They may exchange and share information as part of collaborative oversight.
Deliverable	Feedback on the implementation status
Due Date	Continuous
Status	Closed
MST.0036: PPL/LAPL learning objectives in the Meteorological Information part of the PPL/LAPL syllabus	
Objective	Member States should develop proportionate learning objectives in the 'Meteorological Information' part of the PPL/LAPL syllabus.
Deliverable	Learning objectives, with related question bank
Due Date	2022 Q4
Status	Considered closed, as this does fall in the scope of the FOCA. Meteorological Information however is being tested as part of the PPL/LAPL syllabus.

A.1.2 Safety management system	
FOCA actions (open/in progress)	
FOCA.01: SMS Maturity Level	
Objective	Assess SMS indicator and implement a corresponding EMPIC module.
Deliverable	EMPIC module
Due Date	2022 Q3
Status	In progress
FOCA.02: Risk & Performance Based Oversight (R/PBO)	
Objective	Implement risk and performance based oversight. - Meeting regulatory requirements - Improved used of existing resources The oversight programme shall be developed taking into account - the specific nature of the organisation, - the complexity of its activities, - the results of past certification and/or oversight activities, and shall be based on the assessment of associated risks
Deliverable	Office-wide elicitation and operationalisation
Due Date	End of 2022
Status	In progress
EPAS MSTs	
NIL open/in progress	
EPAS MSTs (closed)	
MST.0002: Promotion of SMS	
Objective	Member States should encourage implementation of safety promotion material developed by the European Safety Promotion Network, the SMICG and other relevant sources of information on the subject of safety management.
Deliverable	Guidance/training material/best practices
Due Date	Continuous
Status	Closed

A.1.2 Safety management system (continued)	
MST.0026: SMS Assessment	
Objective	Without prejudice to any obligations stemming from the SES ATM Performance Scheme, Member States should make use of the EASA management system assessment tool to support risk- and performance-based oversight. Member States should provide feedback to EASA on how the tool is used for the purpose of standardisation and continual improvement of the assessment tool.
Deliverable	1) Feedback on the use of the tool 2) Feedback on the status of SMS compliance and performance
Due Date	Continuous with bi-annual reporting (April/October)
Status	Closed

A.1.3 Safety culture	
FOCA actions (open/in progress)	
FOCA.03: Assessment of Safety Culture	
Objective	Assess Safety Culture and implement a corresponding EMPIC module.
Deliverable	1) Report ("Management Cockpit") 2) EMPIC module
Due Date	1) Biannually 2) 2022 Q3
Status	In progress
FOCA actions (closed)	
FOCA.04: FOCA Safety Culture Workshops	
Objective	Conduct Safety Culture workshops in the 3 Safety Departments of the FOCA
Deliverable	Workshop
Due Date	2021
Status	Closed
EPAS MSTs (open/in progress)	
MST.0027: Promotion of safety culture in GA	
Objective	Member State CAs should include provisions to facilitate and promote safety culture (including just culture) in GA as part of their State safety management activities in order to foster positive safety behaviours and encourage occurrence reporting.
Deliverable	Provisions to facilitate and promote safety culture as part of SSP/SPAS
Due Date	Continuous
Status	In progress
MST.0040: Safety and security reporting	
Objective	Without prejudice to the obligations stemming from Regulation (EU) 376/2014, Member States' CAs should align their security reporting mechanisms with existing aviation safety reporting systems, in order to allow for an integrated approach to the management of related risks.
Deliverable	Reporting systems aligned
Due Date	2022/2023
Status	In progress

A.1.3 Safety Culture (continued)	
EPAS MSTs (closed)	
MST.0025: Improvement in the dissemination of safety messages	
Objective	Member States should improve the dissemination of safety promotion and training material by their competent authorities, associations, flying clubs, insurance companies targeting flight instructors and/or pilots through means such as safety workshops and safety days/evenings.
Deliverable	Safety workshops and safety days/evenings
Due Date	2021/2022
Status	Closed

A.2 Operational safety issues

A.2.1 Miscellaneous	
FOCA actions (open/in progress)	
FOCA.05: Safety Performance Indicators and Safety Performance Targets	
Objective	Definition of sound Safety Performance Indicators and Targets for the FOCA safety risk areas.
Deliverable	1) List of Safety Performance Indicators and associated SPTs 2) Report ("Management Cockpit")
Due Date	1) 2023 2) Annually
Status	In progress
EPAS MST (closed)	
MST.0034: Oversight capabilities/focus area: flight time specification	
Objective	Member States shall ensure that the CAs possess the required competence to approve and oversee the operators' flight time specification schemes.
Deliverable	Report on actions implemented to foster capabilities
Due Date	2022/2023
Status	Closed. Process established.

A.2.2 Airborne collision	
FOCA actions aeroplanes + helicopters (open/in progress)	
FOCA.06: Identification of IFR / VFR Hotspots	
Objective	Identifying hotspots regarding possible airborne collision in airspace G and E. Assessment of TMZ Listening Squawk as mitigation measure for airspace infringements.
Deliverable	1) Risk Assessments and Mitigation Assessments 2) "Better visibility of airspace infringements" analysis in cooperation with Skyguide
Due Date	1) Various risk assessments with various due dates (according project planning), Review of the first risk assessments start Q3/2022 2) 2021
Status	In progress
FOCA.07: Awareness of airspace issues	
Objective	Increase awareness of airspace issues in pilot training and improve flight crew discipline in VFR.
Deliverable	1) Raise awareness of airspace issues in training and through examiners at refresher courses. 2) Leaflet (with all airspace classes and Swiss specialties) 3) Awareness campaign for all stakeholders (including ATCO),
Due Date	1) tbd 2) 2022 3) tbd
Status	New (not started)
FOCA.08: AVISTRAT-CH	
Objective	The acronym AVISTRAT-CH stands for the "new national airspace and aviation infrastructure strategy Switzerland". FOCA got the mandate from the department DETEC in 2016. The goal is to set up a strategy to redesign Swiss airspace, ground infrastructure and the relevant processes while maintaining the safety level, improving capacity and not exceeding today's environmental impact of aviation. These goals shall be reached by applying a "cleansheet" / holistic approach and by a close collaboration with the airspace users and the responsible federal offices. The horizon of the program is 2035 which means that the stakeholder needs of 2035 shall be met. Safety is addressed in all main parts of the strategy (e.g. better equipment of airspace users to increase conspicuity, national target level of safety, etc.).
Deliverable	1) Vision (based on stakeholder needs) 2) Strategy
Due Date	1) Was published in 2019 2) 2022
Status	In progress

A.2.2 Airborne collision (continued)	
EPAS MSTs (open/in progress)	
MST.0038: Airspace complexity and traffic congestion	
Objective	Member States should consider 'airspace complexity' and 'traffic congestion' as safety-relevant factors in airspace changes affecting uncontrolled traffic, including the changes along international borders.
Deliverable	Best practice
Due Date	2023
Status	In progress
EPAS MSTs (closed)	
MST.0030: Implementation of SESAR solutions aiming to reduce the risk of mid-air collision en-route and in terminal manoeuvring areas	
Objective	Member States should evaluate together with the ANSPs that are delegated to provide services in their airspace, the needs for implementing SESAR solutions related to enhanced Short Term Conflict Alerts (STCA)/enhanced safety nets such as solutions #60 & #69.
Deliverable	SPAS established
Due Date	2021 Q4
Status	Closed
European Action Plan for Airspace Infringement Risk Reduction	
The actions from the Airspace Infringement Action Plan, published on 01 January 2010, have been implemented where feasible. A new version of the Action Plan is expected.	

A.2.3 Aircraft upset	
FOCA Actions - general aviation (open/in progress)	
FOCA.09: Safety Promotion for General Aviation regarding operational factors	
Objective	Increase awareness concerning inadvertent flight into IMC, flight planning & preparation, loadsheet calculation.
Deliverable	Stay safe publications
Due Date	2022-2024
Status	In progress
FOCA.10: Safety Promotion for General Aviation regarding technical failures	
Objective	Safety Promotion about various topics concerning GA aircraft engine and fuel systems.
Deliverable	Stay Safety publications, SAND
Due Date	Ongoing
Status	In progress
EPAS MST (open/in progress)	
MST.0003: Member States should maintain a regular dialogue with their national aircraft operators of flight data monitoring programmes	
Objective	1) Making the professionals concerned aware of the European operators FDM forum (EOFDM) 2) Promoting FDM good practice
Deliverable	1) Information on EOFDM published in the SMS section of MS website 2) Report of the information event 3) Detailed report of the workshop
Due Date	2021 (Deliverable 1 + 2) 2022 Q2 (Deliverable 3)
Status	In progress (on hold)
EPAS MSTs (closed)	
MST.0015: Helicopter Safety Events	
Objective	Member States' CAs, in partnership with industry representatives, should organise helicopter safety events annually or every two years.
Deliverable	Workshop
Due Date	Continuous
Status	Closed. The SHA (Swiss Helicopter Association) is holding these workshops.

A.2.4 Terrain collision	
FOCA actions - commercial aviation (open/in progress)	
FOCA.11: Safety Promotion for General Aviation regarding operational factors	
Objective	Increase awareness concerning inadvertent flight into IMC, flight planning & preparation, loadsheet calculation.
Deliverable	Stay safe publications
Due Date	2022-2024
Status	In progress
EPAS MSTs (open/in progress)	
MST.0031: Implementation of SESAR solutions aiming to facilitate safe instrument flight rules operations	
Objective	Member States together with their ANSPs and their flight procedure designers (if different from ANSPs) should evaluate the possibility to establish a network of low-level IFR routes in their airspace to facilitate safe helicopter operations. These SESAR solutions, such as solution #113 that are designed to improve safety, should be implemented as far as it is feasible.
Deliverable	IFR routes/report
Due Date	2025
Status	In progress

A.2.5 Ground safety	
FOCA actions (open/in progress)	
FOCA.12: Electrical aircraft batteries - increase awareness	
Objective	Determine risks associated with an intervention of a crashed and battery-damaged electrical aircraft and raise awareness of these dangers.
Deliverable	1) Internal Risk Assessment 2) Information campaign to raise awareness of electric aircraft operators, aerodrome operators and first responders (such as firefighters). 3) Add rescue sheet to the aircraft details of electrical aircraft in the Swiss aircraft register
Due Date	2023
Status	In progress
EPAS MSTs (open/in progress)	
MST.0029: Implementation of SESAR runway safety solutions	
Objective	Member States should evaluate together with the ADR operators and ANSPs the needs for implementing the related SESAR solutions such as those related to ground situational awareness, airport safety net vehicles and enhanced airport safety nets. These SESAR solutions (solutions #01, #02, #04, #26, #47, #48, #70), designed to improve runway safety, should be considered as far as it is feasible.
Deliverable	SPAS
Due Date	2021Q4
Status	In progress

A.2.6 Runway incursion

FOCA actions

NIL. The local Runway Safety Teams, which are led by the airfields and consist of various stakeholders, are analysing Runway Safety Events and take action where necessary. If necessary FOCA enters into dialogue with the Runway Safety Team and discusses possible actions directly.

EPAS MSTs

NIL

European Action Plan for the Prevention of Runway Incursions (EAPPRI)

All recommendations addressed to the regulators of the EAPPRI V3.0, published on 20 November 2017, have been implemented by the FOCA: Recommendations of new versions will be checked and implemented wherever possible.

FOCA advises the airfields and local Runway Safety Teams about new versions of the EAPPRI. The decision on the implementation of the individual recommendations is left to the respective organisations.

A.2.7 Runway excursion

FOCA actions

The local Runway Safety Teams, which are led by the airfields and consist of various stakeholders, are analysing Runway Safety Events and take action where necessary. If necessary FOCA enters into dialogue with the Runway Safety Team and discusses possible actions directly.

EPAS MSTs

NIL

Global Action Plan for the Prevention of Runway Excursions (GAPPRE)

The GAPPRE was published on 5 May 2021, the recommendation addressed to the regulators are in the process of being checked and will be implemented wherever possible. The recommendations of the predecessor, the European Action Plan for the Prevention of Runway Excursions, have all been implemented by the FOCA

FOCA advises the airfields and local Runway Safety Teams about new versions of the GAPPRE. The decision on the implementation of the individual recommendations is left to the respective organisations.

A.3 (Switzerland-)Specific safety issues

A.3.1 Low Flight Network	
FOCA actions	
FOCA.13: National LFN	
Objective	Operate and maintain a national IFR low altitude network for helicopter flights of authorized operators
Deliverable	Extensive network (network connects all geographical regions of Switzerland)
Due Date	2024
Status	In progress

A.3.2 IFR without ATC
FOCA actions
NIL

A.4 Emerging safety issues

A.4.1 Unmanned aircraft systems	
FOCA actions	
FOCA.14: Adoption EU regulation	
Objective	Reach an agreement with the Swiss Modelaircraft association (SMV) regarding the Motion 20.3916, which instructs the Federal Council to exclude traditional model aircraft when adopting EU Regulation 2019/947 and leave this category under national law.
Deliverable	Revised OSCA
Due Date	2022
Status	In progress
FOCA.15: U-space	
Objective	Test, implement and oversee new mandatory U-space services in Switzerland
Deliverable	Implemented U-Space airspaces and services
Due Date	2023
Status	In progress

A.4.2 Aviation cyber security	
FOCA actions	
FOCA.16: Assisting Industry	
Objective	1) Developing criteria to assist industry in defining criticality of aviation functions, systems and information from a holistic safety perspective 2) Providing information to organisations for implementing EASA Part-IS requirements
Deliverable	1) Guidance material 2) Information event
Due Date	2022-2024
Status	In progress
FOCA.17: Effective Oversight	
Objective	1) Establishing a coordinated, performance- and risk-based oversight regime to ensure information security risk protection for relevant organisations 2) Initiating, planning and establishing cooperation with NCSC for cyber security oversight activities related to aviation safety 3) Ensuring available personnel resources either by coordination (with e.g. NCSC) or increase of FOCA FTEs 4) Establishing cyber security training objectives for relevant FOCA personnel
Deliverable	1) Procedure, Audit plan 2) Cooperation agreement 3) n/a 4) Training plan
Due Date	2023
Status	In progress
FOCA.18: Enhancing Cyber Risk Management	
Objective	Enhancing cyber risk management at FOCA by implementing and operating an ISMS and updating FOCA crisis management handbook
Deliverable	1) Management review of 1st iteration 2) Integration of cyber security in crisis management handbook
Due Date	2023
Status	In progress

A.4.2 Aviation cyber security (continued)	
FOCA.19: National and international coordination	
Objective	Ensuring national and international coordination by 1) Developing updated, appropriate and coordinated timelines and reporting processes for safety-relevant cyber attack scenarios in coordination with security and partners in the national cyber strategy 2) Assisting EASA in developing guidance and AMC material regarding risk management and the alignment of ISMS integration 3) Continuing contribution to international networks and foster them. Active participation in relevant ICAO, ECAC, EU, EASA, Eurocontrol, and NCSC fora 4) Participating in EACCC cyber security exercise 2022
Deliverable	1) Agreed and defined legal bases and process 2) AMC/GM 3) Ensure well-coordinated legal bases 4) n/a
Due Date	ongoing
Status	In progress