National Plan for Aviation Safety

Luxembourg

1st revision

August 2024

Contents

1. Purpose

a. National Aviation Safety Program

The National Aviation Safety Program has been published in January 2020: [National Aviation Safety Program - Directorate of Civil Aviation // The Luxembourg Government (gouvernement.lu)](#). It describes the regulatory and structural setup of aviation in Luxembourg. It is designed to be complemented by a National Plan for Aviation Safety (NPAS). The purpose of the NPAS is to define, in consultation with aviation stakeholders, specific actions to be taken at national level to enhance aviation safety. While the National Aviation Safety Program describes a more or less fixed structure, the NPAS is designed to evolve and improve over time, not only by adapting to changing circumstances, but also by incorporating the input from aviation stakeholders.

b. Inputs

The actions of the NPAS are adapted to the specific situation and the specific risks faced by the aviation sector of Luxembourg. The main risks at national level have been derived from several sources:

- The Annual Safety Reports by the Direction de l'Aviation civile (DAC): [Annual Safety Review - Direction de l'aviation civile // Le gouvernement luxembourgeois](#). The safety report for the year 2019 also included a longer-term analysis over more than 5 years, up to the COVID pandemic, based on more than 12000 occurrence reports.
- Shortcomings identified by DAC
- Shortcomings and actions identified by stakeholders.

The NPAS is aligned with the European Plan for Aviation Safety (EPAS: [European Plan for Aviation Safety (EPAS) 2024 - 13th edition | EASA (europa.eu)](#)) where possible. The EPAS includes a number of Member State Tasks (MST), some of which are not applicable due to the specifics of the national aviation sector.

But there is another factor that makes this NPAS different from the national plans of bigger States: as Luxembourg has only one international airport concentrating most of its aviation activities, it includes actions that would be considered local (airport) actions in these States and would not necessarily be included in the NPAS. This concentration also allows for a much more direct influence from stakeholders like the national ANSP, the airport operator, AOC holders and others on the NPAS. Their active contribution makes the NPAS relevant to their main risks and issues.

c. Structure

The next paragraph presents the main risks and opportunities for improvement, identified from different sources. The following three paragraphs then present the planned and ongoing safety actions, separated in three categories: Systemic actions, operational actions and safety oversight actions. Systemic actions (Paragraph 3) are related to the entire aviation system or an entire domain. They do not necessarily have a direct link with occurrences, incidents or accidents. They do however include several actions regarding Safety management. Operational actions (Paragraph 4) are designed to mitigate specific, directly identified risks. Safety oversight actions (Paragraph 5) are Member State Tasks from the EPAS that are addressed

specifically to DAC, as the national oversight authority. They do not include deliverables for other national stakeholders. Finally, paragraph 6 shows the differences between the NPAS and the EPAS by listing the EPAS Member State Tasks that are not applicable to Luxembourg and by explaining why they are not applicable. For this first update, it also includes tasks of the initial NPAS that have ended, for reference.

d. 2024 Update

The 2024 update takes into account the latest national Air Safety Report ([asr-2022.pdf (gouvernement.lu)](asr-2022.pdf)) as well as shortcomings identified by DAC oversight. Although the national Air Safety Report for 2023 is not yet ready, some obvious trends have been identified. The European level is taken into account in two ways: Updates of Member State Tasks of the EPAS Vol. II have been integrated where applicable. In addition, the entire EASA Safety Risk Portfolios (EPAS Vol. III) have been reviewed. Each Safety Issue identified by EASA has been:

- Reflected already in the EPAS or in the NPAS, or
- Matched to one (or several) of DAC's own Safety Issues. These are monitored and prioritized annually, through the Top Ten Safety Issues of the Annual Safety Review, or
- Considered by DAC to be of similar risk in Luxembourg than in the entire EU, therefore relying on EASA's risk assessment, or
- Risk-assessed separately by DAC

The "deliverables" of the actions are now split in two categories: "Past deliverables" are no longer active and are included for reference. The active items are listed under "New and ongoing deliverables".

The "references" for the actions point to the source for the action, respectively for the related risk. The following abbreviations are used:

- EPAS MST.00## : A Member State Task of Volume II of the EPAS (2024 edition)
- EASA SI-####: EASA Safety Issue from Volume III of the EPAS (2024 edition), identified as relevant
- DAC ASR (year): Risk identified through the Annual Safety Review of DAC

2. Main Risks

This part briefly presents the main risks and opportunities for improvement. Some are based on the analysis of safety occurrences, but others are derived from a more proactive analysis taking into account foreseeable future evolutions.

Annual Safety Report

The first element to consider is the analysis of occurrence reports, published in the DAC Annual Safety Report of 2022.

The following Safety Issues were identified as the "Top Ten" by analysis of occurrence reports:

Safety Issue	
1	Fatigue
2	Risk of Mid-Air Collision
3	FOD
4	Windshear
5	Engine failure or problems - multi-engine aircraft
6	Technical - Landing gear
7	Incorrect aircraft setup by crew
8	Unstabilised approach
9	Aircraft deviation from ATC instruction
10	Technical - flight controls

A separate analysis has been made for the airport and airspace of Luxembourg. In this way, a "Top Ten" for Luxembourg has been established. It consists of a mix of some specific Safety Issues and some that also appear in the overall "Top Ten", highlighted in the table below.

	Safety Issue
1	FOD
2	Fatigue
3	Risk of MAC
4	Engine failure or problems - multi-engine aircraft
5	FDP Issues at ELLX
6	Vehicles cutting off aircraft at ELLX entering/exiting apron
7	Improper installation of parts
8	Windshear
9	Airspace infringement
10	Fuel leak on ground - technical issues (risk of fire)

Effectiveness of SMS

Safety Management Systems are an established method to improve safety. However, organisations with an established SMS have to remain vigilant that it is and remains effective. Through its oversight, DAC has identified some cases of the following shortcomings:

- Interaction of higher management with SMS
  In most cases, the issue is not that management is willingly putting other considerations (financial, reputation...) above safety. Still, the real appreciation of safety risks by management is not always present. In particular, changes in higher management can set back an established SMS.
- Insufficient resilience
  Organisational resilience is a key factor in successfully and safely managing operations. Resilience comprises both a system's ability to withstand disturbance, challenges and change, and to recover and sustain operations following disturbance, challenges and change. Since a few years, external influences, even external to the aviation system, coupled with internal changes, put a higher demand on organisational resilience than ever before.
- Limitations to root cause analysis
  Inefficient root cause analysis, leading to ineffective corrective actions, have been noted both in occurrence investigations and in corrective action plans related to findings or non-conformities raised during audits or inspections.

Luxembourg airport and airspace

Several incidents on the runway and taxiways at Luxembourg airport in 2023 and early 2024 highlighted again some known safety issues. The initial NPAS already attempted to tackle some of them at the operational level (see 4b - Runway safety), in particular the lack of a common frequency for aircraft and vehicles on the runway. This is the subject of Safety recommendation LU-2012/004, issued in 2012 by the

Administration des enquêtes techniques (AET). Implementation of a common frequency was agreed by all concerned but was not followed through, although ATC staffing has been increased for this specific purpose. An additional ATC position for the delivery of clearances was introduced, which does relieve the frequency load on the TWR frequency but does not improve situational awareness of pilots and drivers on the manoeuvring area. The long-standing lack of implementation of official Safety recommendations and other contributing factors of the more recent occurrences demonstrate that the causes are not only at operational level, but also at systemic level. The wider pattern at systemic level also includes late and superficial investigation of safety occurrences and more than usual resistance to change. While recent improvements are noted in safety investigations, the cultural changes necessary to improve safety culture among all stakeholders will likely take more efforts and more time.

Commercial air operators

Most commercial air operators from Luxembourg find themselves in a rapidly changing situation, mostly driven by expansion. In 2023, the number of flights, and even more so the flight hours, have already increased above the level of 2019, before the pandemic. This puts air operators into a situation where workload of personnel and utilisation of aircraft is increasing. Hiring and training additional personnel, as well as introducing new aircraft and maybe new aircraft types, are activities that need to be properly managed as well.

General aviation

A ballooning accident in 2021 triggered a review of this segment of general aviation. Aviation accidents leading to serious injuries or fatalities are fortunately very rare in Luxembourg. However, it is noticeable that over the last twelve years, ballooning is the aviation sector most affected by such accidents (a serious injury in 2012, a fatal accident in 2013, and a serious injury in 2021). The other affected activities are parachuting and paragliding. Ballooning accidents typically occur during the landing phase and unlike the paragliding and parachuting accidents, tend to affect passengers more than pilots.

The Annual Safety Review 2023 by EASA ([Annual Safety Review 2023 | EASA (europa.eu)](#)) compiles multi-annual accident and serious incident statistics for different categories of mostly recreational aviation like light aircraft ("non-commercial other than complex aircraft"), microlights, sailplanes and balloons. Obviously, each of these activities is distributed differently across EASA Member States and is more or less represented in Luxembourg. But the contrast to the statistics for Luxembourg is striking: At European level, ballooning plays a very minor role compared to the other activities.

The European statistics confirm that the large majority of balloon accidents and serious incidents occur during the landing phase.

Search and Rescue (SAR)

The plan to thoroughly update the national SAR system has made progress since the initial issue of the NPAS. A coherent update of the national regulations and responsibilities in the domain of SAR is being finalised. The "Corps grand-ducal d'incendie et de secours" (CGDIS) will take over the responsibility of a Rescue Sub-Center (RSC) in 2025.

Cybersecurity

As the civil aviation systems are becoming more and more interconnected with several major elements interacting with the aircraft as well as with each other, aviation cybersecurity covers a very wide scope, such as:

- production organisations and their supply chain;
- air operators including their aircrew and ground personnel;
- continuing airworthiness management and maintenance organisations;
- flight training organisations;
- aerodrome operators and providers of apron management services;
- providers of ground handling services;
- ATM/ANS providers;
- third parties that have access to non-protected aviation transmissions.

In 2024, the main cyber risks identified in aviation security are:

1. Social engineering: cybercriminals often manipulate individuals to access sensitive information, bypassing technical safeguards through human interaction;
2. Third-party contractor breaches: the aviation industry relies on numerous contractors, making it vulnerable to breaches through less secure third-party networks;
3. Malwares on unprotected networks: many operational technologies in aviation are interconnected, and unprotected networks can be exploited to gain unauthorized access;
4. Ransomware: this type of malware can lock out users from their systems, demanding a ransom to restore access, which can severely disrupt operations;
5. Threats against data: intentional cyber-attack brought by a cybercriminal with the goal of gaining unauthorised access and releasing sensitive, confidential or protected data.

The aviation industry faces a dynamic threat landscape. Therefore the context environment of organisations is never static and frequent adaptations are required to maintain the information security risks at an acceptable level.

A portfolio of typical scenarios having the potential to generate events with direct consequences on the safety of flight is detailed in EPAS 2024 Vol. III. These risks are followed with particular attention and include aircraft vulnerability leading to flight safety degradation due to cyber-attacks, GNSS signal manipulation leading to navigation or surveillance degradation, airline systems' vulnerability leading to disruptions due to cyber-attacks, and cyber-attacks in air traffic management.

GPS jamming and spoofing

GPS jamming and spoofing has become a regular occurrence near conflict zones, affecting all civil aircraft in certain regions. These regions are typically located near conflict zones. The airspace and airport of Luxembourg are not directly affected.

Reassessed risks from the first issue of the NPAS

Several risks identified in the first issue of the NPAS are no longer relevant. These are:

- Impact of the COVID-19 pandemic and return to normal operations

- Runway refurbishment works at Luxembourg airport
  The major runway refurbishment works in summer 2021 and 2022 at Luxembourg international airport (ELLX) were successfully completed. The mitigation measures taken for the main risks proved effective.

- Integration of helicopter traffic at Luxembourg airport
  Over the last 2 years, a significant decrease in the number of safety reports involving helicopter traffic at Luxembourg airport has been noticed. The situation is being monitored, but for the moment it does not warrant a significant change of procedures.

3. Systemic actions

a. State Safety Plan

The National Aviation Safety Program has been published in January 2020. The initial version of the National Plan for Aviation Safety (NPAS) has been published in January 2022. While the "Règlement grand-ducal du 18 juillet 2014 relatif au programme national de sécurité aérienne" assigns the responsibility for the NPAS to the Direction de l'Aviation civile, both the initial version and this update are the result of a consultation of all stakeholders.

Title	**National Plan for Aviation Safety**			
Description	Develop a national Safety Plan in collaboration with stakeholders			
Past deliverables		Timeline	Owner	Status
Draft State Safety Plan		Mai 2021	DAC	completed
Consultation of stakeholders		Jun 2021	Stakeholders	completed
Approved State Safety Plan		Dec 2021	DAC	completed
New and ongoing deliverables		Timeline	Owner	Status
Update State Safety Plan		Jun 2024	DAC	completed
Consultation of stakeholders		Jul 2024	Stakeholders	completed
Approved State Safety Plan		Sep 2024	DAC	completed
References	EPAS MST.0001, MST.0028			

b. Strengthening Safety Management Systems

In most aviation domains, safety management systems (SMS) are a legal requirement and are well established by now. DAC is trying to enhance the focus of air operators on safety management by making it a regular topic at operator meetings. In addition, AOC audits now include face-to-face interviews with the accountable manager and nominated persons about their SMS. In the airworthiness domain, while the SMS requirements enacted in Regulation (UE) 2019/1383 are new for a number of organisations, in practice all CAMOs currently approved by DAC are linked to an AOC holder and their activities are already well integrated in the SMS of the AOC holder.

Title	**Promotion of SMS**			
Description	Promote safety management in all domains of aviation.			
Past deliverables		Timeline	Owner	Status
Join SM-ICG		2020	DAC	completed
Internal SMS/SSP training (recurrent / initial)		Done (Sep. 2021)	DAC	completed
New and ongoing deliverables		Timeline	Owner	Status
Promotion of SMS during Operator meetings		continuous	DAC	ongoing
References	EPAS MST.0002, EPAS SPT.0057			

Air operators from Luxembourg have in general seen a very good recovery after the global COVID-19 pandemic. In 2023, their traffic levels were already higher than in the years before the pandemic, with a continuing trend to expand even further. This brings challenges in the areas of staffing, training, fleet management etc. At the same time, although SMS systems are implemented in all relevant organisations, AOC holders as well as ANSP and Aerodrome operator, some of them seem to be struggling to being really effective. Organisations that have implemented an SMS have to be vigilant to ensure that it is and remains effective, and is not seen only as a compliance system.

Title	**Effectiveness of SMS**			
Description	There are multiple factors that mean that organisations may not be providing safety and safety management with the appropriate level of attention and resources. The complex nature of aviation safety and the significance of addressing HF aspects require that the full potential of an SMS is realized, by empowering the safety department and by fostering an adequate safety culture at all levels of the organisation.			
New and ongoing deliverables		Timeline	Owner	Status
Ensuring an effective amount of safety staff/resources to ensure continued safe (risk assessed) operations		2021-	All stakeholders	ongoing
Enhanced focus on the use of SMS processes like risk management and change management		2021-	All stakeholders	ongoing
Continued oversight of SMS of organisations by DAC		2021-	DAC	ongoing
Interface meetings for coordination of SMS-related activities at Luxembourg airport		2024-	ANA, Lux-airport	new
References	EASA SI-5009, EASA SI-5001			

In addition to internal transformations like expansion, fleet renewal or other, organisations are experiencing further external disturbances and challenges due to the global situation. Organisational resilience is therefore a key factor in successfully and safely managing operations.

Title	**Improving resilience of organisations**			
Description	Resilience comprises both a system's ability to withstand disturbance, challenges and change, and to recover and sustain operations following disturbance, challenges and change. This starts with an organisation's SMS capability to anticipate new and emerging threats. The positive contribution to safety of every single staff member is the key component of an organisation's resilience.			
New deliverables		Timeline	Owner	Status
SMS systems to consider new and emerging threats		2024-	All stakeholders	new
References	EASA SI-3009			

In two separate areas, DAC is observing a lack of effective root cause analysis: in investigations of safety occurrences and in oversight findings. In both cases, the analysis tends to stop at the immediate causes and does not progress to the underlying causes. In general, it is the systemic and organisational factors that remain unidentified and therefore unaddressed, although they offer the biggest potential for improvement and the most resilient solutions. Reoccurrence of safety events or findings is often an indication that it was not the mitigating action that was ineffective, but the identification of the root cause. Even in the absence of reoccurrence, it is important to "close the loop" by actively verifying the effectiveness of the mitigating actions taken.

Title	**Ineffective root cause analysis**			
Description	Ineffective root cause analysis often results from superficial "investigations", stopping at the immediate cause or trigger of the event, without analysing the systemic and organisational factors. This can be improved by the use of a structured methodology that specifically addresses the systemic and organisational involvement. Safety managers also need the capacity and the empowerment to question organisational habits.			
New deliverables		Timeline	Owner	Status
Improve root cause analysis		2024-	All stakeholders	new
Improve monitoring of actions taken (closed loop)		2024-	All stakeholders	new
References	EASA SI-3018			

c. UAS

The evolution of UAS calls for a well-planned integration in the airspace and the aviation system. In order to enable this integration, DAC has set up a department specifically for UAS. Its objective is to establish the conditions of the safe operation of both recreational and professional use of drones.

Title	**UAS – unmanned aerial systems**			
Description	Safe integration of UAS in the aviation system in Luxembourg			
Past deliverables		Timeline	Owner	Status
Launch a media campaign for "Open" category UAS users		done	DAC	done
Establish a Forum for professional drone users		done (Dec. 2021)	DAC	done (Dec. 2021)
New and ongoing deliverables		Timeline	Owner	Status
Complement EU regulations by national regulations		ongoing	DAC	ongoing
References	DAC ASR 2019, EASA SI-2014			

d. SAR

SAR (Search and Rescue) activities can be divided in 2 parts:

- Alerting system
- Search and rescue operations

Current situation

Overall, a working system is in place. As the territory of Luxembourg is part of the Brussels FIR, the RCC (Rescue Coordination Center) responsible for SAR is the Brussels RCC. ANA Luxembourg is designated as Rescue Sub-Center (RSC) for the territory of Luxembourg but covers only the alerting part.

However, the existing arrangements are obsolete in several ways:

- They do not cover all scenarios
  Search and Rescue operations itself are well-defined by specific action plans for two situations:
  - For emergencies at or near Luxembourg airport: AEP – Aerodrome emergency plan
  - For emergencies with a high number of casualties: PIU NOVI (Plan nombreuses victimes)

  For other emergencies, RCC Brussels would take the lead. However its airborne means for SAR consist of a Belgian military helicopter based in Koksijde, located more than 250km from Luxembourg, so that its effective intervention in Luxembourg would be impractical as well as ill-defined by lack of bilateral agreements.

- They do not cover all ICAO requirements

- They do not make use of the best means that have become available in the meantime like:
  - Locally based Police and EMS (Emergency Medical Services) helicopters
  - Better communication means and channels

In a real emergency, these means would likely be used in an ad-hoc manner. Establishing a clear plan and responsibilities would therefore significantly increase their effectiveness at the most critical time.

Recommendations

DAC has performed a study of the current situation of SAR in Luxembourg which has been presented to the responsible ministries and entities in March 2020. It includes 22 recommendations focused on the following areas:

- Defining a national SAR concept
- Establishing a legal framework for SAR
- Assigning responsibilities and providing the necessary means
- Establishing international agreements with neighboring States, including clarification of the roles of RCC Brussels and RSC Luxembourg and international assistance
- Recruitment and training of staff
- Designation of a supervisory authority for SAR

Based on these recommendations, a new setup has been agreed by all stakeholders. Its main element will be a new Rescue Sub-Center (RSC) to be set up by CGDIS.

Title	**SAR – Search and Rescue arrangements**			
Description	A complete review and re-arrangement of the legal framework, responsibilities, international agreements and response plans is in progress and almost complete. The roles and responsibilities have been agreed among all stakeholders. CDGIS will set up a new Rescue Sub-center for Luxembourg that will assure the coordination of all aerial and terrestrial means for search and rescue. This includes: - Locally based Police and EMS (Emergency Medical Services) helicopters - Better communication means and channels			
New and ongoing deliverables		Timeline	Owner	Status
A coherent set of adapted national regulations, clear responsibilities and response plans for SAR		2024	DAC, CGDIS	ongoing
Set up a new Rescue Sub-center (RSC) for Luxembourg		2025 (tbc)	CGDIS	new
References	n/a			

e. Airspace complexity and traffic congestion

In order to reduce the risk of mid-air collisions and airspace infringements, EASA is promoting good practices in airspace design that reduce 'airspace complexity' and 'traffic congestion'. (EPAS Safety Promotion Task SPT.0120).

Title	**Airspace complexity and traffic congestion**			
Description	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.			
Ongoing deliverables		Timeline	Owner	Status
Consult with FABEC partners on potential airspace changes		2025	ANA	ongoing
References	EPAS MST.0038, EPAS SPT.0120			

f. Cybersecurity

Cybersecurity in aviation is a relatively new and growing area where awareness needs to be increased and where most aspects require national coordination and capability development.

Title	**National aviation cybersecurity arrangements**			
Description	Close contacts with the *Haut-Commissariat pour la Protection Nationale* (HCPN) and the *Institut luxembourgeois de régulation* (ILR) are established. The discussions concern information sharing, joint oversight and common tooling to carry out risk assessments, vulnerability management, incident detection and reporting. The aim is also to analyse the interplay between NIS2, Part-IS and AvSec legislations.			
New and ongoing deliverables		Timeline	Owner	Status
A coherent set of adapted national regulations and clear responsibilities for cybersecurity in aviation		tbd	DAC	Ongoing
Update National Plan for Aviation Safety (cybersecurity risks and actions)		2024	DAC	Ongoing
Participate in the *Aviation Cybersecurity Sub-Group* jointly chaired by European Commission's DG MOVE and DG CNECT		2024	DAC, other national authorities	Ongoing
References	Part-IS / AvSec / NIS2			

Title	**ISMS implementation for the civil aviation authority**			
Description	DAC is implementing its Information Security Management System (ISMS) to achieve compliance with the authority requirements of the Commission Implementing Regulation (EU) 2023/203 of 27 October 2022 laying down rules for the application of Regulation (EU) 2018/1139 of the European Parliament and of the Council, as regards requirements for the management of information security risks with a potential impact on aviation safety. The transposition of NIS2 Directive in national law in 2024 will also require the implementation of information security risk management for Public Administrations.			
New and ongoing deliverables		Timeline	Owner	Status
Implement an ISMS and information security risk management		2024	DAC	Ongoing
References	Part-IS / NIS2			

4. Operational actions

a. Reduce the risk of mid-air collisions

The Annual Safety Reports of DAC regularly identify the risk of mid-air collisions as the highest risk. Because a mid-air collision would be a catastrophic outcome, multiple safety barriers exist to avoid it. The actions presented here aim at strengthening these safety barriers.

Title	Improvement and validation of the Surveillance chain at ELLX			
Description	Radar detection issues in Luxembourg airspace, linked to an upgrade of the surveillance chain, have been identified as a latent condition in 2019. Corrective actions were introduced and delivered some improvements, but their validation for a normal traffic situation proved difficult during the pandemic years with significantly reduced traffic levels. Some specific issues could still not be traced to their root cause and remain to be solved.			
Ongoing deliverables		Timeline	Owner	Status
Validation of the surveillance chain in normal traffic situation		2024	ANA	ongoing
Implementation of ARTAS Radar tracker		2024	ANA	new
Implementation of Wide-area Multilateration (WAM)		2025	ANA	new
References	DAC ASR 2019-2022			

Title	Implementation of SESAR solutions aiming to reduce the risk of mid-air collision en-route and in terminal manoeuvring areas			
Description	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. These SESAR solutions, designed to improve safety, should be implemented as far as it is feasible.			
Ongoing deliverables		Timeline	Owner	Status
Evaluate implementation of SESAR solution #60: Improving conflict alerts for controllers - Enhanced short-term conflict alert (STCA) for terminal Manoeuvring areas (TMAs)		tbd	ANA	Ongoing
Evaluate implementation of SESAR solution #69: Better conflict detection tools - Enhanced short-term conflict alerts (STCA) with downlinked parameters		tbd	ANA	Ongoing
Regular assessment of STCA performance		2024	ANA	Ongoing
References	EPAS MST.0030, DAC ASR 2019			

Although the number of airspace infringements in Luxembourg is relatively limited, it is appropriate to keep monitoring the situation. ANA volunteers to assist with safety promotion to the local GA community, although it is understood that not all "intruders" are local pilots.

Title	Safety promotion for airspace infringement and collision avoidance			
Description	Several General Aviation organisations in and around Luxembourg have held regular safety seminars with active participation of DAC. DAC and ANA will continue their support of these seminars. The risk of mid-air collision and of airspace infringements will be on their agenda as required.			
Ongoing deliverables		Timeline	Owner	Status
Monitoring of airspace infringements in Luxembourg		continous	DAC, ANA	New
Promotion of airspace infringement and collision avoidance in GA safety seminars		as required	ANA	ongoing
References	DAC ASR 2019			

b. Runway safety

Several sources combine to justify actions to prevent runway incursions at Luxembourg airport:

- The incorrect presence of a maintenance van on the runway resulted in a serious incident in LVP operations in January 2010. The Final report by AET contains 12 Safety recommendations. While most are implemented, several actions that require a longer lead-time are still in progress.
- In particular, the lack of a common frequency for aircraft and vehicles on the runway (AET SR LU-2012/004) continues to be a factor in runway incursions and other safety occurrences on the runway and taxiways.
- Runway incursions have been identified as a risk at Luxembourg Airport, both by the Local Runway Safety Team (LRST) and the Annual Safety Review of DAC. The LRST has collaboratively decided to implement a number of actions to lower the risk of runway incursions.

While the initial focus was mainly on the prevention of runway incursions, the planned actions will improve runway and taxiway safety in general.

Title	**Enhance ground situational awareness**			
Issue to be addressed	Runway incursions by aircraft, vehicle or persons			
Description	The incorrect presence of a maintenance van on the runway resulted in a serious incident in LVP in January 2010. The Final report by AET contains 12 Safety recommendations. While most are implemented, several actions that require a longer lead-time are still in progress.			
Past deliverables		Timeline	Owner	Status
Training and assessment of all vehicle drivers accessing the runway to include radiotelephony in English (AET SR LU-2012/005)		done	ANA	completed
Study on radio signal transmission at ELLX from one runway end to the other (higher elevation in the middle of the runway)		2022	ANA	completed
Training of all external drivers accessing maneuvering area for runway refurbishment works		2021-2022	Lux-Airport	completed
New and ongoing deliverables		Timeline	Owner	
Operational A-SMGCS Level 2 (AET SR LU-2012/003)		2022	ANA	Delayed 2024-2025
Common frequency for aircraft and vehicles on the runway (AET SR LU-2012/004)		2023	ANA, LRST	Delayed
- Development and simulation of a concept of operations		2024	ANA	new
Runway incursion prevention actions defined by the LRST:			LRST	partially implemented
- Coordination of callsign assignment for vehicles		2022	ANA, Lux-Airport	
- Switchable stopbars on all runway intersections		2024	ANA, Lux-Airport	
References	AET Safety recommendations LU-2012/003, LU-2012/004, LU-2012/005, EASA SI-2006, SI-1001			

c. Operational issues linked to increasing aviation activities

Where not so long ago, the sharp decline in activities due to the COVID pandemic posed a threat in terms of skill and knowledge degradation of aviation personnel, today the opposite scenario brings a very similar threat for organisations. The rapid increase of aviation activities induces the fact that fast pilot integration is necessary to sustain the growth. This high number of newly trained pilots can have an operational impact.

In addition, some of the most experienced and qualified staff have either left the industry or have been reassigned to different functions. The risk is for organisations to lose knowledge in the transition to the successor if it is not well planned and executed.

Title	**Skills and knowledge degradation due to inexperienced personnel**		
Description	Skill and knowledge degradation may result from integrating new and inexperienced personnel, and from rotation of experienced personnel to different functions or entirely out of the aviation industry. Possible mitigating actions include: - Use of FDM to monitor for deviations - Use of Occurrence reports to monitor for trends - Increased use of double-checking/counter-signing, traceability of information given		
Ongoing deliverables	Timeline	Owner	Status
Operators to take into consideration experience for crew rostering	2021	Air Operators	2024-
ATC service providers to take into consideration recent experience for ATCO rostering	2021-	ANA	continuous
Organisations to consider the skill and knowledge degradation in their risk assessment	2021-	All stakeholders	continuous
References	EASA SI-5003		

As a Safety Issue, fatigue is at or near the top in the Annual Safety Reviews of DAC since years. The number of reports is increasing significantly. This could partially be linked to the average flight times, which have also increased. On the other hand, some reports are now filed by crews of operators that were not affected by this issue before. In addition to pilots, other personnel assuring safety-relevant tasks also seems to be affected.

Title	**Aviation personnel fatigue**			
Description	As the aviation activities are growing rapidly in the last months, the hiring of qualified personnel is being difficult and quite long in time, there is a general lack of resources that leads to extra workload. Fatigue will reduce the ability to concentrate, remember and make decisions and could potentially lead to people being more easily distracted and eventually lose situational awareness. As the number of flights increases, the workload is increasing and there is a lot of pressure to make sure their aircraft are departing on time.			
Ongoing deliverables		Timeline	Owner	Status
Fatigue reporting promotion		2022-	DAC Air Operators	ongoing
Implementation of FRM principles		2022-2025	Air Operators, ANA	ongoing
Raise awareness of all operational personnel to fatigue management		2022-2025	All stakeholders	ongoing
References	DAC ASR 2022, EASA SI-5002, SI-1039			

d. Dialogue with operators on FDM

Flight data monitoring (FDM) is an effective tool to enhance both flight safety and operational efficiency. Its effectiveness is steadily increasing over time as the trend towards more data and better analysis capabilities continues. DAC has established a working group at national level and is enhancing its oversight of operators' FDM programmes.

Title	**Member States should maintain a regular dialogue with their national aircraft operators on flight data monitoring programmes**			
Description	Promoting FDM good practice DAC will establish a working group with national operators with the purpose to promote and exchange best practices in the domain of FDM. The FDM oversight will be reinforced with a dedicated inspection related to FDM.			
Past deliverables		Timeline	Owner	Status
Establish FDM working group at national level		2023	DAC, operators	Done
New and ongoing deliverables		Timeline	Owner	Status
Promote EOFDM publications		2024	DAC-OPS	ongoing
Perform FDM inspection to CAT operators requiring FDM		2024	DAC-OPS	ongoing
References	EPAS MST.0003			

e. Peer-to-Peer support programs

In order to prevent reoccurrence of an accident similar to the Germanwings accident of 2015, Regulation (EU) 2018/1042 requires all operators to establish a proactive and non-punitive support program for flight crew. This requirement poses some challenges, especially for small operators. In 2021, a working group with the participation of all national AOC holders has been established: the Support Program Coordinator Forum (SPCF). It is led by an operator representative, with DAC participating as observer. This working group met 6 times since its creation end of 2021. The activities of the SPCF are reflected in the actions below.

Title	**Maintain and develop effective peer-to-peer support programs**			
Description	Maintain the Support Program Coordinator Forum (SPCF) in order to discuss and exchange on - experiences in the PSP domain; - best practices with regards to PSP implementation; - outcomes of PSP implementation; - further developments of PSP; - conclusions to feed the NPAS.			
Past deliverables		Timeline	Owner	Status
Establish a national working group: Support Program Coordinator Forum (SPCF)		2021	Operators, DAC	completed
Develop promotional material		2022	SPCF	completed
New and ongoing deliverables		Timeline	Owner	Status
Maintain the Support Program Coordinator Forum (SPCF)		continuous	Operators, DAC	new
References	EASA SI-3024			

Title	**Consider implementation of peer-to-peer support programs (PSP) for other crew members (cabin crew, technical crew) and other safety-sensitive personnel**			
Description	The Air Ops regulation (CAT.GEN.MPA.215) is requiring the PSP for flight crew only. However, flight crew are not the only category of personnel who is performing safety-related duties. Consideration should also be given to other crew members such as cabin crew, technical crew, loadmasters, mechanics, dispatchers…			
New deliverables		Timeline	Owner	Status
Consider implementation of PSP for other crew members and other safety-sensitive personnel		2024-	Operators	new
References	EASA SI-3012			

Title	**Promote crew well-being**			
Description	During the last 12 months, the results of the PSP are showing a significant increase in crew well-being issues. The SPCF members have analysed the data related to crew well-being and in order to maintain the risk of well-being issues to an acceptable level, have decided to raise awareness to the operators' management by recommending them to include crew well-being in their management policies and to promote crew well-being through dedicated training and other means.			
New deliverables		Timeline	Owner	Status
Consider crew well-being as part of the management policies and promote crew well-being through dedicated training and other means.		2024-	Operators	new
Develop best practices related to well-being		2024-2025	SPCF	new
References	EASA SI-3024			

f. General Aviation: Meteorological info in the PPL/LAPL syllabus

This item addresses weather-related risks such as entering IMC, icing conditions, carburettor icing, and poor weather conditions. Weather is an important contributing factor to GA accidents, often related to pilots underestimating the risks of changing weather conditions prior to take-off and during the flight, as weather deteriorates.

Title	**PPL/LAPL learning objectives in the Meteorological Information part of the PPL/LAPL syllabus**			
Description	Member States should develop proportionate learning objectives in the 'Meteorological Information' part of the PPL/LAPL syllabus. Such learning objectives to be of a basic, non-academic nature and address key learning objectives in relation to: — practical interpretation of ground-based weather radar, strengths and weaknesses; — practical interpretation of meteorological satellite imagery, strengths and weaknesses; — forecasts from numerical weather prediction models, strengths and weaknesses.			
Ongoing deliverables		Timeline	Owner	Status
Learning objectives, with related question bank		2024	ATOs	Ongoing
References	EPAS MST.0036			

g. General Aviation: Improvement in the dissemination of safety messages

Several general aviation associations already organise safety workshops or similar events. DAC, as well as ANA, are available to support such events.

Title	**Improvement in the dissemination of safety messages**			
Description	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.			
Ongoing deliverables		Timeline	Owner	Status
Safety workshops and safety days/evenings		continuous	GA organisations	Ongoing
Participation of DAC in associations' safety events		continuous	DAC	Ongoing
References	EPAS MST.0025			

h. Promotion of safety culture in General Aviation

Safety culture, including occurrence reporting, is less established among general aviation pilots than among professional pilots. After some trouble related to software transition, an entirely new web portal for occurrence reporting is available: ECCAIRS 2 Central Hub | Home (aviationreporting.eu). It provides information about safety culture and just culture as well as an easy way to report safety occurrences to DAC.

DAC usually participates in safety workshops for general aviation pilots by presenting the Annual safety report, which results from the analysis of occurrence reports. DAC will continue its commitment to these seminars.

Title	**Promotion of safety culture in General Aviation**			
Description	Member State competent authorities 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.			
Ongoing deliverables		Timeline	Owner	Status
Presentation of safety analysis in GA safety seminars		2022-	DAC	Ongoing
Provide an easy way for GA pilots to report occurrences via ECCAIRS 2 Central Hub	Home (aviationreporting.eu)		continuous	DAC	Ongoing
Provide feedback to individuals addressing an occurrence report directly to DAC		continuous	DAC	Ongoing
References	EPAS MST.0027			

i. GPS Jamming and Spoofing

The number of reported GPS jamming and spoofing events has increased by 150% in 2023 over 2022. While most of the GPS jamming event are easily manageable by flight crews, the proportion of spoofing events, which have a higher risk, is also increasing.

The Safety information Bulletin SIB2022-02R3 issued by EASA provides more detailed information: EASA Safety Publications Tool (europa.eu)

Title	**GPS Jamming and Spoofing**			
Description	GNSS signals may be disturbed or altered in countries adjacent to conflict zones, affecting the operation of aircraft enroute and/or operating at aerodromes. GNSS signal interference may be only temporary, and pilots should not only be aware of the risk but also ensure that procedures in case of GNSS signal loss are included in the flight planning.			
New deliverables		Timeline	Owner	Status
Prepare flight crew for GPS jamming and spoofing according manufacturer recommendations and EASA SIB2022-02R3		2024-	Operators	Ongoing
References	EASA SI-0034, SI-5501A			

j. Approach path management

The number of reported unstabilised approaches in 2022 was already significantly higher than in 2018 and 2019, before the COVID pandemic. In 2023, it increased again by more than 65%. The causes are not entirely clear and may include to a varying degree weather-related external factors, flight crew competence and better reporting.

Title	**Approach path management**			
Description	This safety issue (EASA SI-0007) addresses the inappropriate execution of an approach at any point from FL100 until reaching safe taxiing speed. This can lead to runway excursions, aircraft upset, terrain collision, or airborne collision. It covers all types of instrumental and visual approaches. The following areas are reviewed in this safety issue: • Management of the energy of the aircraft and the influence of external factors affecting the approach, such as tail- or crosswind, windshear, down/up drafts and other weather-related factors; • Decision-making process of the flight crew to go around or continue with the approach; and • SOPs and the relevance of those procedures for the approach flown, flight crew training and the existing regulatory framework.			
New deliverables		Timeline	Owner	Status
Use FDM to monitor unstabilised approaches		2024-	Operators	Ongoing
References	DAC ASR 2022, EASA SI-0007, SI-0037, SI-4005			

k. Inadequate ATCO-pilot operational communication

Clear communication between ATCOs and flight crew is essential in ensuring complete understanding of instructions and in maintaining situational awareness. ATCO-pilot communication deficiencies may lead to all types of serious incidents and accidents. Common issues include ineffective readback/hearback, imprecise conditional clearances, lack of traffic information, occasional deviations from standard phraseology, etc.

Title	Inadequate ATCO-pilot operational communication			
Description	Clear and unambiguous ATCO-pilot communication is an important factor for situational awareness of all involved parties. Stakeholders should try to improve communication in daily operations to ensure that all involved are "on the same page" at all times.			
New deliverables		Timeline	Owner	Status
Improve use of phraseology, readback and hearback		2024-	All stakeholders	new
References	EASA SI-2027			

5. Safety oversight actions

Several Member State Tasks (MSTs) of the EPAS are not addressed to the aviation organisations in the State, but have a narrower focus: the competent authority. This part of the NPAS describes the MSTs that are addressed specifically to DAC and are designed to enhance its safety oversight capabilities. Some deliverables may have an indirect impact on the organisations under DAC's oversight, but the main actions are internal actions for DAC.

a. Assessment of SMS and safety culture at organisations

EASA has developed a management system assessment tool for use by national authorities within their oversight role. This tool has been evaluated by the different oversight departments of DAC. OPS and LIC departments have partially integrated it in their specific audit questionnaires. In 2021, NSA department has adopted it for trial in parallel with the EoSM validation. NAV department will evaluate it for application in its domain.

Title	**Assessment of SMS**			
Description	Consistent risk- and performance-based oversight 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. Member States should regularly inform EASA about the status of compliance with SMS requirements and SMS performance of their industry. For organisations holding several certificates (e.g. AOC, CAMO, ATO…), it is important to have a transversal assessment of the SMS in order to address the interdependencies between the different activities of the organisation.			
Past deliverables		Timeline	Owner	Status
Trial application in ATM domain		done	DAC-NSA	Completed
New and ongoing deliverables		Timeline	Owner	Status
Evaluate the EASA management system assessment tool for the airworthiness domain		2022	DAC-NAV	Delayed 2025
The EASA tool is not used by the DAC OPS and LIC departments as such but the SMS checklist is containing a lot of elements from it.		done	DAC-OPS DAC-LIC	Continuous
Feedback to EASA on the use of the tool Feedback to EASA on the status of SMS compliance and performance		Continuous with bi-annual reporting (April/October)	DAC-NSA DAC-NAV DAC-OPS DAC-LIC	Continuous
Implementation of a transversal methodology to assess the SMS of an organization holding several certificates.		tbd	DAC-NAV DAC-OPS DAC-LIC	New
References	EPAS MST.0026			

A strong safety and reporting culture is an essential enabler of an effective management system. However, safety culture is not easy to assess. EASA has therefore introduced a new task in the EPAS 2024 edition to enable better assessment of organisations' safety culture. Whereas the EPAS task is defined for air operators, DAC is planning to extend it to the aerodrome and ATM domains, where a strong safety culture is equally important.

Title	**Assessment of safety culture at organisations**			
Description	This task aims to improve the Member States' capacity to assess the safety culture at organisations, and complements EPAS action RES.0053 'Mapping the socio-economic impact on aviation safety'. In a first phase (ending 2024-Q1), in order to support national competent authorities (NCAs), EASA will develop guidance and practical tools to measure safety culture at air operators. As soon as finalised, such guidance and tools will be made available to the Member States. This phase will be an interactive phase where contributions/feedback from Member States and industry stakeholders will be sought. In a second phase (2024-2025), the task for Member States will consist in including in their oversight programmes the assessment of safety culture of air operators with the support of the EASA guidance and practical tools.			
New deliverables		Timeline	Owner	Status
Guidance and practical tools to measure safety culture at air operators		2024 Q1	EASA	new
Oversight programme for organisations includes the assessment of safety culture		2024-2025	DAC	new
References	EPAS MST.0042			

b. Human factors competency of DAC Staff

A Member State Task of the EPAS aims to achieve Human Factor competency of regulatory staff. It goes hand in hand with Safety Promotion Task SPT.0115 of the EPAS, according to which EASA should develop a competency framework for regulatory staff.

As most DAC oversight staff participated in a Human Factors Course organized in-house in November 2015 and SMS Courses including human factor elements in 2016, 2021 and 2022, basic Human Factor skills are present. An alignment with EASA recommendations will be planned as next step but depends on the advancement of SPT.0115 (development by EASA of guidance and tools to organise the implementation of the competency framework, and plan and conduct the training for the respective regulatory staff).

Title	**Foster a common understanding and oversight of Human Factors**			
Description	The task includes some preparatory activities which will be performed by EASA with the support of the Human Factor Collaborative Analysis Group (HF CAG) in terms of: — development of guidance and tools for the competency assessment of regulatory staff before and after training; — guidance for the appropriate level of Human Factors competency for Human Factors trainers; — development of promotion material to be provided as guidance to Member States and encourage implementation. These guidance and tools will be provided to the MS competent authorities to organise the implementation of the competency framework, and plan and conduct the training for the respective regulatory staff.			
New and ongoing deliverables		Timeline	Owner	Status
Guidance for competency assessment of regulatory staff		2023	DAC	Partially done
Guidance for competency for trainers		2023	DAC	Partially done
Implementation of the human factors' competency framework		2024-Q4	DAC	new
References	EPAS MST.0037, SPT.0115			

c. Oversight capabilities

DAC has established a management system that has been certified according ISO 9001:2015 in November 2019. The management system ensures DAC's compliance to all applicable authority requirements. Due to the small size and the proximity of the aviation sector in Luxembourg, DAC can maintain a close oversight of organisations. Specific actions to improve cooperative oversight involve a better understanding of operators' governance structure: cf. point e) below – MST.0019.

The actions in place to promote SMS at organisations, as described in Article 3.b, are mostly interactive. They are delivering feedback to DAC on the existing management systems of organisations in all sectors.

Title	Oversight capabilities/focus areas			
Description	**(a) Availability of adequate personnel in CAs** Member States shall ensure that adequate personnel is available to discharge their safety oversight responsibilities. **(b) Cooperative oversight in all sectors** Member States shall ensure that the applicable authority requirements are adhered to in all sectors. The objective is to ensure that each organisation's activities are duly assessed, known to the relevant authorities and that those activities are adequately overseen, either with or without an agreed transfer of oversight tasks. *NB: EASA will continue to support CAs in the practical implementation of cooperative oversight, e.g. benefitting from the outcome of the trial projects conducted between the United Kingdom, Norway, France, Czech Republic, as well as with exchanges of best practices and guidance.* **(c) Organisations management system in all sectors** Member States shall foster the ability of CAs to assess and oversee the organisations' management system in all sectors. This shall focus in particular on safety culture, the governance structure of the organisation, the interaction between the risk identification/assessment process and the organisation's monitoring process, the use of inspection findings and safety information such as occurrences, incidents, and accidents and, where applicable, flight data monitoring. This should lead CAs to adapt and improve their oversight system.			
New and ongoing deliverables		Timeline	Owner	Status
a) Manpower reviews are performed in order to check the adequacy and the availability of the personnel		annual	DAC	Ongoing
b) c) Better understanding of operators' governance structure: see item 5.e below, EPAS MST.0019				
c) Interviews of accountable manager and nominated persons on SMS are included in AOC audits		continuous	DAC	Ongoing
Initial NPAS issued		2021 Q4	DAC	Done
NPAS reviewed		2024	DAC	Done
References	EPAS MST.0032, MST.0028, MST.0042			

d. Oversight of flight time specification schemes

Oversight of flight time specification schemes is in place.

Title	Oversight capabilities/focus area: flight time specification schemes			
Description	Member States shall ensure that the NCAs possess the required competence to approve and oversee the operators' flight time specification schemes; in particular, those including fatigue risk management. NCAs should focus on the verification of effective implementation of processes established to meet the requirements on operators' responsibilities and to ensure the adequate management of fatigue risks. NCAs should consider the latter when performing audits of the operators' management systems. Feedback from Member States on the implementation of this action is normally obtained via EASA standardisation activities.			
Past deliverables		Timeline	Owner	Status
Dedicated FRM inspection has been created in 2019		done	DAC-OPS	completed
Dedicated FTL inspection is in place.		done	DAC-OPS	completed
FTL is part of the risk profile of the operator which is used for the risk based oversight programme		done	DAC-OPS	completed
New and ongoing deliverables		Timeline	Owner	Status
Feedback to EASA on actions implemented to foster NCA's oversight capabilities		2024 Q4	DAC	new
References	EPAS MST.0034			

e. Better understanding of operators' governance structure

DAC's checklists used for AOC audits include the aspect of group operations. Also, some inspections are carried out to verify activities subcontracted to the group (e.g. dispatch). The airworthiness domain is awaiting the development of the recently initiated EASA rulemaking task about business group CAMOs (RMT.0734). EASA will support this MST by providing guidance on how to effectively oversee group operations based on an overall concept for the oversight of such operations.

Title	**Better understanding of operators' governance structure**			
Description	Member States' competent authorities should foster a thorough understanding of operators' governance structure. This should in particular apply in the area of group operations. Aspects to be considered include: — extensive use of outsourcing, — the influence of financial stakeholders, and — controlling management personnel, where such personnel are located outside the scope of approval. Note: The Agency will support this MST by providing guidance on how to effectively oversee group operations based on an overall concept for the oversight of such operations. This will consider work ongoing at ICAO level (cross-border operations) and include continuing airworthiness management aspects. The timeline is amended accordingly.			
Past deliverables		Timeline	Owner	Status
Guidance material		2022 Q2	EASA	completed
Risk profile of operators to include the operators' governance structure		2022	DAC-OPS	completed
New and ongoing deliverables		Timeline	Owner	Status
Monitor development of RMT.0734 (Business Group CAMO)		2022	DAC-NAV	ongoing
References	EPAS MST.0019			

f. Share ELP best practices

As stated in this MST, EASA will collect such feedback at the opportunity of the various Standardisation activities. It is understood that, beyond normal interaction at TeB or similar level, no specific information collection has been set up by EASA. DAC will support EASA during any standardisation visits as well as by its usual participation in related TeB meetings and activities.

Title	**Language proficiency requirements — share best practices, to identify areas for improvement for the uniform and harmonised language proficiency requirements implementation**			
Description	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. Note: EASA will collect such feedback at the opportunity of the various Standardisation activities.			
New and ongoing deliverables		Timeline	Owner	Status
Feedback on the implementation status		continuous	DAC	ongoing
References	EPAS MST.0033, SPT.0105			

g. Improved oversight of ballooning operations

After a ballooning accident resulting in a serious injury in 2021, ballooning has been identified as the most critical sector of General aviation in Luxembourg. DAC has followed up with a presentation of the legal requirements to national balloon operators in March 2022. Further oversight and a better understanding of ballooning operations is required.

Title	**Improved oversight of ballooning operations**			
Description	Improved understanding and oversight of ballooning operations			
New deliverables		Timeline	Owner	Status
Improved oversight of ballooning operators		2025-2026	DAC-OPS	new
References	DAC ASR 2021			

h. Safety and security reporting coordination mechanism

Aviation activities are exposed to both safety and security risks. However, the methods of handling safety and security risks differ: different regulations and different authorities are involved not only at national level, but also at European level, and different processes apply (just culture and dissemination for safety, stricter confidentiality for security). Within the limits imposed by the respective regulations and European authorities, the Safety and Security departments of DAC will share data that is of interest for both. Occurrences of interest for both are for example cybersecurity occurrences, intentional infringements by drones, any occurrences where the application of security measures impacts safety and vice versa (risk transfer), etc.

Title	**Safety and security reporting coordination mechanism**			
Description	Without prejudice to the obligations stemming from Regulation (EU) No 376/2014, Member States shall ensure that appropriate coordination mechanisms are established between safety and security reporting systems in order to allow for an integrated approach to the management of risks.			
New deliverables		Timeline	Owner	Status
Establish coordination mechanism		2023/2024	DAC-SAF DAC-SUR	new
References	EPAS MST.0040			

i. Improvement of data quality in occurrence reporting

The national occurrence reporting database of DAC has successfully been migrated to the ECCAIRS2 software in September 2023. Since then, the reporting organisations and DAC are in the process of switching to direct entry of reports into the database. DAC is using this opportunity to validate not only the technical aspects, but also the data quality of the reports. For this purpose, an Excel feedback form has been developed and is used to give feedback on data quality. This double purpose is creating an additional workload and is slowing down the transfer, but it should benefit data quality in the long term.

Since 2014, DAC has been using the ERC Risk index of the ARMS methodology (see DAC Annual Safety Report 2022) as basis for the prioritisation of Safety issues in its Annual Safety Report. However, since January 2023, a risk classification of all occurrences according to the ERCS methodology is mandatory. Since scoring each occurrence according 2 different methodologies would be too time-consuming, a new prioritisation method is required for the Annual Safety Report of 2023. After the first year of ERCS scoring, it is prudent to validate its use for purpose of prioritisation before basing the annual analysis on unvalidated data.

Title	**Improvement of data quality in occurrence reporting**			
Description	The objective of the task is to help Member States and the Agency in data-driven decision-making to improve aviation safety. To this end, Member States should promote the benefits of good data quality in occurrence reports. For this, the already published ECCAIRS coding guidance Chapter 2 should be used as a reference.			
New deliverables		Timeline	Owner	Status
Develop feedback form based on Coding Guidance Chapter 2		2024	DAC	Done
Provide feedback on data quality to reporting organisations		2024	DAC	Ongoing
Verify presence and correctness of mandatory fields in oversight inspections and audits		ongoing	DAC	Ongoing
Validation of ERCS scoring for risk assessment (DAC annual safety report) and development of a prioritisation method		2024	DAC	Ongoing
References	EPAS MST.0043			

6. Closed and non-applicable items

This section regroups the actions from the first issue of the NPAS that have been closed, as well as the Member State Tasks of the EPAS that, after evaluation, are considered not applicable for the aviation sector in Luxembourg.

a. Helicopter traffic integration study

A feasibility study for designated helicopter take-off and landing areas at Luxembourg airport was planned after a relatively high number of occurrences involving GA helicopter traffic was recorded. While GA Helicopter traffic is still taking place, the number of related occurrences has decreased significantly. Consequently, there is currently no need for this study. The majority of helicopter flights is locally-based HEMS and Police operations. They are using a long-standing exemption, by which these operations take place from a taxiway instead of the main runway, which has not led to any significant safety occurrences.

Title	**Helicopter traffic integration study for ELLX**			
Description	The integration of helicopter traffic with airplane traffic at Luxembourg airport presents a challenge. A separation of helicopter traffic from the main runway would probably be beneficial for safety, but needs to be studied in detail.			
Deliverables		Timeline	Owner	Status
A feasibility study for designated helicopter take-off and landing areas at Luxembourg airport		2022	DAC, ANA, Lux-Airport	on hold
References	DAC ASR Top Ten Safety Issues – runway incursion by aircraft, (EPAS MST.0038)			

b. Systemic issues linked to the COVID-19 pandemic

These actions were included in the "systemic actions" chapter of the first issue of the NPAS. They were specific to the COVID-19 pandemic and the recovery from that significant disruption, and are no longer relevant.

Title	**Restarting a complex system is challenging**			
Description	The global aviation system merges people, technology and operating environments into a single complex socio-technical system. Because this system is highly interconnected, changes can have knock-on effects that have not been anticipated. Normally, when a change to the system is made, it is risk assessed and trialled in detail. The shutdown and subsequent restart (in new circumstances) of approximately 80% of the aviation system will almost certainly have unpredictable consequences. Thus the aviation system resilience needs to be improved.			
Deliverables		Timeline	Owner	Status
Review of the existing Risk Assessments to check their suitability for the return to, or continuation of (new) operations and identification of potential new hazards		2021-	All stakeholders	Closed
References	EASA Covid-19 portfolio: C-47/SI-5005, C-46/SI-5008			

Title	Missing suppliers and difficulty liaising with suppliers			
Description	Due to the pandemic, some suppliers have suspended their activities. Others are experiencing the impact of corona-related lockdown like difficult working conditions, short-time working, longer production and delivery times. This makes it difficult for organisations to keep the supply chain upright.			
Deliverables		Timeline	Owner	Status
Anticipate potential issues by risk management and change management processes in the framework of SMS		2021-	All stakeholders	Closed
Increase the monitoring activities of suppliers and responsiveness when the services are not being delivered as expected.		2021-	All stakeholders	Closed
References	EASA Covid-19 portfolio: 55/SI-50NN			

c. Jet blast

These actions were included in the "operational actions" chapter of the first issue of the NPAS. Jet blast from taxying aircraft can directly or indirectly put personnel in danger. Following several such incidents at Luxembourg, a study was initiated. The study was completed and mitigating measures like blast fences and AIP updates were introduced.

Title	Jet blast study by Lux-Airport			
Description	Personnel at Luxembourg airport is at risk from the jet blast of taxying aircraft. Several parking positions are affected, mainly on the cargo apron P7, but also on P1. A jet blast study has been initiated by Lux-Airport to obtain better data.			
Past deliverables		Timeline	Owner	Status
Study into the risks and potential solutions for jet blast at ELLX		2023	Lux-Airport	completed
References	DAC ASR 2018, 2019			

d. FOD

These actions were included in the "operational actions" chapter of the first issue of the NPAS. FOD was identified as a risk in relation to the runway refurbishment at Luxembourg airport of summer 2021 and 2022. After successful completion of the refurbishment, it is no longer necessary to take special measures. Responsibilities for FOD were reassigned to the aerodrome operator, who decided no tot pursue the plan for a FOD detection system.

Title	**FOD prevention completed**			
Description	A complete refurbishment of the runway at ELLX is planned for summer 2021 and 2022. The work on the runway will be carried out at night only, while flight operations take place during the day. Work on TWY I may take place during the day. An increased risk of FOD on the runway and on taxiways used for vehicle access is expected.			
Past deliverables		Timeline	Owner	Status
FOD prevention plan		2022	Lux-Airport	completed
Training of all external drivers accessing maneuvering area for runway refurbishment works		2021-2022	Lux-Airport	completed
Implement a FOD detection system		2021-2022	ANA	not done
References	DAC Annual ASR 2019			

e. EPAS MST.0035 Fraud cases in Part-147 organisations

There is only one Part-147 organisation in Luxembourg. It provides only type-rating training, mostly for its own staff, and holds examinations mostly in Luxembourg. Based on many years' oversight, no problems of this nature were ever encountered. The risk is considered low enough, so that no additional actions on top of the normal oversight by DAC are required.

Title	**Prevention, detection and mitigation of fraud cases in Part-147 organisations**			
Description	EVT.0002, the report on the EU maintenance licensing and training system, denounced cases of fraud or cheating during the examinations. The action includes discussions with the CAs/industry on how to prevent, detect, mitigate and eliminate fraud cases.			
Deliverables		Timeline	Owner	Status
n/a				
References	EPAS MST.0035			

f. EPAS MST.0015 Helicopter Safety Events

It is assumed that the task to organise annual helicopter safety events is intended for States that have a large helicopter industry. For Luxembourg, with only one small helicopter AOC, safety events are not considered an adapted means of communication. Direct communication, facilitated by short distances, is more effective.

The difficulty for a small authority does not lie in keeping contact with operators, but rather in keeping contact with all the developments in the larger industry. In the rotorcraft domain, DAC is achieving this by participating in the helicopter expert group (subgroup of the TeB Air Ops) since 2020.

Title	**Helicopter safety events**			
Description	Member States' CAs, in partnership with industry representatives, should organise helicopter safety events annually or every two years. The EHEST, IHST, CA, Heli Offshore or other sources of safety promotion materials could be freely used and promoted.			
Deliverables		Timeline	Owner	Status
n/a				
References	EPAS MST.0015			

g. EPAS MST.0024 Loss of separation between civil and military aircraft

This MST was triggered by encounters of civil aircraft with "non-cooperative" military aircraft (aircraft operating without transponder) over the high seas. No such events have occurred in Luxembourg.

Title	**'Due regard' for the safety of civil traffic over high seas**			
Description	States must have due regard for the safety of civil aircraft and must have established respective regulations for national State aircraft. Several EU Member States had reported an increase in incidents involving close encounters between civil and military aircraft and more particularly an increase in non-cooperative international military traffic over the high-sea waters. Taking into account this situation and the possible hazard to civil aviation safety, the EC mandated EASA to perform a technical analysis of the reported occurrences. The technical analysis issued a number of recommendations for the Member States: • fully apply the ICAO Manual on Civil-Military Cooperation in Air Traffic Management (Doc 10088); • closely coordinate to develop, harmonise and publish operational requirements and instructions for State aircraft to ensure that 'due regard' for civil aircraft is always maintained; • support the development and harmonisation of civil/military coordination procedures for ATM at EU level and beyond if possible; • report relevant occurrences to EASA; and • facilitate/make primary surveillance radar data available in military ATC centres to civil ATC units. The objective of this action is to ensure that Member States follow up on the recommendations and provide feedback on the implementation. EASA will analyse occurrences reported by Member States, with a view to considering the development of specific actions.			
Deliverables		Timeline	Owner	Status
n/a				
References	EPAS MST.0024			

h. EPAS MST.0041 Harmonisation in Helicopter AOC approvals, procedures and documents

There is no specific helicopter AOC holder in Luxembourg, only one with mixed airplane and helicopter operations. Its approvals, procedures and documents are handled in line with DAC's standard processes applicable to all AOC holders.

Title	**Harmonisation in Helicopter AOC approvals, procedures and documents**			
Description	Member States should harmonise and, to the extent possible, simplify the application processes in the area of commercial operations with helicopters, including the use of common application forms and compliance lists with an indicative scope as follows: • establish a harmonised process, a standardised checklist/guide for application for and changes to a helicopter AOC (OPS SPECs), with possible extension to CAMOs and ATOs; • harmonise the process to add/remove a helicopter from the AOC; • harmonise/standardise Member States' practices and development of a common application process (e.g. common application form for the removal of an item from the MEL); • develop guidance on the implementation of the EFB provisions with regard to the versatility of helicopter operations. The Agency will facilitate and support the development of this task with the Helicopter Expert Group, a Subgroup of the Air OPS TEB.			
Deliverables		Timeline	Owner	Status
n/a				
References	EPAS MST.0041			