THE REPUBLIC OF GHANA

NATIONAL AVIATION SAFETY PLAN

2021 -2025

Table of Contents

Records of Amendments

Revision No.	Date	Entered By
Original Issue	18th May 2022	SSP Implementation Team

List of Tables and Figures

List of Tables

List of Figures

1. Introduction

1.1 Overview of the NASP

Ghana is committed to enhancing aviation safety and to the resourcing of supporting activities. The purpose of this National Aviation Safety Plan (NASP) is to continually reduce fatalities and the risk of fatalities, through the development and implementation of a national aviation safety strategy. A safe aviation system contributes to the economic development of Ghana and its industries. The NASP promotes the effective implementation of Ghana's safety oversight system, a risk-based approach to managing safety, as well as a coordinated approach to collaboration between Ghana and other States, regions and industry. All stakeholders are encouraged to support and implement the NASP as the strategy for the continuous improvement of aviation safety.

The NASP of Ghana is in alignment with the ICAO *Global Aviation Safety Plan* (GASP, Doc 10004) and the AFI Regional Aviation Safety Plan (AFI-RASP).

Charles Ebo Kraikue

Director-General, Ghana Civil Aviation Authority &
Accountable Executive, State Safety Programme.

1.2 Structure of the NASP

This NASP presents the strategy for enhancing aviation safety for a period of 5 years. It is comprised of six sections. In addition to the introduction, sections include: the purpose of the NASP, Ghana's strategic approach to managing aviation safety, the national operational safety risks identified for the 2021 - 2025 NASP, other safety issues addressed in the NASP and a description of how the implementation of the Safety Enhancement Initiatives (SEIs) listed in the NASP is going to be monitored.

1.3 Relationship between the NASP and the State Safety Programme (SSP)

This NASP addresses operational safety risks identified in the ICAO GASP and the AFI-RASP in the absence of a fully implemented SSP for Ghana. Ghana is committed to fully implement an SSP by end 2022 as a State's responsibilities for the management of safety comprise both safety oversight and safety management, collectively implemented through an SSP. Initiatives listed in this NASP address organizational challenges and aim to enhance organizational capabilities related to effective safety oversight.

Note:

By the end of 2022, through an effective SSP, Ghana will be able to identify and mitigate national operational safety risks. The SSP will provide safety information to the NASP and allow Ghana to manage its aviation activities in a coherent and proactive manner, measure the safety performance of its civil aviation system, monitor the implementation of the NASP's SEIs and address any identified hazards and deficiencies. The NASP is one of the key documents produced as part of Ghana's SSP documentation. It is the means by which Ghana defines, and drives the implementation of SEIs generated by the SSP process and drawn from the ICAO GASP and the AFI-RASP. It also allows Ghana to determine initiatives to strengthen the SSP or otherwise needed to achieve its safety objectives. Safety intelligence gathered through the SSP also contributes to other national plans, such as the air navigation plan. Further information on Ghana's developing SSP can be found at www.gcaa.com.gh.

1.4 Responsibility for the NASP development, implementation and monitoring

The Ghana Civil Aviation Authority is responsible for the development, implementation and monitoring of the NASP, in collaboration with National Aviation Safety Coordination Group (NASCG) which comprises of Ghana Civil Aviation Authority (GCAA), Ghana Meteorological Agency (GMET), National Communication Authority (NCA), Environmental Protection Agency (EPA), Ghana Air Force, Ghana Nuclear Regulatory Authority (GNRA), Aircraft Accident Investigation Bureau (AIB) Ghana and with the aviation industry. The NASP was developed in consultation with national operators and other stakeholders, and in alignment with the 2020-2022 Edition of the GASP and the AFI-RASP.

1.5 National safety issues, goals and targets

The NASP addresses the following national safety issues:

1) Controlled Flight Into Terrain (CFIT);

2) Loss Of Control In-Flight (LOC-I);

3) Mid-Air Collision (MAC);

4) Runway Excursion (RE);

5) Runway Incursion (RI)

6) Bird Strikes (BIRD)

7) Failure of Navigational Aids (ATM/CNS)

8) Unreliable Navigational Aids (ATM/CNS)

9) Unreliable Meteorological forecast (OTHER)

10) Ground Collision (GCOL)

In order to address the issues listed above and enhance safety at the national level, the 2021 - 2025 NASP contains the following goals and targets as shown in Table 1.

Table 1: NASP Goals, Targets and Indicators

Goals	Targets		Indicators
Goal 1: Achieve a continuous reduction of operational safety risks	1.1	Maintain a decreasing trend of global accident rate	• Number of accidents • Number of accidents per 10,000 departures (accident rate) • Number of fatal accidents • Number of fatal accidents per 10,000 departures (fatal accident rate) • Number of fatalities • Number of fatalities per passengers carried (fatality rate) • Percentage of occurrences related to high-risk categories (HRCs)
Goal 2: Strengthen Ghana's safety oversight capabilities	2.1	Ghana intends to improve its current score of 89.89% achieved in 2019 for the Effective Implementation (EI) of the critical elements (CEs) of its safety oversight system (with focus on priority PQs) as follows: by 2022 – 92 per cent by 2026 – 95 per cent by 2030 – 99 per cent	• Overall global EI score • Overall regional EI score • Ghana to meet the EI score as per the timelines • Ghana to fully implement the priority PQs related to its safety oversight system • Percentage of required corrective action plans (CAPs) submitted by Ghana (using OLF) • Percentage of completed CAPs by Ghana (using OLF)

	2.2	By 2022, Ghana to reach a safety oversight index greater than 1, in all categories.	• Ghana to maintain a safety oversight index greater than 1 in all categories. • Safety oversight index per category
Goal 3: Implement effective State Safety Programme (SSP)	3.1	By end of 2022, Ghana to implement the foundation of its SSP	• Percentage of each subject area implemented • Percentage of satisfactory SSP foundational PQs • Percentage of required CAPs related to the SSP foundational PQs submitted by Ghana (using OLF) • Percentage of required CAPs related to the SSP foundational PQs completed by Ghana (using OLF)
	3.2	By 2025, Ghana to implement an effective SSP, appropriate to its aviation system complexity	• Level of maturity achieved in Annex 19 PQs, by Ghana. • Number of applicable Service Providers in Ghana who have implemented an SMS. • Level of maturity achieved in the implementation the national aviation safety plan of Ghana.
Goal 4: Increase collaboration at the regional level	4.1	By 2022, Ghana to be able to offer assistance to States that do not expect to meet GASP Goals 2 and 3, and to play a major part in the regional safety oversight mechanism.	• Number of States requiring assistance/support • Number of States actively seeking assistance • Number of States that received assistance • Number of States offering assistance
	4.2	By 2022, Ghana to contribute information on safety risks, including SSP safety performance indicators (SPIs), to AFI Regional Aviation Safety Group (RASG-AFI)	• Number of Reports on safety risks to RASG-AFI • Number of SSP SPIs shared with RASG-AFI • Number of Reports on safety matters forwarded other States, RASG-AFI and other stakeholders.

	4.3	By 2022, Ghana should have an effective safety oversight capability and an effective SSP, to enable it actively lead RASG-AFI safety risk management activities.	• Fully established and implemented effective safety oversight capabilities • An effective SSP implementation • Active and leading roles in RASG-AFI's safety risk management activities • Number of States in RASG-AFI, assisted by Ghana to establish and implement their National Aviation Safety Plans
Goal 5: Expand the use of industry programmes	5.1	By 2021, all service providers in Ghana to use globally harmonized SPIs as part of their safety management system (SMS)	• Number of service providers in Ghana using globally harmonized metrics for their SPIs
	5.2	By 2022, increase the number of service providers in Ghana participating in the corresponding ICAO-recognized industry assessment programmes	• Number of service providers in Ghana participating in the corresponding ICAO-recognized industry assessment programmes
Goal 6: Ensure the appropriate infrastructure is available to support safe operations	6.1	By 2022, Ghana to implement the air navigation and airport core infrastructure	• Number of elements of air navigation and airport core infrastructure implemented by Ghana.

1.6 Operational Context

There are two (2) aerodromes going through the certification process in Ghana, and one (1) international aerodrome which is certified. The airspace of Ghana is classified into Classes A, B, C, D, E, F and G. There were 149204[1] movements in Ghana over the period of 2018 to 2021. There are currently eight (8) active air operator certificates (AOCs) issued by Ghana, and of those there are two (2) issued to operators conducting international commercial air transport operations. Ghana also has three (3) helicopter operators. There are 20 heliports in Ghana. Common challenges in Ghana include but not limited to:

- Meteorology (lack of equipment and qualified personnel etc.)
- Topography (high grounds around airports on approach and take-off paths)
- Infrastructure (lack of appropriate ground aids, strength, length and surfaces of Runways etc.)
- Socio-political issues (location of some airports, building in restricted areas around airports, number of people who can afford air travel etc.)

1 www.gacl.com.gh/traffic-statistics-2019/

2. Purpose of Ghana's National Aviation Safety Plan

The NASP is the master planning document containing the strategic direction of Ghana for the management of aviation safety for a period of five (5) years from 2021 to 2025. This plan lists national safety issues, sets national aviation safety goals and targets, and presents a series of safety enhancement initiatives (SEIs) to address identified safety deficiencies and achieve the national safety goals and targets.

The NASP has been developed using international safety goals and targets and HRCs from both the GASP (www.icao.int/gasp) and the AFI-RASP. These are highlighted in the text, where applicable. The SEIs listed in the NASP support the improvement of safety at the wider regional and international levels and include several actions to address specific safety risks and recommended SEIs for individual States set out in the AFI-RASP. Ghana has adopted these SEIs and has included them in this plan. Cross-references are provided to the AFI-RASP for individual SEIs where relevant.

3. Ghana's Strategic Approach To Managing Aviation Safety

The NASP presents the SEIs that were developed based on the organizational challenges (ORG) and operational safety risks (OPS), as presented in the ICAO global aviation safety roadmap, as well as State-specific issues identified by safety oversight inspections and audits, data collection and analysis from service providers' SMS, etc. This plan is developed and maintained by Ghana Civil Aviation Authority (GCAA), in coordination with all stakeholders and is updated at least every two (2) years.

The NASP includes the following national safety goals and targets, for the management of aviation safety, as well as a series of indicators to monitor the progress made towards their achievement. They are tied to the goals, targets and indicators listed in the GASP and the AFI-RASP and include additional national safety goals, targets and indicators.

Table 2: NASP Goals, Targets and Indicators linkage to that of GASP and RASP

Goals	Targets		Indicators	Link to GASP and RASP
Goal 1: Achieve a continuous reduction of operational safety risks	1.1	Maintain a decreasing trend of global accident rate	• Number of accidents • Number of accidents per 10,000 departures (accident rate) • Number of fatal accidents • Number of fatal accidents per 10,000 departures (fatal accident rate) • Number of fatalities per passengers carried (fatality rate) • Percentage of occurrences related to high-risk categories (HRCs)	• This goal is directly linked to Goal 1 and Target 1.1 of the GASP and linked to Goal 1 and Target 1.1 of the RASP (*To be amended to incorporate RASP Targets)*

Goal 2: Strengthen Ghana's safety oversight capabilities	2.1	Ghana intends to improve its current score of 89.89% achieved in 2019 for the Effective Implementation (EI) of the critical elements (CEs) of its safety oversight system (with focus on priority PQs) as follows: by 2022 – 92 per cent by 2026 – 95 per cent by 2030 – 99 per cent	• Ghana to meet the EI score as per the timelines • Ghana to fully implement the priority PQs related to its safety oversight system • Percentage of required corrective action plans (CAPs) submitted by Ghana (using OLF) • Percentage of completed CAPs by Ghana (using OLF)	• This goal is directly linked to Goal 2 and Target 2.1 of the GASP and linked to Goal 2 and Target 2.1 of the RASP
	2.2	By 2022, Ghana to reach a safety oversight index greater than 1, in all categories.	• Ghana to maintain a safety oversight index greater than 1 in all categories. • Safety oversight index per category	• This goal is directly linked to Goal 2 and Target 2.2 of the GASP and linked to Goal 2 and Target 2.2 of the RASP
Goal 3: Implement effective State Safety Programme (SSP)	3.1	By end of 2022, Ghana to implement the foundation of its SSP	• Percentage of each subject area implemented • Percentage of satisfactory SSP foundational PQs • Percentage of required CAPs related to the SSP foundational PQs submitted by Ghana (using OLF) • Percentage of required CAPs related to the SSP foundational PQs completed by Ghana (using OLF)	• This goal is directly linked to Goal 3 and Target 3.1 of the GASP and linked to Goal 3 and Target 3.1 of the RASP

	3.2	By 2025, Ghana to implement an effective SSP, appropriate to its aviation system complexity	• Level of maturity achieved in Annex 19 PQs, by Ghana. • Number of applicable Service Providers in Ghana who have implemented an SMS. • Level of maturity achieved in the implementation the national aviation safety plan of Ghana.	• This goal is directly linked to Goal 3 and Target 3.2 of the GASP and linked to Goal 3 and Target 3.2 of the RASP
Goal 4: Increase collaboration at the regional level	4.1	By 2022, Ghana to be able to offer assistance to States that do not expect to meet GASP Goals 2 and 3, and to play a major part in the regional safety oversight mechanism.	• Number of States requiring assistance/support • Number of States actively seeking assistance • Number of States that received assistance • Number of States offering assistance	• This goal is directly linked to Goal 4 and Target 4.1 of the GASP and linked to Goal 4 and Target 4.1 of the RASP
	4.2	By 2022, Ghana to contribute information on safety risks, including SSP safety performance indicators (SPIs), to AFI Regional Aviation Safety Group (RASG-AFI)	• Number of Reports on safety risks to RASG-AFI • Number of SSP SPIs shared with RASG-AFI • Number of Reports on safety matters forwarded other States, RASG-AFI and other stakeholders.	• This goal is directly linked to Goal 4 and Target 4.2 of the GASP and linked to Goal 4 and Target 4.2 of the RASP
	4.3	By 2022, Ghana should have an effective safety oversight capability and an effective SSP, to enable it actively lead RASG-AFI safety risk management	• Fully established and implemented effective safety oversight capabilities • An effective SSP implementation • Active and leading roles in RASG-AFI's	• This goal is directly linked to Goal 4 and Target 4.3 of the GASP and linked to Goal 4 and Target 4.3 of the RASP

		activities.	safety risk management activities • Number of States in RASG-AFI, assisted by Ghana to establish and implement their National Aviation Safety Plans	
Goal 5: Expand the use of industry programmes	5.1	By 2022, all service providers in Ghana to use globally harmonized SPIs as part of their safety management system (SMS)	• Number of service providers in Ghana using globally harmonized metrics for their SPIs	• This goal is directly linked to Goal 5 and Target 5.1 of the GASP and linked to Goal 5 and Target 5.1 of the RASP
	5.2	By 2022, increase the number of service providers in Ghana participating in the corresponding ICAO-recognized industry assessment programmes	• Number of service providers in Ghana participating in the corresponding ICAO-recognized industry assessment programmes	• This goal is directly linked to Goal 5 and Target 5.2 of the GASP and linked to Goal 5 and Target 5.2 of the RASP
Goal 6: Ensure the appropriate infrastructure is available to support safe operations	6.1	By 2022, Ghana to implement the air navigation and airport core infrastructure	• Number of elements of air navigation and airport core infrastructure implemented by Ghana.	• This goal is directly linked to Goal 6 and Target 6.1 of the GASP and linked to Goal 6 and Target 6.1 of the RASP

The SEIs in this plan are implemented through Ghana's existing safety oversight capabilities and the service providers' SMS. SEIs derived from the ICAO global aviation safety roadmap were identified to achieve the national safety goals and targets presented in the NASP. Some of the national SEIs are linked to overarching SEIs at the regional and international levels and help to

enhance safety globally. The full list of the SEIs is presented in Appendix A to the NASP.

The NASP also addresses emerging issues. Emerging issues include concepts of operations, technologies, public policies, business models or ideas that might impact safety in the future, for which insufficient data exists to complete typical data-driven analysis. It is important that Ghana remains vigilant on emerging issues to identify potential safety risks, collect relevant data and proactively develop mitigations to address them. The NASP addresses the following emerging issues, which were identified by Surveillance inspections and audits, occurrence reports received from the general public and industry, etc., for further analysis:

1) Operations of RPAS
2) Small drones operating in the vicinity of aerodromes
3) SBAS Operations
4) Cross Crew Qualifications
5) Use of Tablets in the Cockpit for departures and approaches
6) Use of unlicensed personnel by service providers

4. National Operational Safety Risks

The NASP includes SEIs that address national operational safety risks, derived from lessons learned from operational occurrences and from a data-driven approach. These SEIs may include actions such as: rule-making; policy development; targeted safety oversight activities; safety data analysis; and safety promotion.

Ghana will publish an Annual Safety Report with effect from December 2022, which will be available on the Ghana Civil Aviation Authority's website (www.gcaa.com.gh/). The summary of accidents and serious incidents that occurred in Ghana and those for aircraft registered in Ghana involved in commercial air transport and aircraft involved in general aviation are shown in Table 3 and Table 4 respectively.

Table 3: Summary of Accidents and Serious Incidents that occurred in Ghana

Year	Fatal accidents	Non-fatal accidents	Serious incidents
Commercial air transport occurrences in Ghana			
2006 to 2021	**2**	**13**	**28**
2022	**0**	**0**	**0**
General aviation aircraft occurrences in Ghana			
2006 to 2021	**1**	**0**	**1**
2022	**0**	**0**	**0**

Table 4: Summary of Accidents and Serious Incidents involving Ghana registered aircraft

Year	Fatal accidents	Non-fatal accidents	Serious incidents
Occurrences involving commercial air transport aircraft registered in Ghana			
2006 - 2021	**0**	**5**	**24**
2022	**0**	**0**	**0**
Occurrences involving general aviation aircraft registered in Ghana			
2006 - 2021	**0**	**0**	**0**
2022	**0**	**0**	**0**

The following 29 national High Risk Categories (HRCs) of occurrences in the Ghana context were considered of the utmost priority because of the number of fatalities and risk of fatalities associated with such events. They were identified based on analyses from mandatory and voluntary reporting systems, accident and incident investigation reports, safety oversight activities over the past five (5) years, the SSP, as well as on the basis of regional analysis conducted by AFI RASG, BAGASOO, APIRG, BAGAIA and on the operational safety risks described in the GASP. These HRCs are in line with those listed in the 2020 - 2022 Edition of the GASP, as well as the AFI-RASP:

1) Controlled Flight Into Terrain (CFIT);
2) Loss of Control In-flight (LOC-I)
3) Mid-Air Collision (MAC)
4) Runway Excursion (RE)
5) Runway Incursion (RI)

In addition to the national operational safety risks listed above, the following additional categories of operational safety risks have been identified:

1) Bird Strikes (BIRD)
2) Failure of Navigational Aids (ATM/CNS)
3) Unreliable Navigational Aids (ATM/CNS)
4) Unreliable Meteorological Forecast (OTHER)
5) Ground Collision (GCOL)

The aviation occurrence categories from the Commercial Aviation Safety Team (CAST)/ICAO Common Taxonomy Team (CICTT) were used to assess risk categories in the process of determining national operational safety risks. The CICTT taxonomy can be found in Appendix C.

In order to address the national operational safety risks listed above, Ghana identified the following contributing factors leading to HRCs and will implement a series of SEIs, some of which are derived from the ICAO OPS roadmap, contained in the GASP:

HRC 1: Bird Strikes

1) Migration of Birds across the Runway of Certified Aerodromes.
2) Location of Abattoir in close proximity to Airports.
3) Human activities in settlements which have come close to the Airports.
4) Birds being attracted to grasshoppers, earth worms, and other insects after clearing weeds around the Runway and also the airside of airports.

HRC 2: Failure of Navigational Aids

1) Erratic Power Supply
2) Failure of Mains power supply
3) Failure of system components
4) Encroachment of the critical and sensitive areas of navigational aids.

HRC 3: Unreliable Navigational Aids

1) Uncalibrated Navigational Aids in accordance with periodicity requirements.
2) Failure of system components
3) Encroachment of the critical and sensitive areas of navigational aids.
4) Erratic Power Supply

HRC 4: Unreliable Meteorological forecast

1) Lack of qualified Meteorological forecasters at aerodromes
2) Lack of appropriate Meteorological equipment installed at aerodromes

HRC 5: Ground Collision

1) Lack of adherence to Standard Operating Procedures (SOPs) by personnel and vehicular movements on the RAMP
2) Human Error by personnel authorized to conduct operations on the RAMP
3) Unclear instructions by ATC
4) Unclear RAMP Markings and lighting
5) Unavailable / inaccurate Ground movement charts

The full list of the SEIs is presented in the Appendices A and B to the NASP.

5. Other Safety Issues

In addition to the national operational safety risks listed in the NASP, Ghana has identified other safety issues and initiatives selected for the NASP. These are given priority in the NASP since they are aimed at enhancing and strengthening Ghana's safety oversight capabilities and the management of aviation safety at the national level.

The eight critical elements (CEs) of a safety oversight system are defined by ICAO. Ghana is committed to the effective implementation of these eight CEs, as part of its overall safety oversight responsibilities, which emphasize Ghana's commitment to safety in respect of its aviation activities. The eight CEs are presented in the Figure 1 below:

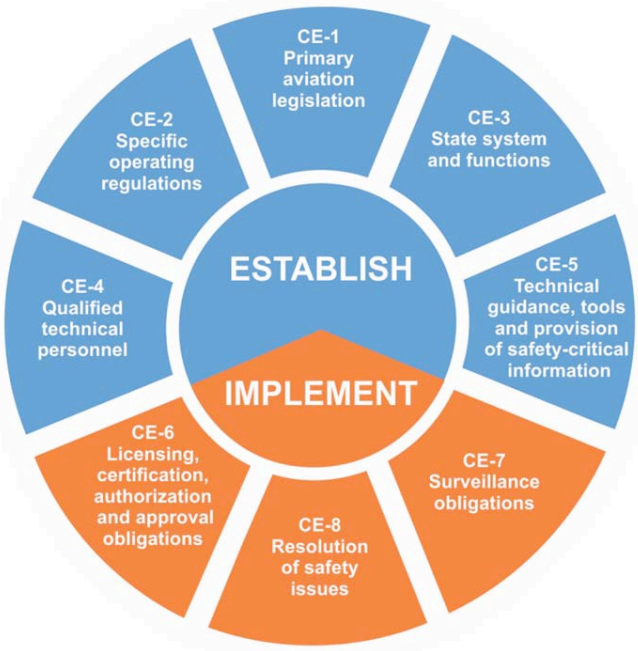

Figure 1: Critical elements of a State's safety oversight system

The latest ICAO activities, which aim to measure the effective implementation of the eight CEs of Ghana's safety oversight system, as part of the ICAO Universal Safety Oversight Audit Programme (USOAP), have resulted in the scores shown in Table 5.

Table 5: ICAO USOAP Scores for Ghana

Overall EI score							
89.89%							
EI score by CE							
CE-1	**CE-2**	**CE-3**	**CE-4**	**CE-5**	**CE-6**	**CE-7**	**CE-8**
96.88%	95.79%	92.31%	98.53%	92.91%	86.11%	78.38%	83.33%
EI score by audit area[2]							
LEG	**ORG**	**PEL**	**OPS**	**AIR**	**AIG**	**ANS**	**AGA**
91.30%	91.67%	98.75%	87.60%	93.40%	93.48%	84.94%	87.12%

The safety oversight index (SOI) of a State is an ICAO indicator of its safety oversight capabilities. Every State audited by ICAO has an SOI. It is a number greater than zero where "1" represents a level at which the safety oversight capabilities of a State would indicate the minimum expected capabilities considering the number of departures as an indication of the size of that State's aviation system. The calculations conducted by ICAO of Ghana's SOI have resulted in the scores shown in Table 6.

2 Eight audit areas pertaining to USOAP, i.e. primary aviation legislation and civil aviation regulations (LEG), civil aviation organization (ORG); personnel licensing and training (PEL); aircraft operations (OPS); airworthiness of aircraft (AIR); aircraft accident and incident investigation (AIG); air navigation services (ANS); and aerodromes and ground aids (AGA).

Table 6: Calculated ICAO SOI Scores for Ghana

Overall SOI score	Score in the area of Operations	Score in the area of Air Navigation	Score in the area of Support Functions
1.63	**1.43**	**1.72**	**1.73**

The following other safety issues in the Ghanaian context were considered of the utmost priority because they are systemic issues, which impact the effectiveness of safety risk controls. They were identified based on analysis from USOAP data, accident and incident investigation, and safety oversight activities over the past ten (10) years, as well as the SSP. These issues are typically organizational in nature and relate to challenges associated with the conduct of States' safety oversight functions, implementation of SSP at the national level and the level of SMS implementation by national service providers. They take into consideration organizational culture, policies and procedures within Ghana Civil Aviation Authority (GCAA), Ghana Meteorological Agency (GMET), National Communication Authority (NCA), Environmental Protection Agency (EPA), Ghana Air Force, Ghana Nuclear Regulatory Authority (GNRA), Aircraft Accident Investigation Bureau (AIB) Ghana, and those of service providers. These safety issues are in line with those listed in the 2020 - 2022 of the GASP, as well as the AFI-RASP:

1) ***Bird Strike***. The frequency of occurrence of Bird strikes in Ghana is becoming an issue of concern.

2) ***Unreliable Meteorological forecast.*** In addition, lack of reporting wind shear, which is a safety issue in some aerodromes, is of high priority which needs to be resolved. The relevant MET offices also do not issue wind shear warnings for those aerodromes.

3) ***Failure/Unreliable Navigational Aids.*** Inaccurate navigation can result in catastrophic accidents.

4) ***Unavailability of required aeronautical charts.*** Leads to inaccurate navigation which can lead to airspace users not certain of their position and can result in catastrophic accidents.

5) ***Memorandum of Understanding (MOU) between the Nuclear Regulatory Authority and the Accident Investigation Body (AIB).*** The MoU to be reviewed to address the possible overlap of responsibilities with respect to the functions and responsibilities of the two entities concerning investigation of accidents and incidents involving radioactive materials.

6) Promulgation of provisions of Annex 2 to the Chicago Convention on high seas airspace in the primary aviation legislation, to ensure compliance without exception.

In order to address the issues listed above, Ghana will implement a series of SEIs, some of which are derived from the ICAO ORG roadmap, contained in the GASP. The full list of the SEIs is presented in the Appendix A and Appendix B to the NASP.

6. Monitoring Implementation

Ghana will continuously monitor the implementation of the SEIs listed in the NASP and measure safety performance of the national civil aviation system, to ensure the intended results are achieved, using the mechanisms presented in the Appendix A to this plan.

In addition to the above, Ghana will review the NASP every 2 years in line with the GASP, to keep the identified operational safety risks, safety issues and selected SEIs updated and relevant. The Ghana Civil Aviation Authority (GCAA) will periodically review the safety performance of the initiatives listed in the NASP to ensure the achievement of national safety goals and targets. If required, Ghana will seek the support of AFI RASG, BAGASOO, industry, etc., to ensure the timely implementation of SEIs to address safety deficiencies and mitigate risks. Through close monitoring of the SEIs, Ghana will make adjustments to the NASP and its initiatives, if needed, and update the NASP accordingly.

Ghana will use the indicators listed in Section 3 of this plan to measure safety performance of the civil aviation system and monitor each national safety target. An Annual safety report will be published to provide stakeholders with relevant up-to-date information on the progress made in achieving the national safety goals and targets, as well as the implementation status of the SEIs.

In the event that the national safety goals and targets are not met, the root causes will be presented. If Ghana identifies critical safety risks, reasonable measures will be taken to mitigate them as soon as practicable, possibly leading to an unscheduled revision of the NASP.

Ghana adopted a standardized approach to provide information at the regional level, for reporting to the RASGs (Ghana's safety information is shared with RASG through the designated focal point, i.e. the USOAP National Continuous Monitoring Coordinator (NCMC)).This allows the region to receive information and assess safety risks using common methodologies.

Any questions regarding the NASP and its initiatives, and further requests for information may be addressed to the following:

Ghana Civil Aviation Authority (GCAA)

Private Mail Bag

Kotoka International Airport, Accra

Telephone: +233302776171

Fax: +233302773293

Email: sspghana@caa.com.gh

Website: www.caa.com.gh/

Appendix A: Detailed SEIs – National Operational Safety Risks

HRC 1: Controlled Flight Into Terrain (CFIT)							
Goal 1: Achieve a continuous reduction of operational safety risks							
Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI-1: Mitigate contributing factors to the risk of CFIT	1.Implement the following CFIT safety actions:		GCAA Inspectors (Airworthiness / Operations Sections, SRD)	GCAA Inspector (ANS, Airworthiness & Operations Sections), ANSPs, Air Operators	Number of CFIT Accident/incident per 10,000 Flight Movements	High	Surveillance of Air Operators, ANSP activities
	(a) Ensure aircraft are equipped with terrain awareness and warning system (TAWS) in accordance with Annex 6	Implemented					
	b) Promote the wider use of TAWS beyond the requirements of Annex 6	Implemented					
	c) Issue a Safety Advisory to increase adherence to TAWS warning procedures	Implemented					
	d) Promote greater awareness of approach risks	Implemented					
	e) Consider the implementation of continuous descent final approaches (CDFA)	Implemented					

	f) Consider the implementation of minimum safe altitude warning (MSAW) systems	Implemented					
	g) Ensure the timeliness of updates and accuracy of Electronic Terrain and Obstacle Data (eTOD)	End of 2022					
	h) Promote the use of GPS-derived position data to feed TAWS	End of 2022					
	2. Validate the effectiveness of the safety enhancement initiatives (SEIs) presented in this roadmap through the analysis of Mandatory Occurrence Reporting (MORs) and Voluntary Occurrence Reporting systems (VORs) and accident/incident investigations (apply safety management methodologies)	Continuing Process	CAA Inspectors (Safety Regulation Department (SRD))	GCAA Inspectors (SRD), Accident/Incident Investigation Bureau (AIB), National Aviation Safety Coordination Group (NASCG)	Number of CFIT Accident/incident per 10,000 Flight Movements	High	High Safety reporting (MOR/VOR)
	3. Identify additional contributing factors, for example:	Continuing Process	GCAA Inspectors (ANS and Operations Sections)	GCAA Inspectors (ANS & Operations sections, Section), ANSP, PANS-OPS Service Providers, Air Operators	Number of CFIT Accident/incident per 10,000 Flight Movements	High	Continuous monitoring via surveillance activities on ANSP, ATO and Air Operators
	a) Flight in adverse environmental conditions						
	b) Approach design and documentation (e.g. approaches with vertical guidance (APV) or localizer performance with vertical guidance (LPV) approaches)						

	c) Phraseology used (standard vs. non-standard)						
	d) Pilot fatigue and disorientation						
	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for CFIT						
	5. Conduct continuous evaluations of the performance of the SEIs						
SEI -2: Mitigate contributing factors to CFIT accidents and incidents	Implement the following CFIT safety actions:	End of 2022	GCAA Inspectors (Airworthiness & Operations Sections)	GCAA Inspectors (ANS, Airworthiness, and Operations Sections), ANSP, Air Operators	Number of CFIT Accident / incident per 10,000 flight movements.	High	Surveillance of Air Operators, ANSP activities
	a) Support the adoption of TAWS in accordance with Annex 6						
	b) Promote the wider use of TAWS beyond the requirements of Annex 6						
	c) Promote the adherence to TAWS warning procedures						
	d) Promote greater awareness of approach risks						
	e) Promote the implementation of CDFA						
	f) Promote the implementation of MSAW systems						

	g) Promote the timeliness of updates and accuracy of eTOD						
	h) Promote the use of global positioning system (GPS)-derived position data to update TAWS						
	2. Validate the effectiveness of the SEIs presented in this roadmap in the region using data provided by States and industry (apply safety management methodologies)	Continuing Process	GCAA Inspectors (SRD), SSP Implementation Team, AIB,	GCAA Inspectors (SRD), SSP Implementation Team, AIB, Air Operators, & Flight simulator products and service providers	Number of occurrences analysed per year / CFIT occurrence rates in MOR,VOR and AIG reports	High	High Safety reporting (MOR/VOR)
	3. Identify additional contributing factors, for example:	End of 2022	GCAA Inspectors (Airworthiness & Operations Sections)	GCAA Inspectors (ANS, Airworthiness, and Operations Sections), ANSP, Air Operators	Number of CFIT Accident / incident per 10,000 flight movements.	High	Surveillance of Air Operators, ANSP activities
	a) Flight in adverse environmental conditions						
	b) Approach design and documentation						
	c) Phraseology used (standard vs non-standard)						
	d) Pilot fatigue and disorientation						
	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for CFIT						

	5. Conduct continuous evaluation of the performance of the SEIs						
HRC 2 : Loss of Control In-flight (LOC-I)							
Goal 1: Achieve a continuous reduction of operational safety risks							
Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI -3: Mitigate contributing factors to the risk of LOC-I accidents and incidents	1. Implement the following LOC-I safety actions:	Implemented	GCAA Inspectors (Operations Section)	GCAA Inspectors (Operations Section), Air Operators, and Flight simulator products and service providers	Number of LOC-I Accident/incident per 10,000 flying hours.	High	Surveillance of operator and ATO training activities
	a) Require upset prevention and recovery training in all full flight simulator type conversion and recurrent training programmes						
	b) Require more time devoted to training for the pilot monitoring role	Continuing process	GCAA Inspectors (Safety Regulation Department (SRD))	CAA Inspectors (SRD), Accident & Incident Investigation Bureau (AIB), National Aviation Safety Coordination Group (NASCG)			

	2. Validate the effectiveness of the SEIs in the industry through MORs and VORs systems and accident/incident investigations (apply safety management methodologies)	Continuing Process	GCAA Inspectors (SRD), SSP Implementation Team, AIB,	GCAA Inspectors (SRD), SSP Implementation Team, AIB, Air Operators, & Flight simulator products and service providers	Number of occurrences analysed per year / LOC-I occurrence rates in MOR,VOR and AIG reports	High	High Safety reporting (MOR/VOR)
	3. Identify additional contributing factors, for example:	Continuing Process	GCAA Inspectors (Operation Section)	GCAA Inspectors (Operation Section), Air Operators, Flight simulator products and service providers	Stick shaker activation events in FDA data LOC-I occurrence rates 10,000 FHs	High	Surveillance of Air operator and ATO training activities
	a) Distraction						
	b) Adverse weather				Number of LOC-I occurrence per 10,000 FHs		
	c) Complacency						
	d) Inadequate standard operating procedures (SOPs) for effective flight management						
	e) Insufficient height above terrain for recovery						

	f) Lack of awareness of or competence in procedures for recovery from unusual aircraft attitudes						
	g) Inappropriate flight control inputs in response to a sudden awareness of an abnormal bank angle.						
	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for LOC-I, for example:	End of Q4 2022					
	a) Increase the effectiveness of regulatory oversight						
	b) Improve regulations						
	5. Conduct continuous evaluations of the performance of the SEIs	Continuing process					
HRC 3: Mid Air Collision (MAC)							

Goal 1: Achieve a continuous reduction of operational safety risks							
Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI 4: Mitigate contributing factors to MAC accidents and incidents	1. Implement the following MAC safety actions: a) Establish guidance and regulations to ensure aircraft are equipped with airborne collision avoidance system (ACAS), in accordance with Annex 6	Implemented	GCAA Inspectors (Operations and Airworthiness Sections)	GCAA Inspectors (Operations and Airworthiness Sections), Air Operators	Number of MAC occurrence per 10,000 FHs	High	Certification and Surveillance of Air Operators, ATOs, ANSPs
	b) Ensure adherence to ACAS warning procedures	Continuing Process	GCAA Inspectors (Operations and Airworthiness Sections)	GCAA Inspectors (Operations and Airworthiness Sections), Air Operators			
	c) Promote the improvement of air traffic control (ATC) systems, procedures and tools to enhance conflict management	Continuing process	GCAA Inspectors (ANS Section)	GCAA Inspector (ANS Section), ANSPs and Air Operators			
	d) Promote the improvement of communications systems and procedures, such as controller-pilot datalink	Implemented	GCAA Inspectors (ANS Section)	GCAA Inspector (ANS Section), ANSPs and Air Operators			

	2. Validate the effectiveness of the SEIs through the analysis of MORs and VORs and accident/incident investigations (apply safety management methodologies)	Continuing Process	GCAA Inspectors (ANS Section)	GCAA Inspector (ANS Section), ANSPs and Air Operators	Number of MAC occurrence per 10,000 FHs	High	High Safety reporting (MOR/VOR)
	3. Identify additional contributing factors, for example:	Continuing Process	GCAA Inspectors (ANS and Operations Sections)	GCAA Inspectors (ANS and Operations Sections), Air Operators, ANSPs and Airport Operators	Number of MAC occurrence per 10,000 FHs	High	Continuous monitoring via surveillance activities on ANSP, ATO and Air Operators
	a) Traffic conditions - traffic density, complexity, mixture of aircraft types and capabilities, etc.						
	b) ATC performance related to workload, competence, teamwork, procedures,						
	commitment, etc., as well as the influence of air navigation services providers' (ANSP) safety management						
	c) Flight crew training and corporate culture with workload, competence, teamwork, procedures, commitment etc., and the influence of aircraft operator's safety management	Continuing Process	CAA Inspectors (Operations Sections)	Operations Sections, SRD, Air Operators, ATOs and Flight simulator products and service providers,			

	d) ATC systems - flight data processing, communication, short term conflict alert (STCA), etc., as well as the interaction with the human operators and the aircraft systems, and the procurement policy of the ANSP	Implemented	GCAA Inspectors (ANS Section)	GCAA Inspector (ANS Section), ANSPs			
	e) Aircraft equipment - autopilots, transponders and ACAS, but also aircraft performance (e.g. rate-of-climb) and their physical size	Implemented	GCAA Inspectors (Airworthiness and Operations Sections)	GCAA Inspectors (Operations Sections), Air Operators, ATOs and Flight simulator products and service providers,			
	f) Navigation infrastructure - both coverage and quality	Implemented	GCAA Inspectors (ANS Section)	GCAA Inspector (ANS Section), ANSPs			
	g) Surveillance - both coverage and quality						
	h) Flight plan processing - efficiency and reliability of flight plan submission,						
	approval and distribution						
	i) Airspace - complexity of airspace design, route layout, extent of controlled or						
	uncontrolled airspace, proximity of military operational or training areas, etc.						
	j) Flight in adverse environmental conditions that may influence conflict management and collision avoidance						

	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for MAC	Continuing process					
	5. Conduct continuous evaluations of the performance of the SEIs	Continuing process					
HRC 4: RUNWAY EXCURSION (RE)							
Goal 1: Achieve a continuous reduction of operational safety risks							
Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI 5: Mitigate contributing factors to Re accidents and incidents	1. Implement the following RE safety actions: a) Ensure the establishment and implementation of a State runway safety programme and runway safety teams	Q4 of 2022	GCAA Inspectors (ANS and ASAS Sections)	GCAA Inspectors (ANS and ASAS Section), ANSP, Aerodrome Operators	Number of RE Accident / incident per 10,000 FHs	High	Continuous monitoring via surveillance activities on ANSP, Aerodrome Operators, ATO and Air Operators

b) Promote the establishment of policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer demonstrated winds)	Implemented	GCAA Inspectors (Operations Section)	GCAA Inspectors (Operations Section), Air Operators, ATO and Flight Simulator products and service providers			
c) Ensure effective and timely reporting of meteorological and aerodrome conditions (e.g. runway surface condition in accordance with the ICAO global reporting format in Annex 14, Volume I, braking action and revised declared distances)	Continuing process	GCAA Inspectors (ANS and ASAS Sections)	GCAA Inspectors (ANS and ASAS Sections), ANSPs, Aerodrome operators			
e) Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, PANS-Aerodrome	Continuing process	GCAA Inspectors (ANS and ASAS Sections	GCAA Inspectors(ASAS Section), Aerodrome Operators			
f) Ensure that procedures to systematically reduce the rate of unstabilized approaches to runways are developed and used	Implemented	GCAA Inspectors (Operations Section)	GCAA Inspector (ASAS Section), Aerodrome Operators			
2. Validate the effectiveness of the SEIs through the analysis of MORs, VORs and accident / incident investigations (apply safety management methodologies)	Implemented	SSP Implementation Team, AIB,	SSP Implementation Team, AIB, GCAA Inspector (Operations Section), Air operators			High Safety reporting (MOR/VOR)

3. Identify additional contributing factors, for example:	Continuing process	GCAA Inspectors (SRD), SSP Implementation Team, AIB,	SSP Office, AIB, GCAA Inspectors (SRD), Air operators, AMOs, ATOs, ANSPs, Aerodrome operators			Continuous monitoring via surveillance activities on ANSP, Aerodrome Operators, ATO and Air Operators
a) Ineffective SOPs						
b) Failure to adhere to the appropriate SOPs						
c) Long/floated/bounced/firm/off-centre/crabbed landing						
d) Inadequate approach procedures design						
e) Inadequate regulatory oversight	Implemented	GCAA Inspectors (SRD)				
4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RE	Continuing Process	GCAA Inspectors (SRD), SSP Implementation Team, AIB,				
5. Conduct continuous evaluations of the performance of the SEIs						
HRC 5: RUNWAY INCURSION (RI)						

Goal 1: Achieve a continuous reduction of operational safety risks							
Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI 6: Mitigate contributing factors to RI accidents and incidents	1. Implement the following RI safety actions:		GCAA Inspectors (ANS and ASAS Sections)				
	a) Ensure the establishment and implementation of a State runway safety programme and runway safety teams	Q4 of 2022					
	b) Promote the establishment of policy, procedures and training that supports situational awareness for controllers, pilots and airside vehicle drivers	Q4 of 2022					

	c) Ensure effective use of stop bars while promoting the use of suitable technologies to assist the improvement of situational awareness, such as improved resolution airport moving maps (AMM), electronic flight bags (EFBs), enhanced vision systems (EVS) and head-up displays (HUD), advanced-surface movement guidance and control systems (A-SMGCS), and runway incursion warning systems (ARIWS).	Continuing process	GCAA Inspectors (ANS, Operations, and ASAS Sections)	GCAA Inspectors (ANS, ASAS, Operations Sections), ANSPs, Air Operators, Aerodrome Operators and allied services.	Number of RI Accident / incident per 10,000 FHs	High	Continuous monitoring via surveillance activities on ANSP, Aerodrome Operators, ATO and Air Operators
	d) Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, PANS-Aerodrome	Implemented	GCAA Inspectors (ASAS Section)				
	e) Ensure the use of standard phraseologies in accordance with applicable State regulations and ICAO provisions (e.g. Doc 9432, Manual of Radiotelephony)	Implemented	GCAA Inspectors (ANS and Operations Sections)				
	f) Ensure the identification and publication in the aeronautical information publication (AIP) of hot spots at aerodromes	Continuing process	GCAA Inspectors (ANS Section)				

	g) Ensure that suitable strategies to remove hazards or mitigate risks associated with identified hot spots are developed and executed.	Continuing process	GCAA Inspectors (ANS and ASAS Sections)				
	2. Validate the effectiveness of the SEIs through the analysis of MORs, VORs and accident/incident investigations (apply safety management methodologies)	Continuing process	SSP Implementation Team, GCAA SRD and AIB,	SSP Implementation Team, AIB, GCAA Inspector (Operations Section), Air operators	Number of RI Accident / incident per 10,000 FHs	High	High Safety reporting (MOR/VOR)
	3. Identify additional contributing factors, for example: a) Operations in low visibility conditions	Implemented	GCAA Inspectors (ANS, ASAS, and Operations Sections)	GCAA Inspectors (ANS, ASAS, Operations Sections), ANSPs, Air Operators, Aerodrome Operators and allied services.	Number of RI Accident / incident per 10,000 FHs	High	Continuous monitoring via surveillance activities on ANSP, Aerodrome Operators, ATO and Air Operators
	b) Complex or inadequate aerodrome design	Continuing process	GCAA Inspectors (ANS and ASAS Sections)				
	c) Conditional clearances	Continuing process	GCAA Inspectors (ANS Section)				
HRC 6: BIRD STRIKE							

Goal 1: Achieve a continuous reduction of operational safety risks							
Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI 7: Mitigate contributing factors to the risk of Bird strike accidents and incidents	Implement the following Bird Strike safety actions: a. Observe bird activities and bird strikes at the airports and promote collecting, reporting, recording and analysis of data through various means.	Continuing process	GCAA Inspectors (ASAS, and ANS Sections), SSP Implementation Team and AIB	GCAA Inspectors (ANS, ASAS, and Operations Sections), ANSP, Air Operators, Aerodrome Operators and allied services	Number of Bird strike Accident/incident per 10,000 flying hours.	High	Surveillance of Aerodromes, ANSP, air operators activities
	b. Ensure the better management of vegetation and land use at and around the airports.						Safety reporting (MOR/VOR)
HRC 7: Unreliable Navigational Aids (ATM/CNS)							
Goal 1: Achieve a continuous reduction of operational safety risks							

Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI 8: Mitigate contributing factors to the risk of unreliable navigational aids accidents and incidents	Implement the following safety actions: a) ensure backup power supply which meets ICAO standards to provide continuity of operations of navigational aids at all times	Implemented	GCAA Inspectors (ANS Section)	GCAA Inspectors (ANS Section), ANSPs, Aerodrome Operators,	Number of failures of Navigational aids Accident/incident due to power failure per Year.	High	
	b) Ensure the flight and ground testing of navigational aids in accordance with the periodicity requirements of the systems as per the Ghana Civil Aviation Directives and ICAO Standards.	Continuing process	GCAA Inspectors (ANS Section)				
	c) ensure protection against encroachment of the critical and sensitive areas of navigational aids.	Continuing process	GCAA Inspectors (ANS and ASAS Sections)				
	d) ensure effective maintenance of navigational aids systems in accordance with OEM specifications and maintenance schedule of service provider.	Continuing process	GCAA Inspectors (ANS Section)				
HRC 8: Unreliable Meteorological forecast (OTHER)							
Goal 1: Achieve a continuous reduction of operational safety risks							

Target 1.1: Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI 9: Mitigate contributing factors to the risk of unreliable Meteorological Forecast accidents and incidents	Implement the following safety actions: a) ensure adequate number of qualified Meteorological forecasters are stationed at aerodromes b) ensure appropriate Meteorological equipment installed at aerodromes	Q2 of 2023	GCAA Inspectors (ANS Section)	GCAA Inspectors (ANS Section), ANSP, Air Operators, Aerodrome Operators	Number of qualified Meteorological Forecasters per ANSP's methodology for determining staff strength at aerodromes Installed and commissioned appropriate Meteorological equipment at aerodromes	High	Surveillance and monitoring of ANSP
HRC 9: Ground Collision (GCOL)							
Goal 1: Achieve a continuous reduction of operational safety risks							
Target 1.1: Maintain a decreasing trend of the national accident rate							

Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics / Indicators	Priority	Monitoring Activity
SEI 10: Mitigate contributing factors to the risk of Ground Collision accidents and incidents	Implement the following safety actions: a) Ensure adherence to Standard Operating Procedures (SOPs) by personnel and vehicular movements on the RAMP	Continuing process	GCAA Inspectors (ANS, ASAS and Operations Sections)	CAA Inspectors (ANS, ASAS and Operations Sections), Aerodrome operators and allied services, ANSPs, and Air operators	Number of Ground collisions Accident/incident per year	High	Surveillance and monitoring of ANSP, Air Operators, Aerodrome Operators and Allied Services
	b) ensure training personnel authorized to conduct operations on the RAMP to help reduce accidents and incidents by Human Error	Continuing process	CAA Inspectors (ANS, ASAS and Operations Sections)				
	c) Training of ATC personnel on correct aviation phraseology to prevent Unclear instructions for operations	Continuing process	CAA Inspectors (ANS Section)				
	d) ensure RAMP Markings and lighting meet ICAO Standards	Continuing process	CAA Inspectors (ASAS Section)				
	e) ensure provision and availability of updated and current Ground movement charts	Q4 of 2022	CAA Inspectors (ANS and ASAS Sections)				

Appendix B: Detailed SEIs – Other Safety Issues

Goal 2: Strengthen Ghana's safety oversight capabilities **Target 2.1:** Ghana to improve its current score of 89.89% achieved in 2019 for the Effective Implementation (EI) of the critical elements (CEs) of its safety oversight system (with focus on priority PQs) as follows: by 2022 – 92 per cent; by 2026 – 95 per cent; and by 2030 – 99 per cent. **Target 2.2:** By 2022, Ghana to reach a safety oversight index greater than 1, in all categories.							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI 11: Consistent implementation of ICAO SARPs at the national level	Implement the following safety actions:	Q4 of 2022			· Ghana to meet the EI score as per the timelines given in NASP (Table 2	High	· State EI Score on OLF Dashboard
	a) Address all priority protocol questions (PQs) of the USOAP CMA		GCAA & AIB	GCAA, AIB, Air operators, ANSPs, Aerodrome operators, ATOs and Flight Simulators service providers	· Ghana to fully implement the priority PQs related to its safety oversight system		· ICAO and Regional Safety Oversight Team (ROST) mission Assessments

	b) Increase the level of compliance with ICAO SARPs and the EI of CEs at the national level (all CEs, emphasis on CE-6 to CE-8)				· Percentage of required corrective action plans (CAPs) submitted by Ghana (using OLF)		· State SOI score on iSTARs
	c) obtain Safety Oversight Index (SOI) greater than 1, in all categories				· Percentage of completed CAPs by Ghana (using OLF) · safety oversight index score greater than 1, in all categories		
Goal 3: Implement effective State Safety Programme (SSP)							
Target 3.1: By end of 2022, Ghana to implement the foundation of its SSP							
Target 3.2: By 2025, Ghana to implement an effective SSP, appropriate to its aviation system complexity							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
	1. Implement the following safety actions: a)Secure State-level commitment to improve safety	Implemented			· Percentage of each Audit area or CE implemented satisfactorily · Percentage of satisfactory SSP foundational PQs	Medium	· State SOI score on iSTARs
	b)Conduct initial SSP gap analysis (checklist) then the detailed SSP self-assessment	Implemented			· Percentage of required CAPs related to the SSP foundational PQs submitted by Gha-		· SSPIA

SEI – 12: SSP implementation at the national level					na (using OLF)		
	c) Establish an SSP implementation team	Implemented	GCAA & AIB	GCAA & AIB, Air operators, ANSPs, Aerodrome operators, ATOs and Flight Simulators service providers	· Percentage of required CAPs related to the SSP foundational PQs completed by Ghana (using OLF)		
	d) Develop an implementation plan for the SSP	Implemented			· Level of maturity achieved in Annex 19 PQs, by Ghana.		
	e) Issue SMS regulations for service providers	Implemented			· Number of applicable Service Providers in Ghana who have implemented an SMS.		
	f) verify SMS implementation	On-going			· Level of maturity achieved in the implementation the national aviation safety plan of Ghana		
	g) Identify and share safety management best practices	Continuing process					
SEI – 13:	1. Implement the following safety	Q4 of 2022	SSP Accountable	SSP Accountable		Medium	State Safety Pro-

Strategic allocation of resources to start SSP implementation	actions: a) Work with the ICAO Regional Office to make use of available means (e.g. Technical Cooperation Bureau) to acquire assistance needed for SSP implementation b) Work with RSOO, other States and other organizations, as appropriate to train qualified technical personnel to fulfil their duties and responsibilities regarding SSP implementation		Executive and SSP Coordinator	Executive, SSP Co-ordinator and, USOAP NCMC, ICAO Regional Office	· Number of missions or assistance received · Number of technical personnel trained in SSP implementation		gramme Implementation Assessment (SSPIA)
SEI – 14: Strategic collaboration with key aviation stakeholders to complete SSP implementation	1. Implement the following safety actions: a)Identify and work with collaborators (i.e. key aviation stakeholders) to execute the action plan for implementation b) Work with collaborators to ensure all elements of the SSP are present, suitable, operational and effective c) Establish a system for the continuous improvement of the SSP, in collaboration with all relevant stakeholders	Continuing process	SSP Implementation Team and NASCG	SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Office and aviation industry	Number of completed tasks in the NASP Plans (i.e. Appendices A and B)	Medium	State Safety Programme Implementation Assessment (SSPIA)

	d) Serve as a champion State to promote best practices among other States						
SEI – 15: Establishment of safety risk management at the national level	Implement the following safety actions: a) Establish a legal framework related to the protection of safety data, safety information and other related sources	Implemented	SSP Implementation Team	SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Office and aviation industry	Number of safety risks analyzed in the database	Medium	Annual Safety Reports
	b) Establish a State mandatory occurrence reporting system	Implemented					
	c) Develop a safety database for monitoring system safety issues and hazards, in line with the principles of Doc 9859 — Safety Management Manual	Ongoing					
	d) Establish and maintain a process to identify hazards from collected safety data	Ongoing					

	e) Establish and utilize a process to ensure the assessment of safety risks associated with identified hazards	Ongoing					
	f) Establish a State confidential voluntary safety reporting system providing data to the safety database	Implemented					
SEI – 16: Establishment of safety risk management at the national level (step 2)	Implement the following safety actions: a) Develop safety performance indicators using the established safety risk management process	Q4 of 2022	SSP Implementation Team	SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Office and aviation industry		Medium	Annual Safety Reports
	b) Develop safety performance measurement methodologies, aligned with the regional safety metrics, using the established safety risk management process						
	c) Establish the acceptable level of safety performance to be achieved through the SSP						

	d) Ensure the establishment of mandatory safety reporting systems by service providers						
	e) Encourage establishment of voluntary safety reporting systems as part of service providers' SMS	Continuing process					
	f) Promote safety awareness and the two-way communication, sharing and exchange of safety-relevant information within the State's aviation organizations and encourage sharing of safety information with industry within the State	Continuing process					
	g) Contribute information on safety risks and SSP safety performance indicators to the RASG	Continuing process					
SEI-17: Acquisition of resources to in-	Implement the following safety actions:	Continuing process	SSP Implementation Team	SSP Implementation Team and NASCG		Medium	

crease the proactive use of risk modelling capabilities	a) Identify resources needed to support safety intelligence collection and processing, advanced data analysis, risk modelling and information-sharing capabilities			and, USOAP NCMC, ICAO Regional Office and aviation industry			
	b) Attract, recruit, train, and retain qualified technical personnel to specialize in risk modelling						
	c) Ensure that the Civil Aviation Safety Inspector workforce is trained to perform safety oversight of service providers that have implemented SMS						
	Implement the following safety actions:	Continuing process	SSP Implementation Team	SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Of-		Medium	

SEI-18: Strategic collaboration with key aviation stakeholders to support the proactive use of risk modelling capabilities	a) Identify areas where collaboration/support is needed to ensure that stakeholders understand and implement safety culture concepts to fully embrace an open, just culture and non-punitive safety reporting			fice and aviation industry			
	b) Establish a process via RASG and/or RSOO (or other regional bodies) for a mentoring system, including providing assistance to States/industry, as well as the sharing of best practices, to support safety culture development and the proactive use of risk modelling						
	c) Foster and participate in public-private partnerships similar to the commercial / general aviation safety teams' concept to identify and implement system safety enhancements	Continuing process	SSP Implementation Team	SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Office and aviation industry		Medium	

	d) Collaborate with national and industry stakeholders to establish a mechanism for the regular sharing and exchange of safety information, analyses, safety risk discover-ies/lessons learned and best practices within a confidential and non-punitive environment						
SEI-19: Advancement of safety risk manage-ment at the national level	Implement the following safety ac-tions: a)Establish data sharing connectivity and integra-tion among the State's aviation safety databases, including the mandatory occurrences reporting sys-tem, voluntary safety reporting systems, safety audit re-ports and aviation system statistics (traffic counts, weather information, EI scores, etc.)	Q4 of 2022	SSP Implementation Team	SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Of-fice and aviation industry		Medium	Annual Safety Re-ports

	b) Develop risk modelling capabilities to support monitoring of system safety issues and accident/incident prevention						
	c) Foster and participate in public-private partnerships similar to the commercial / general aviation safety teams' concept to identify and implement system safety enhancements						
	d) Collaborate with national and industry stakeholders to establish a mechanism for the regular sharing and exchange of safety information, analyses, safety risk discoveries / lessons learned and best practices within a confidential and non-punitive environment						
Goal 4: Increase collaboration at the regional level							

Target 4.1: By 2022, Ghana to be able to offer assistance to States that do not expect to meet GASP Goals 2 and 3, and to play a major part in the regional safety oversight mechanism.

Target 4.2: By 2022, Ghana to contribute information on safety risks, including SSP safety performance indicators (SPIs), to AFI Regional Aviation Safety Group (RASG-AFI)

Target 4.3: By 2022, Ghana should have an effective safety oversight capability and an effective SSP, to enable it actively lead RASG-AFI safety risk management activities.

Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics / Indicators	Priority	Monitoring Activity
SEI – 20: Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner	Implement the following safety actions: a) Based on the identified safety deficiencies, establish a mechanism to identify collaborators and develop an action plan for the resolution of those deficiencies (CE-1 to CE-5)	Continuing process	GCAA, AIB ICAO Regional Office, RASG, RSOO	GCAA ICAO Regional Office, BAGASOO, BAGAIA, Contracting States and aviation industry	· Number of States requiring assistance/support · Number of States actively seeking assistance · Number of States that received assistance · Number of Reports on safety risks to RASG-AFI	Medium	USOAP-CMA OLF and Annual Safety Reports
	b) Use a regional safety oversight mechanism to support a State that does not expect to meet GASP Goals 2 and 3						
	c) Provide assistance via States, regions and industry to other States for primary aviation legislation development (in coordination with SEI-1B) (CE-1)						

	d) Provide assistance via States, regions and industry to other States for the development of national regulations (CE-2)	Continuing process	GCAA, AIB ICAO Regional Office, RASG, RSOO	GCAA ICAO Regional Office, BAGASOO, BAGAIA, Contracting States and aviation industry	· Number of SSP SPIs shared with RASG-AFI	Medium	USOAP-CMA OLF and Annual Safety Reports
	e) Establish a process via RASG and/or RSOO for a mentoring/collaboration system, including providing State/industry assistance as well as sharing of best practices and internal follow-up actions (CE-1 to CE-5, emphasis on CE-3)				· Number of Reports on safety matters forwarded other States, RASG-AFI and other stakeholders		
	RSOO, other States, ICAO, industry joint programmes and/or technical school partnerships to attract, recruit and train qualified and sufficient technical personnel and develop a strategy for their retention (CE-4)				· Fully established and implemented effective safety oversight capabilities		
	g) Establish and implement a process for the development and promulgation of technical guidance, tools and the provision of safety-critical information, in collaboration with other States, RSOO, ICAO and/or other stakeholders, with the understanding that these materials need to be tailored to each State's national regulations and operational environments (CE-5)				· Maturity status of the SSP implementation		

	h) Work with RASG and/or RSOO to address high-risk categories of occurrences to improve safety oversight				· Active and leading roles in RASG-AFI's safety risk management activities · Number of States in RASG-AFI, assisted by Ghana to establish and implement their National Aviation Safety Plans		
Goal 5: Expand the use of industry programmes **Target 5.1:** By 2022, all service providers in Ghana to use globally harmonized SPIs as part of their safety management system (SMS) **Target 5.2:** By 2022, increase the number of service providers in Ghana participating in the corresponding ICAO-recognized industry assessment programmes							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI-21: Improvement of industry compliance with applicable regulations	Implement the following safety actions: a) Work together within industry to ensure compliance with applicable regulations (CE-6 to CE-8)	Continuing process	Industry	Industry, SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Office and aviation	· Number of service providers in Ghana using globally harmonized metrics for their SPIs	Medium	Surveillance of service providers, USOAP CMA activities

	b) Encourage service providers to participate in the corresponding, ICAO-recognized industry assessment programmes (IOSA, ISAGO, etc.,) c)Encourage the active participation of industry in the RASGs to assist with the implementation of safety enhancement initiatives (CE-6 to CE-8)	Continuing process	Industry	Industry, SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Office and aviation	Number of service providers in Ghana using globally harmonized metrics for their SPIs	Medium	Surveillance of service providers, USOAP CMA activities
SEI-22: Improvement of industry compliance with	Implement the following safety actions:	Continuing process	Industry	SSP Implementation Team and NASCG and, USOAP NCMC,	· Number of service providers in Ghana participating in the		Surveillance of service providers, USOAP CMA activ-

applicable SMS requirements	a) Implement a safety management system (SMS) commensurate to the size and complexity of the service provider, as required by national regulations and Annex 19 b) Notify competent authorities/entities in the region (States, RASG, RSOO) when there may be discrepancies in the application of SMS requirements among States in the region c) Utilize available guidance material (e.g. from States or non-governmental organizations) to assist with SMS implementation			ICAO Regional Office and aviation industry	corresponding ICAO-recognized industry assessment programmes		ities
SEI-23: Resources for service providers to effectively im-	Implement the following safety actions:	Continuing process	Industry	SSP Implementation Team and NASCG and, USOAP NCMC,		Medium	Surveillance of service providers, USOAP CMA activ-

plement SMS	a) Work in collaboration with the State and industry associations to advance SMS implementation and identify expectations that cannot be efficiently resourced			ICAO Regional Office and aviation industry			ities
	b) Identify areas where resources are needed as part of the SMS implementation plan developed following the SMS gap analysis						
	c) Establish a process for resource planning and allocation to enable SMS implementation, including resources which may be obtained from industry organizations						
	d) Obtain commitment from the accountable executive within the service provider for the necessary resources to enable SMS implementation						

	e) Encourage other service providers (e.g. interlining operators) to implement SMS within their operation by providing resources, such as qualified technical personnel to assist them						
SEI-24: Strategic collaboration with key aviation stakeholders to complete SSP implementation	Implement the following safety actions: a) Help identify relevant collaborators from the key aviation stakeholders involved in implementing SSP	Continuing process	Industry	SSP Implementation Team and NASCG and, USOAP NCMC, ICAO Regional Office and aviation industry	.	Medium	Surveillance of service providers, USOAP CMA activities
	b) Work with collaborators to support an action plan for SSP implementation: Support SSP through sharing and supporting harmonization of SMS within industry						
	c) Support RASG and/or RSOO efforts to establish a mentoring system, including providing assistance to States / industry, as well as sharing of best practices to support SSP implementation						

	d) Provide input to the process for sharing technical guidance, tools and safety-critical information related to SSP and SMS (e.g. advisory circulars, staff instructions, safety performance indicators), in collaboration with States, RASG, RSOO, ICAO and/or other stakeholders						
	e) Support continuous improvement of SSP, in collaboration with States, RASG, RSOO, ICAO and/or other stakeholders						
	f) Continue to work with regional groups to address high-risk categories of occurrences						
SEI-25: Establishment of safety risk management at the	Implement the following safety actions:	Continuing process	Industry	SSP Implementation Team and NASCG and,	·	Medium	Surveillance of service providers, USOAP CMA activ-

service provider level	a) Establish mandatory safety reporting systems			USOAP NCMC, ICAO Regional Office and aviation industry			ities
	b) Provide information from the service provider to the State mandatory safety reporting system, as required						
	c) Establish internal mechanisms related to the protection of safety data, safety information and related sources for the purpose of safety improvement						
	d) Establish voluntary and confidential hazard/occurrence reporting systems as part of the SMS						
	e) Establish and maintain a safety database for technical personnel to monitor system safety issues within the service provider						
	f) Establish and utilize a safety risk management process						

	g) Develop safety performance measurement methodologies, aligned with harmonized safety metrics within industry, via the established safety risk management process						
	h) Develop safety performance indicators and associated targets/alert settings, via the established safety risk management process						
	i) Encourage the use of globally harmonized metrics for the development and monitoring of safety performance indicators, as part of the service providers' SMS						
	j) Encourage sharing and use of information from within industry to identify hazards and mitigate safety risks						
Goal 6: Ensure the appropriate infrastructure is available to support safe operations							

Target 6.1: By 2022, Ghana to implement the air navigation and airport core infrastructure							
Safety enhancement initiative	**Action**	**Timeline**	**Responsible entity**	**Stakeholders**	**Metrics / Indicators**	**Priority**	**Monitoring Activity**
SEI –26: Implement appropriate air navigation and airport core infrastructure to support safe operations In accordance with conclusions and resolutions of ICAO PIRGs and RASGs	Implement appropriate core infrastructure in accordance with the ICAO Basic Build Blocks (BBBs), Aviation System Block Upgrades (ASBU), etc., as described in the ICAO GANP	Continuing process	GCAA, ANSPs, and Aerodrome Operators	GCAA, ANSPs, Aerodrome Operators, ICAO Regional Office and aviation industry	· Number of elements of air navigation and airport core infrastructure implemented by Ghana.	High	Surveillance of service providers, USOAP CMA activities

Appendix C: CICTT' AVIATION OCCURRENCE TAXONOMY

This Appendix describes the common taxonomies and their definitions and their usage for occurrence reporting developed by the Commercial Aviation Safety Team (CAST) / International Civil Aviation Organization (ICAO) Common Taxonomy Team (CICTT). The CICTT comprises of Government officials and aviation industry leaders, charged with developing common taxonomies and definitions for aviation accident and incident reporting systems intended to improve the aviation community's capacity to focus on common safety issues.

The descriptions of occurrences below are derived from CICTT's Aviation Occurrence Categories: Definitions and Usage, October 2011 (4.2) document.

1. **ABNORMAL RUNWAY CONTACT (ARC)**

Definition: Any landing or takeoff involving abnormal runway or landing surface contact

Usage Notes:

- Events such as hard/heavy landings, long/fast landings, off center landings, crabbed landings, nose wheel first touchdown, tail strikes, and wingtip/nacelle strikes are included in this category.

- Gear-up landings are also recorded here. However, if a system/component failure or malfunction occurred, which led to the gear up landing, the event is also coded under the appropriate system/component failure or malfunction category.

- Do not use this category for runway contacts after losing control, e.g., runway contact after take-off.

- Occurrences in which the gear collapses during the take-off run or the landing roll are not included here except if a condition in the usage notes above has been met.

NOTE: Throughout this document the term runway or landing area is taken in its broadest sense and includes runways, landing strips, waterways, unimproved landing areas, and landing pads (which may include offshore platforms, building roofs, roads, ships, and fields), or other landing areas.

NOTE: Does not include helicopter hard/heavy landings after an off-field emergency autorotation when there was no intention to land before the autorotation was entered.

NOTE: Includes (tail) rotor striking the intended landing surface during take-off and landing. However, collisions with obstacles during take-off and landing, such as trees or walls, should be coded under TOL.

NOTE: Does not include off-field landing by gliders.

2. ABRUPT MANEUVER (AMAN)

Definition: The intentional abrupt maneuvering of the aircraft by the flight crew.

Usage Notes:

- This category includes the intentional maneuvering of the aircraft to avoid a collision with terrain, objects/obstacles, weather or other aircraft (Note: The effect of intentional maneuvering is the key consideration).

- Abrupt maneuvering may also result in a loss of control or system/component failure or malfunction. In this case the event is coded under both categories (e.g., AMAN and LOC–I, AMAN and SCF–NP, or AMAN and SCF–PP).

- Abrupt maneuvering may also occur on ground, examples include hard braking maneuver, rapid change of direction to avoid collisions, etc**.**

3. AERODROME (ADRM)

Definition: Occurrences involving Aerodrome design, service, or functionality issues.

Usage Notes:

- Includes deficiencies/issues associated with a State approved Aerodrome runways, taxiways, ramp area, parking area, buildings and structures, Crash/Fire/Rescue (CFR) services, obstacles on the Aerodrome property, lighting, markings, signage, procedures, policies, and standards.

- Examples include closed runways, improperly marked runways, construction interference, lighting failures, signage limitations, etc.

- Occurrences do not necessarily involve an aircraft.

- Effects of Aerodrome design are also included here. For example, building layout and architecture which leads to surface wind disruptions would be coded as both ADRM and WS/TRW or TURB as appropriate.

- Includes heliports (excludes unprepared or natural landing sites).

- Includes loose foreign objects on aerodromes and on heliports (excludes unprepared or natural landing sites).

4. AIRPROX/TCAS ALERT/LOSS OF SEPARATION/NEAR MIDAIR COLLISIONS/MIDAIR COLLISIONS (MAC)

Definition: Airprox, TCAS alerts, loss of separation as well as near collisions or collisions between aircraft in flight.

Usage Notes:

- Includes all collisions between aircraft while both aircraft are airborne.
- Both air traffic control and cockpit crew separation-related occurrences are included.
- To be used for AIRPROX reports.
- Genuine TCAS alerts are included here.

5. ATM/CNS (ATM)

Definition: Occurrences involving Air traffic management (ATM) or communications, navigation, or surveillance (CNS) service issues.

Usage Notes:

- Includes ATC facility/personnel failure/degradation, CNS service failure/degradation, procedures, policies, and standards.
- Examples include, NAVAID outage, NAVAID service error, controller error, Supervisor error, ATC computer failure, Radar failure, and navigation satellite failure.
- Occurrences do not necessarily involve an aircraft.

NOTE: ATM includes all of the facilities, equipment, personnel, and procedures involved in the provision of State approved Air Traffic Services.

6. *BIRD (BIRD)*

Definition: Occurrences involving collisions/near collisions with bird(s)/wildlife.

Usage Notes:

- *May occur in any phase of flight.*

NOTE: Bird strikes were previously categorized as "other". Users may wish to update their historic data by replacing "other" with "BIRD" where the occurrence involved a bird/wildlife strike.

7. CABIN SAFETY EVENTS (CABIN)

Definition: Miscellaneous occurrences in the passenger cabin of transport category aircraft.

Usage Notes:

- Includes significant events related to carry-on baggage, supplemental oxygen, or missing/non-operational cabin emergency equipment.
- Includes inadvertent deployment of emergency equipment.
- Includes medical emergency for a person other than a flight crewmember or a medical evacuation patient.

- Excludes turbulence and other weather-related events, which are covered under TURB, ICE, or WSTRW respectively.

8. COLLISION WITH OBSTACLE(S) DURING TAKE-OFF AND LANDING (CTOL)

Definition: Collision with obstacle(s) during take-off or landing whilst airborne.

Usage Notes:

- For all aircraft (excluding rotorcraft), to be used only in cases where the crew was aware of the true location of the obstacle, but its clearance from the aircraft flightpath was inadequate.
- Includes contact with obstacles, such as vegetation, trees and walls, snow drifts, power cables, telegraph wires and antennae, offshore platforms, maritime vessels and structures, land structures and buildings.
- Includes collisions during take-off to and landing from the hover.
- Includes water obstacles during take-off from water (e.g., waves, dead-heads, ships, swimmers).
- Not to be used for occurrences classified under CFIT, LOC–I or SCF–PP.

9. CONTROLLED FLIGHT INTO OR TOWARD TERRAIN (CFIT)

Definition: Inflight collision or near collision with terrain, water, or obstacle without indication of loss of control.

Usage Notes:

- CFIT is used only for occurrences during airborne phases of flight.
- CFIT includes collisions with those objects extending above the surface (for example towers, trees, power lines, cable car support, transport wires, power cables, telephone lines and aerial masts).
- CFIT can occur during either Instrument Meteorological Conditions (IMC) or Visual Meteorological Conditions (VMC).
- Includes instances when the cockpit crew is affected by visual illusions or degraded visual environment (e.g., black hole approaches and helicopter operations in brownout or whiteout conditions) that result in the aircraft being flown under control into terrain, water, or obstacles.
- If control of the aircraft is lost (induced by crew, weather or equipment failure), do not use this category; use Loss of Control – Inflight (LOC–I) instead.
- For an occurrence involving intentional low altitude operations (e.g., crop dusting, aerial work operations close to obstacles, and Search and Rescue (SAR) operations close to water or ground surface) use the Low Altitude Operations (LALT) code instead of CFIT.
- Do not use this category for occurrences involving intentional flight into/toward terrain. Code all collisions with obstacles during take-off and landing under TOL. Code all suicides under Security Related (SEC) events.
- Do not use this category for occurrences involving runway undershoot/overshoot, which are classified as Undershoot/Overshoot (USOS).

- Includes flying into terrain during transition into forward flight.

- For helicopter operations, not to be used for take-off and landing phases, except when the occurrence involves flying into terrain without indication of loss of control during transition into forward flight.

10. EVACUATION (EVAC)

Definition: Occurrence where either: (a) person(s) are injured during an evacuation; (b) an unnecessary evacuation was performed; (c) evacuation equipment failed to perform as required; or (d) the evacuation contributed to the severity of the occurrence.

Usage Notes:

- Includes cases where an injury(ies) was (were) sustained during the evacuation through an emergency exit or main cabin door.

- Includes cases where the evacuation itself is the accident (in essence, had there not been an evacuation there would not have been an accident).

- An unnecessary evacuation is one that was either erroneously commanded by the crew or uncommanded.

- Only used for passenger carrying operations involving transport category aircraft.

- Includes evacuation following a ditching or survivable crash landing in water provided one of the conditions above is met.

11. EXTERNAL LOAD RELATED OCCURRENCES (EXTL)

Definition: Occurrences during or as a result of external load or external cargo operations.

Usage Notes:

- Includes cases where external load or the load lifting equipment used (e.g., long line, cable) contacts terrain, water surface, or objects.
- Includes cases where the load or, in the absence of a load, the load lifting equipment strikes or becomes entangled with the main rotor, tail rotor, or the helicopter fuselage.
- Includes injuries to ground crew handling external loads as result of contact with/dropping/inadvertent release of external load.
- Includes ground injuries to ground crew handling external loads due to the downwash effect or falling branch, trees, etc.
- Includes external hoist, human external cargo, and long lines.
- If the preparation of the external load by ground crew played a role, also code under RAMP.
- Failures or malfunctions of the onboard external load handling lifting equipment or release systems should be coded under SCF-NP, as these are considered to be aircraft systems.

12. FIRE/SMOKE (NON-IMPACT) (F–NI)

Definition: Fire or smoke in or on the aircraft, in flight, or on the ground, which is not the result of impact.

Usage Notes:

- Includes fire due to a combustive explosion from an accidental ignition source.
- Includes fire and smoke from system/component failures/malfunctions in the cockpit, passenger cabin, or cargo area.
- Non-combustive explosions such as tire burst and pressure bulkhead failures are coded under System/Component Failure – Non-Powerplant (SCF–NP).
- Fire/Smoke resulting from an accident impact is coded under Fire/Smoke (post-impact) (F–POST).

13. FIRE/SMOKE (POST-IMPACT) (F–POST)

Definition: Fire/Smoke resulting from impact.

Usage Notes:

- This category is only used for occurrences where post impact fire was a factor in the outcome.

- This category is only used in conjunction with another category. For example, a system/component failure that also results in a post-impact fire will be coded as SCF–PP and F–POST or SCF–NP and F–POST.

14. FUEL RELATED (FUEL)

Definition: One or more powerplants experienced reduced or no power output due to fuel exhaustion, fuel starvation/mismanagement, fuel contamination/wrong fuel, or carburetor and/or induction icing.

Usage Notes:

- The following fuel-related definitions are provided for clarity:

  - ✓ Exhaustion: No usable fuel remains on the aircraft.

  - ✓ Starvation/mismanagement: Usable fuel remains on the aircraft, but it is not available to the engines.

  - ✓ Contamination: Any foreign substance (for example, water, oil, ice, dirt, sand, bugs)in the correct type of fuel for the given powerplant(s).

  - ✓ Wrong fuel: Fuel supplied to the powerplant(s) is incorrect, for example, Jet A into a piston powerplant, 80 octane into a powerplant requiring 100 octane.

- Includes cockpit crew or ground crew-induced fuel-related problems that are not the result of mechanical failures. Interruptions of the fuel supply caused by mechanical failures are coded elsewhere as non-powerplant or powerplant system/component failures (SCF–NP or SCF–PP), as appropriate.

- Also used when the wrong fuel causes a powerplant failure (e.g., through detonation). In this case it should be coded as FUEL, not as a system/comfponent failure or malfunction-powerplant (SCF–PP).

- Includes cases where there was a high risk of fuel exhaustion but there was no actual loss of power.

15. GLIDER TOWING RELATED EVENTS (GTOW)

Definition: Premature release, inadvertent release or non-release during towing, entangling with towing, cable, loss of control, or impact into towing aircraft/winch.

Usage Notes:

- Applicable both to aircraft under tow by winch or by another aircraft or to aircraft executing towing.

- To be used in events only after reaching airborne phase.

- Includes loss of control because of entering the towing aircraft wake turbulence and events where of airspeed is out of limits during tow.

16. GROUND HANDLING (RAMP)

Definition: Occurrences during (or as a result of) ground handling operations.

Usage Notes:

- Includes collisions that occur while servicing, boarding, loading, and deplaning the aircraft also during boarding and disembarking while helicopter is hovering.
- Includes injuries to people from propeller/main rotor/tail rotor/fan blade strikes.
- Includes pushback/powerback/towing events.
- Includes Jet Blast and Prop/rotor down wash ground handling occurrences.
- Includes aircraft external preflight configuration errors (examples: improper loading and improperly secured doors and latches) that lead to subsequent events.
- Includes all parking areas (ramp, gate, tiedowns).
- Except for powerback events, which are coded here, if a collision occurs while the aircraft is moving under its own power in the gate, ramp, or tiedown area, code it as a ground collision (GCOL).
- Includes operations at aerodromes, heliports, helidecks, and unprepared operating sites.
- If external loads involved, also code as EXTL.

17. GROUND COLLISION (GCOL)

Definition: Collision while taxiing to or from a runway in use.

Usage Notes:

- Includes collisions with an aircraft, person, animal, ground vehicle, obstacle, building, structure, etc., while on a surface other than the runway used for landing or intended for takeoff.

- Ground collisions resulting from events categorized under Runway Incursion (RI) or Ground Handling (RAMP) are excluded from this category.

NOTE: Taxiing includes ground and air taxiing for rotorcraft on designated taxiways.

18. ICING (ICE)

Definition: Accumulation of snow, ice, freezing rain, or frost on aircraft surfaces that adversely affects aircraft control or performance.

Usage Notes:

- Includes accumulations that occur inflight or on the ground (i.e., deicing-related).

- Carburetor and induction icing events are coded in the FUEL Related (FUEL) category.

- Windscreen icing which restricts visibility is also covered here.

- Includes ice accumulation on sensors, antennae, and other external surfaces.

- Includes ice accumulation on external surfaces including those directly in front of the engine intakes.

19. LOSS OF CONTROL – GROUND (LOC-G)

Definition: Loss of aircraft control while the aircraft is on the ground.

Usage Notes:

- Used only for non-airborne phases of flight, i.e., ground/surface operations.
- The loss of control may result from a contaminated runway or taxiway (e.g., rain, snow, ice, slush).
- The loss of control during ground operations can occur as the result of other occurrence categories as well. For example, LOC-G may result from a system/component failure or malfunction to the powerplant (SCF–PP) or non-powerplant (SCF–NP), or from evasive action taken during a Runway Incursion (RI–VAP, or RI–A). For these occurrences, the event is coded under both categories (e.g., LOC–G and SCF–PP, LOC–G and SCF–NP, or LOC–G and RI–VAP or RI–A).
- Do not use when a mechanical failure rendered the aircraft uncontrollable.
- Rotorcraft during sloping ground or moving helideck operations, dynamic rollover and ground resonance events are also included here.

20. LOSS OF CONTROL – INFLIGHT (LOC-I)

Definition: Loss of aircraft control while, or deviation from intended flightpath, inflight. Loss of control inflight is an extreme manifestation of a deviation from intended flightpath. The phrase "loss of control" may cover only some of the cases during which an unintended deviation occurred. It is, therefore, suggested that the occurrence title is reviewed and changed accordingly (for example, Deviation from Intended Flightpath- DEV).

Usage Notes:

- Used only for airborne phases of flight where aircraft control was lost.
- Loss of control can occur during either Instrument Meteorological Conditions (IMC) or Visual Meteorological Conditions (VMC).
- The loss of control during flight may occur as a result of a deliberate maneuver (e.g., stall/spin practice)
- Occurrences involving configuring the aircraft (e.g., flaps, slats, on-board systems, etc.) are included as well as rotorcraft retreating blade stall.
- Stalls are considered loss of control and are included here.
- Rotorcraft occurrences which involve power settling (vortex ring), or settling with power to ground contact are coded here and as ARC if during normal landing or takeoff.
- Rotorcraft External Load operations involving loss of control related to the external load should be coded as LOC-I as well as EXTL.
- Includes Rotorcraft "Loss of Tail Rotor Effectiveness".

- Includes loss of control during practice or emergency autorotation.

- Includes pilot-induced or assisted oscillations.

- For unmanned aircraft events, includes hazardous outcomes involving deviation from intended flightpath associated with anticipated or unanticipated loss of datalink. However, if loss of datalink is the direct result of a system/component failure or malfunction, code the occurrence as system/component failure or malfunction – non powerplant (SCF-NP) only.

- For icing-related events, which are also loss of control, code both LOC–I and ICE).

- If the loss of control is a direct result of a system/component failure or malfunction (SCF), code the occurrence as an SCF–NP, or SCF–PP only. However, loss of control may follow less severe system/component failures, and in this case, code both categories.

- Cockpit crew vision-related events and flight in degraded visual environments (for example, obscuration, black hole approach events, brownouts, or whiteout events), where the aircraft is flown under control into terrain, water, or obstacles, are coded under CFIT, not LOC–I.

21. LOSS OF LIFTING CONDITIONS EN-ROUTE (LOLI)

Definition: Landing en-route due to loss of lifting conditions.

Usage Notes:

- Applicable only to aircraft that rely on static lift to maintain or increase flight altitude, namely sailplanes, gliders, hang gliders and paragliders, balloons and airships.\
- All static lift forms to be considered, including atmospheric lift, namely from Orographic, Thermal, Mountain Wave and Convergence Zone, and buoyancy lift namely from lighter than air gas or hot air.
- Also include motorglider and paramotor aircraft if operating under static atmospheric lift conditions, and the engine could not be started.
- If the aircraft was flying intentionally at low height above the terrain, use LALT instead (typical cases occur with gliders in competition flying).

22. LOW ALTITUDE OPERATIONS (LALT)

Definition: Collision or near collision with obstacles/objects/terrain while intentionally operating near the surface (excludes takeoff or landing phases).

Usage Notes:

- 'Terrain' includes water, vegetation, rocks, and other natural elements lying on, or growing out of, the earth.

- Includes ostentatious display, maneuvering at low height, aerobatics, sightseeing, demonstration flights, aerial inspection, avalanche mining, human hoist or human cargo sling, search and rescue operations, aerial application, intentional helicopter operations close to obstacles during aerial work and scud running with airplanes (ducking under low visibility conditions).

- Also includes intentional maneuvering in close proximity to cliffs, mountains, into box canyons, and similar flights where the aircraft aerodynamic capability is not sufficient to avoid impact.

- If there is a loss of control during low altitude operations, both loss of control – inflight (LOC–I) and LALT are coded.

  NOTE: Excluding rotorcraft air taxi phase of flight on designated taxiways.

23. OTHER (OTHR)

Definition: Any occurrence not covered under another category.

24. RUNWAY EXCURSION (RE)

Definition: A veer off or overrun off the runway surface.

Usage Notes:

- Only applicable during either the takeoff or landing phase.

- The excursion may be intentional or unintentional. For example, the deliberate veer off to avoid a collision, brought about by a Runway Incursion. In this case, code both categories.

- Use RE in all cases where the aircraft left the runway/helipad/helideck regardless of whether the excursion was the consequence of another event.

25. RUNWAY INCURSION – ANIMAL (RI–A)

Definition: Collision with, risk of collision, or evasive action taken by an aircraft to avoid an animal on a runway or on a helipad/helideck in use.

Usage Notes:

- Includes encounters with wildlife on a runway in use.

- Includes instances where evasive action is taken by the flight crew that leads to a collision off the runway or to consequences other than a collision (e.g., gear collapsing).

- Runway incursions may occur at controlled or uncontrolled airports.

- Excludes unprepared/natural landing sites.

26. RUNWAY INCURSION – VEHICLE, AIRCRAFT OR PERSON (RI–VAP)

Definition: Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft.

Notes:

- *From Procedures for Air Navigation Services – Air traffic Management (ICAO DOC 4444), first included in April 2004.*

- *Excludes unprepared/natural landing sites.*

27. SECURITY RELATED (SEC)

Definition: Criminal/Security acts which result in accidents or incidents (per the International Civil Aviation Organization [ICAO] Annex 13).

Usage Notes:

- While security-related acts can lead to accidents as defined as by ICAO Annex 13, they are not considered accidents by some organizations. Regardless, these events have similar consequences in that they result in serious injury or death to person(s) and/or substantial damage to the aircraft. For these reasons, they are categorized as security-related occurrences for prevention purposes only.

- Examples include, a) hijacking and/or aircraft theft; b) interference with a crewmember (e.g., unruly passengers); c) flight control interference; d) ramp/runway/taxiway security; e) sabotage; f) suicide; and g) acts of war.

28. SYSTEM/COMPONENT FAILURE OR MALFUNCTION (NON-POWERPLANT) (SCF–NP)

Definition: Failure or malfunction of an aircraft system or component other than the powerplant.

Usage Notes:

- If the failure renders the aircraft uncontrollable it is coded as SCF–NP only, not as loss of control (LOC–I or LOC–G). However, if the failure does not render the aircraft uncontrollable, but leads to a loss of control, code the event under both SCF–NP and LOC–I or LOC–G, as appropriate.

- Rotorcraft main rotor and tail rotor system, drive system and flight control failures or malfunctions are also coded here.

- Includes errors or failures in software and database systems.

- Includes non-powerplant parts or pieces separating from an aircraft.

- For unmanned aircraft, includes failure or malfunction of ground-based, transmission, or aircraft-based communication systems or components –or– datalink systems or components.

- Includes failures/malfunctions of ground-based launch or recovery systems equipment.

- Includes all failures/malfunctions, including those related to or caused by maintenance issues.

29. SYSTEM/COMPONENT FAILURE OR MALFUNCTION (POWERPLANT) (SCF–PP)

Definition: Failure or malfunction of an aircraft system or component related to the powerplant.

Usage Notes:

- If the failure renders the aircraft uncontrollable it is coded as SCF–PP only, not as loss of control (LOC–I or LOC–G). However, if the failure does not render the aircraft uncontrollable, but leads to a loss of control, code the event under both SCF–PP and LOC–I or LOC–G, as appropriate.

- Includes failures or malfunctions of any of the following: propellers, propeller system and engine gearbox, reversers, and powerplant controls.

- Includes powerplant parts or pieces separating from a powerplant.

- Includes all failures/malfunctions, including those related to or caused by maintenance issues.

- Rotorcraft main rotor and tail rotor system, drive system and flight control failures or malfunctions are coded as non-powerplant failures (SCF–NP), not SCF–PP.

- The following fuel-related powerplant problems are coded under the category FUEL, not under the category SCF–PP: fuel exhaustion; fuel starvation/mismanagement; fuel contamination; wrong fuel; carburetor and induction icing.

  NOTE: For sub-categorization of SCF–PP, a separate taxonomy has been developed and can be found on the CICTT website.

30. TURBULENCE ENCOUNTER (TURB)

Definition: In-flight turbulence encounter.

Usage Notes:

- Includes encounters with turbulence in clear air, mountain wave, mechanical, and/or cloud-associated turbulence.
- Wake vortex encounters are also included here.
- Flights into wind shear or thunderstorm-related turbulence are coded as WSTRW.
- Includes turbulence encountered by aircraft when operating around or at buildings, structures, and objects.

31. UNDERSHOOT/OVERSHOOT (USOS)

Definition: A touchdown off the runway/helipad/helideck surface.

Usage Notes:

- An undershoot / overshoot of a runway/helipad/helideck occurs in close proximity to the runway/helipad/helideck and includes offside touchdowns and any occurrence where the landing gear touches off the runway/helipad/helideck surface.
- Off-airport emergency landings are excluded from this category.

- To be used for occurrences during the landing phase.

- Includes offside touchdowns on heliports, helidecks and other defined areas to be used wholly or in part for the arrival, departure and surface movement of helicopters (does not include helicopter unprepared or natural landing sites).

32. UNINTENDED FLIGHT IN IMC (UIMC)

Definition: Unintended flight in Instrument Meteorological Conditions (IMC).

Usage Notes:

- May be used as a precursor to CFIT, LOC–I or LALT.

- Applicable if the pilot was flying according to Visual Flight Rules (VFR), as defined in Annex 2 – Rules of the Air – to the Convention on International Civil Aviation, and by any reason found oneself inadvertently in IMC.

- Only to be used when loss of visual references is encountered.

- Only to be used if pilot not qualified to fly in IMC and/or aircraft not equipped to fly in IMC.

33. UNKNOWN OR UNDETERMINED (UNK)

Definition: Insufficient information exists to categorize the occurrence.

Usage Notes:

- Includes cases where the aircraft is missing.
- Includes those occurrences where there is not enough information at hand to classify the occurrence or where additional information is expected in due course to better classify the occurrence.

34. WIND SHEAR OR THUNDERSTORM (WSTRW)

Definition: Flight into wind shear or thunderstorm.

Usage Notes:

- Includes flight into wind shear and/or thunderstorm-related weather.
- Includes inflight events related to hail.
- Includes events related to lightning strikes.
- Includes events related to heavy rain (not just in a thunderstorm).
- Icing and turbulence encounters are coded separately (see ICE and TURB).

— END —