ICAO

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Global Aviation Safety Plan

2020-2022 Edition

INTERNATIONAL CIVIL AVIATION ORGANIZATION

EXECUTIVE SUMMARY

Safety is a top priority in aviation. The purpose of the Global Aviation Safety Plan (GASP) is to continually reduce fatalities, and the risk of fatalities, by guiding the development of a harmonized aviation safety strategy, and developing and implementing regional and national aviation safety plans. A safe aviation system contributes to the economic development of States and their industries. The GASP promotes the implementation of a State's safety oversight system, a risk-based approach to managing safety as well as a coordinated approach to collaboration between States, regions and industry. States are encouraged to support and implement the GASP as the strategy for the continuous improvement of global aviation safety.

ICAO recognizes the need for its safety strategy to evolve and ensure its sustained effectiveness and efficiency in the changing regulatory, economic and technical environments. The 2020-2022 edition of the GASP maintains some key elements from its previous edition, such as goals for States to improve their effective safety oversight capabilities and to progress in the implementation of State safety programmes (SSPs). Main changes in the plan include new goals and targets for States, regions and industry, as well as tools to measure States' safety oversight capabilities. This edition of the plan also recognizes the importance of safety risk analyses at national and regional levels. It incorporates guidelines and a structure by which States, groups of States or entities within a region identify hazards and mitigate operational safety risks through the assistance of regional aviation safety groups as well as regional coordination. The vision of the GASP is to achieve and maintain the aspirational safety goal of zero fatalities in commercial operations by 2030 and beyond, which is consistent with the United Nations' *2030 Agenda for Sustainable Development*. The plan's mission is to continually enhance aviation safety performance internationally by providing a collaborative framework for States, regions and industry. This is supported by a series of goals:

Goal 1 is to achieve a continuous reduction of operational safety risks.

Goal 2 calls for all States to strengthen their safety oversight capabilities.

Goal 3 is also aimed at individual States and calls for the implementation of effective SSPs.

Goal 4 calls for States to increase collaboration at the regional level to enhance safety.

Goal 5 aims to expand the use of industry programmes.

Goal 6 focuses on the need to ensure the appropriate infrastructure is available to support safe operations.

To achieve the GASP goals, authorities within the State need to provide sufficient resources and qualified technical personnel for the effective implementation of the State's safety enhancement initiatives. In order to mitigate the risk of fatalities, States, regions and industry need to address the high-risk categories of occurrences (HRCs). The selection of types of occurrences which are deemed global HRCs (previously referred to as "global safety priorities" in the 2017-2019 edition of the GASP) is based on actual fatalities from past accidents, high fatality risk per accident or the number of accidents and incidents. The following HRCs, in no particular order, have been identified for the 2020-2022 edition of the GASP: controlled flight into terrain; loss of control in-flight; mid-air collision; runway excursion; and runway incursion.

The GASP includes the global aviation safety roadmap, which serves as an action plan to assist the aviation community in achieving its goals through a structured, common frame of reference for all relevant stakeholders.

Each region and each State should use the GASP to develop a regional aviation safety plan and national aviation safety plan, respectively, which includes industry participation. The regional or national aviation safety plan presents the strategic direction for the management of aviation safety at the regional or national level, for a set time period and should be developed in line with the GASP's goals, targets and HRCs.

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DEFINITIONS

Acceptable level of safety performance (ALoSP). The level of safety performance agreed by State authorities to be achieved for the civil aviation system in a State, as defined in its State safety programme, expressed in terms of safety performance targets and safety performance indicators.

Adequate. The state of fulfilling minimal requirements; satisfactory; acceptable; sufficient.

Audit. A systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which requirements and audit criteria are fulfilled.

Audit area. One of eight audit areas pertaining to the Universal Safety Oversight Audit Programme (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).

Critical elements (CEs). The critical elements of a safety oversight system encompass the whole spectrum of civil aviation activities. They are the building blocks upon which an effective safety oversight system is based. The level of effective implementation of the CEs is an indication of a State's capability for safety oversight.

Effective implementation (EI). A measure of the State's safety oversight capability, calculated for each critical element, each audit area or as an overall measure. The EI is expressed as a percentage.

Operator. The person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Safety. The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.

Safety audit. A USOAP CMA audit that a State requests and pays for (on a cost-recovery basis). The State determines the scope and date of a safety audit. Also see definition of *audit*.

Safety data. A defined set of facts or set of safety values collected from various aviation-related sources, which is used to maintain or improve safety.

Note.— Such safety data is collected from proactive or reactive safety-related activities, including but not limited to:

a) accident or incident investigations;
b) safety reporting;
c) continuing airworthiness reporting;
d) operational performance monitoring;
e) inspections, audits, surveys; or
f) safety studies and reviews.

Safety enhancement initiative (SEI). One or more actions to eliminate or mitigate risks associated with contributing factors to a safety occurrence or to address an identified safety deficiency.

Safety information. Safety data processed, organized or analysed in a given context so as to make it useful for safety management purposes.

Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

Safety oversight. A function performed by a State to ensure that individuals and organizations performing an aviation activity comply with safety-related national laws and regulations.

Safety performance. A State or a service provider's safety achievement as defined by its safety performance targets and safety performance indicators.

Safety performance indicator. A data-based parameter used for monitoring and assessing safety performance.

Safety performance target. The State or service provider's planned or intended target for a safety performance indicator over a given period that aligns with the safety objectives.

Safety risk. The predicted probability and severity of the consequences or outcomes of a hazard.

Significant safety concern (SSC). Occurs when the State allows the holder of an authorization or approval to exercise the privileges attached to it, although the minimum requirements established by the State and by the Standards set forth in the Annexes to the Convention are not met, resulting in an immediate safety risk to international civil aviation.

State safety programme (SSP). An integrated set of regulations and activities aimed at improving safety.

ABBREVIATIONS AND ACRONYMS

ACI	Airports Council International
ALoSP	Acceptable level of safety performance
ANC	Air Navigation Commission
ANS	Air navigation services
APV	Approaches with vertical guidance
ASBU	Aviation system block upgrade
ASIAP	Aviation safety implementation assistance partnership
ATM	Air traffic management
ATS	Air traffic services
BARS	Basic aviation risk standard
BBB	Basic building blocks
CAA	Civil aviation authority
CANSO	Civil Air Navigation Services Organisation
CAP	Corrective action plan
CAST	Commercial Aviation Safety Team
CE	Critical element
CFIT	Controlled flight into terrain
CICTT	CAST/ICAO Common Taxonomy Team
CMA	Continuous monitoring approach
COSCAP	Cooperative development of operational safety and continuing airworthiness programme
EASA	European Aviation Safety Agency
EI	Effective implementation
EUROCONTROL	European Organisation for the Safety of Air Navigation
FAA	United States Federal Aviation Administration
FSF	Flight Safety Foundation
GADSS	Global Aeronautical Distress and Safety System
GANP	Global Air Navigation Plan
GASOS	Global aviation safety oversight system
GASP	Global Aviation Safety Plan
GASPRG	Global Aviation Safety Plan Roadmap Group
GASP-SG	Global Aviation Safety Plan Study Group
HLSC	High-level Safety Conference
HRC	High-risk categories of occurrences
IAOPA	International Council of Aircraft Owner and Pilot Associations
IATA	International Air Transport Association
IBAC	International Business Aviation Council
ICCAIA	International Coordinating Council of Aerospace Industries Associations
IFALPA	International Federation of Airline Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
IOSA	IATA Operational Safety Audit
IS-BAO	International Standard for Business Aircraft Operations
ISAGO	IATA Safety Audit for Ground Operations
ISSG	Industry Safety Strategy Group
iSTARS	integrated Safety Trend Analysis and Reporting System
LOC-I	Loss of control in-flight
NCLB	No Country Left Behind
PANS	Procedures for Air Navigation Services
PIRG	Planning and implementation regional group
RAIO	Regional accident and incident investigation organization
RASG	Regional aviation safety group
RSOO	Regional safety oversight organization

SAFE	Safety Fund
SARPs	Standards and Recommended Practices
SDG	Sustainable development goals
SEI	Safety enhancement initiatives
SM ICG	Safety Management International Collaboration Group
SMS	Safety management system
SPI	Safety performance indicator
SSC	Significant safety concern
SSP	State safety programme
UN	United Nations
USOAP	Universal Safety Oversight Audit Programme

PART I

PLANNING

Chapter 1

INTRODUCTION

1.1 ICAO STRATEGIC OBJECTIVE ON SAFETY

1.1.1 Safety is the highest priority of the International Civil Aviation Organization (ICAO) Strategic Objectives. This Strategic Objective aims to enhance global civil aviation safety and focuses primarily on a State's effective safety oversight and its capabilities in the management of safety. The objective is set in the context of growing passenger and cargo movements, and the need to address efficiency and environmental sustainability. A safe aviation system contributes to the economic development of States and their industries. The Global Aviation Safety Plan (GASP) outlines the key safety enhancement initiatives (SEIs) for the next triennium in order to achieve ICAO's Safety Strategic Objective.

1.1.2 More information on the Strategic Objectives can be found on the ICAO website at www.icao.int.

1.2 WHAT IS THE GASP?

The GASP presents the strategy which supports the prioritization and continuous improvement of aviation safety. In Resolution A39-12: *ICAO Global planning for safety and air navigation*, the Assembly recognized the importance of a global framework to support the Safety Strategic Objective of ICAO. In addition, the Assembly resolved that the GASP, along with the *Global Air Navigation Plan* (GANP, Doc 9750), shall provide the framework in which regional and national aviation safety plans will be developed and implemented, thus ensuring harmonization and coordination of efforts aimed at improving international civil aviation safety, capacity and efficiency. The global aviation safety roadmap, presented in the GASP, serves as an action plan to assist the aviation community in achieving the GASP goals through a structured, common frame of reference for all relevant stakeholders. The GASP is complemented by the GANP, which presents the strategy to achieve a global interoperable air navigation system for all users, during all phases of flight, and which meets agreed levels of safety, provides for optimum economic operations, is environmentally sustainable and meets national security requirements.

1.3 HISTORY OF THE GASP

1.3.1 ICAO introduced the first version of the GASP in 1997 by formalizing a series of conclusions and recommendations developed during an informal meeting between the Air Navigation Commission (ANC) of ICAO and industry. The GASP was used to guide and prioritize the technical work programme of ICAO and was updated regularly to ensure its continuing relevance.

1.3.2 In May 2005, a meeting with industry identified the need to broaden the GASP to provide a common frame of reference for all stakeholders. Such a plan would allow a more proactive approach to aviation safety and help coordinate and guide safety policies and initiatives worldwide to reduce the accident risk for commercial aviation. It was then decided that industry representatives from the Industry Safety Strategy Group (ISSG) would work together with ICAO to develop a common approach for aviation safety. The global aviation safety roadmap, developed by the ISSG, provided the foundation upon which the GASP 2007 edition was based. In March 2006, ICAO held the Directors General of Civil Aviation Conference (DGCA/06) on a global strategy for aviation safety, which welcomed the development of the global aviation safety roadmap and recommended that ICAO develop an integrated approach to SEIs, based on the roadmap. The global aviation safety roadmap would provide a global framework for the coordination of safety policies and initiatives.

1.3.3 In 2013, during its 38th Session, the Assembly urged ICAO to complete the development of a global aviation safety roadmap in support of the GASP. The second High-level Safety Conference held in 2015 (HLSC 2015) agreed on the need for ICAO to develop a global aviation safety roadmap in support of the GASP, in collaboration with States, regional aviation safety groups (RASGs), aviation safety partners and industry.

1.3.4 The 2014-2016 edition was published in 2013 and included GASP objectives for States to achieve, through the implementation of an effective safety oversight system, a State safety programme (SSP) and safety capabilities necessary to support future aviation systems.

1.3.5 In 2015, ICAO established the Global Aviation Safety Plan Roadmap Group (GASPRG) to undertake necessary actions to assist ICAO in updating the GASP, particularly in relation to the development of a new global aviation safety roadmap that would support the implementation of the GASP. The GASPRG was composed of subject matter experts from States, regions and industry. It included participation by all the organizations previously involved in the ISSG.

1.3.6 The 2017-2019 edition of the GASP was published in 2016 and maintained the objectives presented in the 2014-2016 edition. The 2017-2019 edition included the introduction of the new global aviation safety roadmap, developed by the GASPRG, to assist the aviation community in achieving the objectives presented in the GASP. It provided a structured, common frame of reference for all relevant stakeholders from States, regions and industry.

1.3.7 The GASP has significantly changed since its introduction in 1997 and has evolved through continual consultations and reviews. The 2020-2022 edition of the GASP includes a new set of goals, targets and indicators, in line with the United Nations' *2030 Agenda for Sustainable Development*. The global aviation safety roadmap was maintained and expanded to encompass organizational challenges and operational safety risks. The 2020-2022 edition of the GASP was developed through the efforts of the GASP Study Group (GASP-SG), a joint industry-regulatory expert group established by ICAO to ensure that the plan and its content reflect the needs of the aviation community at the international, regional and national levels.

1.4 PURPOSE OF THE GASP

1.4.1 The purpose of the GASP is to continually reduce fatalities, and the risk of fatalities, associated with accidents by guiding the harmonized development and implementation of regional and national aviation safety plans. States, regions and industry facilitate the implementation of the GASP through coordinated SEIs. The GASP seeks to assist States, regions and industry in their respective safety planning and implementation by:

a) establishing GASP goals, targets and indicators;

b) providing a framework for planning and implementation of SEIs;

c) presenting the global aviation safety roadmap, which can be used to achieve the GASP goals and to set specific targets at both national and regional levels as well as for industry partners; and

d) providing a methodology to guide States in the identification of hazards and emerging issues, and the management of safety risks.

1.4.2 Through the GASP, ICAO continues to prioritize global action in areas of aviation safety by addressing the currently identified high-risk categories (HRCs) of occurrences: controlled flight into terrain; loss of control in-flight; mid-air collisions; runway excursions; and runway incursions. SEIs in these areas contribute to the reduction of the global accident rate and the continuous reduction of fatalities.

1.5 GASP PRINCIPLES

The GASP contains a vision which states the intent behind this plan. It also includes a mission statement, which reflects what ICAO seeks to achieve through the GASP. A set of values are presented in the plan, which aim to guide SEIs and enable the GASP to meet its purpose.

Vision: To achieve and maintain the goal of zero fatalities in commercial operations by 2030 and beyond.

Mission: To continually enhance international aviation safety performance by providing a collaborative framework for States, regions and industry.

***Values*:** GASP strives to enhance global civil aviation safety by:

a) promoting a positive safety culture;

b) recognizing and promoting the aviation sector's responsibility for the safety of the public;

c) encouraging collaboration, teamwork and shared learning in the management of safety;

d) protecting safety data and safety information;

e) promoting the sharing and exchange of safety information;

f) taking data-driven decisions;

g) prioritizing actions to address operational safety issues through a risk-based approach;

h) allocating resources to identify and analyse hazards, and address their consequences or outcomes through a risk-based approach; and

i) proactively managing emerging issues.

1.6 SCOPE OF THE GASP

1.6.1 The GASP is a strategic document that enables States, regions and industry to adopt a flexible, step-by-step approach for safety planning and implementation. In accordance with ICAO Standards and Recommended Practices (SARPs), States must develop their safety oversight capabilities and implement an SSP. The GASP is a means for States to achieve compliance with ICAO safety-related SARPs and to go beyond the minimum level of compliance by proactively enhancing safety through the management of operational safety risks. The GASP assists States to identify deficiencies and prioritize actions so they can meet their safety responsibilities by providing an implementation strategy presented in the global aviation safety roadmap. The GASP further assists States in strengthening their capabilities in the management of safety through a structured process founded on the critical elements (CEs) of a State safety oversight system. A State's safety responsibilities comprise both safety oversight and safety management, collectively implemented through an SSP.

1.6.2 Although the GASP provides a global perspective, regional SEIs, including those involving individual States, should be coordinated through the RASGs to address specific safety concerns in line with the GASP goals and targets. In addition, States, regions and industry should prioritize SEIs to first establish effective safety oversight capabilities and then address operational safety risks effectively.

1.6.3 The GASP and GANP support each other by recognizing the need for appropriate infrastructure to support safe operations. The coordination of activities between the RASGs and the planning and implementation regional groups (PIRGs) are key to the successful implementation of the GASP and the GANP, respectively, since increases in air navigation capacity and improvements in efficiency must be done in a safe manner and appropriate safety nets are required to prevent accidents.

Note.— The Safety Management Manual *(Doc 9859) contains guidance related to a State's safety management responsibilities.*

1.7 GASP REVIEW PROCESS

1.7.1 The GASP is reviewed and updated prior to each session of the ICAO Assembly, every three years.

1.7.2 During the consultation process for the revision of the 2017-2019 edition of the GASP, States commented that the GASP, including the global aviation safety roadmap, should continue to benefit from broad consultation with States, regions and industry. Feedback also included requests that ICAO maintain the GASPRG beyond the task of completing the roadmap and engage the group in the development of the 2020-2022 edition of the GASP. In Resolution A39-12: *ICAO global planning for safety and air navigation*, the Assembly encouraged ICAO to continue the development of the global aviation safety roadmap. In an effort to best address the revision of the GASP, the Secretariat conducted an in-depth review of the GASP development process. As a result, the existing GASPRG was expanded to encompass a better regional representation and further involve States and industry in the development process and was renamed the GASP-SG.

1.7.3 The GASP is developed through the efforts of the GASP-SG, a joint regulatory-industry expert group established by ICAO to ensure that the plan and its content reflect the needs of the aviation community at the international, regional and national levels.

1.7.4 The ANC reviews the GASP as part of its work programme and consults with States and non-governmental organizations on proposed amendments. The consultation is conducted via the State letter process or alternatively through an Air Navigation Conference or a High-level Safety Conference. The ANC then reports to the Council and provides the following input:

a) review of the global progress made in improving aviation safety performance and in the implementation of SSPs and safety management systems (SMS), as well as any relevant risk mitigations;

b) recommendations by RASGs;

c) lessons learned by States, regions and industry;

d) possible changes in future aviation needs, regulatory contexts and other influencing factors;

e) results of research, development and validation on operational and technological matters which may affect the global aviation safety roadmap; and

f) proposed amendments to the GASP's content.

1.7.5 The GASP is under the authority of the ICAO Council to ensure consistency among the GASP, the other ICAO global plans, and the ICAO Strategic Objectives. The Council approves the GASP prior to eventual budget-related developments and endorsement by the ICAO Assembly. After approval by the Council, the GASP is presented to the following session of the Assembly for endorsement by Member States.

1.8 RELATIONSHIP WITH OTHER GLOBAL PLANS

1.8.1 The Convention on International Civil Aviation establishes ICAO's objective to foster "the planning and development of international air transport". Air transport is a key enabler for sustainable economic and social development. ICAO's global plans are essential in supporting safe, secure, efficient, economically viable and environmentally responsible air transportation. They provide a means to advance ICAO's Strategic Objectives and ensure that no country is left behind. The ICAO global plans include: the GASP, the GANP and the Global Aviation Security Plan (GASeP).

1.8.2 Safety is critical when planning implementation of air navigation operational improvements, in line with the GANP, to determine if these improvements can be implemented in a safe manner. A safety risk assessment provides information to identify hazards that may arise from, for example:

a) any planned modifications in airspace usage;

b) the introduction of new technologies or procedures; or

c) as a result of the decommissioning of older navigational aids.

1.8.3 A safety risk assessment also enables the assessment of potential consequences (e.g. a mid-air collision). Based on the results of a safety risk assessment, mitigation strategies may be implemented to ensure an acceptable level of safety performance (ALoSP) is maintained with any air navigation operational improvement. Any operational improvement to enhance the performance of the air navigation system, should be built on the basis of a safety risk assessment.

1.8.4 The GASP complements the GANP by providing States and service providers with the tools to implement a safety management approach through SSPs and SMS. The GANP, through the evolution of the system described in the conceptual roadmap and the operational improvements detailed in the technical frameworks, supports the goals within the GASP and the GASeP by enhancing safety and security of the air navigation system as reflected in the performance ambitions.

1.8.5 Safety and security are of paramount importance in aviation. The travelling public's perception of a safe aviation system is also linked to how secure the system is in actuality. Fatalities that result from acts of unlawful interference affect the public's perception of aviation safety. The GASeP provides the foundation for States, industry and other stakeholders to work together with the shared and common goal of enhancing aviation security worldwide. It aims to achieve key priority outcomes, such as developing a security culture and improving oversight. The GASP goals and targets support the GASeP by providing best practices and models that can be as effective in managing security as they are in safety management. These include: effective oversight, organizational culture, risk management and assurance processes. The GASeP in turn supports the GASP's vision of zero fatalities. The overall cumulative improvements to aviation security globally enhance the security, safety, facilitation and operations of the international civil aviation system. There is also a need to assess safety risks stemming from mitigation actions in the area of security. Integrated risk management principles have the benefit of harmonizing risk management measures and avoiding negative interference of sector-specific mitigation strategies.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1 GENERAL

An individual State's responsibility for safety oversight is the foundation upon which a safe global air transport system is built. States that experience difficulties in carrying out safety oversight functions can impact the state of international civil aviation. Despite the decreasing trend in the global accident rate, fatalities associated with scheduled commercial operations persist. Meanwhile, as air traffic volume is expected to increase, the pressure to reduce the global accident rate is compounded. A series of identified HRCs needs to be addressed to reduce fatalities and the risk of fatalities (refer to Chapter 3). The GASP provides a collaborative framework for States, regions and industry to support the management of organizational challenges and operational safety risks.

2.2 STAKEHOLDERS — ROLES AND RESPONSIBILITIES UNDER THE GASP

2.2.1 Key aviation stakeholders for the GASP include, but are not limited to, ICAO, States, RASGs, regional safety oversight organizations (RSOOs), regional accident and incident investigation organizations (RAIOs), cooperative development of operational safety and continuing airworthiness programmes (COSCAPs), and industry. The PIRGs also play a key role, coordinating with the RASGs.

2.2.2 All aviation stakeholders need to be involved in the effort to continually improve safety. In addition to the development of SARPs, ICAO supports the implementation of the GASP by providing resources, implementation tools and assistance via different programmes and initiatives, such as the No Country Left Behind (NCLB) initiative. States that may be in a position to do so can also provide assistance to other States in achieving the GASP goals.

2.2.3 The GASP provides a strategy for the continuous improvement of aviation safety at the international level. States and regions are responsible for the development of national and regional aviation safety plans, in line with the GASP. National and regional SEIs should be adapted based on challenges faced by States and other stakeholders concerned. The following sections describe the specific roles of ICAO, States, regions and industry with regard to the implementation of the GASP.

2.3 THE ROLE OF ICAO

ICAO plays a role in coordinating and monitoring the implementation of the GASP at the global and regional levels. The role of ICAO within the GASP includes the following:

a) promoting collaboration at the global level to enhance safety;

b) coordinating activities of the RASGs to ensure they are aligned with the GASP;

c) ensuring close coordination between the RASGs and the PIRGs;

d) encouraging the active participation of States and industry in the RASGs;

e) encouraging the active involvement of regional mechanisms, such as RSOOs, RAIOs and COSCAPs, in RASG activities;

f) implementing a global aviation safety oversight system (GASOS) with the goal of strengthening national and regional safety oversight capabilities, accident investigation and SSPs;

g) encouraging States with effective safety oversight systems to provide assistance to other States, where practicable;

h) providing data and tools to support the monitoring of GASP implementation;

i) facilitating the sharing and exchange of safety information and best practices across regions;

j) facilitating access to resources and technical assistance by States; and

k) facilitating training and workshops.

2.4 THE ROLE OF STATES

The role of States within the GASP includes the following:

a) addressing significant safety concerns (SSC) as a priority;

b) acquiring the necessary expertise, either directly or through access to workshops, pools of experts, etc.;

c) developing and implementing a national aviation safety plan, taking into account the regional aviation safety plan and the GASP (refer to Part II, Chapter 2);

d) ensuring the effective implementation of the eight CEs of a State safety oversight system (see Chapter 3, Figure 3-1);

e) building upon safety oversight systems to adopt a safety management approach under the SSP (the Annex 19 — *Safety Management* SARPs are intended to assist States in managing aviation safety risks. States shall require that applicable service providers under their authority implement an SMS (Chapter 3, 3.3.2 refers));

f) providing technical assistance to other States, where practicable;

g) participating actively in the activities of the RASG;

h) sharing safety information with the RASG and ICAO (including the status of national SEIs); and

i) allocating resources to actively and continuously participate in the regional groups.

2.5 THE ROLE OF REGIONS

2.5.1 In the context of the GASP, the term “region” refers to a group of States and/or entities working together to enhance safety within a geographic area.

2.5.2 At the regional level, RASGs are the main drivers of the safety planning process. They are composed of States, regional entities and industry, among others. RASGs build on work already done by States and/or existing regional organizations such as the COSCAPs and RSOOs. They serve as regional cooperative fora integrating global,

regional, national and industry efforts in continuing to enhance aviation safety worldwide. RASGs eliminate duplication of effort through the establishment of cooperative regional safety programmes. This coordinated approach significantly reduces both financial and human resource burdens on States and allows for the delivery of measurable safety improvements.

2.5.3 The role of the RASGs within the GASP includes the following:

a) supporting and monitoring progress towards the achievement of the GASP goals at the regional level;

b) developing and implementing a regional aviation safety plan consistent with the GASP and coordinating its implementation at the regional level (refer to Part II, Chapter 1);

c) structuring their work in line with the GASP to address organizational challenges, operational safety risks, emerging issues and safety performance management;

d) identifying safety risks and issues of priority, and encouraging States to initiate action using the roadmap;

e) coordinating and tracking regional SEIs and GASP indicators;

f) monitoring regional safety performance indicators (SPIs) and identifying where action is needed;

g) providing technical assistance to States in their respective regions (e.g. by identifying subject matter experts, conducting workshops and facilitating training); and

h) serving as the focal point to coordinate regional efforts and programmes related to the GASP aimed at mitigating operational safety risks.

2.5.4 As an integral part of the GASP, RASGs, together with RSOOs, coordinate all activities undertaken to address regional safety issues ensuring harmonization to the extent practicable. RSOOs play an important role by supporting the establishment and operation of safety oversight systems and analysing safety information at the regional level. A number of States face difficulties resolving safety deficiencies due to a lack of resources. ICAO has taken the initiative to address this issue by facilitating the establishment of RSOOs through which groups of States can collaborate and share resources to improve their safety oversight capabilities. There are a growing number of RSOOs, several of which are already well established, while some are expected to become fully operational over the next few years. RSOOs cover, in a general sense, a number of legal fora and institutional structures including international intergovernmental organizations, such as the European Aviation Safety Agency (EASA) and the Pacific Aviation Safety Office (PASO). Less institutionalized projects, established under the ICAO COSCAP, also play a key role in the GASP. The regional aviation safety plan, referred to in 2.5.3 b) above, may be supplemented by aviation safety plans developed by RSOOs.

Note.— Guidance related to the establishment and management of an RSOO is provided in the Safety Oversight Manual, *Part B* — The Establishment and Management of a Regional Safety Oversight Organization *(Doc 9734, Part B).*

2.5.5 RAIOs facilitate the implementation of accident and incident investigation systems by allowing States to share the necessary financial and human resources, thus enabling them to meet their accident investigation obligations under the Convention on International Civil Aviation.

Note.— Guidance related to the establishment and management of an RAIO is provided in the Manual on Regional Accident and Incident Investigation Organization *(Doc 9946).*

2.6 THE ROLE OF INDUSTRY

2.6.1 In the context of the GASP, the term “industry” refers to service providers, such as: operators of aeroplanes or helicopters; approved maintenance organizations; organizations responsible for the type design or manufacture of aircraft, engines or propellers; approved training organizations; air traffic services (ATS) providers; and operators of aerodromes, as well as non-governmental organizations and other entities that form part of the aviation industry, as appropriate.

2.6.2 Industry should engage in SMS implementation to continually identify hazards and address operational safety risks, as well as work collaboratively with ICAO, the regions and individual States on safety information exchange, safety monitoring and auditing programmes. Non-governmental organizations should work with their members to help them develop their SPIs and provide guidance material and training to assist with addressing HRCs and SMS implementation. In order to ensure congruence between SSP and SMS indicators, States need to actively engage service providers in the development of SMS SPIs. Additionally, service providers should use a harmonized approach in the development of their SPIs, as part of their SMS.

Note.— Doc 9859 contains guidance related to service providers’ SPIs.

2.6.3 Industry should actively support the implementation of the GASP. Industry stakeholders should review the roadmap to identify SEIs and actions that support national and regional aviation safety plans. To this end, industry should actively participate in, and contribute to, the RASGs to enhance safety in a coordinated manner.

Chapter 3

CHALLENGES AND PRIORITIES IN SAFETY PLANNING

3.1 GENERAL

3.1.1 This chapter presents safety-related challenges and priorities that are deemed of concern to the international aviation community. These challenges are derived from the analysis of safety data collected from proactive and reactive safety-related activities conducted by ICAO. The challenges identified are used to assist ICAO in defining priorities for global action, which then serve as the basis for the development of the GASP goals and targets. The identification of safety-related challenges and the prioritization of areas that require action are key steps in the safety planning process. Safety data used to identify challenges and define priorities includes, but is not limited to: accident or incident investigations; safety reporting; continuing airworthiness reporting; operational performance monitoring; inspections, audits, surveys; and safety studies and reviews. This chapter provides background information on the goals and targets selected for the 2020-2022 edition of the GASP.

3.1.2 When a State, region or industry conducts its own data-driven analysis to identify challenges and determine priorities, it should consider its strengths, weaknesses, opportunities and threats. These provide a foundation and context for developing a State's or region's aviation safety plan in line with the GASP goals and targets (refer to Part I, Chapter 4). Several factors affect the way the GASP is implemented at the regional and national levels. These should be considered as part of the analysis and should include: political, legal, economic, socio-cultural, and technological factors.

3.1.3 The analysis undertaken by ICAO led to the identification of challenges that have been addressed in the GASP. These challenges are primarily related to a State's responsibilities for the management of safety. Section 3.3 of this chapter presents the findings from the analysis of operational safety risks that served to identify the HRCs deemed as global safety priorities, additional operational safety risk categories that States and regions should consider, and emerging issues. In addition, the analysis examined the need for appropriate infrastructure to support safe operations (refer to Section 3.4). Findings from the analysis included in this chapter were used to develop the GASP goals and targets presented in Part I, Chapter 4.

3.2 ORGANIZATIONAL CHALLENGES

Organizational challenges are systemic issues which take into consideration the impact of organizational culture, and policies and procedures on the effectiveness of safety risk controls. Organizations include entities in a State, such as the civil aviation authority (CAA) and service providers, such as operators of aeroplanes, ATS providers and operators of aerodromes. Organizations should identify hazards in systemic issues and mitigate the associated risks to manage safety. A State's responsibilities for the management of safety comprise both safety oversight and safety management, collectively implemented through an SSP.

3.2.1 Ensuring effective safety oversight as part of the SSP

3.2.1.1 Safety oversight is a function by means of which States ensure effective implementation of the safety-related SARPs and associated procedures contained in the Annexes to the Convention on International Civil Aviation and related ICAO documents. Safety oversight also ensures that the national aviation industry provides a safety level equal to, or better than, that defined by the SARPs. States have overall safety oversight responsibilities, which emphasize a State's commitment to safety in respect of the State's aviation activity. The eight critical elements (CEs) of a safety oversight system are presented in Figure 3-1. States must establish CE-1 through CE-5 prior to the implementation of CE-6 through CE-8 in order to provide effective safety oversight and safety management. An individual State's responsibility for safety oversight is the foundation upon which a safe global air transport system is built. States that experience difficulties in carrying out safety oversight functions can impact the state of international civil aviation.

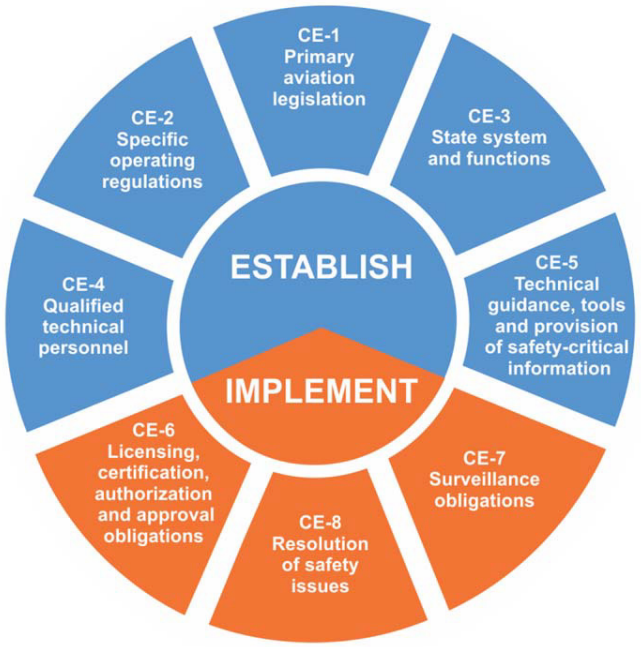

Figure 3-1. Critical elements (CEs) of a State's safety oversight system

3.2.1.2 States should work to continually improve their effective implementation of the eight CEs of the State's safety oversight system in all relevant areas, as appropriate to their aviation system complexity. Through collaborative efforts, the level of effective implementation of the CEs of a State's safety oversight system can increase, particularly in those regions where a State faces shortages of human, financial or technical resources. Collaboration may involve the establishment of organizations that provide safety solutions in regions experiencing resource constraints. Effective safety oversight requires investment in human and technical resources to achieve the GASP goals and to ensure that SEIs yield the intended benefits. States may rely on assistance provided by ICAO, other States and/or organizations, including RSOOs and RAIOs.

3.2.1.3 States may voluntarily consider delegating safety functions, including those related to certification and surveillance, to competent States and/or organizations, such as safety oversight organizations under the GASOS.

3.2.1.4 Furthermore, States may consider delegating activities to other competent organizations, such as trade associations, industry representative organizations or other bodies that may collect, analyse and protect safety data and safety information on their behalf, provide training or conduct monitoring activities.

3.2.1.5 Although States may delegate functions to other States and/or organizations, including RSOOs, they remain responsible for their obligations under the Convention on International Civil Aviation. However, subject to agreements under Article 83 *bis*, a State of Registry may elect to transfer certain functions and duties, together with the responsibilities, to the State of the Operator in the case of lease, charter or interchange of aircraft. The primary purpose of the transfer of certain functions under an Article 83 *bis* agreement is to enhance safety oversight capabilities by transferring responsibility for oversight to the State of the Operator, recognizing that this State may be in a better position to carry out these functions. However, before agreeing to transfer any functions, the State of Registry should determine that the State of the Operator is fully capable of carrying out the functions to be transferred in accordance with the Convention on International Civil Aviation and SARPs.

3.2.2 Ensuring effective safety management as part of the SSP

3.2.2.1 States should build upon fundamental safety oversight systems to fully implement SSPs. As per Annex 19, States shall require that applicable service providers under their authority implement an SMS. The SMS enables service providers to capture and transmit safety information, which contributes to safety risk management. An SSP requires the implementation of a risk-based approach that achieves an ALoSP. In this context, the role of the State evolves to include the establishment and achievement of safety performance targets, as well as effective oversight of its service providers' SMS. Individual States should provide safety information derived from their SSPs to their respective RASGs to contribute to regional safety risk management activities.

3.2.2.2 An SSP requires increased collaboration across operational domains to identify hazards and manage risks. The analysis of various forms of safety data is needed to develop effective mitigation strategies specific to each State or region. This requires ICAO, States, regions and industry to work closely together on safety risk management. In addition, collaborative efforts between key stakeholders, including service providers and regulatory authorities, are essential to the achievement of safety performance targets established through a State's SSP or service providers' SMS. Through partnerships with such key stakeholders at national and regional levels, safety data should be analysed to support maintenance of SPIs related to the risks and the major components of the aviation system. Key stakeholders should reach agreements to identify appropriate SPIs, determine common classification schemes and establish analysis methodologies that facilitate the sharing and exchange of safety information, in accordance with ICAO provisions on the protection of safety information.

3.2.2.3 Implementation of SSPs and SMS involve regulatory, policy and organizational changes that may require additional resources or different personnel qualifications, depending on the degree to which each of the SSP and SMS elements have already been implemented. Additional resources may also be needed to support the collection, analysis and management of information required to develop and maintain a risk-based decision-making process. In some cases, States in need of such resources may obtain assistance through the RASGs, RSOOs or other competent States or organizations. In addition, technical capabilities should be developed to collect, analyse and protect safety data and safety information, identify safety trends and disseminate results to relevant stakeholders. An SSP may require investments in the technical systems that enable analytical processes, as well as knowledgeable and skilled professionals required to support the programme.

3.3 OPERATIONAL SAFETY RISKS

3.3.1 Operational safety risks arise during the delivery of a service or the conduct of an activity (e.g. operation of an aircraft, airports or of air traffic control). Operational interactions between people and technology, as well as the operational context in which aviation activities are carried out, are taken into consideration to identify performance limitations and hazards. States, regions and industry should conduct regular national and regional risk analyses, taking into consideration the HRCs presented in this chapter.

3.3.1.1 ***Regional operational safety risks*** – The RASGs should utilize available data to determine the region's operational safety risks which include global HRCs and additional regional operational safety risks. The time period and measurement of progress for the implementation of SEIs should be determined using the roadmap.

3.3.1.2 ***National operational safety risks*** – States should review and analyse available safety data to determine their operational safety risks, which include global HRCs and additional national or regional operational safety risks. States may also seek assistance, or delegate data collection/analysis to another State, from RSOOs or other competent States or organizations. States should address national operational safety risks. In addition, States should take into account the HRCs listed in the GASP and the regional operational safety risks (established by the RASG) when determining their national operational safety risks. This assessment should be data-driven. As with the regions, States should determine a time period for the implementation of SEIs and be able to measure their progress.

3.3.2 Based on the regional and national analyses, the State/region should conduct an assessment of the number of operational safety risks that can be managed and prioritize them according to the safety risk management process. In addition, the State/region should develop a method of measuring the progress of any initiative taken in that given time period.

3.3.3 High-risk categories of occurrences

The vision of the GASP is to achieve and maintain the goal of zero fatalities in commercial operations by 2030 and beyond. A series of HRCs need to be addressed to mitigate the risk of fatalities. The types of occurrences deemed global HRCs (previously referred to as "global safety priorities") were selected based on actual fatalities, high fatality risk per accident or the number of accidents and incidents. Based on results from the analysis of safety data collected from proactive and reactive sources of information (e.g. accidents, incidents, events), as well as from ICAO and other non-governmental organizations, the following HRCs, in no particular order, have been identified for the 2020-2022 edition of the GASP:

a) controlled flight into terrain (CFIT);

b) loss of control in-flight (LOC-I);

c) mid-air collision (MAC);

d) runway excursion (RE); and

e) runway incursion (RI).

Note.— Information on accident statistics, the HRCs and other safety data is found on the ICAO website at: www.icao.int/safety/Pages/Safety-Report.aspx.

3.3.3.1 Controlled flight into terrain

CFIT is an in-flight collision with terrain, water or obstacle without indication of loss of control. Accidents categorized as CFIT involve all instances where an aircraft is flown into terrain in a controlled manner, regardless of the crew's situational awareness. CFIT accidents involve many contributing factors, including: procedure design and documentation; pilot disorientation; and adverse weather. Requirements for aircraft to be equipped with ground proximity warning systems have significantly reduced the number of CFIT accidents. Despite the absence of CFIT accidents involving transport category aircraft over the past few years, CFIT accidents often have catastrophic results when they occur, with very few, if any, survivors. Therefore, there is a high fatality risk associated with these events.

3.3.3.2 Loss of control in-flight

A loss of control in-flight (LOC-I) is an extreme manifestation of a deviation from intended flight path. Accidents categorized as LOC-I involve a loss of control in-flight that is not recoverable. LOC-I accidents often have catastrophic results with very few, if any, survivors. Therefore, there is a high fatality risk associated with these events. LOC-I events involve many contributing factors that can be categorized as being either aeroplane systems-induced, environmentally induced, pilot/human-induced or any combination of these three. Of the three, pilot-induced accidents represent the most frequently identified cause of LOC-I accidents. The number of fatalities resulting from LOC-I events involving commercial air transport aeroplanes has led to an examination regarding current training practices, such as the introduction of upset prevention and recovery training requirements for flight crew members.

3.3.3.3 Mid-air collision

A mid-air collision refers to a collision between aircraft while both are airborne. Mid-air collisions can be the result of a level bust due to a loss of separation between aircraft. Mid-air collisions involve many contributing factors, including: traffic conditions; air traffic controller workload; aircraft equipment; and flight crew training. Requirements for aircraft to be equipped with traffic alert and collision avoidance system/airborne collision avoidance system (TCAS/ACAS) have significantly reduced the number of mid-air collisions. However, when they occur, mid-air collisions often have catastrophic results with very few, if any, survivors. Therefore, there is a high fatality risk associated with these events.

3.3.3.4 Runway excursion

A runway excursion is a veer off or overrun off the runway surface. The term "runway excursion" is a categorization of an accident or incident which occurs during either the take-off 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. Runway excursions involve many contributing factors, including unstabilized approaches and the condition of the runway. The high number of accidents resulting from runway excursions involving commercial air transport aeroplanes has led to several initiatives regarding runway safety. The term "runway safety" describes a series of occurrence categories, including: abnormal runway contact; ground collision; runway excursion; runway incursion; loss of control on the ground; collision with obstacle(s); and undershoot/overshoot. However, runway excursions remain predominant in terms of number of occurrences. Although statistically the majority of runway excursions are survivable, the fatality risk remains significant. The outcome of a runway excursion (e.g. whether it is survivable) is based on several factors, including the speed at which an aircraft touches down or departs the runway end during the excursion (high energy excursions), runway contamination and the characteristics of the runway end safety area at the aerodrome.

3.3.3.5 Runway incursion

A runway incursion is 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. Incursions produce an increased risk of collision for aircraft occupying the runway. When collisions occur outside the runway (e.g. on a taxiway or on the apron), the aircraft and/or vehicles involved are usually travelling relatively slowly. However, when a

collision occurs on the runway, at least one of the aircraft involved will often be travelling at considerable speed (high energy collisions) which increases the fatality risk. Runway incursions involve many contributing factors, including: aerodrome design; pilot and air traffic controller workload; and use of non-standard phraseology. Although statistically very few runway incursions result in collisions, there is a high fatality risk associated with these events. The collision between two B747s at Los Rodeos Airport, Tenerife, in 1977, was the result of a runway incursion and remains the worst accident in aviation history, with the highest number of fatalities.

3.3.4 Additional categories of operational safety risks

3.3.4.1 In addition to the HRCs, States and regions should consider the remaining risk categories for which sufficient data exists, as identified in 3.3.1.1 and 3.3.1.2.

3.3.4.2 ICAO has developed a dedicated site on its secure portal for the RASGs to list additional operational safety risks. For consistency of reporting, States and regions are encouraged to use the aviation occurrence categories from the Commercial Aviation Safety Team (CAST)/ICAO Common Taxonomy Team (CICTT).

Note.— Additional information on the CICTT is found on the ICAO website at https://www.icao.int/safety/airnavigation/AIG/Pages/Taxonomy.aspx.

3.3.5 Emerging issues

3.3.5.1 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 the international aviation community remain vigilant on emerging issues to identify potential safety risks, collect relevant data and proactively develop mitigations to address them. The management of emerging issues, particularly potential safety risks, can provide opportunities to foster innovation. The use of new technologies, procedures and operations should therefore be encouraged.

3.3.5.2 ICAO developed a dedicated site on its secure portal for the RASGs to list emerging issues and potential safety risks. For consistency of reporting, States and regions should use the existing categories in the CICTT and advise of the need to create and/or modify the categories.

Note.— Additional information on the dedicated site for additional operational safety risks and emerging issues is found on the ICAO website at https://www.icao.int/gasp.

3.4 APPROPRIATE INFRASTRUCTURE TO SUPPORT SAFE OPERATIONS

3.4.1 In addition to the safety-related challenges and operational safety risks, the GASP supports the implementation of the GANP, by requiring appropriate infrastructure to support the provision of the essential services outlined in the basic building blocks (BBB). The BBB framework describes the backbone of any robust air navigation system by defining the essential air navigation services to be provided for international civil aviation according to ICAO SARPs and Procedures for Air Navigation Services (PANS). These are essential services in the areas of aerodrome operations, air traffic management, search and rescue, meteorology and aeronautical information. Once these essential services are being provided, they constitute the baseline for any operational improvement to enhance the performance of the system (aviation system block upgrades (ASBU)). In addition to the essential services, the BBB framework identifies the end users of these services as well as the assets necessary to be deployed to provide these services (communications, navigation and surveillance infrastructure).

3.4.2 The BBB is an independent framework, not a block of the ASBU framework. The BBB do not represent any evolutionary step, but the baseline. This baseline is defined by the basic services agreed by the States under the Convention on International Civil Aviation so that international civil aviation may be developed in a safe and orderly manner. The ASBU framework defines a group of operational improvements within some areas of the air navigation system on which the aviation community agreed to work on in order to maintain or improve the performance of that system (ASBU threads). An ASBU element is a specific change in operations designed to improve the performance of the air navigation system under specified operational conditions.

Note.— Additional information on the BBB framework is found in the Global Air Navigation Plan, *(GANP, Doc 9750) as well as on the ICAO website at https://www4.icao.int/gangway.*

Chapter 4

GASP GOALS, TARGETS AND INDICATORS

4.1 GENERAL

4.1.1 The GASP goals were developed using the structure presented in the United Nations (UN) *2030 Agenda for Sustainable Development*, which contains a series of sustainable development goals (SDGs) and targets (refer to https://sustainabledevelopment.un.org/sdgs for more information). This Agenda is a plan of action for people, planet and prosperity. It contains seventeen UN SDGs that balance the three dimensions of sustainable development: economic; social; and environmental. ICAO's Strategic Objectives are strongly linked to fifteen of the seventeen SDGs and ICAO is fully committed to work in close cooperation with States and other UN Bodies to support related targets.

Note.— Additional information on the contribution of each ICAO Strategic Objective to the UN SDGs can be found at www.icao.int/about-icao/aviation-development/Pages/SDG.aspx.

4.1.2 The GASP goals are the results toward which efforts in aviation safety are directed. They present the desired outcomes that ICAO's Safety Strategy (as presented in the GASP) aims to produce. The GASP goals are written in a manner that describes high-level outcomes that States, regions or industry must aim to achieve. Each of the GASP goals contains specific targets. Targets are specific desired outcomes from the actions taken by States, regions and industry to achieve the goals, at a certain point of time. The GASP targets are written in a manner that identify who the specific actions are directed to (e.g. States) and which indicators should be tracked to demonstrate progress towards the goal. Some goals contain more than one target and each of the GASP targets is linked to a series of indicators. Indicators are a measurement index used to evaluate if the GASP yields the expected results by States, regions and industry. The GASP indicators provide evidence about whether the desired outcomes occurred, and measure the progress in the activities related to the GASP targets. They are written in a manner that references quantitative data (e.g. number or percentage). Some indicators refer to occurrences (e.g. number of accidents) that are deemed an outcome of deficient management of aviation safety. Others refer to activities conducted by States or other stakeholders (e.g. completion of corrective action plans (CAPs)), deemed to improve management of aviation safety. Ultimately, the GASP indicators are used to measure the achievement of the GASP goals.

4.1.3 The GASP goals, targets and indicators are presented in Table 4-1. These goals are derived from the analysis presented in Part I, Chapter 3, which identified safety-related challenges and the prioritization of areas that require action to enhance safety. The following sections provide detailed information regarding each of the goals and targets, as well as the associated indicators.

4.2 KEY CONCEPTS AND METRICS USED IN THE GASP GOALS

4.2.1 This section provides a detailed explanation of some of the key metrics used in the GASP goals, targets and indicators. Some of these concepts are new or represent an evolution from previous metrics used by ICAO to measure safety performance.

4.2.2 Accident rate

ICAO's primary indicator of safety in the global air transport system is the accident rate based on scheduled commercial operations involving fixed-wing aircraft with a maximum certificated take off mass greater than 5 700 kg. Aircraft accidents are categorized using the definition provided in Annex 13 — *Aircraft Accident and Incident*

Investigation and the details of each accident are reviewed by the ICAO Safety Indicators Study Group to assure the accuracy of the data. Departures data is collated by the ICAO Air Transport Bureau using a combination of inputs. Estimates are made where data has not been provided by States, otherwise State data and commercial sources are used to obtain the best estimate of the actual number of departures. As new data is provided to ICAO, it is incorporated into the database, which may result in small changes to the calculated rates from year to year. The fatal accident rate is based on accidents that involve one or more fatal injuries using the definition provided in Annex 13.

4.2.3 Priority protocol questions for a safety oversight system

4.2.3.1 There are currently about 1 000 protocol questions (PQs). Although all the Universal Safety Oversight Audit Programme (USOAP) PQs contribute equally to the effective implementation (EI) score, they do not all equally impact the operational safety risk. For example, those PQs relating to documentation, although important, have a less direct impact to operational safety risk. Some PQs, if found to be unsatisfactory, could have a significant impact on operational safety and could indicate an elevated risk of an SSC. Many States are finding it a challenge to address a significant proportion of the PQs. Given that these States face difficulty addressing all the PQs, it is worthwhile to give them an indication of which PQs may require closer attention or priority.

4.2.3.2 The term “priority PQs” refers to PQs that have a higher correlation to operational safety risks. The identification of priority PQs is important so that States can focus their resources accordingly. It should be noted that the whole set of PQs continue to be essential to comprehensively assess the effective implementation of a safety oversight system by a State.

4.2.4 SSP foundational PQs

The term “foundation of an SSP” refers to a subset of the USOAP PQs that have been identified as fundamentals and are considered as prerequisites for sustainable implementation of the full SSP. These are referred to as “SSP foundational PQs”. SSP foundational PQs are grouped into subject areas derived from Annex 19 and Doc 9859. States can prioritize and address these PQs when conducting the SSP gap analysis or while defining the SSP implementation/action plan. The concept of “foundation of an SSP” is intended to replace the 60 per cent EI score previously used in the GASP as a threshold to progress into implementation of the SSP. The intent is that these PQs be included in the SSP implementation planning to ensure sustainability. The full list of SSP foundational PQs can be found using the SSP Foundation tool available via the ICAO integrated Safety Trend Analysis and Reporting System (iSTARS) at www.icao.int/safety/iStars.

4.2.5 Safety oversight index

4.2.5.1 The safety oversight index of a State is an indicator of its safety oversight capabilities. Every audited State has a safety oversight index. It is a number greater than zero where the number one represents a level at which the safety oversight capabilities of a State would indicate the minimum expected capabilities considering the number of departures, as a proxy to the size of that State’s aviation system.

Note.— Analysis has shown that annual commercial scheduled departure volumes represent very well the safety oversight activity levels of States. In order to even better reflect those levels for the operational oversight activities, only departures of flag carriers of that State are considered over the safety oversight index of the operations category (refer to 4.2.5.3).

4.2.5.2 The safety oversight index is a mathematical function comparing a State’s EI score and traffic volume to a safety oversight target EI score which is computed using a global log-linear regression. The safety oversight index will tend to decrease over time if traffic increases and the EI score remains unchanged. Details on the mathematical model used, as well as the rationales behind the model, are available via the iSTARS at www.icao.int/safety/iStars.

4.2.5.3 The safety oversight index is broken down into three functional categories, as follows:

a) ***operations*** – this category groups EI scores for USOAP audit areas related to personnel licensing and training (PEL), aircraft operations (OPS) and airworthiness of aircraft (AIR);

b) ***air navigation*** – this category groups EI scores for USOAP audit areas related to aerodromes and ground aids (AGA) and air navigation services (ANS); and

c) ***support functions*** – this category groups EI scores for USOAP audit areas related to primary aviation legislation and civil aviation regulations (LEG), civil aviation organization (ORG) and aircraft accident and incident investigation (AIG).

4.2.5.4 The safety oversight index is a new concept introduced into the 2020-2022 edition of the GASP and serves as one of several indicators of a State's safety oversight capabilities. States should focus on achieving all of the GASP targets and continually improve their EI score as part of their responsibilities for the management of safety.

4.2.5.5 The Safety Oversight Index application (available on iSTARS) should be used by a State, in addition to its EI score, as one of the tools to assess its safety oversight capabilities.

4.2.5.6 ICAO utilizes the safety oversight index to identify and prioritize States that will receive assistance, from ICAO and other entities, to help them improve their safety oversight system. These States should increase their compliance efforts and reach out for assistance. ICAO also uses the safety oversight index to determine which States are best suited for partnering with ICAO, as well as with regional entities, to assist other States in improving their safety oversight system. Such States are encouraged to collaborate internationally but still work on improving their own system.

4.3 DESCRIPTION OF GASP GOALS, TARGETS AND INDICATORS

4.3.1 The GASP contains an aspirational safety goal to achieve and maintain zero fatalities in commercial operations by 2030 and beyond. This goal is deemed "aspirational" as it represents an ambition of achieving an even safer aviation system. The year 2030 has been selected as the time frame for reaching this goal as it is when the traffic volume is forecasted to double. It is also the target year presented in the UN SDGs *Agenda for Sustainable Development*. The GASP is aligned with the timelines of this agenda since the GASP goals contribute to the achievement of the UN SDGs.

4.3.2 A series of goals support this aspirational safety goal. The 2020-2022 edition of the GASP contains six goals. Some of the goals are derived from the three objectives contained in the previous, 2017-2019 edition of the GASP, which called for States to implement effective safety oversight systems, implement SSPs and move towards predictive risk management. During the consultation process to update the GASP, ICAO received feedback from States and non-governmental organizations, requesting a greater emphasis on the management of operational safety risks in the GASP goals. As a response to this feedback, the goals also now address organizational challenges (ORG) and operational safety risks (OPS). The goals presented in this chapter supersede the objectives presented in the 2017-2019 edition of the GASP.

4.3.3 **Goal 1** of the GASP is to achieve a continuous reduction of operational safety risks. This reduction is achieved by a series of actions targeting the HRCs. It addresses operational issues which States, regions and industry may face, as well as operational safety risks that must be mitigated as part of national and regional aviation safety plans.

4.3.3.1 **Target 1.1** calls for the decrease of the global accident rate for commercial scheduled operations. Several indicators are linked to this target including: number of accidents; fatal accidents and fatalities by State, region or globally; as well as accident, fatal accident and fatality rates (i.e. number of occurrences per million departures). GASP indicators also include the percentage of occurrences related to the HRCs.

4.3.4 **Goal 2** is aimed at States individually and seeks to strengthen their safety oversight capabilities. This goal calls for all States to progress in their implementation of the eight CEs and address organizational challenges faced by States when implementing a safety oversight system. There are two targets associated with this goal.

4.3.4.1 **Target 2.1** calls for all States to improve their score for the EI of the CEs of the State's safety oversight system in a progressive manner that would result in incremental increases, until a high overall EI score is reached. As part of this target, States should focus primarily on the priority PQs. GASP indicators related to this target examine: the overall EI score; activities by States, such as the number of those having fully implemented the priority PQs; and the percentage of required CAPs submitted by States to ICAO via the Online Framework (OLF) to address findings from USOAP continuous monitoring approach (CMA) activities.

4.3.4.2 **Target 2.2** calls for all States to reach a safety oversight index greater than one in all categories by 2022. The concept of the safety oversight index is described in 4.2.5 of this chapter. GASP indicators related to this target include the percentage of States maintaining a safety oversight index greater than one in all categories and the percentage of each category with a safety oversight index greater than one at the global level.

4.3.5 **Goal 3** is also aimed at individual States and calls for the implementation of effective SSPs. The goal addresses organizational challenges faced by States when implementing an SSP and includes the implementation of SMS by service providers within individual States, in accordance with Annex 19. Two targets are linked to this goal and they represent a phased approach to SSP implementation.

4.3.5.1 **Target 3.1** calls for all States to implement the foundation of an SSP by 2022. GASP indicators related to the foundation of an SSP include the number of States having implemented the foundation of an SSP, as well as the percentage of PQs deemed satisfactory related to the SSP foundation.

4.3.5.2 Once States have reached Target 3.1, they can then progress into **Target 3.2**, which calls for the implementation of an effective SSP by 2025. An "effective SSP" refers to an SSP that actually achieves the objectives that it is intended to achieve. Effectiveness of an SSP will be measured by the SSP-related PQs, which will be included as part of the USOAP CMA activities to assess States' implementation of ICAO safety management provisions. The target for an effective SSP encompasses SMS implementation among service providers. GASP indicators for an effective SSP include safety management-related activities, such as the number of States that require applicable service providers under their authority to implement an SMS and the number of States that have implemented a national aviation safety plan.

4.3.6 **Goal 4** is aimed at the regions as defined in the GASP. It calls for States to increase collaboration at the regional level to enhance safety. Three targets are associated with this goal.

4.3.6.1 **Target 4.1** urges States that do not expect to meet GASP Goals 2 and 3, to use a regional safety oversight mechanism, another State or other safety oversight organization's ICAO-recognized functions, in seeking assistance to strengthen their safety oversight capabilities. GASP indicators related to this target include the number of States requiring assistance as well as the number seeking that assistance. States should seek assistance with sufficient lead time to reach the other targets in the GASP related to safety oversight capabilities, set for 2022. States may benefit from the GASOS, presented in Appendix C.

4.3.6.2 **Target 4.2** calls for all States to contribute information on safety risks, including SSP SPIs, to their respective RASGs by 2022. This target aims at building up each RASG's safety risk management capabilities. GASP indicators for this target include the number of States and service providers contributing information on safety risks to RASGs, as well as the number of States that are sharing their SSP SPIs with the RASGs.

4.3.6.3 **Target 4.3** calls for all States with effective safety oversight capabilities and an effective SSP to actively lead RASGs' safety risk management activities by 2022. A State with effective safety oversight capabilities is one which has, or is expected to meet, GASP Goal 2 in addition to having an effective SSP in place. The intent behind this target is to call upon "Champion States" in each region to lead the RASGs' safety risk management activities. As these States have effective safety oversight capabilities and an effective SSP, they are in the best position to contribute to regional safety management activities, including hazard identification. GASP indicators for this target encompass activities such as the number of RASGs that have a regional aviation safety plan.

4.3.7 **Goal 5** of the GASP is directed at industry and aims to expand the use of industry programmes. Two targets are linked to this goal.

4.3.7.1 **Target 5.1** calls for all service providers to use globally harmonized SPIs as part of their SMS by 2020, taking into account operational needs. The term "globally harmonized SPIs" refers to the use of globally harmonized metrics for the development and monitoring of service providers' SPIs. The GASP indicator related to this target involves the number of service providers using globally harmonized metrics for their SPIs. The use of these harmonized metrics facilitates safety risk management at the regional and international levels.

4.3.7.2 **Target 5.2** relates to the increase in the number of service providers participating in the corresponding ICAO-recognized industry assessment programmes, such as the Airports Council International (ACI) Airport Excellence (APEX) in Safety programme, the Civil Air Navigation Services Organisation (CANSO) and European Organisation for the Safety of Air Navigation (EUROCONTROL) maturity assessment within the Standard of Excellence in Safety Management Systems, the Flight Safety Foundation (FSF) Basic Aviation Risk Standard (BARS), the International Air Transport Association (IATA) Operational Safety Audit (IOSA), and the International Business Aviation Council (IBAC) International Standard for Business Aircraft Operations (IS-BAO). While such programmes do not replace the need for safety oversight by States, ICAO recognizes the benefits of these programmes, which have a positive effect on operational safety among service providers. The GASP indicator related to this target focuses on the number of service providers participating in the corresponding ICAO-recognized industry assessment programmes.

4.3.8 **Goal 6** focuses on the need to ensure the appropriate infrastructure is available to support safe operations. Its associated target calls for all States to implement the air navigation and airport core infrastructure by 2022. The GASP indicator for this target is the number of States having implemented the air navigation and airport core infrastructure elements. This is linked to the activities outlined in the GANP (refer to Part I, Chapter 3, section 3.4).

4.3.9 The GASP contains a global aviation safety roadmap, which presents SEIs for States, regions and industry to address each of the goals described in this chapter. The roadmap provides a flexible approach to implementing a national and regional safety strategy, in line with the GASP (refer to Part II, Chapter 3).

Table 4-1. GASP goals, targets and indicators

ICAO ASPIRATIONAL SAFETY GOAL "ZERO FATALITIES BY 2030 AND BEYOND"			
Goal	**Target**		**Indicators**
Goal 1: Achieve a continuous reduction of operational safety risks	**1.1**[1]	Maintain a decreasing trend of global accident rate	• Number of accidents • Number of accidents per million departures (accident rate) • Number of fatal accidents • Number of fatal accidents per million 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 States' safety oversight capabilities	**2.1**	All States to improve their score for the effective implementation (EI) of the critical elements (CEs) of the State's safety oversight system (with focus on priority PQs) as follows: by 2022 – 75 per cent by 2026 – 85 per cent by 2030 – 95 per cent	• Overall global EI score • Overall EI score per State • Overall regional EI score • Number of States that met the EI score as per the timelines • Number of States that have fully implemented the priority PQs related to a safety oversight system • Percentage of priority PQs implemented by a State • Percentage of each priority PQs implemented globally • Number of States timely updating the filing of differences • Percentage of required corrective action plans (CAPs) submitted by States (using OLF) • Percentage of completed CAPs per State (using OLF)
	2.2	By 2022, all States to reach a safety oversight index greater than 1, in all categories	• Number of States maintaining a safety oversight index greater than 1 in all categories • Percentage of States maintaining a safety oversight index greater than 1 in all categories • Percentage of each category with a safety oversight index greater than 1 globally • Safety oversight index per State, per category
Goal 3: Implement effective State safety programmes (SSPs)	**3.1**	By 2022, all States to implement the foundation of an SSP	• Number of States having implemented the foundation of an SSP • Percentage of each subject area implemented globally • Percentage of satisfactory SSP foundational PQs • Percentage of required CAPs related to the SSP foundational PQs submitted by States (using OLF) • Percentage of required CAPs related to the SSP foundational PQs completed per State (using OLF)
	3.2	By 2025, all States to implement an effective SSP, as appropriate to their aviation system complexity	• Number of States having implemented an effective SSP • Level of maturity achieved in Annex 19 PQs, per State • Number of States that require applicable service providers under their authority to implement an SMS • Number of States that have implemented a national aviation safety plan

[1] *Legend: ORG related targets – Yellow / OPS related targets – Green.*

ICAO ASPIRATIONAL SAFETY GOAL "ZERO FATALITIES BY 2030 AND BEYOND"			
Goal	**Target**		**Indicators**
Goal 4: Increase collaboration at the regional level	**4.1**	By 2020, States that do not expect to meet GASP Goals 2 and 3, to use a regional safety oversight mechanism, another State or other safety oversight organization's ICAO-recognized functions in seeking assistance to strengthen their safety oversight capabilities	• 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, all States to contribute information on safety risks, including SSP safety performance indicators (SPIs), to their respective regional aviation safety group (RASGs)	• Number of States contributing information on safety risks to RASGs • Number of States that are sharing their SSP SPIs with RASGs • Number of States forwarding information on safety matters to States, RASGs or other stakeholders
	4.3	By 2022, all States with effective safety oversight capabilities and an effective SSP, to actively lead RASGs' safety risk management activities	• Number of States with effective safety oversight capabilities and an effective SSP, leading RASGs' safety risk management activities • Number of RASGs that have a regional aviation safety plan
Goal 5: Expand the use of industry programmes	**5.1**	By 2020, all service providers to use globally harmonized SPIs as part of their safety management system (SMS)	• Number of service providers using globally harmonized metrics for their SPIs
	5.2	By 2022, increase the number of service providers participating in the corresponding ICAO-recognized industry assessment programmes	• Number of service providers 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, all States to implement the air navigation and airport core infrastructure	• Number of States having implemented the air navigation and airport core infrastructure elements

Chapter 5

SAFETY PERFORMANCE MEASUREMENT

5.1 MEASURING SAFETY PERFORMANCE RELATED TO THE GASP

The safety performance of the GASP is measured by a series of metrics as defined by the GASP indicators. Elements used to measure safety performance related to the GASP include, but are not limited to:

a) number of fatalities (as the main indicator);

b) accident rate;

c) fatal accident rate;

d) priority PQs for a safety oversight system;

e) safety oversight index;

f) SSP foundational PQs; and

g) PQs related to safety management.

5.2 SAFETY INFORMATION-SHARING AND EXCHANGE

5.2.1 The RASGs play a key role in measuring safety performance and evaluating the success of the GASP. Through the regional aviation safety plans, RASGs set regional goals and targets and determine a series of SEIs to help them achieve these goals and targets. RASGs also use the GASP indicators related to the targets to measure if the SEIs attain their desired outcomes. The regional aviation safety plans are supported by national aviation safety plans developed by States in the region as well as those of other stakeholders, such as regional and non-governmental organizations.

5.2.2 Safety information-sharing and exchange is at the centre of safety performance measurement. The RASGs are in an ideal position to share and exchange safety information due to the composition of their membership, which encompasses representation from States, regions and industry, including but not limited to operators, air navigation services providers, operators of aerodromes and aircraft manufacturers. All these stakeholders bring valuable information of hazards and emerging issues that can feed into the regional safety risk management process.

5.2.3 Some RASGs already conduct safety risk assessments to mitigate risks at the regional level. One of the GASP targets calls for all States to contribute information on safety risks, including SSP SPIs, to their respective RASGs. The intent behind this target is to expand the RASGs' safety risk management capabilities by promoting the sharing of safety-related information. Individual States and service providers within a region should contribute information on safety risks to their RASGs. To further promote safety information-sharing and exchange, States with effective safety oversight capabilities and an effective SSP should actively engage in their RASGs' safety risk management activities. These States are in the best position to contribute to regional safety management activities, such as hazard identification due to their mature SSPs, available data and experience in the area of safety risk management. In addition, the RASGs should also encourage States that do not expect to meet GASP Goals 2 and 3 to share their safety concerns with the RASGs as a source of information on regional safety issues. Safety information collected by the RASGs serves a dual purpose: to identify and prioritize SEIs to mitigate safety risks as

part of the planning process; and to measure the effect of the SEIs as part of the safety assurance process. This information is used to determine if the GASP goals and targets are met at the regional level.

5.3 PROGRESS REPORTING

5.3.1 The timely and accurate reporting of safety information at the international, regional and national levels is critical to verify whether the goals are being achieved and to monitor the implementation of the SEIs of the roadmap. ICAO, the RASGs and partner organizations publish reports on safety as part of their commitment to monitor the progress of their safety goals. Combined, these reports provide perspectives that are both global in nature as well as specific to individual areas, such as flight operations. An analysis of multiple SPIs is essential to assess safety performance globally.

5.3.2 ICAO publishes an annual *Safety Report,* the key components of which include updated analyses of the level of effective implementation of safety oversight systems by States, accident statistics and accident rates. The global accident rate provides an overall indicator of safety performance. The *Safety Report* focuses on trends in those accident categories that have historically accounted for a significant number of occurrences and fatalities. In addition, as of 2021 the *Safety Report* will include a progress report related to GASP implementation by presenting the status of GASP goals and targets at the global and regional levels. These reports and additional information can be found on the ICAO website at www.icao.int/safety.

5.4 RESPONSIBILITIES FOR EVALUATION

RASGs are responsible for continuously evaluating the progress of the GASP goals and targets, as presented in the regional aviation safety plans, to determine if these were met within the allotted timeframe. Each State is responsible for submitting pertinent information from the national aviation safety plan to the RASG, to enable the compilation of regional results. Other stakeholders, such as non-governmental organizations to which specific goals and targets are addressed, should also report back to the respective RASGs to contribute to the evaluation. RASGs have adequate procedures in place to ensure reliable and consistent data flow. ICAO Regional Offices are responsible for working with their respective RASGs to produce a report which is submitted to ICAO Headquarters and serves as the basis of the *State of Global Aviation Safety Report,* presented to the Assembly. The results of this evaluation will also serve as feedback for the revision of subsequent editions of the GASP.

PART II

IMPLEMENTATION

Chapter 1

GASP IMPLEMENTATION AT THE REGIONAL LEVEL

1.1 REGIONAL ROLES AND RESPONSIBILITIES FOR GASP IMPLEMENTATION

1.1.1 Although the GASP presents a global perspective, its content may need to be adjusted to meet regional needs. In order to do so, each region should produce a regional aviation safety plan. The regional aviation safety plan presents the strategic direction for the management of aviation safety at the regional level for a set time period (e.g. over the next five years). It outlines to all stakeholders where the different regional entities involved in the management of aviation safety and the SSP should target resources over the coming years. The RASGs are considered the main drivers behind the planning and implementation of SEIs at the regional level. They are the regional entity responsible for the development and implementation of the regional aviation safety plan. The development of regional plans for air navigation systems including communications, navigation and surveillance, and air traffic management systems is undertaken by ICAO's PIRGs, with the assistance of ICAO Regional Offices. The coordination of activities between the RASGs and the PIRGs are key to the successful implementation of the GASP and the GANP.

1.1.2 Regional aviation safety plans should be developed in alignment with the GASP. However, priority should be given to regional safety concerns. Regional SEIs should be adapted to address issues faced by the States concerned as well as industry and should be based on a regional analysis (refer to Part II, Chapter 3). The development process of the regional aviation safety plan should include consultation with States, industry and other stakeholders. National aviation safety plans of States which make up the region should be aligned and coordinated with the region's aviation safety plan (as appropriate) and with other efforts aimed at enhancing aviation safety. Guidelines should be provided to States on the development of a national aviation safety plan to harmonize content at the regional level. Regional aviation safety plans should be updated to take into consideration revisions to the GASP.

1.1.3 A regional aviation safety plan is a means of obtaining regional support and a mechanism for the coordination of initiatives aimed at improving safety in the region. At the regional level, the RASGs coordinate the planning process based on the GASP SEIs (refer to Part II, Chapter 3). The RASGs play a critical role in the implementation of the GASP by collaborating in the undertaking of regional risk assessment exercises, identifying resources needed and facilitating collaboration. ICAO works to strengthen the role of the RASGs, especially in relation to the implementation of the GASP. The ICAO Regional Offices, through their safety officers, or another officer so-designated, act as focal points in supporting the RASGs in the implementation of the GASP to: define priorities; facilitate additional resources; harmonize approaches; and promote State improvement, performance and accountability. The PIRGs are primarily responsible for the development and maintenance of the air navigation plans, as well as the identification and resolution of air navigation deficiencies. PIRGs serve as a planning and coordination mechanism, while implementation is the responsibility of States. Close coordination between PIRGs and RASGs is necessary to identify safety risks that may arise from, or have an impact on, air navigation matters and resolve them in a collaborative and efficient manner.

1.1.4 The RASGs are considered the main drivers behind the regional aviation safety plans. However, other regional stakeholders may share the responsibility for the development and implementation of the regional aviation safety plan to ensure the harmonization and coordination of efforts (e.g. ICAO Regional Offices, RSOOs, RAIOs, COSCAPs).

1.2 BENEFITS OF DEVELOPING A REGIONAL AVIATION SAFETY PLAN

1.2.1 A regional aviation safety plan allows the region to clearly communicate its strategy for improving safety at the regional level to all stakeholders. It provides a transparent means to disclose how States in the region and other entities involved in civil aviation, work to identify hazards and manage operational safety risks and other safety issues. It also illustrates how planned SEIs help the region meet the goals established. The regional aviation safety plan emphasizes the region's commitment to aviation safety. Since the plan contains information on safety performance measurement, it can also be used as a means to demonstrate the positive impact of investments addressing existing SEIs which have been successful or as a way to justify the need for additional resources to address ongoing or future challenges.

1.2.2 A regional aviation safety plan helps States be aware of national, regional and international organizational challenges and operational safety risks, and can be used to present a strategy for the management of these issues. As States need to have the necessary expertise (e.g. access to technical training, pools of subject matter experts, etc.) to implement SEIs, regions play a key role in identifying subject matter experts, and conducting workshops and training; a regional aviation safety plan should determine the training or resources that would bring the greatest value. The regional aviation safety plan can be useful for a State to validate its hazard identification and safety risk management activities.

1.3 CONTENT OF THE REGIONAL AVIATION SAFETY PLAN

1.3.1 The regional aviation safety plan should include safety goals, targets and indicators in line with the GASP, as well as a series of SEIs that will be carried out to address regional operational safety risks identified through the safety risk management processes conducted at the regional level by States, industry or other stakeholders. The plan should address the identification and prioritization of safety issues across the different sectors of aviation (e.g. commercial air transport, general aviation, helicopter operations). The region should implement the SEIs contained in the plan by assigning them to the appropriate stakeholders and monitoring their progress at regular intervals.

1.3.2 The regional aviation safety plan should contain the following sections, as a minimum:

a) an introduction;

b) the purpose of the regional plan, including links to national aviation safety plans of States that make up the region and the GASP;

c) the region's strategic approach to managing safety in civil aviation, including regional safety goals, targets and indicators;

d) a description of the regional operational safety risks and initiatives planned to address them;

e) a description of other regional safety issues, such as challenges related to SSP implementation, and initiatives planned to address them; and

f) a description of how the region will measure safety performance to monitor implementation of the plan.

1.3.3 Introduction

The introduction (or foreword) should provide an overview of the plan, how it is structured and which regional entity is responsible for its development, implementation and monitoring (the RASG). It should provide a brief description of regional safety issues and the plan's goals and targets. In the introduction, the region should affirm its commitment to aviation safety and to resourcing activities at the regional level to enhance safety. The introduction should also include a description of the region's operational context. This includes, but is not limited to: traffic volume and anticipated growth in the aviation sector; variances in the maturity of aviation systems among the different States that make up the region (e.g. varying levels of implementation of an effective safety oversight system); and common hazards or challenges particular to the region (e.g. topography, meteorology, socio-political issues, etc.).

1.3.4 Purpose of the regional aviation safety plan

This section of the plan should state its purpose. It should include a mention that the regional aviation safety plan was produced as a document which contains the region's strategic direction for the management of aviation safety for a set time period. The purpose should include a clear link between the regional plan, the States' national aviation safety plans (in the region) and the most current edition of the GASP to show how initiatives at the regional level support the improvement of safety at the individual national level and the wider international level.

1.3.5 The region's strategic approach

1.3.5.1 The region's strategic approach to managing safety should be included in the regional aviation safety plan. This section should present the regional safety goals, as well as the associated targets. The regional plan should list all the indicators that the region will use to monitor the achievement of the regional safety targets. Goals, targets and indicators should be traced to those within the GASP, however this should not preclude the establishment of specific regional goals, targets and indicators over and above those of the GASP. A clear link should be established between the goals and targets, and the SEIs which the region will undertake to improve safety. If some of the goals and targets are linked to States' individual SEIs or overarching initiatives at the international level, these links should be stated in the plan and include the benefits associated with harmonizing the regional strategy with the national and international strategies.

1.3.5.2 Dates associated with the GASP targets should be considered as the final deadline for stakeholders to meet the GASP goals. Based on the level of maturity of certain activities in a region (e.g. level of SSP implementation), the regional aviation safety plan may contain dates which precede those of the GASP targets. The GASP targets should not preclude a region from completing SEIs ahead of the global targets.

1.3.5.3 This section of the plan should also describe how the plan is developed and endorsed, including collaboration with States, industry and other stakeholders. The plan should explain that a collaborative approach is needed to identify issues and implement SEIs to mitigate risks.

1.3.6 Regional operational safety risks

The plan should include a description of the regional operational safety risks, which were identified as part of the regional analysis (e.g. by individual States, the RASG, RSOOs, PIRGs and/or RAIOs) and based on the operational safety risks described in the GASP (refer to Part I, Chapter 3, Section 3.3). Regional operational safety risks are linked to a series of HRCs that need to be addressed to mitigate the risk of fatalities. Regional HRCs should be traced to those within the GASP; however this should not preclude the establishment of additional HRCs over and above those of the GASP. Additional HRCs should be identified through a data-driven approach (e.g. based on incident data). In this section of the plan, the region should briefly explain which HRCs were selected for the region and why they were given priority. For example, a specific accident category may be considered a top concern and addressed as an operational safety risk in the regional aviation safety plan because of the number of fatalities

associated to its potential occurrence. In this section, the region should describe a set of SEIs derived from the roadmap, which it plans to implement, or is in the process of implementing, to address all the identified HRCs (refer to Part II, Chapter 3). Regional operational safety risks should encompass the different sectors of aviation.

1.3.7 Other regional safety issues

In addition to regional operational safety risks, the regional aviation safety plan should include other safety issues that have been identified by the region and that need to be addressed to improve safety. This section should contain a description of the safety issues, which were identified as part of the region's analysis or based on the GASP. Safety issues should be identified through a data-driven approach (e.g. based on USOAP data). These issues are typically organizational in nature and relate to challenges associated with the conduct of States' safety oversight functions, implementation of SSPs at the regional level and the level of SMS implementation by industry in the region. In this section of the plan, the region should briefly explain which organizational challenges were selected for the region and why they were given priority. For example, deficiencies in a specific CE of an effective safety oversight system may be common to the majority of States in the region and considered a top concern. In such cases, these deficiencies should be addressed as a safety issue in the regional plan because of their impact on the ability of States to fulfil their safety oversight responsibilities, which impacts the region as a whole. In this section, the region should describe a set of SEIs, derived from the roadmap, which it plans to implement, or is in the process of implementing, to address all the identified safety issues (refer to Part II, Chapter 3). For example, States in the region may lack qualified personnel as part of their CAAs; the plan can present this issue and a brief description of the intended course of action to address this deficiency. The plan can also be useful in securing resources to assist States and other stakeholders in the region in completing the SEIs listed.

1.3.8 Monitoring implementation

1.3.8.1 The regional aviation safety plan will contain a description of how the region will monitor the implementation of the SEIs listed in the plan, and how it will measure safety performance to ensure the intended results are achieved. The plan should explain how each target will be measured and monitored to track performance. Indicators being used to measure safety performance should be traced to those in the GASP. In addition to a regional aviation safety plan, the region should also produce safety performance dashboards to provide all stakeholders with up-to-date information on the progress made in achieving the regional goals and targets, as well as the implementation status of SEIs.

1.3.8.2 If the regional goals and targets are not met, the root cause should be presented. Corrective actions should be developed and included in the next revision of the plan, with updated SEIs. If the region identifies critical issues, reasonable measures should be taken to mitigate those risks as soon as practicable, possibly leading to an earlier revision of the regional aviation safety plan.

1.3.8.3 A standardized approach for providing information at the regional level is encouraged. This allows the region to receive information and assess safety risks using common methodologies. When information is received, a standardized method of conducting analyses should be introduced and should contain detailed explanations, including the different aspects of the analyses such as causal factors.

Chapter 2

GASP IMPLEMENTATION AT THE NATIONAL LEVEL

2.1 NATIONAL ROLES AND RESPONSIBILITIES FOR GASP IMPLEMENTATION

2.1.1 Assembly Resolution A39-12: *ICAO global planning for safety and air navigation* recognizes the importance of effective implementation of national aviation safety plans. It resolves that States should develop and implement national aviation safety plans, in line with the goals of the GASP. Each State should produce a national aviation safety plan. If the State has implemented an SSP, the plan should be linked to this programme. If the State has other national plans, the national aviation safety plan should be linked to these, as appropriate. The national aviation safety plan presents the strategic direction for the management of aviation safety at the national level, for a set time period (e.g. over the next five years). It outlines to all stakeholders where the CAA and other entities involved in the management of aviation safety should target resources over the coming years.

2.1.2 The national aviation safety plan should be developed in alignment with the GASP and the regional aviation safety plan. However, priority should be given to national safety concerns, including addressing SSCs. National SEIs should be based on the State's self-assessment (refer to Part II, Chapter 3). The development process of the national aviation safety plan should include consultation with industry and other stakeholders, as necessary. The State should follow guidelines on the development of a national aviation safety plan if these are provided at the regional level. The national aviation safety plan will be updated, as necessary, to take into consideration revisions to the GASP and to the regional aviation safety plan.

2.2 BENEFITS OF DEVELOPING A NATIONAL AVIATION SAFETY PLAN

2.2.1 Documentation required as part of a State's safety management capabilities contain information regarding a State's policies, procedures and activities related to the management of safety. However, this documentation may not be readily accessible to the public or may be written in a manner that is not understood by persons who are not subject matter experts.

2.2.2 A national aviation safety plan allows the State to clearly communicate its strategy for improving safety at the national level to all stakeholders, including other government branches. It provides a transparent means to disclose how the CAA, and other entities involved in civil aviation, work to identify hazards and manage operational safety risks and other safety issues. It also illustrates how planned SEIs will help the State meet the established goals. The national aviation safety plan emphasizes the State's commitment to aviation safety. Since the plan contains information on safety performance measurement, it can also be used as a means to demonstrate the positive impact of investments in existing SEIs which have been successful or as a way to justify the need for additional resources to address ongoing or future challenges.

2.3 CONTENT OF THE NATIONAL AVIATION SAFETY PLAN

2.3.1 The national aviation safety plan should include safety goals, targets and indicators in line with the GASP, the regional safety plan, as well as a series of SEIs that will be carried out to address national operational safety risks identified through the State and industry's safety risk management processes. The plan should address the identification and prioritization of safety issues across the different sectors of aviation (e.g. commercial air transport, general aviation, helicopter operations). The State should implement the SEIs contained in the plan through its existing safety management activities.

2.3.2 The national aviation safety plan should contain the following sections, as a minimum:

a) an introduction;

b) the purpose of the national plan, including links to the regional aviation safety plan and the GASP;

c) the State's strategic approach to managing safety in civil aviation, including national safety goals, targets and indicators;

d) a description of national operational safety risks and initiatives planned to address them;

e) a description of other safety issues, such as challenges related to SSP implementation, and initiatives planned to address them; and

f) a description of how the State will measure safety performance to monitor implementation for the plan.

2.3.3 Introduction

The introduction (or foreword) should provide an overview of the plan, how it is structured and how it is linked to the SSP, if implemented. This section should identify which entity (or entities) within the State is responsible for the national aviation safety plan's development, implementation and monitoring (e.g. the CAA). The introduction should provide a brief description of national safety issues and the plan's goals and targets. It should also include a description of the State's operational context. This includes, but is not limited to: traffic volume and anticipated growth in the aviation sector; the maturity of the aviation system within the State (e.g. varying levels of SMS implementation amongst industry); and common hazards or challenges particular to the State (e.g. topography, meteorology, socio-political issues, etc.). In the introduction, the State should affirm its commitment to aviation safety and to resourcing activities at the national level to enhance safety. For this reason, it is recommended that the introduction be signed by the Director General of Civil Aviation or a higher level.

2.3.4 Purpose of the national aviation safety plan

This section of the plan should state its purpose. It should include a mention that the national aviation safety plan was produced as a document which contains the State's strategic direction for the management of aviation safety for a set time period. The purpose should include a clear link between the national aviation safety plan, the regional aviation safety plan and the most current edition of the GASP to show how initiatives at the national level support the improvement of safety at the wider regional and international levels.

2.3.5 The State's strategic approach

2.3.5.1 The State's strategic approach to managing safety should be included in the national aviation safety plan. This section should present the national safety goals, as well as the associated targets. The national plan should list all the indicators that the State will use to monitor the achievement of the national safety targets. Goals, targets and indicators should be traced to those within the GASP and the regional aviation safety plan, however this should not preclude the establishment of specific national goals, targets and indicators over and above those of the GASP. A clear link should be established between the goals and targets, and the SEIs which the State will undertake to improve safety. If some of the goals and targets are linked to overarching SEIs at the regional or international levels, these links should be stated in the plan and include the benefits associated with harmonizing the national strategy with the regional and international strategies.

2.3.5.2 Dates associated with the GASP targets should be considered as the final deadline for stakeholders to meet the GASP goals. Based on the level of maturity of certain activities in a State (e.g. level of SSP implementation), the national aviation safety plan may contain dates which precede those of the GASP targets. The GASP targets should not preclude a State from completing SEIs ahead of the global targets.

2.3.5.3 This section of the plan should also describe how the plan is developed and endorsed, including collaboration with different entities within the State, industry and other stakeholders. The plan should explain that a collaborative approach is needed to identify issues and implement SEIs to mitigate risks.

2.3.6 National operational safety risks

The plan should include a description of national operational safety risks, which were identified as part of the State's analysis, derived from regional analysis (e.g. by the State itself, the RASG, RSOOs, PIRGs, and/or RAIOs) or based on the operational safety risks described in the GASP (refer to Part I, Chapter 3, Section 3.3). National operational safety risks are linked to a series of HRCs that need to be addressed to mitigate the risk of fatalities. National HRCs should be traced to those within the GASP, however this should not preclude the establishment of additional HRCs over and above those of the GASP. Additional HRCs should be identified through a data-driven approach (e.g. based on incident data). Collaboration with industry is important in identifying operational safety risks. In this section of the plan, the State should briefly explain which HRCs were selected and why they were given priority. For example, a specific accident category may be considered a top concern and addressed as an operational safety risk in the national aviation safety plan because of the number of fatalities associated to its potential occurrence. In this section, the State should describe a set of SEIs derived from the roadmap, which it plans to implement, or is in the process of implementing, to address all the identified HRCs (refer to Part II, Chapter 3). National operational safety risks should encompass the different sectors of aviation.

2.3.7 Other safety issues

In addition to the national operational safety risks, the national aviation safety plan should include other safety issues that have been identified by the State and that need to be addressed to improve safety. This section should contain a description of the safety issues, which were identified as part of the State's analysis derived from regional analysis or based on the GASP. Safety issues should be identified through a data-driven approach (e.g. based on USOAP data). These issues are typically organizational in nature and relate to challenges associated with the conduct of the State's safety oversight functions, its implementation of an SSP and the level of SMS implementation by industry. In this section of the plan, the State should briefly explain which organizational challenges were selected for the State and why they were given priority. For example, deficiencies in a specific CE of an effective safety oversight system may be considered a top concern and addressed as a safety issue in the national plan because of their impact on the State's abilities to fulfil its safety oversight responsibilities. In this section, the State should describe a set of SEIs derived from the roadmap, which it plans to implement, or is in the process of implementing, to address all the identified safety issues (refer to Part II, Chapter 3). For example, a State may lack a safety data collection and processing system as part of its SSP; the plan can present this issue and a brief description of the intended course of action to address this deficiency. The plan can also be useful in securing resources to assist the State in completing the SEIs listed.

2.3.8 Monitoring implementation

2.3.8.1 The national aviation safety plan should contain a description of how the State will monitor the implementation of the SEIs listed in the plan and how it will measure safety performance to ensure the intended results are achieved. The plan should explain how each target will be measured and monitored to track performance. Indicators being used to measure safety performance should be traced to those within the GASP and the regional

aviation safety plan. In addition to a national aviation safety plan, the State should produce safety performance dashboards to provide all stakeholders with up-to-date information on the progress made in achieving the national goals and targets, as well as the implementation status of SEIs.

2.3.8.2 If the national goals and targets are not met, the root cause should be presented. Actions should be developed and included in the next revision of the plan, with updated SEIs. If the State identifies critical issues, reasonable measures should be taken to mitigate those risks as soon as practicable, possibly leading to an earlier revision of the plan.

2.3.8.3 A standardized approach for individual States to provide information at the regional level is encouraged (e.g. for reporting to the RASGs, see GASP Target 4.2 in Part I, Chapter 4). This allows the region to receive information and assess safety risks using common methodologies.

2.4 RELATIONSHIP BETWEEN THE NATIONAL AVIATION SAFETY PLAN AND THE SSP

2.4.1 An SSP comprises a range of processes and activities that together provide a State with the means to manage safety and to deliver well-directed safety oversight. An effective SSP assists States to proactively identify hazards and mitigate safety risks at the national level. It is the foundation on which a State builds a proactive approach to national aviation safety.

2.4.2 Effective SSP implementation is a gradual process. The State plans, organizes, develops, implements, maintains, controls and continuously improves the SSP in a manner that meets its safety objectives. The complexity of the air transportation system and the maturity of the State's safety oversight capabilities determine the time required to achieve a fully mature SSP. The level of effective implementation of an SSP in the State affects its relationship with the national aviation safety plan.

2.4.2.1 ***States that have not fully implemented an SSP*** – A State without a fully implemented SSP may not have the data collection, analysis and safety risk management capabilities to identify national operational safety risks. In this case, its national aviation safety plan should be guided primarily by the GASP and the regional aviation safety plan. These two documents assist the State to identify and manage operational safety risks. A State's responsibilities for the management of safety comprises both safety oversight and safety management, collectively implemented through an SSP. In a State that has not fully implemented an SSP, the national aviation safety plan should include activities to address organizational challenges and enhance organizational capabilities (refer to Part I, Chapter 3). These activities include putting in place the steps necessary to fully implement an SSP.

2.4.2.2 ***States that have fully implemented an SSP*** – A State with an effective SSP has the capability to identify and mitigate national operational safety risks. The SSP assists in the development of the State's national aviation safety plan; it may include aspects from the GASP and the regional aviation safety plan. The SSP allows the State to manage its safety improvement activities in a coherent and proactive manner, measuring its safety performance, monitoring the implementation of the plan's SEIs and addressing any identified deficiencies. The national aviation safety plan is one of the key documents produced as part of the SSP documentation. It is the means by which a State defines and drives the implementation of SEIs generated by the SSP process or drawn from the GASP. It also allows a State to determine activities to strengthen the SSP or to achieve its safety objectives. Safety intelligence gathered through the SSP may also contribute to other national plans, such as the air navigation plan.

Note.— Doc 9859 contains additional guidance related to the relationship between the national aviation safety plan and the SSP.

2.5 RELATIONSHIP BETWEEN THE NATIONAL AVIATION SAFETY PLAN AND OTHER RELEVANT NATIONAL PLANS

2.5.1 The national aviation safety plan's focus is to present a strategic direction for the management of a particular area of aviation: safety. The national aviation safety plan, as well as other aviation plans in areas such as aviation security and air navigation, should all be linked together in a broader national aviation plan to ensure an integrated strategic approach at the State level. This broader national aviation plan can be considered as a civil aviation "master plan" addressing all aspects of air transport at the State level, including aviation safety, air navigation capacity and efficiency, security and facilitation, economic development, and environmental protection, with the objective to provide a clear and comprehensive planning and implementation strategy for the future development of the entire civil aviation sector in terms of policies, legislation, objectives, facilities, equipment, organization and capacity building (e.g. an overview of the land-use strategy for future airport development). Therefore, the national aviation safety plan contains in-depth information specific to aviation safety items that are referenced in the broader civil aviation master plan (e.g. all safety-related initiatives that must be accomplished as part of the future airport development) (refer to Figure 2-1). The civil aviation master plan should also emphasize the importance of air transport to the State's economic development. Furthermore, since investments in air transport contribute to the State's prosperity, the civil aviation master plan should include economic aspects. As such, the civil aviation master plan should be linked to a State's overarching national development plan, where applicable. This ensures integration of the national aviation safety plan along with other areas of aviation and raises the visibility of aviation initiatives at the broader State level.

2.5.2 The national development plan (also referred to as a national strategy, national framework for development or State development plan) is the document that facilitates the interaction between the State and financial development institutions, which can assist in the financing of large-scale projects (e.g. construction of a new international airport). The national development plan addresses all sectors of activity in the State (health, justice, transport, etc.). The national development plan provides assistance to mobilize public and private resources and partnerships for the implementation of the civil aviation master plan and detailed projects to modernize or strengthen the civil aviation sector. It is a tool to gain donor support for the implementation of the civil aviation master plan, its projects and the detailed safety enhancement initiatives contained in the national aviation safety plan. A clearly defined relationship among these three plans enables the prioritization and optimum allocation of resources for all the planned projects within the State, across all sectors of activity.

Figure 2-1 Relationship among the national aviation safety plan and other relevant national plans

Chapter 3

GLOBAL AVIATION SAFETY ROADMAP

3.1 PURPOSE OF THE ROADMAP

The global aviation safety roadmap is an action plan developed to assist the aviation community in achieving the GASP goals. It provides a structured, common frame of reference for all relevant stakeholders to develop and implement national and regional aviation safety plans by presenting a series of SEIs linked to the GASP goals and targets. The use of the global aviation safety roadmap as the basis for national and regional safety planning enhances coordination, thus reducing inconsistencies and duplication of effort.

3.2 STRUCTURE OF THE ROADMAP

3.2.1 The global aviation safety roadmap outlines specific SEIs associated with the GASP goals and targets. Each SEI is supported by a set of actions. The roadmap includes specific initiatives targeted to the three different set of stakeholders: individual States; regions (which refers to a group of States within a region, as well as RASGs, regional organizations, RSOOs, RAIOs and other regional entities); and industry. Successful achievement of the roadmap implementation relies upon the close collaboration and cooperation of all stakeholders.

3.2.2 The global aviation safety roadmap is composed of two pieces:

a) *organizational challenges* – this part of the roadmap (referred to as the ORG roadmap) provides SEIs to meet GASP goals related to States' safety oversight capabilities and the implementation of SSPs, as well as industry's implementation of SMS, and contains two distinct components, in line with the GASP goals, to address safety management responsibilities:

1) State safety oversight system; and

2) SSP, including service providers' SMS.

b) *operational safety risks* – this part of the roadmap (referred to as the OPS roadmap) provides SEIs to meet the GASP goals related to a continuous reduction of operational safety risks, and regional and industry safety risk management activities to address the HRCs.

3.2.3 All the SEIs of the roadmap are presented in a standardized "roadmap template" format, which covers the following points:

a) *SEI.* A description of the specific safety enhancement initiative;

b) *Stakeholder.* The entity to which the SEI is addressed (States, regions or industry);

c) *Actions.* A description of the tasks required for the implementation of an SEI; and

e) *References*. Documents and tools that may assist stakeholders in implementing the SEIs and associated actions.

3.2.4 The GASP goal related to the need for appropriate infrastructure to support safe operations should be addressed through coordination between PIRGs and RASGs. This goal is met by criteria defined through the BBBs, as described in the GANP. More information on the GANP can be found on the ICAO website at www.icao.int/airnavigation/Pages/GANP-Resources.aspx.

3.3 ORGANIZATIONAL CHALLENGES (ORG) ROADMAP

3.3.1 The ORG roadmap comprises two components to facilitate its use and is divided into three horizontal streams, each with specific SEIs aimed at States, regions and industry, as presented in Figure 3-1. The SEIs are laid out in a sequence and may need to be accomplished in a specific order. As stakeholders accomplish each SEI, represented by a numbered box in the diagram, they advance through the roadmap thus achieving the different GASP goals. Each SEI has a number, which links it to a detailed description of the corresponding initiative, found in a roadmap template.

3.3.2 The component of the roadmap related to a State safety oversight system is divided into two phases: Phase 1 focuses on the establishment of an effective safety oversight framework, as per CE-1 to CE-5; and Phase 2 focuses on the implementation of an effective safety oversight system, as per CE-6 to CE-8. In each of the roadmap templates, CEs in parenthesis refer to the CE(s) which are addressed by a specific action.

3.3.3 States should have basic elements of Phases 1 and 2 in place to ensure effective safety oversight before pursuing the second component of safety management, which focuses on SSP and SMS implementation. However, some of the steps to implement an SSP may have been started in Component 1, as part of the establishment of an effective safety oversight system (i.e. the foundation of an SSP). Despite the breakdown of the roadmap into components, the SEIs should not be viewed as stand-alone activities. In many cases, they are interrelated and serve to meet several goals simultaneously. Therefore, the SEIs in the ORG roadmap are not linked to one specific GASP goal or target. SEIs related to a State or a region's organizational challenges should be included in the national or regional aviation safety plan (refer to section 3.5).

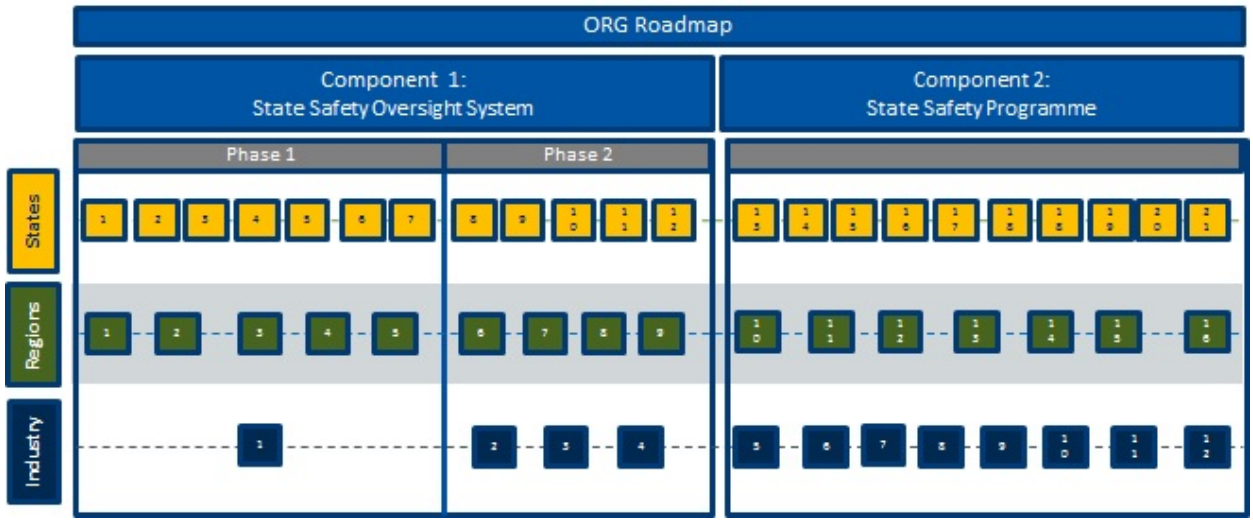

Figure 3-1 ORG roadmap diagram

3.4 OPERATIONAL SAFETY RISKS (OPS) ROADMAP

3.4.1 The OPS roadmap addresses operational safety risks and is based on the HRCs identified in Part I, Chapter 3. It contains specific SEIs to address each of the five HRCs: controlled flight into terrain; loss of control in-flight; mid-air collision; runway excursion; and runway incursion. States, regions and industry should use this part of the roadmap to assist them in developing a plan to mitigate the risks associated with these categories of occurrences. Unlike the ORG roadmap, the OPS roadmap is not divided into components or steps. SEIs can be accomplished in parallel.

3.4.2 The SEIs presented in the roadmap are considered global safety enhancements, applicable to all States and regions. They should be implemented to mitigate the risks associated with the HRCs deemed of global concern. The OPS roadmap identifies the SEIs for each HRC. This is not an exhaustive list. Stakeholders should verify the latest safety enhancements in coordination with regional organizations and RASGs for additional actions that may address hazards and emerging issues. Stakeholders should conduct analyses of data and reports to validate the effectiveness of the implemented SEIs. In order to develop data collection and analysis capabilities, SSP and SMS should be implemented (refer to the SEIs in the ORG roadmap). Stakeholders can then derive contributing factors through data analysis. The roadmap gives specific examples of potential contributing factors. These are not exhaustive and may not be applicable to all stakeholders or operational environments. Based on the analysis, stakeholders may need to develop and implement further SEIs to mitigate any additional risks. Stakeholders should assess the effectiveness of the SEIs and may need to refine them in response to changes that may introduce new hazards. SEIs related to a State or a region's operational safety risks should be included in the national or regional aviation safety plan (refer to section 3.5).

3.4.3 The ORG roadmap is not a substitute for the safety risk management activities that need to be conducted by individual States as part of their SSP and by service providers through their SMS. A safety management approach to targeting the HRCs can result in successful mitigation strategies. Once SSP and SMS are implemented in accordance with Annex 19, stakeholders can refine their SEIs in relation to the HRCs suitable to their operating environment. The OPS roadmap is supported by the ORG roadmap component related to SSP and SMS, which enables safety risk management and safety assurance processes to be implemented.

3.5 HOW TO USE THE ROADMAP TO DEVELOP A NATIONAL AVIATION SAFETY PLAN

3.5.1 States, regions (supported primarily by the RASGs) and industry should use the roadmap individually and collectively as the basis to develop national and regional aviation safety plans that define the specific SEIs to improve safety. This section presents the steps that a State should take to develop its national aviation safety plan using the roadmap as a way to define SEIs. Figure 3-2 illustrates the seven steps of the national aviation safety plan development process. The same steps presented in this section should be used by the regions when developing a regional aviation safety plan.

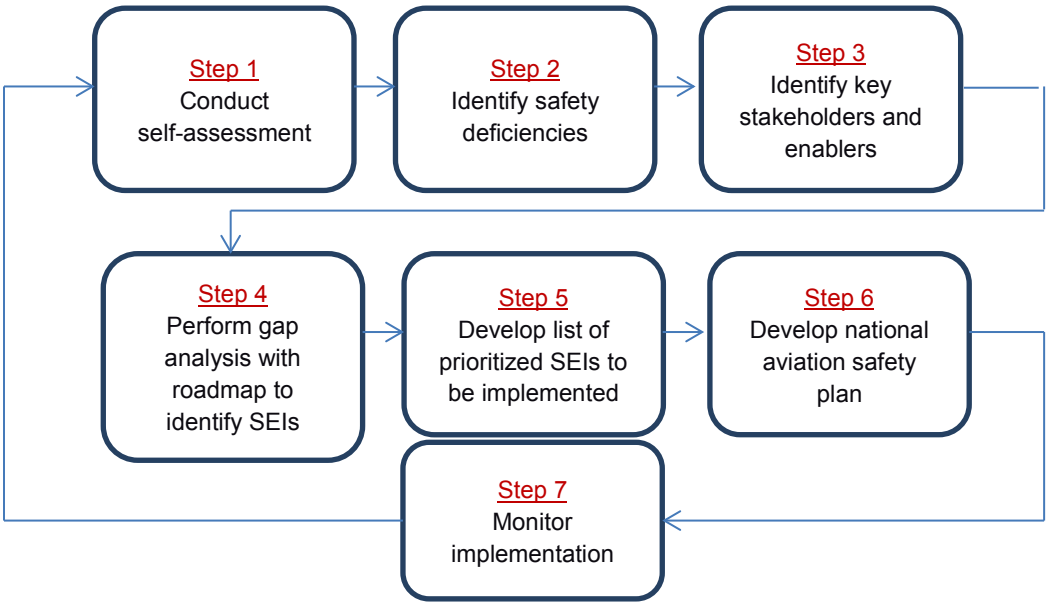

Figure 3-2 National aviation safety plan development process

3.5.2 Step 1 — Conduct self-assessment

3.5.2.1 In conjunction with an initial review of the roadmap, the State should conduct a self-assessment to understand its current operational environment. The analysis needs to assess established capabilities, system size and level of complexity, and available resources. The self-assessment should use several sources of information.

3.5.2.2 The State should assess its level of EI of the CEs of a safety oversight system and of the status of SSP implementation to develop a baseline understanding of its current safety oversight capabilities and operational environment. To accomplish this task, the State should use the suite of electronic safety tools available on ICAO iSTARS as presented in Table 3-1. The PQ Tester, Safety Audit Information and State Safety Briefings applications, as well as the USOAP CMA OLF tools, may be particularly useful to determine the EI score and identify existing safety deficiencies. The State should also consult iSTARS to determine its safety oversight index for the three functional categories (see Part I, 4.2.5.3).

3.5.2.3 A State moving into SSP implementation should conduct an SSP gap analysis to ensure it is ready to begin SSP implementation. It should use the ICAO iSTARS SSP Gap Analysis application and the SSP Foundation tool to complete this process. All these tools assist the State to identify specific deficiencies related to safety oversight and SSP implementation. If a State already has an effective SSP, it can use the established safety risk management process to identify hazards.

3.5.2.4 The State should also consult the latest edition of the GASP and the regional aviation safety plan to assist it in identifying organizational challenges and operational safety risks (including the HRCs) that may be common to the region or of global concern. The State may also refer to regional entities, such as the RASG, for assistance in identifying safety deficiencies.

Table 3-1. iSTARS tools to assist States to identify specific deficiencies related to safety oversight and assist States with SSP implementation

iSTARS SAFETY TOOLS		
States can use the following tools to determine the EI score, identify existing safety deficiencies related to safety oversight, as well as determine the safety oversight index for the three functional categories (see Part I, 4.2.5.3)	USOAP PQs	PQ Tester
	Level of implementation and SSCs	Safety Audit Information
	Summary of State safety indicators	State Safety Briefing
	Risk-based prioritization for operations, air navigation and support functions	Safety Oversight Index
States can use the following tools for SSP implementation	State safety programmes	SSP Gap Analysis
	Status of SSP foundational PQs	SSP Foundation

3.5.3 Step 2 — Identify safety deficiencies

Based on the results of the self-assessment, the State should identify a series of safety deficiencies that need to be addressed. The identified deficiencies assist the State to identify the appropriate starting point in the ORG roadmap (i.e. component and phase, in the case of the first component). The HRCs should also be addressed as part of the safety deficiencies, based on the content of the OPS roadmap and the State's safety data analysis.

3.5.4 Step 3 — Identify key stakeholders and enablers

Based on the results of the self-assessment and the identified safety deficiencies, the State should identify key stakeholders with supporting capabilities, additional resources and other strengths or opportunities (e.g. external funding, support from the RASGs) that can assist it in addressing the deficiencies and enable safety improvements. Stakeholder mapping should include all stakeholders that can contribute to the success of the plan. Stakeholders will be involved in developing, implementing and sustaining the SEIs presented in the roadmap.

3.5.5 Step 4 — Perform gap analysis with roadmap to identify SEIs

Once Steps 1 to 3 have been completed, the State has sufficient information to identify the appropriate starting point within the ORG roadmap. It should then perform a gap analysis using the ORG roadmap and select a series of SEIs that are needed to address the identified safety deficiencies and help it achieve the GASP goals. By reviewing the identified safety deficiencies and/or results of the gap analysis in comparison to the selected SEIs, a list of potential SEIs can be identified and selected as relevant corrective actions. In addition, the State should review the SEIs presented in the OPS roadmap and identify those that have not been implemented to serve as safety risk mitigations for the HRCs.

3.5.6 Step 5 — Develop list of prioritized SEIs to be implemented

3.5.6.1 The State should review the list of potential SEIs and assess its capability to implement all of them. The review of potential SEIs should evaluate the availability of resources (human, financial, technical, training, stakeholder commitments, etc.) necessary to complete each of the SEIs. In addition to identifying necessary resources, the ability to make the changes should also be considered. This assessment should include the political will to change, and the availability of the technology and resources necessary to implement the change.

3.5.6.2 The State should prioritize SEIs that have the greatest impact on safety. One method would be to focus on actions having the greatest potential safety enhancement while requiring the fewest resources to complete. It is good practice to use a quantitative approach in this analysis. Where a quantitative approach is not feasible, the State may rely on the knowledge and expertise of an evaluation team. Based on the assessment, the State should develop a list of prioritized SEIs to be completed within a specified timeframe.

3.5.6.3 A conclusion that implementation of an SEI is not practical should only be arrived at as a last resort. If such a conclusion is reached, aviation activities need to be adjusted to eliminate or mitigate the consequence of the hazard or identified safety deficiency.

3.5.7 Step 6 — Develop national aviation safety plan

The SEIs selected in Step 5 serve as the basis for the national aviation safety plan. Once a list of prioritized SEIs has been developed, the State should develop the national aviation safety plan, which will become the master document for implementing the SEIs at the national level. The national aviation safety plan should cover a manageable set of actions that represent the steps necessary to achieve the defined goals. Once the plan is finalized, a responsible party or organization should be identified to lead the implementation of each SEI. Established regional activities and organizations (e.g. the RASGs) may be able to provide implementation strategies and support. The State is also encouraged to collaborate with other stakeholders at the national and regional levels to harmonize existing plans. The State should endeavour to implement the applicable SEIs within the timelines associated with the GASP targets. In the event that the timelines proposed in the GASP may not be achievable, the State should develop attainable timelines in coordination with ICAO and other stakeholders, as appropriate.

3.5.8 Step 7 — Monitor implementation

After the national aviation safety plan has been finalized, SEIs should be assigned to the organizations or individuals responsible for leading the implementation. Related activities should be continuously monitored to ensure that actions are accomplished, any roadblocks to implementation are removed and the plan accommodates any newly identified gaps. As the plan's SEIs are completed, the steps listed in this section should be repeated in order to identify other SEIs that the State may need to complete.

Appendix A

ORGANIZATIONAL CHALLENGES (ORG) ROADMAP

1. STATES

1.1 Component 1 — State safety oversight system

1.1.1 Phase 1 — Establishment of a safety oversight framework (CE-1 to CE-5)

Safety enhancement initiative	SEI-1 — Consistent implementation of ICAO SARPs at the national level
Stakeholder	States
Actions	☐ 1A — Work at the national level to address significant safety concerns as a priority ☐ 1B — Address all priority protocol questions (PQs) of the USOAP CMA ☐ 1C — Establish primary aviation law and regulations, to empower the competent authority to conduct regulatory oversight, this includes separation of oversight functions and service provision functions (CE-1 and CE-2) ☐ 1D — Increase the level of compliance with ICAO SARPs and the EI of CEs at the national level (CE-1 to CE-5) ☐ 1E — Establish a process for the identification of differences with ICAO SARPs (CE-2)
References	1A and 1D — Doc 9734, *Safety Oversight Manual*, Part A — *The Establishment and Management of a State Safety Oversight System* — Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* — iSTARS safety audit information (login required) 1C and 1D — Doc 9734, *Safety Oversight Manual*, Part A — *The Establishment and Management of a State Safety Oversight System* — Canadian Aviation Regulations — Civil Aviation Safety Regulations of Australia — European Aviation Safety Rules — United States Federal Aviation Administration (FAA) Regulations — ICAO reference documents — iMPLEMENT — iSTARS State safety briefings (login required) — Latin American Civil Aviation Regulations — Model Civil Aviation Regulations — Rules of the Civil Aviation Authority of New Zealand — ICAO USOAP CMA and USOAP CMA Online Framework (login required)

Safety enhancement initiative	SEI-2 — Development of a comprehensive regulatory oversight framework
Stakeholder	States
Actions	☐ 2A — Establish and maintain an independent regulatory oversight authority, which includes separation of oversight functions from service provision functions where these exist within the authority (CE-3) ☐ 2B — Develop an effective system to promulgate technical guidance and tools, and provide safety-critical information needed for technical personnel to effectively perform their safety oversight functions (CE-5) ☐ 2C — Establish an effective system to attract, recruit, train and retain qualified and sufficient technical personnel to support regulatory oversight (see SEI-5) (CE-3 and CE-4)
References	2A — Doc 9734, *Safety Oversight Manual*, Part A — *The Establishment and Management of a State Safety Oversight System* 2B and 2C — FAA Inspector Training System — Flight Standards (International) Course — ICAO-Endorsed Government Safety Inspector Training Programme — ICAO Global Aviation Training course catalogue — ICAO TRAINAIR PLUS Programme — iSTARS — Ramp Inspection Programmes (SAFA/SACA)

Safety enhancement initiative	SEI-3 — Establishment of an independent accident and incident investigation authority, consistent with Annex 13 — *Aircraft Accident and Incident Investigation*
Stakeholder	States
Actions	☐ 3A — Establish an independent accident and incident investigation authority, as per Annex 13 requirements (CE-1 and CE-3) ☐ 3B — Develop an effective system to promulgate technical guidance and tools, and provide safety-critical information needed for technical personnel to effectively conduct accident and incident investigations (CE-5) ☐ 3C — Establish an effective system to attract, recruit, train and retain qualified and sufficient technical personnel to support accident and incident investigations (see SEI-5) (CE-3 and CE-4)
References	3A — Annex 13, *Aircraft Accident and Incident Investigation* — Doc 9734, *Safety Oversight Manual,* Part A — *The Establishment and Management of a State Safety Oversight System* — ICAO Model Aircraft Accident and Incident Investigation (AIG) Act — ICAO Model Aircraft Accident and Incident Investigation (AIG) Regulations 3B — Doc 9734, *Safety Oversight Manual* — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* — Doc 9946, *Manual on Regional Accident and Incident Investigation Organization* — Doc 9962, *Manual on Accident and Incident Investigation Policies and Procedures* — Doc 9973, *Manual on Assistance to Aircraft Accident Victims and their Families* — Doc 9998, *ICAO Policy on Assistance to Aircraft Accident Victims and their Families* — Doc 10053, *Manual on Protection of Safety Information,* Part I — *Protection of Accident and Incident Investigation Records* — Doc 10062, *Manual on the Investigation of Cabin Safety Aspects in Accidents and Incidents* — Cir 315, *Hazards at Aircraft Accident Sites* 3C — Cir 298, *Training Guidelines for Aircraft Accident Investigators*

Safety enhancement initiative	SEI-4 — Strategic allocation of resources to enable effective safety oversight
Stakeholder	States
Actions	☐ 4A — Confirm executive or legislative mandate to receive financial resources from government or other external sources and expend them (CE-1) ☐ 4B — Establish a process for the resource planning and allocation in alignment with a competent authority's organizational structure, which is required to conduct effective safety oversight (CE-2 and CE-3). SEI-1 and SEI-5 could be used to identify resource requirements (CE-1 to CE-5) ☐ 4C — Obtain a sustainable and stable source of financing through commitments from the national and agency leadership and other stakeholders (CE-1 to CE-3). For small scope short-term improvements: ○ Utilize the ICAO Safety Fund (SAFE), Technical Co-operation Bureau, or other means to acquire technical and financial assistance in coordination with RASG/RSOO/ICAO Regional Office ○ Seek assistance from more experienced States and other stakeholders in coordination with RASG/RSOO/ICAO Regional Office ○ Seek assistance from sources of financing (World Bank, African Development Bank, etc.) in coordination with RASG/RSOO/ICAO Regional Office ☐ 4D — Develop a process for assessing changing resource requirements and sustain necessary coordination with resource stakeholders for safety oversight improvements, as outlined in Component 1 of this roadmap (CE-1 to CE-3)
References	— ICAO Safety Fund (SAFE) — ICAO Technical Co-operation Bureau — RASGs — RSOOs and COSCAPs

Safety enhancement initiative	SEI-5 — Qualified technical personnel to support effective safety oversight
Stakeholder	States
Actions	☐ 5A — Establish an effective system to identify and track qualifications and training of existing technical personnel (CE-4) ☐ 5B — Identify the gaps in qualified technical personnel and training requirements necessary to implement the oversight mandate (CE-4) ☐ 5C — Establish a compensation scheme for the attraction and retention of qualified technical personnel (CE-4) ☐ 5D — Make use of RSOOs, RAIOs, or equivalent means, to secure qualified technical personnel to perform those functions which cannot be performed by the State acting on its own (CE-4) ☐ 5E — Establish human resource plans to support hiring and retention of the appropriate number of qualified technical personnel required (CE-4) ☐ 5F — Implement training policies and programmes for technical personnel and verify that the type and frequency of training successfully completed (i.e. initial, recurrent, specialized and on-the-job training) are sufficient to acquire/maintain the required qualifications and level of competence corresponding to the assigned duties and responsibilities of technical personnel (CE-4) ☐ 5G — Develop a process for assessing changing needs for qualified technical personnel requirements and develop procedures to update hiring, retention and training of personnel needs, in coordination with SEI-4B (CE-4)
References	— Doc 8335, *Manual of Procedures for Operations Inspection, Certification and Continued Surveillance* — Doc 9734, *Safety Oversight Manual* — Doc 10070, *Manual on the Competencies of Civil Aviation Safety Inspectors* — ICAO-Endorsed Government Safety Inspector Training Programme — ICAO TRAINAIR PLUS Programme

Safety enhancement initiative	SEI-6 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Stakeholder	States
Actions	☐ 6A — 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) ☐ ☐ 6B — Use a regional safety oversight mechanism, or the services of another competent State or organization to support a State that does not expect to meet GASP Goals 2 and 3 ☐ ☐ 6C — Provide assistance via States, regions and industry to other States for primary aviation legislation development (in coordination with SEI-1B) (CE-1) ☐ 6D — Provide assistance via States, regions and industry to other States for the development of national regulations (CE-2) ☐ 6E — 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) ☐ 6F — Collaborate with RASG and/or 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) ☐ 6G — 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) ☐ 6H — While working to improve safety oversight, work with RASG and/or RSOO to address high-risk categories of occurrences (see OPS roadmap)
References	6A to 6G — Doc 9734, *Safety Oversight Manual* — ICAO Technical Co-operation Bureau — No Country Left Behind initiative — RASGs — RSOOs and COSCAPs — Safety oversight index application (login required) 6H — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-7 — Provision of the primary source of safety information to ICAO by completing, submitting and updating all relevant documents and records
Stakeholder	States
Actions	☐ 7A — Update USOAP corrective action plan items ☐ 7B — Complete and submit the self-assessment checklist based on USOAP CMA priority PQs ☐ 7C — Complete and submit the State aviation activity questionnaire ☐ 7D — Complete and submit the compliance checklists on electronic filing of differences system ☐ 7E — Update documents and records, as required, in a timely manner
References	— Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual,* sections 2.8, 2.14 and 2.15 — iSTARS — USOAP CMA Computer-based Training — USOAP CMA Online Framework (login required) — USOAP CMA Workshops

1.1.2 Phase 2 — Implementation of a safety oversight system (CE-6 to CE-8)

Safety enhancement initiative	SEI-8 — Consistent implementation of ICAO SARPs at the national level
Stakeholder	States
Actions	☐ 8A — Work at the national level to address significant safety concerns as a priority ☐ 8B — 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)
References	— Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* — iSTARS safety audit information (login required)

Safety enhancement initiative	SEI-9 — Continued implementation of and compliance with ICAO SARPs at the national level
Stakeholder	States
Actions	☐ 9A — Implement licensing, certification, authorization and approval processes (CE-6) ☐ 9B — Implement regulatory oversight and enforcement processes (CE-7 and CE-8) ☐ 9C — Establish a system to resolve safety concerns identified via accident and incident investigations, surveillance activities, safety reports and other means (CE-8)
References	9A — Doc 8335, *Manual of Procedures for Operations Inspection, Certification and Continued Surveillance* 9B — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* 9C — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-10 — Strategic allocation of resources to enable effective safety oversight
Stakeholder	States
Actions	☐ 10A — Use SEI-1 and SEI-5 to identify resource requirements (CE-6 to CE-8) ☐ 10B — Leverage regional groups such as the RASG to identify additional resources
References	— ICAO Safety Fund (SAFE) — ICAO Technical Co-operation Bureau — RASGs

Safety enhancement initiative	SEI-11 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Stakeholder	States
Actions	☐ 11A — Based on the identified safety deficiencies, establish a mechanism to identify collaborators and develop an action plan for the resolution of those deficiencies (CE-6 to CE-8) ☐ 11B — Use an RSOO or other competent State or organization to support a State that does not expect to meet GASP Goals 2 and 3 ☐ 11C — Provide assistance via RASG and/or RSOO to other States for the conduct of surveillance activities (CE-7) ☐ 11D — Use technical guidance, tools and safety-critical information, developed in collaboration with other States, RSOO, ICAO and/or other stakeholders, to enable technical personnel to perform their safety oversight functions effectively (CE-6 to CE-8) ☐ 11E — While working to improve safety oversight, continue to work with RASG and/or RSOO to address high-risk categories of occurrences (see OPS roadmap)
References	11A to 11D — RASGs — RSOOs and COSCAPs — GASOS — Safety oversight index application (login required) 11E — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-12 — Continued provision of the primary source of safety information to ICAO by updating all relevant documents and records as progress is made
Stakeholder	States
Actions	☐ 12A — Update USOAP corrective action plan items ☐ 12B — Update and submit the self-assessment checklist based on USOAP CMA priority PQs ☐ 12C — Update and submit the State aviation activity questionnaire (SAAQ) ☐ 12D — Update and submit the compliance checklists (CCs) on the electronic filing of differences (EFOD) system
References	— Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual,* sections 2.8, 2.14 and 2.15 — iSTARS

1.2 Component 2 — State safety programme

Safety enhancement initiative	SEI-13 — Start of SSP implementation at the national level
Stakeholder	States
Actions	☐ 13A — Secure State-level commitment to improve safety ☐ 13B — Conduct initial SSP gap analysis (checklist) then the detailed SSP self-assessment ☐ 13C — Establish an SSP implementation team ☐ 13D — Develop an implementation plan for the SSP ☐ 13E — Issue SMS regulations for service providers and verify SMS implementation ☐ 13F — Identify and share safety management best practices
References	13A, B and D — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual* — ICAO USOAP CMA Online Framework (login required) — iSTARS SSP gap analysis (login required) — Safety Management International Collaboration Group (SM ICG), *10 Things You Should Know About SMS* 13A, C and E — SM ICG, *The Frontline Manager's Role in SMS* — SM ICG, *The Senior Manager's Role in SMS* 13E — SM ICG, *SMS Evaluation Tool* — CANSO Standard of Excellence in Safety Management Systems 13F — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators*

Safety enhancement initiative	SEI-14 — Strategic allocation of resources to start SSP implementation
Stakeholder	States
Actions	☐ 14A — Establish a process for planning and allocation of resources to enable SSP implementation and identify areas where resources are needed ☐ 14B — Obtain resources from national and appropriate authorities' leadership and stakeholders within the State to support SSP implementation ☐ 14C — Work with the ICAO Regional Office to make use of available means (e.g. Technical Co-operation Bureau) to acquire assistance needed for SSP implementation ☐ 14D — Work with RSOO, other States and other organizations, as appropriate to train qualified technical personnel to fulfil their duties and responsibilities regarding SSP implementation
References	14A and B — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual* 14C — ICAO Technical Co-operation Bureau regional coordinator 14D — SM ICG, SMS Inspector Competency Guidance

Safety enhancement initiative	SEI-15 — Strategic collaboration with key aviation stakeholders to start SSP implementation
Stakeholder	States
Actions	☐ 15A — Identify areas where collaboration/support is needed as part of the SSP implementation plan (see SEI-14) ☐ 15B — Identify relevant collaborators from key aviation stakeholders, including other States that are implementing or have implemented an SSP ☐ 15C — Develop an action plan to address the elements identified as missing or deficient during the SSP gap analysis (see SEI-13B) ☐ 15D — Establish a process via RASG and/or RSOO for a mentoring system, including providing assistance to States/industry, as well as sharing of best practices to support SSP implementation ☐ 15E — Develop a process to provide training on SSP to relevant staff, in collaboration with RSOO and/or other States (e.g. initial, recurrent and advanced) (see SEI-14D) ☐ 15F — Establish and implement a process for sharing technical guidance, tools and safety-critical information related to SSP (e.g. advisory circulars, staff instructions, safety performance indicators), in collaboration with other States, RASG, RSOO, ICAO and/or other stakeholders
References	15A to 15C — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual* — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) — ICAO USOAP CMA Online Framework (login required) — iSTARS SSP gap analysis (login required) — SM ICG, SSP Assessment Tool 15D to 15F — Aviation Safety Implementation Assistance Partnership (ASIAP) — ICAO Technical Co-operation Bureau (Regional coordinator) — No Country Left Behind initiative safety implementation resources 15E — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) 15F — Safety Management Implementation website

Safety enhancement initiative	SEI-16 — Strategic collaboration with key aviation stakeholders to complete SSP implementation
Stakeholder	States
Actions	☐ 16A — Work with collaborators (identified in SEI-15) to execute the action plan for implementation ☐ 16B — Work with collaborators to ensure all elements of the SSP are present, suitable, operational and effective ☐ 16C — Establish a system for the continuous improvement of the SSP, in collaboration with all relevant stakeholders ☐ 16D — Serve as a champion State to promote best practices among other States
References	16A — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) 16B — SM ICG, SSP Assessment Tool 16D — Aviation Safety Implementation Assistance Partnership (ASIAP) — ICAO Technical Co-operation Bureau (Regional coordinator) — No Country Left Behind initiative safety implementation resources — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators*

Safety enhancement initiative	SEI-17 — Establishment of safety risk management at the national level (step 1)
Stakeholder	States
Actions	☐ 17A — Establish a legal framework related to the protection of safety data, safety information and other related sources ☐ 17B — Establish a State mandatory occurrence reporting system ☐ 17C — Develop a safety database for monitoring system safety issues and hazards, in line with the principles of Doc 9859 — *Safety Management Manual* ☐ 17D — Establish and maintain a process to identify hazards from collected safety data ☐ 17E — Establish and utilize a process to ensure the assessment of safety risks associated with identified hazards ☐ 17F — Establish a State confidential voluntary safety reporting system providing data to the safety database (see SEI-17C)
References	17A to 17F — Annex 19, *Safety Management* — Doc 9859, *Safety Management Manual* 17B to 17D — Commercial Aviation Safety Team (CAST)/ICAO Common Taxonomy Team (CICTT) — ICAO Accident/Incident Data Reporting (ADREP) Taxonomy — SM ICG, *Development of a Common Hazard Taxonomy* — SM ICG, *Hazard Taxonomy Examples* 17E — SM ICG, *Risk Based Decision Making Principles*

Safety enhancement initiative	SEI-18 — Establishment of safety risk management at the national level (step 2)
Stakeholder	States
Actions	☐ 18A — Develop safety performance indicators using the established safety risk management process ☐ 18B — Develop safety performance measurement methodologies, aligned with the regional safety metrics, using the established safety risk management process (see SEI-17E) ☐ 18C — Establish the acceptable level of safety performance to be achieved through the SSP ☐ 18D — Ensure the establishment of mandatory safety reporting systems by service providers ☐ 18E — Encourage establishment of voluntary safety reporting systems as part of service providers' SMS ☐ 18F — 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 ☐ 18G — Contribute information on safety risks and SSP safety performance indicators to the RASG
References	18A to 18F — Doc 9859, *Safety Management Manual* 18A to 18D — SM ICG, *A Systems Approach to Measuring Safety Performance — The Regulator Perspective* — SM ICG, *Measuring Safety Performance Guidelines for Service Providers* 18E and 18F — RASG regional safety reports

Safety enhancement initiative	SEI-19 — Acquisition of resources to increase the proactive use of risk modelling capabilities
Stakeholder	States
Actions	☐ 19A — Identify resources needed to support safety intelligence collection and processing, advanced data analysis, risk modelling and information-sharing capabilities ☐ 19B — Attract, recruit, train, and retain qualified technical personnel to specialize in risk modelling ☐ 19C — Ensure that the Civil Aviation Safety Inspector workforce is trained to perform safety oversight of service providers that have implemented SMS
References	N/A

Safety enhancement initiative	SEI-20 — Strategic collaboration with key aviation stakeholders to support the proactive use of risk modelling capabilities
Stakeholder	States
Actions	☐ 20A — 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 ☐ 20B — 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 ☐ 20C — Foster and participate in public-private partnerships similar to the commercial/general aviation safety teams' concept to identify and implement system safety enhancements ☐ 20D — 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
References	20A — CANSO Guidelines on Just Culture — CANSO Safety Culture Definition and Enhancement Process — SKYbrary Safety Culture in Aviation and Just Culture resources and tools 20B — EASA Network of Analysts 20C — Commercial Aviation Safety Team — European Strategic Safety Initiative — General Aviation Joint Steering Committee — International Helicopter Safety Team — RASGs 20D — Aviation Safety InfoShare — ICAO Safety Information Monitoring Service (SIMS)

Safety enhancement initiative	SEI-21 — Advancement of safety risk management at the national level
Stakeholder	States
Actions	☐ 21A — Establish data sharing connectivity and integration among the State's aviation safety databases, including the mandatory occurrences reporting system, voluntary safety reporting systems, safety audit reports and aviation system statistics (traffic counts, weather information, EI scores, etc.) ☐ 21B — Develop risk modelling capabilities to support monitoring system safety issues and accident/incident prevention ☐ 21C - Encourage information-sharing with industry
References	21A and 21B — EUROCONTROL Voluntary ATM Incident Reporting (EVAIR) — European Authorities Coordination Group on Flight Data Monitoring (EAFDM) — FAA Aviation Safety Information Analysis and Sharing Program — FAA Confidential Information Sharing Program — IATA Flight Data eXchange (FDX) — IATA STEADES Global Aviation Safety Data Sharing Program — iMPLEMENT

2. REGIONS

2.1 Component 1 — State safety oversight system

2.1.1 Phase 1 — Establishment of a safety oversight framework (CE-1 to CE-5)

Safety enhancement initiative	SEI-1 — Consistent implementation of ICAO SARPs at the regional level
Stakeholder	Regions
Actions	☐ 1A — Work together with States at the regional level to assist States with low EI and/or significant safety concerns: ○ Provide support toward shortfalls in roadmap safety enhancement initiatives found in multiple States to increase cost effectiveness ○ Adopt best practices for identifying cost-effective types of support that lead to sustained safety oversight improvements and adjust regional resource priorities (in coordination with SEI-3B) ○ Coordinate assistance to States that have taken temporary measures to address potential SSCs. ☐ 1B — Increase the level of compliance with ICAO SARPs and the EI of CEs within the region (CE-1 to CE-5). ☐ 1C — Develop harmonized regulations, technical guidance, and tools for promulgation by States, and develop a process for the provision of safety-critical information in the region, consistent with ICAO SARPs (CE-2 and CE-5) ☐ 1D — Develop training requirements to harmonize competencies of technical personnel needed to support effective safety oversight at the regional level (CE-4) ☐ 1E — Work regionally through RASG, RSOO and ICAO Regional Office to enhance safety in a sustainable manner
References	— Doc 9734, *Safety Oversight Manual,* Part B — *The Establishment and Management of a Regional Safety Oversight Organization* — Doc 9868, *Procedures for Air Navigation Services — Training* (PANS-TRG) — Doc 10002, *Cabin Crew Safety Training Manual* — Doc 10070, *Manual on the Competencies of Civil Aviation Safety Inspectors* — iMPLEMENT — No Country Left Behind initiative safety implementation resources

Safety enhancement initiative	SEI-2 — Establishment of an independent regional accident and incident investigation process, consistent with Annex 13 — *Aircraft Accident and Incident Investigation*
Stakeholder	Regions
Actions	☐ 2A — Establish a RAIO, if necessary (see SEI-1B) (CE-3) ☐ 2B — Identify champion States, via the RASGs, to assist in building the accident and incident investigation capabilities of States which require assistance (CE-3 to CE-4) ☐ 2C — Provide resources for accident and incident investigation (including, but not limited to, personnel and technical support) to perform those functions which cannot be performed by the State acting on its own (see SEI-1A) (CE-3 and CE-4)
References	2A — Doc 9946, *Manual on Regional Accident and Incident Investigation Organization* 2C — Annex 13, *Aircraft Accident and Incident Investigation* — Doc 9734, *Safety Oversight Manual,* Part A — *The Establishment and Management of a State Safety Oversight System* and Part B — *The Establishment and Management of a Regional Safety Oversight Organization* — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* — Doc 9962, *Manual on Accident and Incident Investigation Policies and Procedures* — Doc 9973, *Manual on Assistance to Aircraft Accident Victims and their Families* — Doc 9998, *ICAO Policy on Assistance to Aircraft Accident Victims and their Families* — Doc 10062, *Manual on the Investigation of Cabin Safety Aspects in Accidents and Incidents* — Cir 298, *Training Guidelines for Aircraft Accident Investigators* — Cir 315, *Hazards at Aircraft Accident Sites* — ICAO Model Aircraft Accident and Incident Investigation (AIG) Act — ICAO Model Aircraft Accident and Incident Investigation (AIG) Regulations

Safety enhancement initiative	SEI-3 — Regional safety enhancement initiatives to support consistent coordination of regional programmes in establishing adequate safety oversight capabilities
Stakeholder	Regions
Actions	☐ 3A — Identify resources that are available to support roadmap safety enhancement initiatives for States in the region (all CEs, emphasis on CE-1 to CE-5) ☐ 3B — Use the roadmap and RASG- and/or RSOO-specific analyses of relevant safety-critical information to determine regional priorities and resources that can be used to assist States. Due to the scarce human and financial resources, any planned actions should be targeted at those safety risks which can be sustainably addressed and have the highest impact in terms of improving safety (all CEs, emphasis on CE-1 to CE-5) ☐ 3C — Facilitate the provision of financial and technical assistance among regional resourced entities (RASG, RSOO, ICAO Regional Office, champion States, development banks, regional economic communities and other regional aid programmes) and give priority to States requiring assistance (in alignment with State SEI-4) (all CEs, emphasis on CE-1 to CE-5) ☐ 3D — Establish an RSOO or equivalent means, to perform those functions which cannot be performed by the State acting on its own ☐ 3E — Strengthen existing RSOO (CE-1 to CE-5)
References	— Doc 9734, *Safety Oversight Manual,* Part B — *The Establishment and Management of a Regional Safety Oversight Organization* — Aviation Safety Implementation Assistance Partnership (ASIAP)

Safety enhancement initiative	SEI-4 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Stakeholder	Regions
Actions	☐ 4A — Based on the identified safety deficiencies, establish a mechanism to identify collaborators and develop and execute an action plan for the resolution of those deficiencies (CE-1 to CE-5) ☐ 4B — Provide assistance via States, regions and industry to States for primary aviation legislation development (in coordination with State SEI-1B) (CE-1) ☐ 4C — Provide assistance via States, regions and industry to States for the development of national regulations (CE-2) ☐ 4D — 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-3) ☐ 4E — Collaborate with RASG and/or RSOO, 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) ☐ 4F — Establish and implement a process for the development and promulgation of technical guidance, tools and the provision of safety-critical information, in collaboration with 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 environment (CE-5) ☐ 4G — While working to improve safety oversight, work with RASG and/or RSOO to address high-risk categories of occurrences (see OPS roadmap)
References	4A to 4F — Doc 9734, *Safety Oversight Manual* — ICAO Technical Co-operation Bureau — iMPLEMENT — No Country Left Behind initiative — RASGs — RSOOs and COSCAPs 4G — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-5 — Provision of the regional safety information to ICAO by asking States to complete, submit and update all relevant documents and records
Stakeholder	Regions
Actions	☐ 5A — Assess if States in the region have provided the information in 5B to 5E to ICAO ☐ 5B — Solicit States in the region to complete and submit their USOAP corrective action plan ☐ 5C — Solicit States in the region to complete and submit their self-assessment checklist based on USOAP CMA PQs ☐ 5D — Solicit States in the region to complete and submit their SAAQ ☐ 5E — Solicit States in the region to complete and submit their CCs on the EFOD system ☐ 5F — Make use of the RASGs, regional organizations or other regional fora to collect and share safety information, in order to assess the level of implementation of ICAO SARPs at the regional level
References	— Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* — iSTARS — USOAP-CMA Computer-based Training — USOAP CMA Online Framework (login required) — USOAP CMA Workshops

2.1.2 Phase 2 — Implementation of a safety oversight system (CE-6 to CE-8)

Safety enhancement initiative	SEI-6 — Continued implementation of and compliance with ICAO SARPs at the regional level
Stakeholder	Regions
Actions	☐ 6A — Work together with States in the region to assist States with low EI and/or significant safety concerns: o Provide support toward shortfalls in roadmap safety enhancement initiatives found in multiple States to increase cost effectiveness o Adopt best practices for identifying cost-effective types of support that lead to sustained safety oversight improvements and adjust regional resource priorities continuously (in coordination with SEI-7B) ☐ 6B — Increase the level of compliance with ICAO SARPs and the EI of CEs within the region (CE-6 to CE-8) ☐ 6C — Work with States' competent authorities and their enforcement oversight processes, to address safety concerns regarding foreign operators, in a timely manner (CE-6 to CE-8) ☐ 6D — Work with stakeholders to resolve safety concerns identified via accident and incident investigations, safety reports and other means (CE-8) ☐ 6E — Continue work on the high-risk categories of occurrences (see OPS roadmap)
References	6A to 6C — Doc 8335, *Manual of Procedures for Operations Inspection, Certification and Continued Surveillance* — Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* 6D — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* 6E — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-7 — Regional safety enhancement initiatives to support consistent coordination of regional programmes in implementing adequate safety oversight capabilities
Stakeholder	Regions
Actions	☐ 7A — Identify resources that are available to support roadmap safety enhancement initiatives for States in the region (all CEs, emphasis on CE-6 to CE-8) ☐ 7B — Use the roadmap and regional analysis of relevant safety-critical information to determine regional priorities and resources that can be used to assist States. Due to the scarce human and financial resources, any planned actions should be targeted at those safety risks which can be sustainably addressed and have the highest impact in terms of improving safety (all CEs, emphasis on CE-6 to CE-8) ☐ 7C — Facilitate the provision of financial and technical assistance among regional resourced entities (RASG, RSOO, ICAO Regional Office, champion States, development banks and other regional aid programmes) and give priority to States requiring assistance, in alignment with SEI-10 (all CEs, emphasis on CE-6 to CE-8) ☐ 7D — Strengthen existing RSOO, if necessary (CE-6 to CE-8)
References	— Aviation Safety Implementation Assistance Partnership (ASIAP)

Safety enhancement initiative	SEI-8 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Stakeholder	Regions
Actions	☐ 8A — Based on the identified safety deficiencies, establish a mechanism to identify collaborators and develop an action plan for the resolution of those deficiencies (CE-6 to CE-8) ☐ 8B — Provide assistance via RASG and/or RSOO to States for the conduct of surveillance activities (CE-7) ☐ 8C — Use technical guidance, tools and safety-critical information, developed in collaboration with States, RSOO, ICAO and/or other stakeholders, to assist in safety oversight functions (CE-6 to CE-8) ☐ 8D — Resolve safety concerns identified via accident and incident investigations, safety reports and other means (CE-8) ☐ 8E — While working to improve safety oversight, continue to work with RASG and/or RSOO to address high-risk categories of occurrences (see OPS roadmap)
References	8A to 8C — RASGs — RSOOs and COSCAPs 8D — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* 8E — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-9 — Continued provision of the primary source of regional safety information to ICAO by asking States to update all relevant documents and records as progress is made
Stakeholder	Regions
Actions	☐ 9A — Assess if States in the region have updated their primary source of safety information to ICAO ☐ 9B — Solicit States in the region to complete and submit their USOAP corrective action plan ☐ 9C — Solicit States in the region to update and submit their self-assessment checklist based on USOAP CMA PQs ☐ 9D — Solicit States in the region to update and submit their SAAQ ☐ 9E — Solicit States in the region to update and submit their CCs on the EFOD system ☐ 9F — Continue to encourage States in the region to update documents and records, as required, in a timely manner ☐ 9G — Continue to make use of the RASGs, regional organizations or other regional fora to collect and share safety information, in order to assess the level of implementation of ICAO SARPs at the regional level
References	— Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* — iMPLEMENT — iSTARS

2.2 Component 2 — State safety programme

Safety enhancement initiative	SEI-10 — Start of promotion of SSP implementation at the regional level
Stakeholder	Regions
Actions	☐ 10A — Identify an entity in the region who will guide and support SSP implementation at the regional level (RASG, RSOO, ICAO Regional Office, etc.) ☐ 10B — Guide and support SSP implementation by States: ○ Assess EI scores and verify completion of Component 1 of the roadmap ○ Collect SSP gap analyses and implementation plans of States ○ Identify common deficiencies ○ Develop regional strategies, including collaboration and resources, to assist States with implementation ○ Identify and promote safety management best practices in coordination with States and/or other regions ○ Follow-up on progress and attain updated gap analysis and implementation plans ○ Use the roadmap to align priorities of the RASG ☐ 10C — Engage States at the regional level and focus activities in line with the roadmap ☐ 10D — Continue work on the high-risk categories of occurrences (see OPS roadmap)
References	10A and 10B — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual* — Safety Management Implementation Website — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) — ICAO USOAP CMA Online Framework (login required) — iSTARS SSP gap analysis (login required) — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators* — SM ICG, *SMS Evaluation Tool* 10D — Annex 13, *Aircraft Accident and Incident Investigation*, Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-11 — Regional safety enhancement initiatives to support consistent coordination of regional programmes for SSP implementation
Stakeholder	Regions
Actions	☐ 11A — Identify resources that are available to support SSP implementation by States in the region ☐ 11B — Use updates provided by States on the status of their SSP implementation to determine regional priorities and resources that can be used to assist individual States in the region ☐ 11C — Work with the ICAO Regional Office to facilitate the provision of technical assistance needed for SSP implementation ☐ 11D — Monitor the progress of SSP implementation (via iSTARS) and adjust regional resource priorities continuously
References	11B to 11D — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual* 11C — Doc 9734, *Safety Oversight Manual,* Part B — *The Establishment and Management of a Regional Safety Oversight Organization* — Aviation Safety Implementation Assistance Partnership (ASIAP) — ICAO Technical Co-operation Bureau regional coordinator 11D — iSTARS SSP gap analysis (login required)

Safety enhancement initiative	SEI-12 — Strategic collaboration with key aviation stakeholders to support SSP implementation
Stakeholder	Regions
Actions	☐ 12A — Identify areas where collaboration/support is needed as part of States' SSP implementation plans (see SEI-14) ☐ 12B — Identify relevant collaborators from the key aviation stakeholders, including States implementing or having implemented an SSP ☐ 12C — Develop and implement a consistent and harmonized strategy to address the common elements identified as missing or deficient during the SSP gap analysis of States in the region ☐ 12D — Establish and implement a process via RASG and/or RSOO for a mentoring system, including providing assistance to States/industry, as well as sharing of best practices to support SSP implementation ☐ 12E — Develop and implement a process to provide training on SSP to relevant staff, in collaboration with RSOO and/or other States (e.g. initial, recurrent and advanced) ☐ 12F — Establish and implement a process for sharing technical guidance, tools and safety-critical information related to SSP (e.g. advisory circulars, staff instructions, safety performance indicators), in collaboration with States, RASG, RSOO, ICAO and/or other stakeholders ☐ 12G — Work with States in the region to ensure that all elements of their SSPs are present, suitable, operational and effective, and promote continual improvement
References	12A to 12C — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual* — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) — ICAO USOAP CMA Online Framework (login required) — iSTARS SSP gap analysis (login required) 12D to 12G — ICAO Technical Co-operation Bureau regional coordinator — No Country Left Behind initiative safety implementation resources 12F — Safety Management Implementation Website — SM ICG, SSP Assessment Tool 12G — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators*

Safety enhancement initiative	SEI-13 — Establishment of safety risk management at the regional level
Stakeholder	Regions
Actions	☐ 13A — Encourage States to actively update their SSP implementation status (via iSTARS) and to provide safety information, to enable the identification of hazards and management of safety risks in the region ☐ 13B — Develop and adopt harmonized safety reporting systems, as part of service providers' SMS within the region (e.g. voluntary reporting systems) ☐ 13C — Encourage States and industry within the region to share safety information and contribute to regional reporting and monitoring mechanisms ☐ 13D — Use regional safety performance measurement methodologies (including harmonized safety metrics) for the RASG to conduct safety risk analysis in coordination with RSOO or RAIO ☐ 13E — Encourage all States to contribute information on safety risks, including SSP safety performance indicators, to the RASG ☐ 13F — Encourage all States with effective safety oversight capabilities, and an effective SSP, to actively engage in RASG's safety risk management activities ☐ 13G — Use harmonized metrics for the development and monitoring of safety performance indicators at the regional level (within the RASG) ☐ 13H — Establish a regional safety risk registry
References	13A — iSTARS 13B to 13H — Doc 9734, *Safety Oversight Manual*, Part B — *The Establishment and Management of a Regional Safety Oversight Organization* — Doc 9859, *Safety Management Manual* — RASG regional safety reports — SM ICG, *A Systems Approach to Measuring Safety Performance — The Regulator Perspective* — SM ICG, *Measuring Safety Performance Guidelines for Service Providers* — Safety oversight index application (login required)

Safety enhancement initiative	SEI-14 — Regional allocation of resources to support continued development of the proactive use of risk modelling capabilities
Stakeholder	Regions
Actions	☐ 14A — Work with States and organizations to leverage available technologies and expertise within the region to enhance safety analysis and monitoring for risk analysis and mitigation strategies ☐ 14B — Identify and pool qualified USOAP auditor candidates from within the region with experience in safety oversight of service providers that have deployed advanced SMS ☐ 14C — Work with the ICAO Regional Office(s) and donor organizations to make use of available means (e.g. Technical Co-operation Bureau) to provide assistance in developing risk modelling capabilities
References	N/A

Safety enhancement initiative	SEI-15 — Regional collaboration with key aviation stakeholders to support the proactive use of risk modelling
Stakeholder	Regions
Actions	☐ 15A — Support States in understanding and implementing safety culture concepts by sharing best practices and facilitating mentoring programmes to support safety culture development and the proactive use of risk modelling ☐ 15B — Promote the sharing and exchange of safety information and best practices within a confidential and non-punitive environment among States and stakeholders ☐ 15C — Encourage and support State public-private partnerships similar to the commercial/general aviation safety teams' concept to identify and implement system safety enhancements ☐ 15D — Encourage and support States' efforts to establish mechanisms 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
References	15A and 15B — CANSO Guidelines on Just Culture — CANSO Safety Culture Definition and Enhancement Process — EASA Network of Analysts — SKYbrary Safety Culture in Aviation and Just Culture resources and tools 15C — Commercial Aviation Safety Team — European Strategic Safety Initiative — General Aviation Joint Steering Committee — International Helicopter Safety Team 15D — Aviation Safety InfoShare — ICAO Safety Information Monitoring Service (SIMS) — RASGs

Safety enhancement initiative	SEI-16 — Advancement of safety risk management at the regional level
Stakeholder	Regions
Actions	☐ 16A — Establish data sharing connectivity and integration among States and stakeholders to enable high-level regional monitoring and analysis activities ☐ 16B — Identify requirements for establishing inter-regional and global data sharing
References	— EUROCONTROL Voluntary ATM Incident Reporting (EVAIR) — European Authorities Coordination Group on Flight Data Monitoring (EAFDM) — European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS) — FAA Aviation Safety Information Analysis and Sharing Program — IATA Flight Data eXchange (FDX) — IATA STEADES Global Aviation Safety Data Sharing Program

3. INDUSTRY

3.1 Component 1 — State safety oversight system

3.1.1 Phase 1 — Establishment of a safety oversight framework (CE-1 to CE-5)

Safety enhancement initiative	SEI-1 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Stakeholder	Industry
Actions	☐ 1A — Based on the identified safety deficiencies, establish a mechanism to identify industry stakeholders and develop an action plan for the resolution of those deficiencies (CE-1 to CE-5) ☐ 1B — Provide input to States, as applicable, for the development of national regulations (CE-2) ☐ 1C — Participate in regional activities for sharing of best practices, mentoring and conducting follow-up actions (CE-3) ☐ 1D — Address high-risk categories of occurrences, as applicable, in coordination with States and regions (see OPS roadmap)
References	1A to 1C — Doc 9734, *Safety Oversight Manual* — RASGs — RSOOs and COSCAPs 1D — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

3.1.2 Phase 2 — Implementation of a safety oversight system (CE-6 to CE-8)

Safety enhancement initiative	SEI-2 — Improvement of industry compliance with applicable regulations
Stakeholder	Industry
Actions	☐ 2A — Work together within industry to ensure compliance with applicable regulations (CE-6 to CE-8) ☐ 2B — Encourage service providers to participate in the corresponding, ICAO-recognized industry assessment programmes (CE-8) ☐ 2C — Encourage the active participation of industry in the RASGs to assist with the implementation of safety enhancement initiatives (CE-6 to CE-8)
References	2B — ACI Airport Excellence (APEX) in Safety — CANSO Standard of Excellence in Safety Management Systems — FSF Basic Aviation Risk Standard (BARS) — IATA Operational Safety Audit (IOSA) — IATA Safety Audit for Ground Operations (ISAGO)

Safety enhancement initiative	SEI-3 — Allocation of industry resources to enable effective safety oversight
Stakeholder	Industry
Actions	☐ 3A — Identify resources that are available to support roadmap safety enhancement initiatives for States and regions (all CEs, emphasis on CE-6 to CE-8) ☐ 3B — Participate in regional and international government/industry collaborative safety enhancement initiatives
References	— Aviation Safety Implementation Assistance Partnership (ASIAP)

Safety enhancement initiative	SEI-4 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Stakeholder	Industry
Actions	☐ 4A — Based on the identified safety deficiencies, establish a mechanism to identify industry stakeholders and develop an action plan for the resolution of those deficiencies (CE-6 to CE-8) ☐ 4B — Assist in resolving safety concerns identified via accident and incident investigations, safety reports and other means (CE-8) ☐ 4C — Continue to work with regional groups to address high-risk categories of occurrences (see OPS roadmap)
References	4A — RASGs — RSOOs and COSCAPs 4B — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* 4C — Annex 13, Aircraft Accident and Incident Investigation, Attachment C — List of examples of serious incidents

3.2 Component 2 — State safety programme

Safety enhancement initiative	SEI-5 — Improvement of industry compliance with applicable SMS requirements
Stakeholder	Industry
Actions	☐ 5A — Implement a safety management system (SMS) commensurate to the size and complexity of the service provider, as required by national regulations and Annex 19 ☐ 5B — 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 ☐ 5C — Utilize available guidance material (e.g. from States or non-governmental organizations) to assist with SMS implementation
References	5A to 5C — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual* 5A — State's national SMS requirements 5C — Safety Management Implementation Website — SM ICG, *SMS for Small Organizations* — CANSO Standard of Excellence in Safety Management Systems

Safety enhancement initiative	SEI-6 — Resources for service providers to effectively implement SMS
Stakeholder	Industry
Actions	☐ 6A — Work in collaboration with the State and industry associations to advance SMS implementation and identify expectations that cannot be efficiently resourced ☐ 6B — Identify areas where resources are needed as part of the SMS implementation plan developed following the SMS gap analysis ☐ 6C — Establish a process for resource planning and allocation to enable SMS implementation, including resources which may be obtained from industry organizations ☐ 6D — Obtain commitment from the accountable executive within the service provider for the necessary resources to enable SMS implementation ☐ 6E — 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
References	— Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual* — CANSO Standard of Excellence in Safety Management Systems Measurement

Safety enhancement initiative	SEI-7 — Strategic collaboration with key aviation stakeholders to complete SSP implementation
Stakeholder	Industry
Actions	☐ 7A — Help identify relevant collaborators from the key aviation stakeholders involved in implementing SSP ☐ 7B — Work with collaborators to support an action plan for SSP implementation: ○ Support SSP through sharing and supporting harmonization of SMS within industry ☐ 7C — 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 ☐ 7D — 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 ☐ 7E — Support continuous improvement of SSP, in collaboration with States, RASG, RSOO, ICAO and/or other stakeholders ☐ 7F — Continue to work with regional groups to address high-risk categories of occurrences (see OPS roadmap)
References	7A to 7E — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual* — State's national SMS requirements 7D — Safety Management Implementation Website 7F — Annex 13, *Aircraft Accident and Incident Investigation*, Attachment C — *List of examples of serious incidents*

Safety enhancement initiative	SEI-8 — Establishment of safety risk management at the service provider level (step 1)
Stakeholder	Industry
Actions	☐ 8A — Establish mandatory safety reporting systems ☐ 8B — Provide information from the service provider to the State mandatory safety reporting system, as required ☐ 8C — Establish internal mechanisms related to the protection of safety data, safety information and related sources for the purpose of safety improvement ☐ 8D — Establish voluntary and confidential hazard/occurrence reporting systems as part of the SMS ☐ 8E — Establish and maintain a safety database for technical personnel to monitor system safety issues within the service provider ☐ 8F — Establish and utilize a safety risk management process
References	8A to 8F — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual* — State's national SMS requirements 8A — Commercial Aviation Safety Team (CAST)/ICAO Common Taxonomy Team (CICTT) — ICAO Accident/Incident Data Reporting (ADREP) Taxonomy — SM ICG, *Development of a Common Hazard Taxonomy* — SM ICG, *Hazard Taxonomy Examples*

Safety enhancement initiative	SEI-9 — Establishment of safety risk management at the service provider level (step 2)
Stakeholder	Industry
Actions	☐ 9A — Develop safety performance measurement methodologies, aligned with harmonized safety metrics within industry, via the established safety risk management process ☐ 9B — Develop safety performance indicators and associated targets/alert settings, via the established safety risk management process ☐ 9C — Encourage the use of globally harmonized metrics for the development and monitoring of safety performance indicators, as part of the service providers' SMS ☐ 9D — Encourage sharing and use of information from within industry to identify hazards and mitigate safety risks
References	9A to 9D — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual* — State's national SMS requirements 9A and 9B — SM ICG, *A Systems Approach to Measuring Safety Performance — The Regulator Perspective* — SM ICG, *Measuring Safety Performance Guidelines for Service Providers* 9B — Safety performance indicators developed by non-governmental organizations: ○ ACI ○ CANSO ○ IATA ○ IBAC ○ International Coordinating Council of Aerospace Industries Associations (ICCAIA) 9C — Globally harmonized metrics for safety performance indicators

Safety enhancement initiative	SEI-10 — Allocation of industry resources to support continuous improvement of SSP and SMS
Stakeholder	Industry
Actions	☐ 10A — Ensure competent technical personnel are allocated, at the service provider level, to support the requirements of the SSP infrastructure ☐ 10B — Provide safety analysis results from service providers to support the SSP
References	N/A

Safety enhancement initiative	SEI-11 — Strategic collaboration with key aviation stakeholders to support the proactive use of risk modelling capabilities
Stakeholder	Industry
Actions	☐ 11A — Work with industry stakeholders to leverage best practices with safety information analysis ☐ 11B — Share safety risk identification with stakeholders for mitigation and monitoring strategies ☐ 11C — Actively participate with States and organizations engaged in risk modelling
References	— Aviation Safety InfoShare — Commercial Aviation Safety Team — European Strategic Safety Initiative — General Aviation Joint Steering Committee — International Helicopter Safety Team — RASGs

Safety enhancement initiative	SEI-12 — Advancement of safety risk management at the service provider level
Stakeholder	Industry
Actions	☐ 12A — Verify that a legal framework related to the protection of safety data, safety information and other related sources is implemented and effective ☐ 12B — Develop risk modelling capabilities to support the monitoring of system safety issues and accident/incident prevention ☐ 12C — Monitor safety information exchange networks for continuous improvements
References	12A — FAA Aviation Safety Information Analysis and Sharing Program — IATA Flight Data eXchange (FDX) — IATA STEADES Global Aviation Safety Data Sharing Program

Appendix B

OPERATIONAL SAFETY RISKS (OPS) ROADMAP

Note 1.– The State may opt to delegate or seek assistance on portions of the OPS roadmap to regional organizations or other State(s).

Note 2.– The term "industry" in the OPS roadmap refers to any organization providing aviation products and/or services.

1. CONTROLLED FLIGHT INTO TERRAIN (CFIT)

Safety enhancement initiative	Mitigate contributing factors to the risk of CFIT
Stakeholder	States
Actions	1. Implement the following CFIT safety actions: a. Ensure aircraft are equipped with terrain awareness and warning system (TAWS) in accordance with Annex 6 b. Promote the wider use of TAWS beyond the requirements of Annex 6 c. Issue a Safety Advisory to increase adherence to TAWS warning procedures d. Promote greater awareness of approach risks e. Consider the implementation of continuous descent final approaches (CDFA) f. Consider the implementation of minimum safe altitude warning (MSAW) systems g. Ensure the timeliness of updates and accuracy of Electronic Terrain and Obstacle Data (eTOD) h. Promote the use of GPS-derived position data to feed TAWS 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) 3. Identify additional contributing factors, for example: 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
References	— Annex 6, *Operation of Aircraft* — ICAO Safety Report — RASGs — Commercial Aviation Safety Team Safety enhancements for CFIT — IATA CFIT

	— IATA Safety Report — Flight Safety Foundation (FSF) ALAR Toolkit — Skybrary — EUROCONTROL

Safety enhancement initiative	Mitigate contributing factors to CFIT accidents and incidents
Stakeholder	Regions
Actions	1. Implement the following CFIT safety actions: 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) 3. Identify additional contributing factors, for example: 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
References	— Annex 6, *Operation of Aircraft* — ICAO Safety Report — RASGs — Commercial Aviation Safety Team Safety enhancements for CFIT — IATA CFIT — IATA Safety Report — Flight Safety Foundation ALAR Toolkit — Skybrary — EUROCONTROL

Safety enhancement initiative	Mitigate contributing factors to CFIT accidents and incidents
Stakeholder	Industry
Actions	1. Implement the following CFIT safety actions: a. Equip aircraft with TAWS b. Increase adherence to TAWS warning procedures c. Develop greater awareness of approach risks d. Promote CDFA e. Utilize MSAW systems f. Utilize up-to-date eTOD g. Utilize GPS-derived position data to feed TAWS 2. Validate the effectiveness of the SEIs presented in this roadmap through the analysis of flight data monitoring (FDM)* and pilot reports** (apply safety management methodologies) 3. Identify additional contributing factors, for example: 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 **TAWS cautions and warnings, and pilot responses to TAWS warnings.* ***Flight planning - failure to comply with minimum safe altitude (MSA) or military operations area (MOA) restrictions.*
References	— Annex 6, *Operation of Aircraft* — ICAO Safety Report — RASGs — Commercial Aviation Safety Team Safety enhancements for CFIT — IATA CFIT — IATA Safety Report — Flight Safety Foundation ALAR Toolkit — Skybrary — EUROCONTROL

2. LOSS OF CONTROL IN-FLIGHT (LOC-I)

Safety enhancement initiative	Mitigate contributing factors to LOC-I accidents and incidents
Stakeholder	States
Actions	1. Implement the following LOC-I safety actions: 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 2. Validate the effectiveness of the SEIs in the industry through MORs and VORs systems and accident/incident investigations (apply safety management methodologies) 3. Identify additional contributing factors, for example: a. Distraction b. Adverse weather 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: a. Increase the effectiveness of regulatory oversight b. Improve regulations 5. Conduct continuous evaluations of the performance of the SEIs
References	— Annex 1, *Personnel Licensing* — Doc 10011, *Manual on Aeroplane Upset Prevention and Recovery Training* — ICAO Safety Report — ICAO LOC-I — RASGs — Commercial Aviation Safety Team Safety enhancements for LOC-I — IATA LOC-I — IATA Safety Report — Flight Safety Foundation — Skybrary — EUROCONTROL

Safety enhancement initiative	Mitigate contributing factors to LOC-I accidents and incidents
Stakeholder	Regions
Actions	1. Implement the following LOC-I safety actions: a. Promote upset prevention and recovery training in all full flight simulator type conversion and recurrent training programmes b. Promote more time devoted to training for the pilot monitoring role 2. Validate the effectiveness of the SEIs in the region using data provided by States and industry (apply safety management methodologies) 3. Identify additional contributing factors, for example: a. Distraction b. Adverse weather c. Complacency d. Inadequate 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 promote further SEIs to mitigate the risk of the identified contributing factors, if any, for LOC-I, for example: a. Organize safety seminars or workshops b. Facilitate regional technical assistance projects 5. Conduct continuous evaluations of the performance of the SEIs
References	— Annex 1, *Personnel Licensing* — Doc 10011, *Manual on Aeroplane Upset Prevention and Recovery Training* — ICAO Safety Report — ICAO LOC-I — RASGs — Commercial Aviation Safety Team Safety enhancements for LOC-I — IATA LOC-I — IATA Safety Report — Flight Safety Foundation — Skybrary — EUROCONTROL

Safety enhancement initiative	Mitigate contributing factors to LOC-I accidents and incidents
Stakeholder	Industry
Actions	1. Implement the following LOC-I safety actions: a. Aircraft upset prevention recovery training in all full flight simulator type conversion and recurrent training programmes b. More time devoted to training multi-crew pilots for the monitoring role c. Promote bank angle alerting systems into all multi-engine aircraft d. Training on manual aircraft handling of approach to stall and stall recovery (including at high altitude) e. Recurrent training on flight mechanics f. Simulator fidelity 2. Validate the effectiveness of the SEIs through the analysis of FDM and pilot reports (apply safety management methodologies) 3. Identify additional contributing factors, for example: a. Distraction b. Adverse weather c. Complacency d. Inadequate 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 5. Conduct continuous evaluations of the performance of the SEIs
References	— Annex 1, *Personnel Licensing* — Doc 10011, *Manual on Aeroplane Upset Prevention and Recovery Training* — ICAO Safety Report — ICAO LOC-I — RASGs — Commercial Aviation Safety Team Safety enhancements for LOC-I — IATA LOC-I — IATA Safety Report — Flight Safety Foundation — Skybrary — EUROCONTROL

3. MID-AIR COLLISION (MAC)

Safety enhancement initiative	Mitigate contributing factors to MAC accidents and incidents
Stakeholder	States
Actions	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 b. Ensure adherence to ACAS warning procedures c. Promote the improvement of air traffic control (ATC) systems, procedures and tools to enhance conflict management d. Promote the improvement of communications systems and procedures, such as controller-pilot datalink 2. Validate the effectiveness of the SEIs through the analysis of MORs and VORs and accident/incident investigations (apply safety management methodologies) 3. Identify additional contributing factors, for example: 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 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 e. Aircraft equipment - autopilots, transponders and ACAS, but also aircraft performance (e.g. rate-of-climb) and their physical size f. Navigation infrastructure - both coverage and quality 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 5. Conduct continuous evaluations of the performance of the SEIs
References	— Annex 6, *Operation of Aircraft* — Annex 8, *Airworthiness of Aircraft* — Annex 19, *Safety Management* — Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9868, *Procedures for Air Navigation Services — Training (PANS-TRG)* — Doc 9859, *Safety Management Manual* — iSTARS

	— ICAO Safety Report — CAST/ICAO Common Taxonomy Team — RASGs — Commercial Aviation Safety Team Safety enhancements for MAC — IATA Safety Report — Flight Safety Foundation — Skybrary — EUROCONTROL

Safety enhancement initiative	Mitigate contributing factors to MAC accidents and incidents
Stakeholder	Regions
Actions	1. Implement the following MAC safety actions: a. Promote guidance and regulations to ensure aircraft are equipped with ACAS, in accordance with Annex 6 b. Promote adherence to ACAS warning procedures c. Promote the improvement of ATC systems, procedures and tools to enhance conflict management. d. Promote the improvement of communications systems and procedures, such as controller-pilot datalink. 2. Validate the effectiveness of the SEIs in the region using data provided by States and industry (apply safety management methodologies) 3. Identify additional regional contributing factors, for example: 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 ANSPs' safety management. c. Flight crew training and corporate culture related to workload, competence, teamwork, procedures, commitment etc., and the influence of aircraft operator's safety management d. ATC systems - flight data processing, communication, STCA, etc., as well as the interaction related to the human operator and the aircraft systems, and the procurement policy of the ANSP e. Aircraft equipment - autopilots, transponders and ACAS, but also aircraft performance (e.g. rate-of-climb) and their physical size f. Navigation infrastructure - both coverage and quality 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 5. Conduct continuous evaluation of the performance of SEIs
References	— Annex 6, *Operation of Aircraft* — Annex 8, *Airworthiness of Aircraft* — Annex 19, *Safety Management* — Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9868*, Procedures for Air Navigation Services — Training (PANS-TRG)* — Doc 9859, *Safety Management Manual* — iSTARS — ICAO Safety Report — CAST/ICAO Common Taxonomy Team — RASGs — Commercial Aviation Safety Team Safety enhancements for MAC

	— IATA Safety Report — Flight Safety Foundation — Skybrary — EUROCONTROL

Safety enhancement initiative	Mitigate contributing factors to MAC accidents and incidents
Stakeholder	Industry
Actions	1. Implement the following MAC safety actions: a. Equip aircraft with ACAS b. Consider equipping aircraft with auto-pilot/flight director ACAS response c. Increase adherence to ACAS warning procedures d. Consider the implementation of STCA, including STCA suitable for terminal areas e. Improve reliability and consistency of safety nets to provide early and dependable warning, and to reduce nuisance alerts f. Improve aircraft systems to alert pilots to any non-availability of transponders and ACAS g. Improve ATC systems, procedures and tools to enhance conflict management - this can include predictability of aircraft trajectories, so that conflicts can be predicted and resolved at an earlier stage, using medium-term conflict detection (MTCD) and similar systems h. Improve communications systems and procedures, such as controller-pilot datalink 2. Validate the effectiveness of the SEIs through the analysis of FDM*, pilot and ATC reports** (apply safety management methodologies) 3. Identify additional contributing factors, for example: 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 ANSPs' safety management c. Flight crew training and corporate culture related to workload, competence, teamwork, procedures, commitment, etc., and the influence of the aircraft operator's safety management d. ATC systems - flight data processing, communication, STCA, etc., as well as the interaction related to human operators and the aircraft systems, and the procurement policy of the ANSP e. Aircraft equipment - autopilots, transponders and ACAS, but also aircraft performance (e.g. rate-of-climb) and their physical size f. Navigation infrastructure - both coverage and quality 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 5. Conduct continuous evaluations of the performance of the SEIs **Traffic alert and collision avoidance system resolution advisories* (*TCAS-RA), TCAS traffic advisories (TCAS-TA).* ***Separation and airspace infringement, level busts, aircraft proximity (AIRPROX), gross navigation errors (GNE) and large height deviations (LHD).*
References	— Annex 6, *Operation of Aircraft* — Annex 8, *Airworthiness of Aircraft* — Annex 19, *Safety Management*

	— Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9868, *Procedures for Air Navigation Services — Training (PANS-TRG)* — Doc 9859, *Safety Management Manual* — iSTARS — ICAO Safety Report — CAST/ICAO Common Taxonomy Team — RASGs — Commercial Aviation Safety Team Safety enhancements for MAC — IATA Safety Report — Flight Safety Foundation — Skybrary — EUROCONTROL

4. RUNWAY EXCURSION (RE)

Safety enhancement initiative	Mitigate contributing factors to RE accidents and incidents
Stakeholder	State
Actions	1. Implement the following RE safety actions: a. Ensure the establishment and implementation of a State runway safety programme and runway safety teams b. Promote the establishment of policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds) c. Promote equipage of runway overrun awareness and alerting systems on aircraft d. Ensure effective and timely reporting of meteorological and aerodrome conditions (e.g. runway surface condition in accordance to the ICAO global reporting format in Annex 14, Volume I, braking action and revised declared distances) e. Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, *PANS-Aerodrome* f. Promote the installation of arresting systems if runway end safety area (RESA) requirements cannot be met g. Ensure that procedures to systematically reduce the rate of unstabilized approaches to runways are developed and used 2. Validate the effectiveness of the SEIs through the analysis of MORs, VORs and accident/incident investigations (apply safety management methodologies) 3. Identify additional contributing factors, for example: 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 4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RE 5. Conduct continuous evaluations of the performance of the SEIs
References	— Annex 14, *Aerodromes*, Volume I — *Aerodrome Design and Operations* — Doc 8168, Procedures for *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9981, *Procedures for Air Navigation Services — Aerodromes* (PANS-Aerodromes) — Doc 9859, *Safety Management Manual* — ICAO Global Runway Safety Action Plan — ICAO Runway Safety Team Handbook — ICAO Runway Safety IKit — RASGs — EASA Safety Promotion — European Action Plan for the Prevention of Runway Excursions (EAPPRE) — Commercial Aviation Safety Team Safety enhancements for RE — RSOOs

	— iSTARS — ICAO Safety Report — CAST/ICAO Common Taxonomy Team — IATA Safety Report — IATA Runway Safety — Skybrary — Flight Safety Foundation ALAR Toolkit

Safety enhancement initiative	Mitigate contributing factors to RE accidents and incidents
Stakeholder	Regions
Actions	1. Implement the following RE safety actions: a. Promote the establishment and implementation of a State runway safety programme and runway safety teams b. Promote the establishment of policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds) c. Promote equipage of runway overrun awareness and alerting systems on aircraft d. Promote effective and timely reporting of meteorological and aerodrome conditions (e.g. runway surface condition in accordance to the ICAO global reporting format in Annex 14, Volume I, braking action and revised declared distances) e. Promote the certification of aerodromes in accordance with ICAO Annex 14, Volume I as well as Doc 9981, *PANS-Aerodrome* f. Promote the installation of arresting systems if RESA requirements cannot be met g. Promote the establishment of procedures to systematically reduce the rate of unstabilized approaches to runways 2. Validate the effectiveness of the SEIs in the region using data provided by States and industry (apply safety management methodologies) 3. Identify additional contributing factors, for example: 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 4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RE 5. Conduct continuous evaluation of the performance of the SEIs
References	— Annex 14, *Aerodromes*, Volume I — *Aerodrome Design and Operations* — Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9981, *Procedures for Air Navigation Services — Aerodromes* (PANS-Aerodromes) — Doc 9859, *Safety Management Manual* — ICAO Global Runway Safety Action Plan — ICAO Runway Safety Team Handbook — ICAO Runway Safety IKit — RASGs — EASA Safety Promotion — European Action Plan for the Prevention of Runway Excursions (EAPPRE) — Commercial Aviation Safety Team Safety enhancements for RE — RSOOs — iSTARS — ICAO Safety Report

	— CAST/ICAO Common Taxonomy Team — IATA Safety Report — IATA Runway Safety — Skybrary — Flight Safety Foundation ALAR Toolkit

Safety Enhancement Initiative	Mitigate contributing factors to RE accidents and incidents
Stakeholder	Industry
Actions	1. Implement the following RE safety actions: a. Active participation in runway safety programmes and runway safety teams b. Policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds) c. Equip the aircraft with runway overrun awareness and alerting systems d. 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) e. Comply with runway-related provisions in ICAO Annex 14, Volume I as well as Doc 9981, *PANS-Aerodrome* f. Consider an arresting system if RESA requirements cannot be met g. Procedures to systematically reduce the rate of unstabilized approaches to runways 2. Validate the effectiveness of the SEIs through the analysis of FDM* and pilot reports** (apply safety management methodologies) 3. Identify additional contributing factors, for example: a. Ineffective SOPs b. Failure to adhere to the appropriate SOPs c. Long/floated/bounced/firm/off-center/crabbed landing d. Inadequate approach procedures design e. Inadequate regulatory oversight 4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RE 5. Conduct continuous evaluations of the performance of the SEIs **For example, long landings, excessive height and speed at threshold, aircraft configuration at 1 000 ft above aerodrome level (AAL), speed at 1 000 ft AAL, tailwind, heading deviation during final approach, use of retardation devices (spoilers, reverse thrust, autobrakes)* ***Braking action, adverse weather, navigational aid (navaid) malfunctions*
References	— Annex 14, *Aerodromes*, Volume I — *Aerodrome Design and Operations* — Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9981, *Procedures for Air Navigation Services — Aerodromes* (PANS-Aerodromes) — Doc 9859, *Safety Management Manual* — ICAO Global Runway Safety Action Plan — ICAO Runway Safety Team Handbook — ICAO Runway Safety IKit — RASGs — EASA Safety Promotion — European Action Plan for the Prevention of Runway Excursions

	(EAPPRE) — Commercial Aviation Safety Team Safety enhancements for RE — RSOOs — iSTARS — ICAO Safety Report — CAST/ICAO Common Taxonomy Team — IATA Safety Report — IATA Runway Safety — Skybrary — Flight Safety Foundation ALAR Toolkit

5. RUNWAY INCURSION (RI)

Safety Enhancement Initiative	Mitigate contributing factors to RI accidents and incidents
Stakeholder	States
Actions	1. Implement the following RI safety actions: a. Ensure the establishment and implementation of a State runway safety programme and runway safety teams b. Promote the establishment of policy, procedures and training that supports situational awareness for controllers, pilots and airside vehicle drivers c. Ensure effective 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), stop bars, and runway incursion warning systems (ARIWS) d. Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, *PANS-Aerodrome* e. Ensure the use of standard phraseologies in accordance with applicable State regulations and ICAO provisions (e.g. Doc 9432, *Manual of Radiotelephony*) f. Ensure the identification and publication in the aeronautical information publication (AIP) of hot spots at aerodromes g. Ensure that suitable strategies to remove hazards or mitigate risks associated with identified hot spots are developed and executed 2. Validate the effectiveness of the SEIs through the analysis of MORs, VORs and accident/incident investigations (apply safety management methodologies) 3. Identify additional contributing factors, for example: a. Operations in low visibility conditions b. Complex or inadequate aerodrome design c. Complexity of traffic (multiple simultaneous line-ups) d. Conditional clearances e. Simultaneous use of intersecting runways f. Late issue of or late changes to departure clearances g. Phraseology use (e.g. non-standard vs. standard, call-sign confusion) h. Concurrent use of more than one language for ATC communications i. English language competence despite the introduction by ICAO of a system of validating competence in aviation English j. Inadequate manoeuvering area driver training and assessment programme 4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RI 5. Conduct continuous evaluations of the performance of the SEIs
References	— Annex 14, *Aerodromes*, Volume I — *Aerodrome Design and Operations* — Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9981, *Procedures for Air Navigation Services — Aerodromes*

	(PANS-Aerodromes) — Doc 9432, *Manual of Radiotelephony* — Doc 9859, *Safety Management Manual* — Doc 9870, *Manual on the Prevention of Runway Incursions* — ICAO Global Runway Safety Action Plan — ICAO Runway Safety Team Handbook — ICAO Runway Safety IKit — RASGs — EASA Safety Promotion — Commercial Aviation Safety Team Safety enhancements for RI — RSOOs — iSTARS — ICAO Safety Report — CAST/ICAO Common Taxonomy Team — IATA Safety Report — IATA Runway Safety — Flight Safety Foundation — Skybrary — EUROCONTROL — European Action Plan for the Prevention of Runway Incursions

Safety Enhancement Initiative	Mitigate contributing factors to RI accidents and incidents
Stakeholder	Regions
Actions	1. Implement the following RI safety actions: a. Promote the establishment and implementation of a State runway safety programme and runway safety teams b. Promote the establishment of policy, procedures and training that supports situational awareness for controllers, pilots and airside vehicle drivers c. Promote the effective use of suitable technologies to assist the improvement of situational awareness, such as improved resolution AMM, EFB, EVS and HUD, A-SMGCS, stop bars and ARIWS *d.* Promote the certification of aerodromes in accordance with ICAO Annex 14, Volume I as well as Doc 9981, *PANS-Aerodrome* e. Promote the use of standard phraseologies in accordance with applicable State regulations and ICAO provisions (e.g. Doc 9432, *Manual of Radiotelephony*) f. Promote the identification and publication in the AIP of hot spots at aerodromes g. Promote suitable strategies to remove hazards or mitigate risks associated with identified hot spots 2. Validate the effectiveness of the SEIs in the region using data provided by States and industry (apply safety management methodologies) 3. Identify additional contributing factors, for example: a. Operations in low visibility conditions b. Complex or inadequate aerodrome design c. Complexity of traffic (multiple simultaneous line-ups) d. Conditional clearances e. Simultaneous use of intersecting runways f. Late issue of or late changes to departure clearances g. Phraseology use (e.g. non-standard vs. standard, call-sign confusion) h. Concurrent use of more than one language for ATC communications i. English language competence despite the introduction by ICAO of a system of validating competence in aviation English j. Inadequate manoeuvering area driver training and assessment programme 4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RI 5. Conduct continuous evaluations of the performance of the SEIs
References	— Annex 14, *Aerodromes*, Volume I — *Aerodrome Design and Operations* — Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9981, *Procedures for Air Navigation Services — Aerodromes* (PANS-Aerodromes) — Doc 9432, *Manual of Radiotelephony* — Doc 9859, *Safety Management Manual* — Doc 9870, *Manual on the Prevention of Runway Incursions* — ICAO Global Runway Safety Action Plan — ICAO Runway Safety Team Handbook

	— ICAO Runway Safety IKit — RASGs — EASA Safety Promotion — Commercial Aviation Safety Team Safety enhancements for RI — RSOOs — iSTARS — ICAO Safety Report — CAST/ICAO Common Taxonomy Team — IATA Safety Report — IATA Runway Safety — Flight Safety Foundation — Skybrary — EUROCONTROL — European Action Plan for the Prevention of Runway Incursions

Safety Enhancement Initiative	Mitigate contributing factors to RI accidents and incidents
Stakeholder	Industry
Actions	1. Implement the following RI safety actions: a. Active participation in a runway safety programme and runway safety teams b. Policy, procedures and training that support situational awareness for controllers, pilots and airside vehicle drivers c. Effective use of suitable technologies to assist the improvement of situation awareness, such as improved resolution AMM, EFB, EVS and HUD, A-SMGCS, stop bars and ARIWS d. Comply with runway-related provisions in ICAO Annex 14, Volume I as well as Doc 9981, *PANS-Aerodrome* e. Use of standard phraseologies in accordance with applicable State regulations and ICAO provisions (e.g. Doc 9432, *Manual of Radiotelephony*) f. Identification and publication in the AIP of hot spots at aerodromes g. Suitable strategies to remove or mitigate hazards associated with identified hot spots 2. Validate the effectiveness of the SEIs through the analysis of ATC data*, and reports from stakeholders (apply safety management methodologies) 3. Identify additional contributing factors, for example: a. Operations in low visibility conditions b. Complex or inadequate aerodrome design c. Complexity of traffic (multiple simultaneous line-ups) d. Conditional clearances e. Simultaneous use of intersecting runways f. Late Issue of or late changes to departure clearances g. Phraseology use (e.g. non-standard vs. standard, call-sign confusion) h. Concurrent use of more than one language for ATC communications i. English language competence despite the introduction by ICAO of a system of validating competence in aviation English j. Inadequate manoeuvering area driver training and assessment programme 4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RI 5. Conduct continuous evaluations of the performance of the SEIs **Transcripts, number of conflicts detected by SMGCS.*
References	— Annex 14, *Aerodromes*, Volume I — *Aerodrome Design and Operations* — Doc 8168, *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS) — Doc 9981, *Procedures for Air Navigation Services — Aerodromes* (PANS-Aerodromes) — Doc 9432, *Manual of Radiotelephony* — Doc 9859, *Safety Management Manual* — Doc 9870, *Manual on the Prevention of Runway Incursions* — ICAO Global Runway Safety Action Plan — ICAO Runway Safety Team Handbook — ICAO Runway Safety IKit — RASGs

	— EASA Safety Promotion — Commercial Aviation Safety Team Safety enhancements for RI — RSOOs — iSTARS — ICAO Safety Report — CAST/ICAO Common Taxonomy Team — IATA Safety Report — IATA Runway Safety — Flight Safety Foundation — Skybrary — EUROCONTROL — European Action Plan for the Prevention of Runway Incursions

Appendix C

IMPLEMENTATION SUPPORT

1. GENERAL

This appendix presents resources and tools for implementation support available to States. Implementation support includes activities such as ICAO programmes, electronic tools, products and services. In addition to the ICAO publications referenced in the global aviation safety roadmap, these resources and tools may be used by stakeholders to assist in the implementation of safety enhancement initiative (SEIs) in support of the GASP goals. This appendix presents a non-exhaustive list of ICAO resources and tools available to States, for use on a voluntary basis, to meet common challenges identified in the GASP. Further information about all of ICAO's implementation support can be found on the ICAO website at www.icao.int.

2. NO COUNTRY LEFT BEHIND INITIATIVE

2.1 The ICAO Council determined that ICAO should focus its implementation activities on States with higher accident rates or security threats and review how to better encourage developed States to provide more comprehensive assistance to developing States. The Council also resolved that ICAO should provide more direct assistance to developing States by playing a more active coordination role between developed and developing States, and by helping to generate the political will needed for States to pool resources, participate in regional efforts, earmark voluntary funds and build capacity.

2.2 The No Country Left Behind (NCLB) initiative coordinates the efforts of ICAO and stakeholders to assist States in implementing Standards and Recommended Practices (SARPs). The main goal is to ensure that implementation is better harmonized globally, so that all States have access to the significant socio-economic benefits of safe and reliable air transport.

2.3 The NCLB initiative also underscores ICAO’s endeavours to resolve significant safety concerns (SSCs) identified through ICAO’s Universal Safety Oversight Audit Programme (USOAP), as well as other safety, security and emissions-related objectives. Further information about the initiative can be found on the ICAO website at www.icao.int/about-icao/NCLB.

3. GASP WEBSITE

ICAO’s dedicated GASP website contains the current version of the GASP in all the official languages of ICAO. The website also contains tools that support the implementation of the GASP at the regional and national levels. These include templates for the development of national and regional aviation safety plans and links to activities conducted by the RASGs. Further information can be found on the GASP website at www.icao.int/gasp.

4. INTEGRATED SAFETY TREND ANALYSIS AND REPORTING SYSTEM

4.1 The future aviation system will become increasingly automated and far more complex and will require the proactive use of risk modelling capabilities. This approach will allow the aviation community to effectively monitor the aviation system in real time and make necessary adjustments to maintain the desired levels of safety.

4.2 ICAO has improved and expanded online access to up-to-date safety information through the integrated Safety Trend Analysis And Reporting System (iSTARS). The current version of iSTARS (iSTARS 3.0, also referred to as SPACE) includes a range of aviation data. The goal of this initiative is to support proactive safety management. Furthermore, through the iSTARS platform ICAO has made much of its safety data available in a format that allows for automatic query and retrieval of information. States can register for access to iSTARS 3.0 at http://portal.icao.int. Information on iSTARS, including how to register, is available on the ICAO website at www.icao.int/safety/istars/pages/intro.aspx.

5. iMPLEMENT

5.1 Under the umbrella of NCLB, "iMPLEMENT" is an initiative that provides States and regions with a prioritized set of implementation-focused recommendations with the goal of maximizing socio-economic benefits at minimum cost. iMPLEMENT is comprised of a suite of ICAO online applications that facilitate data-driven decisions for aviation. It is designed to help Directors General of Civil Aviation and Transport Ministers to:

a) assess the current status of aviation in their State;

b) identify the best solutions to maintain or improve the aviation capability of the State;

c) evaluate the needs of the aviation system in terms of finances, personnel and infrastructure, and to identify and access resources through the existing national, regional and global mechanisms; and

d) showcase the real added value of aviation activities within a State and the socio-economic returns of investing in aviation.

5.2 States can produce a high-level report showing State information using several applications offered through iMPLEMENT, which can help States prioritize their activities on data-based decisions. It also provides a business case for the economic and social impacts of aviation development. Further information about iMPLEMENT can be found on the ICAO website at www.icao.int/implement.

5.3 The Solution Centre is an online application which generates reports that list findings for USOAP protocol questions (PQs) and provides guidance for the resolution of each of these findings. It is designed to help States address PQ findings with the most fitting solutions available. Solutions are divided into four types:

a) Training: courses or training centres providing training on a particular subject;

b) Tools: software, databases or online tools which provide a solution to the finding;

c) Programmes: global, regional and private programmes designed to help correct problems using step-by-step guidance; and

d) Best practices: documents, manuals, templates or other material shared by States and industry on how to resolve a problem or provide corrective action.

5.4 The application was launched during the 39th Session of the Assembly and is available on the iSTARS platform under the ICAO secure platform. Solutions are currently reviewed and enhanced by the Regional Offices.

6. USOAP CONTINUOUS MONITORING APPROACH ONLINE FRAMEWORK

6.1 The USOAP continuous monitoring approach (CMA) online framework (OLF) is a suite of web-integrated applications and centralized database systems, which enables collection of safety-related information and documentation from different sources, and monitors and reports on safety oversight activities by ICAO and Member States. A dedicated website provides States with access to the OLF for the:

a) completion/updates of the State aviation activity questionnaire;

b) completion/updates of the compliance checklists through the electronic filing of differences system;

c) completion/updates of the USOAP CMA self-assessment;

d) completion/updates of the State corrective action plan (CAP);

e) response to mandatory information requests; and

f) access to all safety–related information generated by USOAP CMA activities.

6.2 Further information about the OLF can be found on the ICAO website at www.icao.int/usoap.

7. SAFETY MANAGEMENT

7.1 SSP Foundation tool

The SSP Foundation tool is based on a subset of USOAP PQs, which have been identified as essential for effective State safety programme (SSP) implementation. In addition to the results of the SSP Gap Analysis, the SSP Foundation tool allows States to verify the status of these SSP foundational PQs and include their resolution in their SSP implementation plan. The tool was developed to assist States in building a solid safety oversight foundation, as well as to support the work of ICAO with respect to assessing the progress of SSP implementation and identifying where States need assistance. The SSP Foundation tool is available via iSTARS.

7.2 Safety Management Implementation website

Recognizing the challenges faced in implementing SSPs and safety management systems (SMS), the Safety Management Implementation (SMI) website serves as a repository for multiple examples and tools from States and service providers to complement the *Safety Management Manual* (Doc 9859), Fourth Edition. The SMI website includes some updated examples from the previous edition of this manual. Additional examples are collected, reviewed and posted on an ongoing basis. In this respect, States and non-governmental organizations are invited to submit practical examples and tools. Further information can be found on the SMI website at www.icao.int/SMI.

8. GLOBAL AVIATION SAFETY OVERSIGHT SYSTEM

8.1 In response to growing aviation safety oversight challenges experienced globally, ICAO is undertaking the establishment and implementation of the global aviation safety oversight system (GASOS) within the framework of the GASP. GASOS will be a voluntary, standardized assessment and recognition mechanism for safety oversight organizations (SOOs) such as regional safety oversight organizations (RSOOs) and other intergovernmental regional or sub-regional aviation safety oversight body (e.g. ICAO COSCAP programmes, regional CAAs, etc.), and for accident investigation organizations (AIOs) such as regional accident and incident investigation organizations

(RAIOs). GASOS aims at enabling the delegation of safety functions by States to ICAO-recognized SOOs, while maintaining the States' obligations and responsibilities for safety oversight under the Convention on International Civil Aviation.

8.2 The RSOO Forum held in Swaziland in March 2017, supported the proposed ICAO global strategy and action plan for the improvement of RSOOs. One of the key activities included in the action plan was the establishment of GASOS. The GASOS concept was supported by the Directors General of Civil Aviation meetings of all regions.

8.3 The main objective of establishing GASOS is to strengthen State safety oversight and safety management capabilities by:

a) enabling the delegation of safety functions, as needed, by States to competent SOOs and AIOs that have been assessed and recognized by ICAO; and

b) strengthening existing SOOs and AIOs to make them more effective and efficient in supporting States.

8.4 The expected benefits of GASOS include:

a) increased safety oversight capabilities for States through the delegation of safety functions to competent organizations through GASOS, enabling further implementation of effective State safety programmes;

b) the empowerment and strengthening of RSOOs and other existing regional mechanisms in effectively carrying out safety functions on behalf of States; and

c) increased overall safety performance resulting from improved safety oversight and safety management capabilities on a global scale.

9. TECHNICAL ASSISTANCE PROGRAMME

9.1 The ICAO technical assistance programme focuses on assisting States that require support in resolving safety deficiencies identified by USOAP. ICAO promotes the programme in partnership with States, non-governmental organizations, financial institutions and industry.

9.2 A number of technical assistance projects have been developed utilizing available resources and, as a result, many States have benefited from the programme in terms of enhancing their safety oversight capability, including the resolution of SSCs in some States, which was validated by the USOAP CMA activities.

9.3 In order for ICAO to continue to support States in that respect, the voluntary contributions from donors including States, non-governmental organizations and industry are an important vehicle to fund technical assistance activities.

10. SAFETY FUND

10.1 ICAO's aviation safety implementation initiatives have expanded in an effective and efficient manner. ICAO established the Safety Fund (SAFE), which allows the collection and use of voluntary contributions from States and donors. SAFE is designed to foster the increased assistance to States facing challenges in SARPs implementation.

10.2 Three types of projects can be funded through SAFE:

a) safety-related projects for which States cannot otherwise provide or obtain the necessary financial resources. The principal area of application is to remedy or mitigate safety-related deficiencies identified through USOAP;

b) projects identified through existing mechanisms used at the global level (e.g. the RASGs); and

c) safety-related projects in the ICAO Business Plan which are unfunded.

10.3 In order to mobilize resources for SAFE, ICAO developed a strategy to reach out to donor States as well as the industry for contributions to increase assistance to States. Further information about SAFE can be found on the ICAO website at www.icao.int/safe.

11. AVIATION SAFETY IMPLEMENTATION ASSISTANCE PARTNERSHIPS

ICAO is leading efforts to foster partnerships with States, non-governmental organizations, regional safety organizations, financial institutions and industry, in order to increase the capacity to assist States in managing civil aviation. Consequently, the aviation safety implementation assistance partnership (ASIAP) was established during the second High-level Safety Conference (HLSC 2015) in 2015. The ASIAP serves as a platform for coordinated efforts between partners in terms of information-sharing, collaboration on assistance and supporting a resource mobilization strategy. It is expected that, as a result of close coordination through this mechanism, the assistance capacity towards States will strengthen and contribute to improving aviation safety at the global and regional levels. Further information about ASIAP can be found on the ICAO website at www.icao.int/asiap.

12. CIVIL AVIATION SAFETY INSPECTORS

12.1 Some ICAO Member States are unable to fulfil their civil aviation safety oversight responsibilities due to the lack of aviation personnel that have the highly-specialized technical expertise to perform certain job functions and tasks. ICAO received suggestions to address this problem through the development of an expeditious and effective method for the temporary sharing of qualified technical personnel among ICAO Member States.

12.2 An ICAO initiative is being developed to recognize civil aviation safety inspectors (CASIs) at the global level to help States carry out their safety obligations as required by the Convention on International Civil Aviation. When available, the programme would ensure that CASIs who have successfully completed the programme are identified by ICAO to be proficient to carry out specific tasks and are familiar with the relevant ICAO provisions and guidance material.

12.3 The *Manual on the Competencies of Civil Aviation Safety Inspectors* (Doc 10070) provides guidance on the development and maintenance of a competent CASI workforce. The manual focuses on the competencies that CASIs should demonstrate while performing their duties, in order to enhance the effectiveness of a State's oversight activities today and to better prepare for their oversight needs of the future.

12.4 In order to assist States in identifying the needs of their CAA, ICAO developed the CAA Human Resources (HR) tool. There are three main parts of the CAA HR tool: the benchmarking tool; the manpower planning tool; and the organizational structure guidance. The benchmarking tool provides States with a means to calculate the number of inspectors needed to fulfil their safety oversight responsibilities, based on benchmarking with peers. The manpower planning tool allows States to calculate manpower needs. The organizational structure guidance presents different approaches to managing aviation safety and allows for the sharing of best practices.

13. ADDITIONAL SAFETY INITIATIVES TO COMPLEMENT THE GASP

In addition to the resources and tools presented in this appendix, there are several ICAO initiatives that States, regions and industry can use to enhance safety. These initiatives complement those presented in the global aviation safety roadmap. The initiatives presented in the following sections represent a non-exhaustive list. Further information about all of ICAO's safety initiatives can be found on the ICAO website at www.icao.int/safety.

14. NEXT GENERATION OF AVIATION PROFESSIONALS (NGAP) PROGRAMME

14.1 Over the coming decades, the demand for qualified aviation personnel, such as pilots, aircraft maintenance personnel and air traffic controllers will need to be correlated to aircraft delivery plans and expected traffic volumes. The *Global and Regional 20-year Forecasts* (Doc 9956) compares the number of new personnel to be trained each year with the annual training capacities of the existing training infrastructure with a view of exposing possible shortages or surpluses globally and by region.

14.2 ICAO is working with key stakeholders, under the NGAP programme to address the forecasted shortage of aviation professionals. NGAP was launched to ensure that sufficient qualified and competent aviation professionals are available to operate, manage and maintain the future aviation system. This is a critical aspect since a large contingent of the current generation of aviation professionals will soon retire. Additionally, access to affordable training and education is increasingly problematic and aviation competes with other industries for highly skilled professionals. The lack of standardized competencies in some aviation disciplines, and a lack of awareness by the "next generation" of the types of aviation careers available, further compounds the problem.

14.3 ICAO is working to raise awareness on the impending shortages of personnel by forecasting both global and regional personnel needs, and assisting the global aviation community in attracting, educating, training and retaining the next generation of aviation professionals. Under the NGAP programme, ICAO provides information on developing forecasts, strategies, best practices, planning tools and guidelines for engaging and cultivating the next generation of aviation professionals. ICAO guidance is meant to assist States in their development of national NGAP plans, which will ensure that the demand for qualified technical personnel is met at the national level. States can include their NGAP plan as part of their national aviation safety plan. Further information about the NGAP programme can be found on the ICAO website at www.icao.int/ngap.

15. COMPETENCY-BASED TRAINING AND ASSESSMENT

In 2017, ICAO began working on the revision of competency-based training and assessment provisions for several groups of aviation professionals, including: pilots; cabin crew; air traffic controllers; air traffic safety electronics personnel; aircraft maintenance personnel; and flight dispatchers/flight operations officers. The Competency-based Training and Assessment Task Force (CBTA-TF) was established to provide subject matter expertise to ICAO and assist in the revision of existing ICAO provisions related to competency-based training and assessment, in line with Amendment 5 to Doc 9868, *Procedures for Air Navigation Services — Training* (PANS-TRG), applicable in November 2020. The amendment clarifies competency-related definitions and describes their interdependency. It also describes a methodology to identify competencies and their components. The revision of provisions supports the effective implementation of competency-based training and assessment, and provides a framework to unify all competency-based training initiatives. States that choose to include competency-based training and assessment in their national regulations for specific aviation disciplines should amend them based on the consequential amendments to ICAO provisions and guidance material developed by the CBTA-TF. These include, but are not limited to:

a) Annex 1 — *Personnel Licensing*;

b) Doc 9868, *Procedures for Air Navigation Services — Training* (PANS TRG);

c) Doc 9379, *Manual of Procedures for Establishment and Management of a State's Personnel Licensing System*;

d) Doc 9841, *Manual on the Approval of Training Organizations*;

e) Doc 9941, *Training Development Guide Competency-Based Training Methodology*;

f) Doc 9995, *Manual of Evidence-based Training*;

g) Doc 10002, *Cabin Crew Safety Training Manual*;

h) Doc 10011, *Manual on Aeroplane Upset Prevention and Recovery Training*;

i) Doc 10056, *Manual on Air Traffic Controller Competency-based Training and Assessment;*

j) Doc 10057, *Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment*;

k) Doc 10070, *Manual on the Competencies of Civil Aviation Safety Inspectors;*

l) Doc 10098, *Manual on Training of Aircraft Maintenance Personnel; and*

m) Doc 10106, *Manual on Flight Dispatcher Competency-based Training and Assessment.*

16. RUNWAY SAFETY

16.1 ICAO is coordinating a global effort to improve runway safety. The ICAO runway safety programme involves substantial collaboration with partner organizations including: ACI, CANSO, EASA, EUROCONTROL, Federal Aviation Administration (FAA), Flight Safety Foundation (FSF), IATA, IBAC, International Coordinating Council of Aerospace Industries Associations (ICCAIA), the International Council of Aircraft Owner and Pilot Associations (IAOPA), the International Federation of Airline Pilots' Associations (IFALPA), and the International Federation of Air Traffic Controllers' Associations (IFATCA).

16.2 The ICAO-led runway safety programme supports the establishment of State runway safety programmes and multidisciplinary runway safety teams at aerodromes which require collaboration among regulatory authorities, stakeholders in the areas of air traffic management and aerodrome operations, aircraft operators, and design and manufacturing organizations. The programme incorporates innovative approaches developed by aviation safety experts to continuously reduce risks encountered in the take-off and landing phases as well as during movement on the surface. The ICAO runway safety implementation kit includes tools such as the ICAO *Runway Safety Team Handbook*.

16.3 Regional implementation is being progressed through RASGs and coordinated by the ICAO Regional Offices with the participation of all partner organizations, and aligned with the GASP and regional goals and targets. Global guidance and support are provided by ICAO Headquarters in coordination with its partners. Additional information, including the global runway safety action plan, can be found on the ICAO website at www.icao.int/safety/runwaysafety.

17. CABIN SAFETY

17.1 Cabin safety contributes to the prevention of accidents and incidents, the protection of the aircraft's occupants through proactive safety management including hazard identification and safety risk management, and the increase of survivability in the event of an emergency situation. The main role of cabin crew members focuses on the evacuation of an aircraft in the event of an accident. This role contributes to the aspirational safety goal of zero fatalities by ensuring passenger safety. In addition, cabin crew members also play an important proactive role in managing safety, which can contribute to the prevention of accidents. This role includes, but is not limited to:

a) preventing incidents from escalating in the cabin, such as smoke or fire;

b) informing the flight crew of abnormal situations observed in the cabin or relating to the aircraft, such as pressurization problems, engine anomalies and contamination of critical surfaces; and

c) preventing unlawful interference and managing passenger events that can compromise safety and security of the flight, such as hijackings.

17.2 The ICAO Cabin Safety Group (ICSG) is an international, joint industry-regulatory group composed of cabin safety experts from CAAs, airlines, aircraft manufacturers and non-governmental organizations. The ICSG serves as the expert group, providing advice to ICAO on cabin safety-related matters and assisting in the development or revision of requirements, guidance material and implementation support to enhance cabin safety on a global scale. Since the creation of ICAO's dedicated cabin safety initiative in 2012, ICAO has developed several guidance materials, including:

a) Doc 10002, *Cabin Crew Safety Training Manual*;

b) Doc 9481, *Emergency Response Guidelines for Incidents Involving Dangerous* Goods (updated to include cabin crew procedures for dealing with Lithium battery fires);

c) Cir 340, *Guidelines for the Expanded Use of Portable Electronic Devices*;

d) Doc 10049, *Manual on the Approval and Use of Child Restraint Systems*;

e) Cir 344, *Guidelines on Education, Training and Reporting Practices Related to Fume Events* (which includes cabin crew-related procedures and training);

f) Doc 10062, *Manual on the Investigation of Cabin Safety Aspects in Accidents and Incidents* (which focuses on survival factors in investigations);

g) Doc 10072, *Manual on the Establishment of Minimum Cabin Crew Requirements*;

h) Doc 10086, *Manual on Information and Instructions for Passenger Safety;*

i) Doc 10111, *Manual on the Implementation and Use of Cabin Electronic Flight Bags*; and

j) *Cir 352, UN OHCHR-ICAO Guidelines for Training Cabin Crew on Identifying and Responding to Trafficking in Persons*, developed in conjunction with the United Nations (UN) Office of the High Commissioner for Human Rights (OHCHR).

17.3 Further information about ICAO's cabin safety initiatives can be found on the ICAO website at www.icao.int/cabinsafety.

18. CROSS-BORDER TRANSFER OF AIRCRAFT

18.1 The existing regulatory framework pertaining to cross-border transfers of aircraft was developed when virtually all commercial aircraft were purchased directly by their operators who then retained ownership of such aircraft for use during most or all of their useful lives. As such, changes of aircraft nationality were not common and aircraft tended to reside with one jurisdiction for most or all of its useful life.

18.2 Over the past three decades, aircraft operators have realized substantial capital and operational efficiencies by leasing, rather than owning, a portion of their fleets. Thus, responsibility for the safety oversight of a given aircraft is increasingly likely to pass from one State to another numerous times over its useful life. Some industry experts predict that as much as fifty per cent of the global installed base will be leased by 2030. Aircraft leases typically have terms of seven to twelve years. At the end of a lease term, the lessor places the aircraft with a new operator, often in a different jurisdiction. The increase in cross-border transferability (XBT) activities has highlighted certain inefficiencies in a global system that was developed when cross-border transfer of aircraft was relatively uncommon.

18.3 ICAO is undertaking a structured review of all relevant XBT provisions with the aim of improving, standardizing and enhancing the efficiency of the XBT process. The guidance material and electronic tools will be developed to assist States and other stakeholders with the XBT process. In addition, for States that may not have resources to effectively perform all necessary certification, surveillance and other activities associated with the XBT of aircraft, ICAO is working on developing a mechanism that would facilitate a State's ability to delegate associated functions and duties to individuals or entities. This would standardize and enhance the efficiency of the XBT of aircraft while ensuring a high level of safety.

19. GLOBAL FLIGHT TRACKING

19.1 When an accident occurs, rescuing survivors is the highest priority, followed by the recovery of casualties, the aircraft wreckage and flight data retrieval. Analysis of flight data supports accident investigation. It can facilitate the determination of causes and/or contributing factors, and lead to safety enhancements.

19.2 In order to address the issues above, an effective and globally consistent approach to the alerting of search and rescue services is essential. The effectiveness of current alerting of search and rescue services should be enhanced by addressing a number of key improvement areas and by developing and implementing a globally integrated system, the Global Aeronautical Distress and Safety System (GADSS), which addresses all phases of flight under all circumstances, including distress. This system will maintain an up-to-date record of the aircraft progress and, in case of a forced landing or ditching, the location of survivors, the aircraft and recoverable flight data.

19.3 Main components of the GADSS are the following: aircraft tracking under normal and abnormal conditions; autonomous distress tracking; flight data recovery; and GADSS procedures and information management. ICAO has taken initial steps and adopted provisions related to aircraft tracking, which establish an operator's responsibility to track its aircraft. The provisions recommend an aircraft tracking interval of at least fifteen-minutes where air traffic services are not being provided. They apply everywhere, as a recommendation, and make it a requirement over oceanic areas. The provisions establish thresholds for different types of aircraft. They also include a Standard on the location of an aeroplane in distress, which aims at establishing the location of an accident site within a six nautical mile radius. Operators have the flexibility to choose the system best suited for their type of operation that has the capability for the location of the aircraft to be continuously sent independently of the other aircraft systems and power supply.

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