ICAO

Doc 10004

Global Aviation Safety Plan

2017-2019

Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO

Doc 10004

Global Aviation Safety Plan

2017-2019

Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Published in separate English, Arabic, Chinese, French, Russian
and Spanish editions by the
INTERNATIONAL CIVIL AVIATION ORGANIZATION
999 Robert-Bourassa Boulevard, Montréal, Quebec, Canada H3C 5H7

For ordering information and for a complete listing of sales agents
and booksellers, please go to the ICAO website at www.icao.int

First edition 2013
Second edition 2016

Doc 10004, *Global Aviation Safety Plan*
Order Number: 10004
ISBN 978-92-9258-118-3

AMENDMENTS

Amendments are announced in the supplements to the *Products and Services Catalogue;* the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA		
No.	Date	Entered by

TABLE OF CONTENTS

FOREWORD

This document sets forth a strategy, referred to as the Global Aviation Safety Plan or “GASP”, which supports the prioritization and continuous improvement of aviation safety. The GASP follows an approach and philosophy similar to that of the *Global Air Navigation Plan* (Doc 9750), also referred to as the “GANP”. Both documents promote coordination and collaboration among international, regional and national initiatives aimed at delivering a harmonized, safe and efficient international civil aviation system.

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 the Organization and was updated regularly to ensure its continuing relevance.

In May 2005, another meeting with industry identified a 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 that was 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 on a global strategy for aviation safety (DGCA/06), which welcomed the development of the global aviation safety roadmap and recommended that ICAO develop an integrated approach to safety initiatives, based on the global aviation safety roadmap, which would provide a global framework for the coordination of safety policies and initiatives.

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.

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

The GASP has significantly changed since its introduction in 1997, and has evolved through continuous consultation and review. 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. This 2017-2019 edition updates the GASP to include a global aviation safety roadmap developed to support an integrated approach to implementation.

The input of experts from States, international organizations, regional organizations and industry received through the GASPRG, and from individual experts who have provided support and advice, is gratefully acknowledged.

GLOSSARY

DEFINITIONS

Acceptable level of safety performance (ALoSP). The minimum level of safety performance of civil aviation in a State, as defined in its State safety programme, or of a service provider, as defined in its safety management system, expressed in terms of safety performance targets and safety performance indicators.

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

Audit. A USOAP CMA on-site activity during which ICAO assesses the effective implementation of the critical elements (CEs) of a safety oversight system and conducts a systematic and objective review of a State's safety oversight system to verify the status of a State's compliance with the provisions of the Convention or national regulations and its implementation of ICAO Standards and Recommended Practices (SARPs), procedures and aviation safety best practices. Also see definition of *critical elements (CEs)*.

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

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 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

ACI	Airports Council International
ALoSP	Acceptable level of safety performance
ANC	Air Navigation Commission
APV	approaches with vertical guidance
ASBU	aviation system block upgrade
ASIAP	Aviation Safety Implementation Assistance Partnership
CAA	civil aviation authority
CANSO	Civil Air Navigation Services Organisation
CAPSCA	collaborative arrangement for the prevention and management of public health events in civil aviation
CE	critical element
CFIT	controlled flight into terrain
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
GASP	global aviation safety plan
GASPRG	Global Aviation Safety Plan Roadmap Group
HLSC	High-level Safety Conference

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
I-Kit	implementation kit
IOSA	IATA Operational Safety Audit
ISAGO	IATA Safety Audit for Ground Operations
IS-BAH	International Standard for Business Aircraft Handling
IS-BAO	International Standard for Business Aircraft Operations
iSTARS	integrated safety trend analysis and reporting system
LOC-I	loss of control in flight
NCLB	No Country Left Behind
OEM	original equipment manufacturer
PBN	performance-based navigation
PIRG	planning and implementation regional group
RAIO	regional accident and incident investigation organization
RASG	regional aviation safety group
RPAS	remotely piloted aircraft systems
RPASP	Remotely Piloted Aircraft Systems Panel
RSOO	regional safety oversight organization
RST	runway safety team
SAFE	safety fund
SARPs	Standards and Recommended Practices
SARS	Severe Acute Respiratory Syndrome
SCAN	safety collaboration assistance network
SM ICG	Safety Management International Collaboration Group
SMS	safety management systems
SPI	safety performance indicator
SSC	significant safety concern
SSP	State safety programme
UASSG	Unmanned Aircraft Systems Study Group
UAV	unmanned aerial vehicle
UNOOSA	United Nations Office for Outer Space Affairs
UPRT	upset prevention and recovery training
USOAP	universal safety oversight audit programme
WHO	World Health Organization

Chapter 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 The air transport industry plays a major role in the global economy. With air traffic projected to increase significantly in the future, aviation safety planning at the international, regional and national levels is essential to manage growth in a safe, efficient and environmentally responsible manner.

1.1.2 The GASP sets out a continuous improvement strategy which includes objectives for States to meet through the implementation of effective safety oversight systems, State safety programmes (SSPs) and the development of advanced safety oversight systems, including predictive risk management. The GASP also sets out timelines for the global collective achievement of these near-, mid- and long-term objectives. These timelines are aligned with the established update process for the GASP and the Global Air Navigation Plan (GANP), which are revised on a triennial basis. The GASP is a high level, strategic, planning and implementation policy document developed in conjunction with the *Global Air Navigation Plan* (Doc 9750). Both documents promote coordination of international, regional and national initiatives aimed at delivering a harmonized, safe and efficient international civil aviation system.

1.2 PURPOSE

1.2.1 The overall purpose of the GASP is to guide the harmonized development of regional and State safety planning, supported by regional safety activities coordinated by the regional aviation safety groups (RASGs). The GASP seeks to assist States and regions in their respective safety policies, planning and implementation by:

a) establishing the global safety priorities and GASP objectives;

b) providing a planning framework, timelines and guidance material; and

c) presenting implementation strategies and a global aviation safety roadmap to address the procedures and methods to achieve the GASP objectives and set specific priorities at both State and regional levels as well as the role of industry partners.

1.2.2 The GASP objectives are outlined in Chapter 2. The framework, which enables States to make safety improvements through the use of the four safety performance enablers: standardization, resources, collaboration and safety information exchange, is described in Chapter 4. The global aviation safety roadmap is found in Appendix A and implementation resources available to States are explained in Appendix B.

1.2.3 Through the GASP, ICAO continues to prioritize global action in three areas of aviation safety: improving runway safety; reducing controlled flight into terrain accidents; and reducing loss of control in-flight accidents. Initiatives in these areas, which are described in Chapter 3, contribute to the reduction of the global accident rate.

1.3 SCOPE

1.3.1 In accordance with ICAO Standards and Recommended Practices (SARPs), States must develop their safety oversight capabilities and implement SSPs. The GASP provides a strategy to enhance the implementation of the safety initiatives presented in the global aviation safety roadmap, and to assist States to meet their safety responsibilities.

1.3.2 Although the GASP has a global perspective, States' priorities should be coordinated through the RASGs to address specific safety concerns in line with the global safety priorities. In addition, States and regions should prioritize initiatives associated with the safety performance enablers to first establish effective safety oversight and then address safety risks effectively.

1.3.3 The GASP objectives, the safety performance enablers and the global aviation safety roadmap form the fundamental pillars of the GASP. These may evolve in line with emerging safety issues to be reflected in subsequent editions of the GASP. In line with the global safety priorities, ICAO will develop provisions and provide implementation support.

1.4 PROGRESS MONITORING AND REVIEW

1.4.1 ICAO reviews the GASP every three years through an established process which includes consultation with States and industry (see Appendix C). The progress and effectiveness of States and regions in achieving the objectives and priorities set out in their respective aviation safety plans are measured on an on-going basis. Monitoring and reporting progress enables States and regions to modify their activities based on their performance and to address emerging safety issues. To support States and regions in this endeavour, ICAO publishes annual safety reports which provide an indication of the progress being made (see Chapter 2).

1.4.2 An annual reporting process by planning and implementation regional groups (PIRGs) and RASGs enables the aviation community to identify, manage and monitor safety and air navigation objectives at the international, regional and national levels through their respective work programmes. This process enables ICAO to make high-level policy adjustments to the GASP as well as the GANP, with the approval of the ICAO Council and endorsement by the ICAO Assembly.

1.4.3 The ICAO Air Navigation Commission (ANC) reviews the GASP and GANP as part of its work programme, reporting to the Council one year in advance of each Assembly. After approval by the Council, amendments to the GASP and GANP are submitted for endorsement by ICAO Member States at the following Assembly.

Chapter 2

GLOBAL SAFETY STRATEGY

2.1 ICAO STRATEGIC OBJECTIVE ON SAFETY

2.1.1 ICAO has established five comprehensive strategic objectives, which are revised on a triennial basis. ICAO has a strategic objective dedicated to enhancing global civil aviation safety. This strategic objective is focused primarily on the State's regulatory oversight capabilities. The objective is set in the context of growing passenger and cargo movements and the need to address efficiency and environmental changes. In line with the strategic objective on safety, the GASP outlines the key activities for the triennium. More information on the Strategic Objectives can be found on the ICAO website at www.icao.int/about-icao/Pages/Strategic-Objectives.aspx.

2.1.2 As part of an evaluation on the extent to which ICAO is meeting the needs and expectations of Member States, a survey was conducted in 2015. The purpose of the "*Survey on Needs and Expectations of ICAO Member States*" was to identify ways to improve and inform the future orientations of ICAO, especially those of the ICAO Regional Offices. The survey objectives were to collect the views of directors general of civil aviation on their civil aviation needs and expectations from ICAO and to assess the experience of interacting with ICAO, including with respect to technical assistance provision. Among the questions in the survey, States were asked to rank their priorities. One hundred States participated in the survey, and 70 per cent of the respondents ranked safety as their top strategic priority.

2.2 GASP OBJECTIVES

2.2.1 The GASP objectives call for States to put in place robust and sustainable safety oversight systems and to progressively evolve them into more sophisticated means of managing safety. These objectives align with ICAO's requirements for the implementation of State safety programmes (SSPs) by States and safety management systems (SMS) by service providers.

2.2.2 In order for these objectives to be met, regional aviation safety groups (RASGs) and regional safety oversight organizations (RSOOs) should be involved actively in the coordination and, to the extent possible, harmonization of all activities undertaken to address aviation safety issues at a regional level, including the use of the global aviation safety roadmap by individual States or a group of States.

2.2.3 Figure 2-1 provides an overview of the GASP objectives and their associated timelines. These objectives address a series of steps that States must complete based on the notion that States must first establish an effective safety oversight system prior to implementing an SSP. It is expected that all States will continually progress implementation of Standards and Recommended Practices (SARPs) in order to achieve the GASP objectives and priorities set out in the GASP.

2.2.4 At the 2012 Ministerial Meeting in Africa, a target was set for all African States to attain 60 per cent effective implementation (EI) of the critical elements (CEs) of a State safety oversight system by 2017. This target was adopted by the ICAO Council and endorsed by the ICAO General Assembly as a global measure and formed the basis for the near-term objective included in the 2014-2016 edition of the GASP. It corresponds to a minimum level necessary for a State to perform effective safety oversight and move towards SSP implementation.

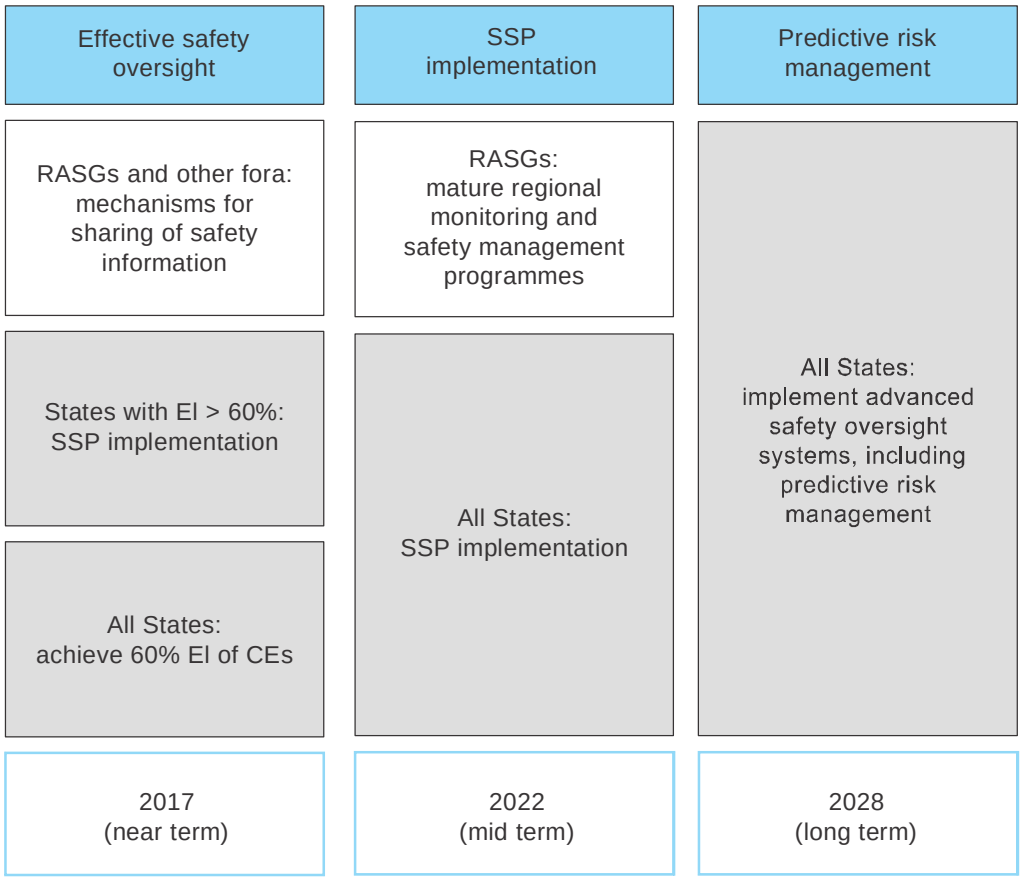

Figure 2-1. GASP objectives and associated timelines

2.2.5 The near-term objectives, to be achieved by 2017, take into account the current level of safety oversight systems implementation at the regional and national levels. Two objectives are intended predominantly for States and the third for all aviation stakeholders. The near-term objectives are as follows:

a) States lacking fundamental safety oversight capabilities are to achieve an EI of at least 60 per cent overall of the eight CEs of a State safety oversight system. States should prioritize the resolution of deficiencies or findings which have the highest impact in terms of safety improvements. The universal safety oversight audit programme (USOAP) protocols, used to assess implementation of ICAO provisions, are categorized according to eight CEs (see Figure 4-3). ICAO's analysis indicates that implementation of CE-6, which addresses licensing, certification, authorization and/or approval obligations, is fundamental to the reduction of accident rates. Furthermore, through a root cause analysis, deficiencies in CE-6 can be traced to protocol questions in CE-1 to CE-5, which establish a safety oversight system. Each deficiency in CE-6 should therefore be associated with a specific action plan for a State's improvement efforts. Effective execution of the action plan provides the basis for prioritized compliance.

b) States which have an EI of 60 per cent or greater should implement SSP, which will facilitate addressing risks specific to their aviation systems; and

c) all States and stakeholders are encouraged to put in place mechanisms for the sharing of safety information through their RASGs and other regional or sub-regional fora.

2.2.6 The mid-term objective calls for all States to achieve SSP implementation by 2022. Additionally, RASGs should continue to advance to mature regional monitoring and safety management programmes. As the time and effort required for SSP implementation will vary among States, the near- and mid-term objectives should be coordinated at the regional level through the RASGs.

Note.— The Safety Management Manual *(Doc 9859) contains guidance related to SSP implementation.*

2.2.7 The long-term objective calls for States to build upon safety management practices within the SSP to develop advanced safety oversight systems, including predictive risk management. Safety analysis will be integrated into all aspects of future aviation systems and will be used to model risks prior to the implementation of operational changes.

2.3 THE ROLE OF ICAO IN IMPROVING SAFETY

2.3.1 ICAO strives, in close collaboration with other stakeholders, to further improve aviation's safety performance while maintaining a high level of capacity and efficiency. This is achieved through:

a) the development of global strategies contained in the GASP and the GANP;

b) the development and maintenance of SARPs and Procedures for Air Navigation Services (PANS) applicable to international civil aviation activities and complemented by manuals and circulars which provide guidance material on their implementation;

c) the monitoring of safety trends and indicators. ICAO audits the implementation of the critical elements of a safety oversight system through USOAP. It has also developed tools to collect, share and analyse operational safety data which allows the identification of existing and emerging risks;

d) the implementation of targeted safety programmes to address safety and infrastructure deficiencies; and

e) an effective response to disruption of the aviation system created by natural disasters, conflicts or other causes.

2.3.2 The timely and accurate reporting of safety information at the international, regional and national levels is critical to verify the achievement of global safety objectives and monitor the implementation of the GASP initiatives. ICAO, the RASGs, and partner organizations publish reports on safety as part of their commitment to monitor the progress of their safety objectives. Combined, these reports provide perspectives that are both global in nature as well as specific to individual areas, such as flight operations. Recognizing that aviation is a complex industry, an analysis of multiple safety indicators is essential to assess safety performance globally. ICAO publishes an annual *Safety Report,* the key components of which include:

a) safety oversight;

b) accident statistics and accident rates; and

c) success stories.

2.3.3 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. The *Safety Report* is supplemented by the *State of Global Aviation Safety Report,* which is published on a triennial basis, prior to each ICAO Assembly. The *State of Global Aviation Safety Report* includes an updated safety analysis as well as

a comprehensive account of achievements through various activities undertaken by ICAO, States and partner organizations. These reports and additional information can be found on the ICAO website at www.icao.int/safety.

2.3.4 In addition to the *Safety Report*, ICAO has created lists of State safety performance indicators (SPIs). A sample set of SPIs was first shared with the international aviation community during the second High-level Safety Conference held in 2015 (HLSC 2015), through an information paper (IP/01) entitled *Safety data, performance metrics and indicators*. The HLSC 2015 recommended that ICAO improve and harmonize those SPIs, taking into account others that were currently in use. The sample set of SPIs presented at the HLSC 2015 is included in Appendix D. Metrics are provided for each SPI along with the type of information that is collected (reactive, predictive, etc.) and the intended use of the information (e.g. for targeting, monitoring or awareness of the indicator value). The sample set of SPIs can be used by States when establishing baselines to define targets and acceptable levels of safety. ICAO is presently developing global SPIs as a follow-up to the HLSC 2015 recommendation.

2.4 THE ROLE OF STATES IN IMPROVING SAFETY

2.4.1 Addressing significant safety concerns

States having significant safety concerns (SSCs) should address these concerns as a priority and then move on to other areas requiring attention and increasing implementation of ICAO provisions.

2.4.2 Establishment of effective safety oversight

2.4.2.1 States lacking effective safety oversight capabilities should achieve an EI rate of CEs of 60 per cent by 2017. States having an EI of less than 60 per cent should increase implementation in all relevant areas. Partnerships can serve to promote increased compliance with SARPs by States. Through collaborative efforts, the level for compliance can increase, particularly in those regions where States face 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 this global safety objective and to ensure that safety initiatives yield the intended benefits. In some cases, States may rely on assistance provided by ICAO and other organizations. In other cases, additional investment or assistance by other States in programmes such as the USOAP continuous monitoring approach (CMA), and other safety assessment initiatives, may be required. As part of effective safety oversight, safety information exchange initiatives may serve to facilitate a process, through agreements, that can enable the sharing and constructive use of sensitive information to improve safety.

2.4.2.2 There are instances when a State may elect to transfer certain oversight functions which are normally the responsibility of the State of Registry in the case of lease, charter or interchange of aircraft. In such cases, the State may consider the transfer of its oversight functions to another State in accordance with Article 83 *bis* of the Convention on International Civil Aviation. The primary purpose of the transfer of certain functions under an Article 83 *bis* agreement is to enhance safety oversight capabilities by delegating 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 and with SARPs.

2.4.3 Implementation of State safety programmes

2.4.3.1 States should build upon fundamental safety oversight systems to implement SSPs. Included in the SSP is the requirement for implementation of SMS by service providers. Standardization of safety initiatives, in the GASP,

associated with an SSP, requires the implementation of a risk-based approach that achieves an acceptable level of safety performance. 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.

2.4.3.2 The transition to 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, and international organizations 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 performance indicators related to the risks and the major components of the aviation system. Key stakeholders should reach agreements to identify appropriate indicators, determine common classification schemes and establish analysis methodologies that facilitate the sharing and exchange of safety information.

2.4.3.3 Implementation of SSPs and SMS may involve regulatory, policy, and organizational changes that require additional resources, personnel retention, or different skill sets, 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 addition, technical capabilities should be developed to collect and analyse data, 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.

2.4.4 Implementation of predictive risk management

In the long term, States should build upon safety management practices within the SSP to develop advanced safety oversight systems, including predictive risk management. Safety analysis will be integrated into all aspects of future aviation systems and are used to predict risks prior to implementation of operational changes. This objective is intended to sustain collaborative decision-making in an environment characterized by increased automation and the integration of advanced capabilities on the ground and in the air, as outlined in the GANP. Further development of safety management functions, including those described in an SSP, are needed to manage safety (e.g. in the highly automated air traffic management concepts of the future). The evolution to this dynamic and integrated environment will require the continuous exchange of information on a real-time basis. As a result, coordination of safety management activities between States as well as across all operational domains will be essential for implementation of the aviation system block upgrades (ASBUs) presented in the GANP. The integration of remotely piloted aircraft into non-segregated airspace will be a reality in the aviation system of the future and safety considerations, such as detect and avoid technology, will need to be taken into account. Since human performance plays a key role in the successful implementation of any new concept, this also needs to be taken into account during the consideration of future aviation systems. The safety performance enablers to be included in the long-term objective will focus on maintaining or enhancing safety while new capabilities and procedures are implemented. Training and regulatory approval processes will be required to ensure a safe and efficient transition to the future aviation system.

2.5 THE ROLE OF REGIONS IN IMPROVING SAFETY

2.5.1 Regional aviation safety groups

2.5.1.1 The RASGs support the implementation of the GASP and address global aviation safety matters from a regional perspective. The RASGs are composed of Member States and observers from RSOOs, cooperative development of operational safety and continuing airworthiness programmes (COSCAPs), original equipment manufacturers (OEMs), international organizations, operators and service providers, among others.

2.5.1.2 As an integral part of the GASP, RASGs, together with RSOOs, harmonize all activities undertaken to address regional safety issues. The RASGs build upon the achievements of existing regional and sub-regional safety organizations and facilitate the exchange of best practices, cooperation and collaboration using a top-down approach, which complements the bottom-up approach of planning by industry, States and sub-regions. The RASGs' activities support the GASP objectives whilst ensuring regional safety priorities are addressed. RASGs track regional safety indicators, coordinate regional initiatives, and provide practical assistance to States in their respective regions.

2.5.1.3 RASGs serve as the focal point to coordinate all regional efforts and programmes aimed at mitigating safety risks. They 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 while delivering measurable safety improvements.

2.5.1.4 The HLSC 2015 noted that there is not yet active participation in the RASGs by the majority of States. It called for States to increase their participation in these important fora. Participation in the RASGs provides States with the opportunity to share best practices and to take part in collaborative safety improvement activities thereby improving implementation of effective risk mitigation.

2.5.2 Regional safety oversight organizations

The RSOOs play an important role by supporting the establishment and operation of safety oversight systems, analysing safety information at the regional level, and reviewing action plans developed within the region. 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.

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

2.5.3 Regional accident and incident investigation organizations

Regional accident and incident investigation organizations (RAIOs) facilitate implementation of accident and incident investigation systems by allowing States to share the necessary financial and human resources, enabling them to fulfil their investigation obligations. Some groups of States have already established RAIOs and other initiatives are underway. The principal objectives of an RAIO are to:

a) provide for the establishment of an adequately funded, professionally trained, and independent regional aircraft accident and incident investigation organization;

b) ensure that all aircraft accidents and incidents are investigated in compliance with the provisions of Annex 13 — *Aircraft Accident and Incident Investigation*;

c) enhance cooperation, while eliminating duplication of effort; and

d) enhance information sharing.

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 IN IMPROVING SAFETY

2.6.1 Industry should progress in SMS implementation and work in a complementary manner with ICAO, the regions and individual States on safety information exchange, safety monitoring and auditing programmes. International organizations should work with their members to help them develop their safety performance indicators (SPIs), and provide guidance material and training to assist with addressing global safety priorities 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.

Note.— The Safety Management Manual *(Doc 9859) contains guidance related to service providers' safety performance indicators.*

2.7 GLOBAL AVIATION SAFETY ROADMAP

2.7.1 During its 38th Session, the Assembly urged ICAO to complete the development of a global aviation safety roadmap in support of the GASP (A38-2, Appendix A, 6.). The HLSC 2015 agreed that in the next edition of the GASP there would be a need for ICAO to develop a global aviation safety roadmap in collaboration with States, RASGs, aviation safety partners and industry.

2.7.2 In 2015, ICAO established the Global Aviation Safety Plan Roadmap Group (GASPRG) to assist with the updating of the GASP, particularly in relation to development of a global aviation safety roadmap to support the implementation of the GASP. The GASPRG was composed of subject matter experts from States, international organizations, regional organizations and industry.

2.7.3 The GASPRG developed a proposal for a global aviation safety roadmap based on Appendix 2 of the 2014-2016 edition of the GASP: *Best Practices* (including the safety initiatives) and an existing *Global Aviation Safety Roadmap (GASR)* document.

2.7.4 During the global aviation safety roadmap development process, the GASPRG took into account three aviation safety maturity levels of States:

a) States lacking a basic safety oversight system;

b) States lacking or in the process of implementing an SSP (and service providers' SMS); and

c) States that have an SSP effectively implemented.

2.7.5 The resulting global aviation safety roadmap has been developed to provide an action plan to assist the entire aviation community in achieving the objectives presented in the GASP. It provides a structured, common frame of reference for all relevant stakeholders. The aim of the global aviation safety roadmap is to ensure that safety initiatives deliver the intended benefits associated with the objectives in a coordinated manner, thus reducing inconsistencies and duplication of effort. The global aviation safety roadmap is presented in Appendix A.

———————

Chapter 3

FOCUS AREAS TO IMPROVE SAFETY

3.1 GLOBAL SAFETY PRIORITIES

3.1.1 As mentioned in Chapter 2, the universal safety oversight audit programme (USOAP) audits have identified that States' inability to effectively oversee aviation operations remains a global safety concern. This GASP provides a detailed strategy to achieve improvements. In addition to the GASP objectives, ICAO has identified high-risk accident categories. These categories were initially determined based on an analysis of accident data, for scheduled commercial air transport operations, covering the 2006–2011 time period. Feedback from the regional aviation safety groups (RASGs) indicates that these priorities still applied during the development of the 2017-2019 edition of the GASP.

3.1.2 Runway safety events were identified as one of the main high-risk accident categories. Runway safety-related events include the following ICAO accident occurrence categories: abnormal runway contact, bird strikes, ground collision, runway excursion, runway incursion, loss of control on the ground, collision with obstacle(s) and undershoot/overshoot.

3.1.3 Controlled flight into terrain (CFIT) and loss of control in flight (LOC-I) were identified as the other two high-risk accident categories. These types of accidents account for a small portion of accidents in a given year but are generally fatal and account for a large portion of the total number of fatalities.

3.1.4 While much progress has been made, these three high-risk accident categories continue to be global safety priorities. Figure 3-1 presents a statistical analysis of the three categories of high-risk accidents, from 2010 to 2014. For each of the three categories, the figure shows what percentage of the total accidents each category represents. It also depicts how each category contributed to the total number of fatal accidents and fatalities worldwide for the given timeframe. The data analysis indicated the following:

a) the three high-risk accident categories account for 60.57 per cent of all fatalities worldwide;

b) over half of the accidents worldwide involved runway safety events;

c) CFIT and LOC-I accidents accounted for less than 6 per cent of all accidents but accounted for over half of all the fatalities worldwide;

3.1.5 Analysis by ICAO region indicated the following, for the same timeframe:

a) runway safety was the main accident category for all the regions;

b) in Asia and Pacific regions (APAC), the three categories accounted for 87.91 per cent of fatalities;

c) in Eastern and Southern Africa (ESAF), 80.95 per cent of all accidents involved runway safety events, over a third of which were fatal. No CFIT or LOC-I accidents were recorded in the region during the timeframe;

d) in European and North Atlantic (EUR NAT), the three categories accounted for 26.81 per cent of fatalities; runway safety events accounted for 57.62 per cent of all accidents in the region;

e) in Middle East (MID), the three categories accounted for 87.22 per cent of all fatalities;

f) in North American, Central American and Caribbean (NACC), the three categories accounted for 100 per cent of all fatalities;

g) in South America (SAM), runway safety events and LOC-I accidents accounted for 55.42 per cent of all fatalities. No fatal CFIT accidents were recorded in the region during the timeframe; and

h) in Western and Central Africa (WACAF), CFIT and LOC-I accidents accounted for almost half (49.19 per cent) of all fatalities. No fatal runway safety related accidents were recorded in the region during the timeframe; however, runway safety events accounted for 39.13 per cent of all accidents in the region.

3.1.6 The data from 2010-2014 is consistent with the analysis conducted in 2006–2011, citing the three existing categories as high-risk accidents that should be prioritized for action by all relevant stakeholders. Based on the analysis presented in 3.1.5, some regions may focus predominantly on one or other of the three categories, based on risk at the regional level. These safety priorities should be addressed at the international, regional and national levels. Initiatives in these areas contribute to the reduction of the global accident rate.

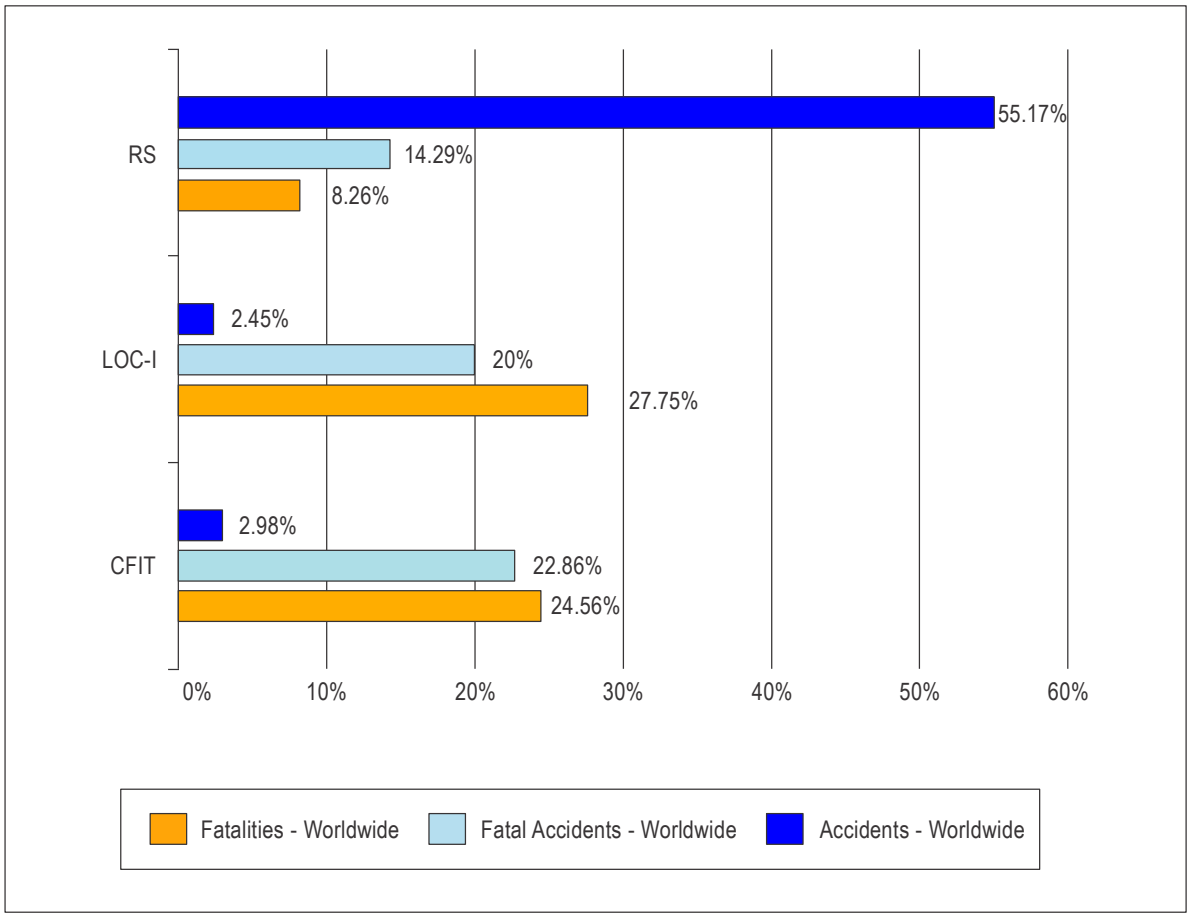

Figure 3-1. High-risk accident categories worldwide (2010–2014)

3.1.7 In their meeting reports, RASG-AFI, RASG-APAC, RASG-MID and RASG-PA (Pan American) cite runway safety events, LOC-I and CFIT as safety priorities in their respective regions. The RASG-PA also includes a fourth priority, addressing mid-air collisions. RASG-EUR sets outs detailed priority safety targets, which include the reduction of the accident rate in commercial air transport. Further information on the RASGs and their safety priorities and initiatives can be found on the ICAO website at www.icao.int/safety/Implementation/Lists/RASGSPIRGS/AllItems.aspx.

3.1.8 Statistics and data on accidents and incidents are found on the ICAO integrated safety trend analysis and reporting system (iSTARS). Information on iSTARS, including how to register, is available on the ICAO website at www.icao.int/safety/istars/pages/intro.aspx.

3.1.9 Improving runway safety

3.1.9.1 ICAO is coordinating a global effort to improve runway safety. The ICAO runway safety programme involves substantial collaboration with partner organizations including: Airports Council International (ACI); the Civil Air Navigation Services Organisation (CANSO); the European Aviation Safety Agency (EASA); European Organisation for the Safety of Air Navigation (EUROCONTROL); the United States Federal Aviation Administration (FAA); the Flight Safety Foundation (FSF); the International Air Transport Association (IATA); the International Business Aviation Council (IBAC); the 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).

3.1.9.2 The runway safety programme supports the establishment of multidisciplinary runway safety teams (RSTs) which require collaboration among regulatory authorities, stakeholders in the areas of air traffic management and aerodromes, 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 (I-Kit) includes tools such as the ICAO *Runway Safety Team Handbook*.

3.1.9.3 The runway safety programme recommends that:

a) RASGs analyse regional runway safety data and develop related safety enhancement initiatives and detailed implementation plans;

b) airports implement RSTs and safety management systems (SMS), and make use of the runway safety I-Kit including the *Runway Safety Team Handbook*; and

c) airports may request ICAO runway safety go-team visits, which are voluntary multi-disciplinary assistance visits to airports, performed by ad-hoc groups of experts, aimed at providing assistance to improve runway safety.

3.1.9.4 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 priorities and targets. Global guidance and support are provided by ICAO Headquarters in coordination with its partners. Additional information can be found on the ICAO website at www.icao.int/safety/runwaysafety.

3.1.10 Controlled flight into terrain

ICAO has introduced amendments to Standards and Recommended Practices (SARPs), and guidance material, aimed at reducing the risk of CFIT accidents. The RASGs have developed an awareness campaign which includes information that operators can use to develop standard operating procedures and enhance flight crew training programmes in this regard. This includes information on the use of instrument approaches with vertical guidance, the use of the continuous

descent final approach technique when flying approach procedures with lateral guidance only, and recurrent training of escape manoeuvres based on ground proximity warning systems with forward-looking terrain avoidance functions. Additional information can be found on the ICAO website at www.icao.int/RASGPA/Pages/asrt.aspx.

3.1.11 Loss of control in flight

3.1.11.1 SARPs, introduced in Annex 1 — *Personnel Licensing,* on upset prevention and recovery training (UPRT) became applicable in November 2014. Extensive guidance to support these provisions is presented in the *Manual on Aeroplane Upset Prevention and Recovery Training* (Doc 10011). States must now focus on implementing these SARPs.

3.1.11.2 Following ICAO's LOC-I Symposium in May 2014, Airbus, Boeing, Bombardier, CAE, EASA, Embraer, IATA and IFALPA agreed to work with ICAO to address LOC-I. Since then, these organizations have jointly developed content for workshops on LOC-I prevention and implementation of UPRT. States should take part in these workshops and initiate or continue activities at the national and regional levels aimed at reducing the risk of LOC-I accidents. Additional information can be found on the ICAO website at www.icao.int/safety/LOCI.

3.2 EMERGING PRIORITIES

3.2.1 In addition to the global safety priorities, ICAO is working with stakeholders to address emerging priorities such as global flight tracking, remotely piloted aircraft systems (RPAS), space transportation and risks arising from conflict zones. Some of these may be addressed in the short-term while others further addressed in the longer-term.

3.2.2 Global flight tracking

3.2.2.1 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.

3.2.2.2 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 increased 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.

3.2.2.3 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 normal 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 providing that service. 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 6 NM radius. Operators have the flexibility to choose the system best suited for their type of operation that allows for the location of the aircraft to be continuously sent independently of the other aircraft systems and power supply.

3.2.3 Remotely piloted aircraft systems

3.2.3.1 ICAO first became involved with the issue of unmanned aerial vehicles (UAVs) over a decade ago when the Air Navigation Commission (ANC) requested the Secretary General to consult with selected States and international organizations with respect to civil UAV activities, procedures and operating authorizations. In 2007, ICAO established an Unmanned Aircraft Systems Study Group (UASSG), tasked with development of a regulatory framework for the safe integration of unmanned aircraft systems in non-segregated airspace. Following an initial period of research and analysis, the UASSG recommended a narrowing of ICAO's focus from all unmanned aircraft to only remotely piloted aircraft (RPA). In 2014, the UASSG transitioned into the Remotely Piloted Aircraft Systems Panel (RPASP).

3.2.3.2 The RPASP currently coordinates and develops SARPs, procedures and guidance material for RPAS to facilitate a safe, secure, and efficient integration of RPA. The UASSG/RPASP has produced guidance material including the *Manual on Remotely Piloted Aircraft Systems* (Doc 10019) which was published in 2015. Doc 10019 provides information relevant to the introduction of RPAS into non-segregated airspace and at aerodromes, including discussions of airworthiness, operations, licensing, air traffic management, command and control, detect and avoid, safety management and security issues. Its intended worldwide audience is civil aviation authorities, RPAS operators, communications service providers, manufacturers, air navigation service providers, aerodrome operators and other airspace users and stakeholders.

3.2.3.3 Proposed SARPs are under development and will guide States in setting their respective national regulations regarding RPAS. The current focus of ICAO's work is on SARPs related to airworthiness, operations, operator certification, licensing of pilots, air traffic management, detect and avoid, security and environment. Licensing provisions are expected in 2018 and the remainder from 2020 onward.

3.2.4 Space transportation

Recent developments in the space transportation industry, specifically the potential increasing frequency of suborbital launches, have drawn attention to how this industry's activities might be integrated into non-segregated airspace. In anticipation of the growth of space transportation, ICAO and the United Nations Office for Outer Space Affairs (UNOOSA) established a group of experts, the Space Learning Group, to better understand the industry's future needs and to plan for more routine activity in non-segregated airspace. The Space Learning Group compiled relevant regulatory material from Member States on the subject of space transportation which can be obtained from the ICAO website at www.icao.int/aeroSPACE. ICAO and UNOOSA also conduct regular symposia as a means to raise awareness of this emerging issue and gather best practices.

3.2.5 Risks arising from conflict zones

To address risks to civil aviation arising from conflict zones, ICAO has developed the Conflict Zone Information Repository which enables ICAO Member States to disseminate information on risks to civil aviation arising from conflict zones. ICAO works in collaboration with States to develop risk advice and best practices for conducting and sharing risk assessments for civil aircraft operations over or near conflict zones. Additional information can be found on the ICAO website at http://www.icao.int/czir/Pages/default.aspx.

3.3 HUMAN FACTORS AND HUMAN PERFORMANCE

Human factors and human performance affect all the safety topics discussed in this document. It is important to recognize that addressing human factors will bring safety improvements across all safety-related issues. Effective human performance is fundamental to operational safety in aviation and should not be considered in isolation but rather be integrated into all aspects of aviation including equipment and system design, procedures, training and competency. Human performance should also be addressed in future airspace concepts.

3.4 METHODS TO UPDATE PRIORITIES AND OBJECTIVES

The HLSC 2015 noted that ICAO, in collaboration with States, RASGs, aviation safety partners and the industry, should develop methods to identify future safety objectives and priorities. The next edition of the GASP will reflect these, taking into account operational safety data, while keeping in mind the necessary continuity and stability of the GASP. ICAO will work on methods to update the priorities and objectives presented in the GASP, as part of the 2020-2022 edition of the GASP, in order to ensure they target present and emerging safety concerns.

Chapter 4

FRAMEWORK TO MEET THE GASP OBJECTIVES

4.1 GASP FRAMEWORK

4.1.1 The GASP framework presented in Figure 4-1 shows a phased strategy to improve aviation safety. The columns in the framework show the three objectives, all of which have associated timelines (see Figure 2-1). Each row represents a safety performance enabler that creates a common thematic thread in support of the objectives throughout the GASP. Safety performance enablers are described in section 4.2. As a State's safety oversight system matures, it progresses through the framework by addressing the objectives in a prioritized sequence. However, the process may not be completely linear and sequential. Parallel work may be undertaken in relation to more than one objective.

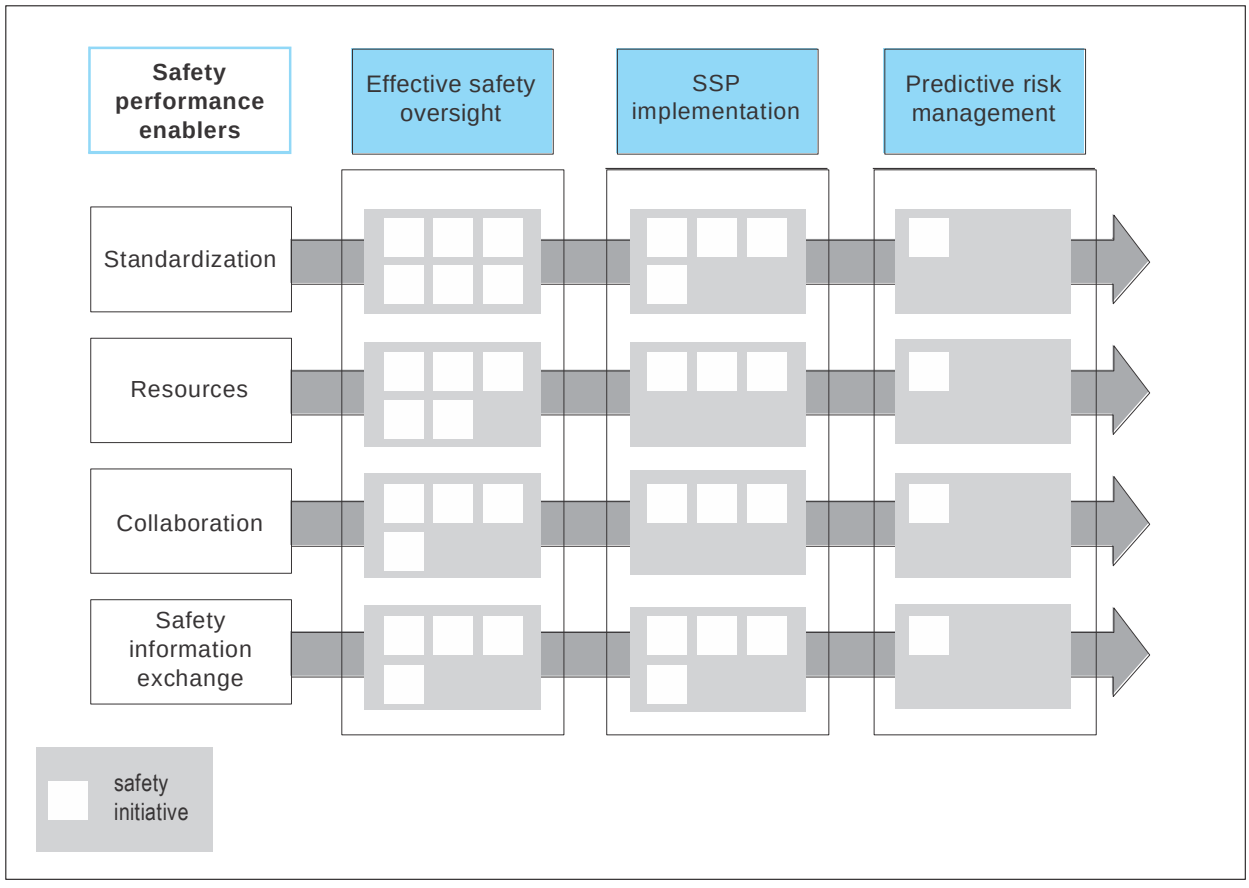

Figure 4-1. GASP framework

4.1.2 There are one or more safety initiatives as presented in the global aviation safety roadmap at the intersection of each safety performance enabler and GASP objective. These initiatives are represented by individual boxes. For example, the consistent implementation of Standards and Recommended Practices (SARPs) would be one of the “standardization” safety initiatives associated with the implementation of effective safety oversight (see Figure 4-2).

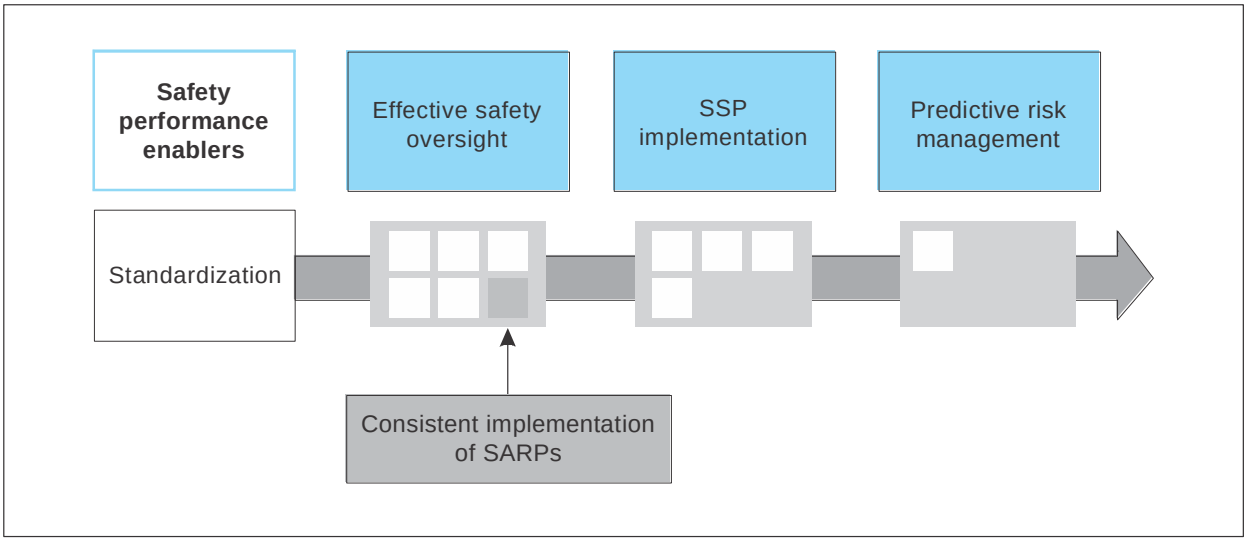

Figure 4-2. Safety initiatives

4.2 SAFETY PERFORMANCE ENABLERS

4.2.1 Safety performance enablers support the achievement of the GASP objectives by providing a common thematic thread throughout the GASP. They were developed to facilitate the planning process and should be viewed as interrelated and interdependent elements of the GASP framework.

4.2.2 The safety performance enablers are common to all the GASP objectives presented in Chapter 2. The global aviation safety roadmap identifies specific safety initiatives for each safety performance enabler and global safety objective combination. To help guide the implementation of these initiatives, guidance material has been developed in support of each safety performance enabler (see Appendix A).

4.2.3 The four safety performance enablers are presented in detail in sections 4.3 to 4.6 of this chapter.

4.3 SAFETY PERFORMANCE ENABLER 1 — STANDARDIZATION

4.3.1 “Standardization” refers to the uniform and consistent implementation of ICAO provisions. The uniform implementation of SARPs is a fundamental tenet of the Convention on International Civil Aviation and forms the foundation of a safe global aviation system. ICAO strives to improve the overall implementation of SARPs through, for example, transparency and disclosure of auditing processes and results. Efforts to attain greater standardization should take into account that States face varying safety issues and have different levels of human, technical and financial resources at their disposal to manage safety. States have an obligation under the Chicago Convention to provide timely notification to ICAO when their national regulations or practices differ from those established by SARPs.

4.3.2 States enhance safety by implementing SARPs through the development, publication and implementation of harmonized regulations at the international, regional and national levels. Similarly, the implementation of industry best practices serves to enhance standardization among service providers.

4.3.3 Monitoring standardization

4.3.3.1 The continuous monitoring of standardization, and the comprehensive analysis and sharing of monitoring results, are essential to verify that GASP objectives are achieved. The universal safety oversight audit programme (USOAP) continuous monitoring approach (CMA) provides updated data on the effective implementation of the eight critical elements (CEs) of a State's safety oversight system. The USOAP CMA monitors whether States develop, maintain and apply national regulations in accordance with SARPs. This includes a State's regulatory and oversight framework, safety processes and systems, as well as technical personnel working together to ensure safe and orderly civil aviation operations and related activities. Through analysis of USOAP data, the CMA provides a tool to monitor the rate of effective implementation (EI) of the CEs of a safety oversight system, which is required for States to meet the GASP objectives.

Note.— Additional guidance on USOAP, CMA and the CEs of a safety oversight system can be found in the Safety Oversight Manual *(Doc 9734), Part A* — The Establishment and Management of a State's Safety Oversight System*, the* Universal Safety Oversight Audit Programme Continuous Monitoring Manual *(Doc 9735), and the* Manual of Procedures for Operations Inspection, Certification and Continued Surveillance *(Doc 8335).*

4.3.3.2 Additionally, programmes undertaken by the Airports Council International (ACI), the Civil Air Navigation Services Organisation (CANSO), the International Air Transport Association (IATA) and the International Business Aviation Council (IBAC) provide means to detect systemic deficiencies common to multiple areas of aviation activity and to share best practices. ICAO, States and international organizations should work together to ensure that safety monitoring and auditing activities are, to the extent possible, conducted in a complementary manner. This enables a comprehensive assessment of the aviation system.

4.3.3.3 Current information regarding the global average of EI, as well as a list of all audited States and those with SSCs, can be obtained from the ICAO website at: www.icao.int/safety/pages/usoap-results.aspx.

4.4 SAFETY PERFORMANCE ENABLER 2 — RESOURCES

4.4.1 A common deficiency identified in assessed and audited States is the lack of an adequate safety oversight organization and infrastructure within the civil aviation authority (CAA). In the majority of cases, this has resulted from insufficient resources being provided for the CAA. As a result, such States are unable to fully comply with international and national requirements relating to the safety of civil aviation, including operations and infrastructure. Figure 4-3 illustrates the percentage of EI by CEs, on a worldwide scale, as at 2014.

4.4.2 CE-4, which addresses qualified technical personnel within the State, has the lowest percentage of EI of all the CEs. Audits and other ICAO missions have shown that where an appropriate safety oversight organization has not been established, control and supervision of aircraft operations and associated activities (e.g. aircraft maintenance) are often deficient, creating an opportunity for unsafe practices.

4.4.3 The establishment of minimum knowledge and experience requirements for the technical personnel performing oversight functions, and the provision of appropriate training to maintain and enhance their competence at the desired level are key components of a State's effective safety oversight system.

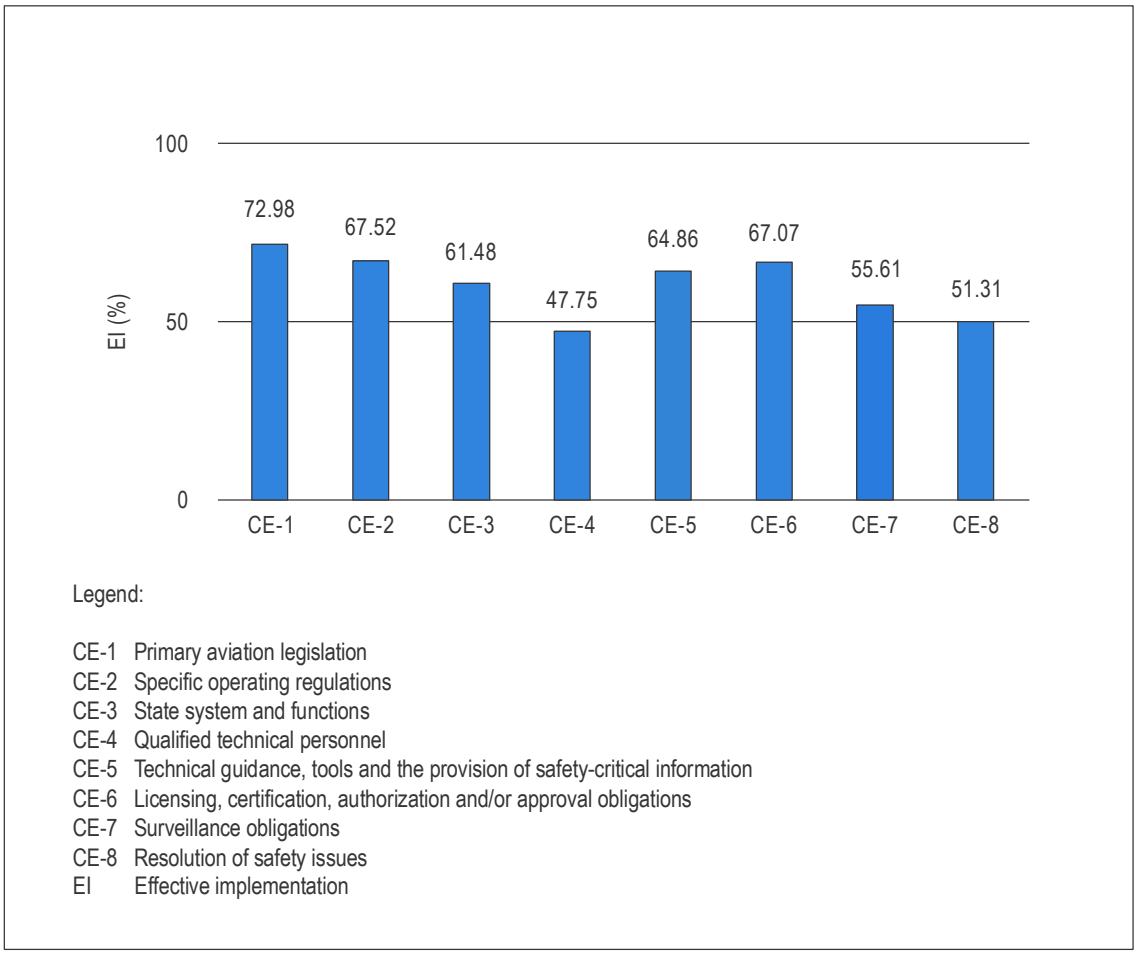

Figure 4-3. EI (%) by CE — worldwide

4.5 SAFETY PERFORMANCE ENABLER 3 — COLLABORATION

4.5.1 Aviation safety requires the participation of all relevant stakeholders. ICAO fosters collaboration among States and other stakeholders to facilitate a coordinated, transparent and proactive approach to safety.

4.5.2 Working with key aviation stakeholders

4.5.2.1 Key aviation stakeholders include, but are not limited to: ICAO, States, international organizations, regional organizations, regional aviation safety groups (RASGs), regional safety oversight organizations (RSOOs), regional accident and incident investigation organizations (RAIOs), industry representatives, air navigation service providers, operators, aerodromes, manufacturers, and maintenance organizations.

4.5.2.2 The GASP objectives promote expanded and strengthened strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner. This approach promotes consistency and maximizes operational benefits as well as cost-effectiveness resulting from the implementation of safety initiatives.

4.5.2.3 Achieving the GASP objectives is contingent upon continued engagement of the international community to address multidisciplinary issues. Through the global aviation safety roadmap, the GASP outlines the different roles of States, industry, international and regional organizations. This enables all parties to collaborate to coordinate the implementation of safety policies, safety oversight activities, SSP and SMS.

4.5.2.4 The GASP objectives guide regional and sub-regional priorities, promoting further coordination of all stakeholder efforts. Collaboration at the regional level assists in the development of collective solutions to common safety deficiencies by aligning and coordinating activities conducted by ICAO, States, industry, and international and regional organizations.

4.6 SAFETY PERFORMANCE ENABLER 4 — SAFETY INFORMATION EXCHANGE

4.6.1 The sharing and exchange of safety information is a fundamental component of the GASP objectives. The scope of information sharing and exchange initiatives is meant to expand progressively as the objectives are met. In order to facilitate the sharing and exchange of safety information, key safety performance indicators (SPIs) as well as a methodology for safety performance measurement, including harmonized taxonomies, must be defined. ICAO, States, and industry continue to work together to identify harmonized safety metrics that will enable not only the sharing and exchange of information but also safety analysis to identify and mitigate safety risks (see Appendix D).

4.6.2 The protection of safety information is essential to the development, evolution, and progress of safety information sharing and exchange initiatives. SARPs and guidance regarding the protection, sharing and exchange of safety information are contained in Annex 13 — *Aircraft Accident and Incident Investigation*, Annex 19 — *Safety Management*, and in the *Code of Conduct on the Sharing and Use of Safety Information* (see Appendix E).

Appendix A

GLOBAL AVIATION SAFETY ROADMAP

1. PURPOSE OF THE ROADMAP

The global aviation safety roadmap is an action plan developed to assist the aviation community in achieving the objectives presented in the GASP. It provides a structured, common frame of reference for all relevant stakeholders. The roadmap's goal is to ensure that safety initiatives deliver the intended benefits associated with the GASP objectives through enhanced coordination, thus reducing inconsistencies and duplication of effort. Completion of the safety initiatives and actions in the roadmap will also enable the aviation community to maintain a focus on addressing the global safety priorities described in the GASP.

2. STRUCTURE OF THE ROADMAP

2.1 The roadmap outlines specific safety initiatives and supporting actions associated with each of the four safety performance enablers (standardization, resources, collaboration and safety information exchange) which, when implemented by stakeholders, will address the GASP objectives and global safety priorities.

2.2 The roadmap provides a set of safety initiatives, prioritized actions and associated timelines for each safety performance enabler found within the GASP framework. Each safety initiative is supported by a set of actions. The roadmap includes specific initiatives targeted to the different streams of stakeholders (States, regions and industry) at different levels of maturity. The roadmap contains three distinct phases, in line with the GASP objectives:

a) Phase I: effective safety oversight;

b) Phase II: State safety programme (SSP) implementation; and

c) Phase III: predictive risk management.

2.3 Safety initiatives under Phase I are aimed at a State lacking a basic safety oversight system and whose effective implementation (EI) of the critical elements (CEs) of the State's safety oversight system is below a score of 60 per cent. The EI score assists stakeholders in determining which phase of the roadmap is most applicable to a stakeholder's current level of maturity. It indicates to stakeholders the appropriate starting point within the roadmap and assists in determining the portions of the roadmap that are applicable.

2.4 Phase I of the roadmap is divided into two sub-phases: Sub-phase I-A focuses on the establishment of an effective safety oversight framework, as per CE-1 to CE-5; and Sub-phase I-B focuses on the implementation of an effective safety oversight system, as per CE-6 to CE-8 (see Figure A-1). It is imperative that States complete Sub-phases I-A and I-B to ensure effective safety oversight before focusing on SSP implementation in Phase II. However, some of the steps to implement an SSP (Phase II) may have been started in Phase I, as part of the establishment of an effective safety oversight system (e.g. establishing primary aviation law and regulations).

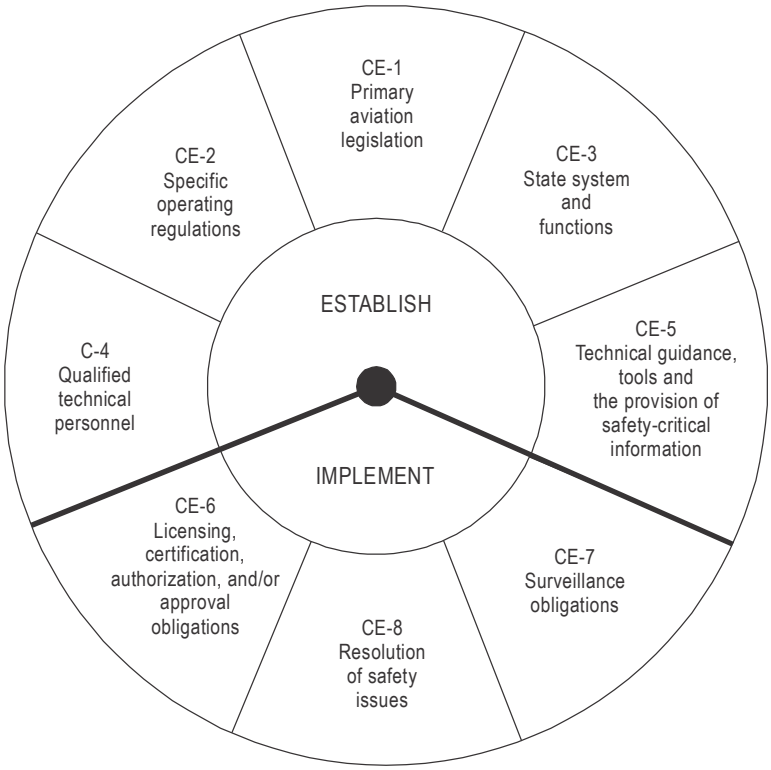

Figure A-1. Critical elements of a State's safety oversight system

2.5 Safety initiatives under Phase II are aimed at a State lacking or in the process of implementing an SSP, whose effective implementation of the CEs of the State's safety oversight system is above a score of 60 per cent, and which is ready to progress into SSP implementation as demonstrated by the presence of effective safety oversight capabilities based on the eight CEs.

2.6 Safety initiatives under Phase III are aimed at States that have effectively implemented SSPs.

2.7 The safety initiatives described in this appendix facilitate the planning process and should not be viewed as stand-alone activities. In many cases, the safety initiatives are interrelated and capable of integrating with and supporting each other.

2.8 All the safety initiatives of the roadmap are presented in a standardized template format, which covers the following points:

a) *GASP objective*. The relevant objective, as described in the GASP, to which the safety initiative is associated;

b) *Safety performance enabler.* The relevant safety performance enabler, as described in the GASP, to which the safety initiative is associated;

c) *Safety initiative.* A description of the specific safety initiative;

d) *Phase.* The specific phase or sub-phase within the roadmap to which a safety initiative is associated;

e) *Stakeholder.* The entity to which the initiative is addressed. There are three overarching categories:

1) States;

2) regions, which include States within a region, as well as regional organizations, the regional aviation safety groups (RASGs), regional safety oversight organizations (RSOOs), regional accident and incident investigation organizations (RAIOs) and other regional entities, as appropriate; and

3) industry;

f) *Actions.* A description of the tasks required for the implementation of a safety initiative. In Phase I, CEs in parenthesis refer to the CE(s) which are addressed by a specific action (see Figure A-1); and

g) *References*. Documents and tools that may assist stakeholders in implementing the safety initiatives and associated actions.

2.9 The overall view of the roadmap is presented in Figure A-2. The structure of the roadmap is based on the GASP objectives and associated timelines, as illustrated in Figure 2-1. The roadmap is divided into three horizontal streams, each with initiatives aimed at States, regions and industry. Within the roadmap diagram, tracks of dotted lines represent the four safety performance enablers as they apply to a specific stakeholder. The safety initiatives are laid out in a sequence and should be accomplished in a specific order (e.g. safety initiatives in Sub-phase I-A are needed for a State to implement the safety initiatives in Sub-phase I-B). As stakeholders accomplish each safety initiative, represented by a numbered box in the diagram, they advance through the roadmap thus achieving the different objectives.

2.10 Each safety initiative has a number, which links it to a detailed description of the corresponding initiative, found in a template. Safety initiatives are numbered as follows:

a) the first letter (e.g. SRI-1) corresponds to the stakeholder to whom the safety initiative is addressed where:

S = State;

R = region; and

I = industry;

b) the second letter (e.g. SRI-1) represents the safety performance enabler linked to the safety initiative where:

S = standardization;

R = resources;

C = collaboration; and

X = safety information exchange;

c) the third letter (e.g. SRI-1) stands for “initiative”;

d) the number (e.g. SRI-1) identifies a specific safety initiative within a series of initiatives aimed at a specific stakeholder and under a certain safety performance enabler; and

e) the final letter (e.g. SRI-1A) designates a specific action under a safety initiative.

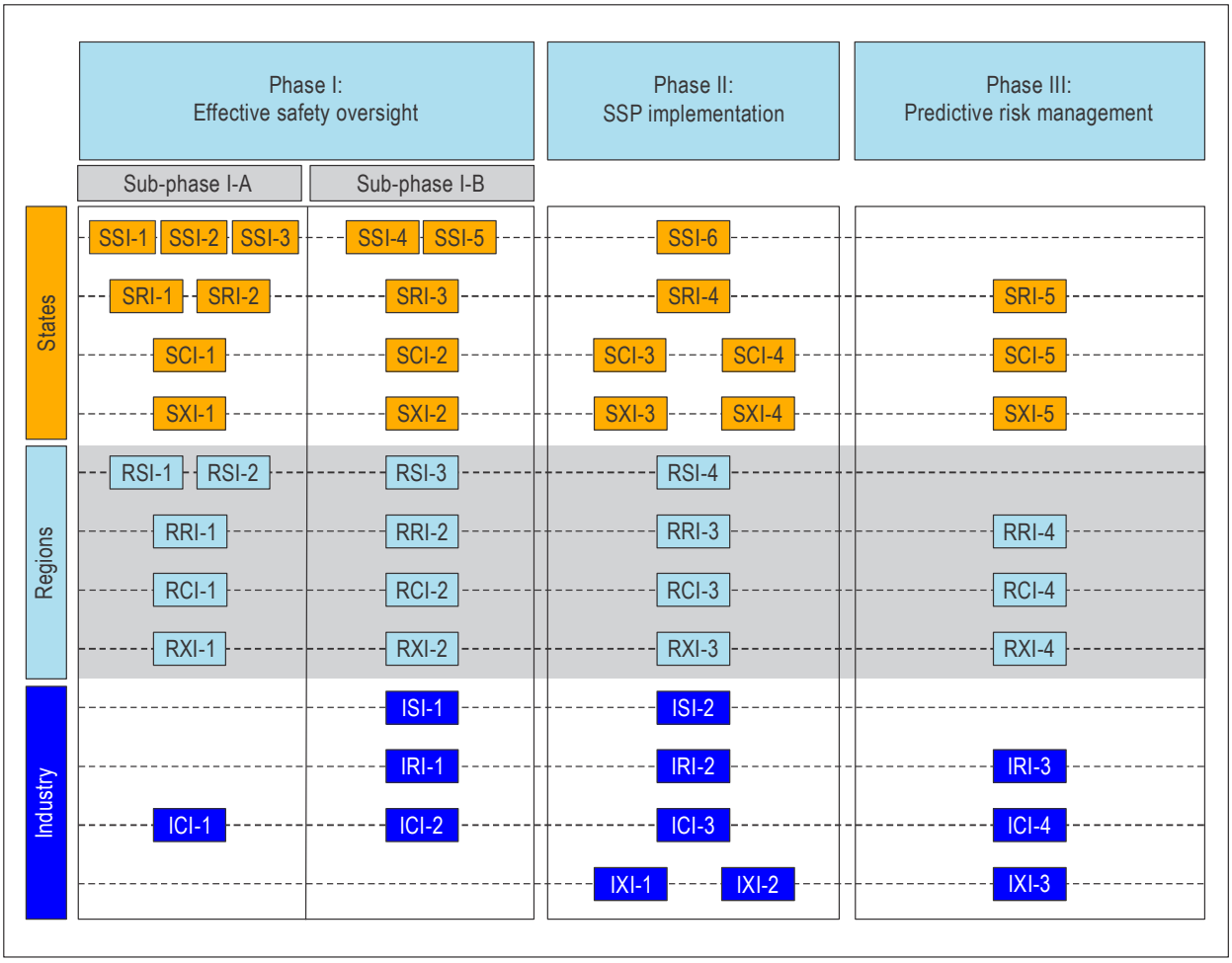

Figure A-2. Global aviation safety roadmap diagram

3. WORKING IN PARTNERSHIP

3.1 All aviation stakeholders need to be involved in the effort to continually improve safety. The roadmap provides a common frame of reference for all stakeholders and clearly identifies the roles played by States, regions and industry while emphasizing their complementary nature. In addition to the development of SARPs, ICAO supports the implementation of the roadmap by providing resources, implementation tools and assistance via different programmes and initiatives, such as the No Country Left Behind campaign.

3.2 As noted in section 4.5.2, key aviation stakeholders include, but are not limited to ICAO, States, international organizations, regional organizations, the RASGs, RSOOs, RAIOs, industry representatives, air navigation service providers, operators, aerodromes, manufacturers and maintenance organizations. The planning and implementation regional groups (PIRGs) also play a key role, coordinating with the RASGs.

3.3 RASGs serve as regional cooperative fora integrating global, regional, sub-regional, national and industry efforts in continuing to enhance aviation safety worldwide. RASGs develop and implement work programmes that support a regional performance framework for the management of safety on the basis of the GASP.

3.4 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 cooperative development of operational safety and continuing airworthiness programme (COSCAP), also play a key role in the roadmap.

3.5 Industry stakeholders are encouraged to review the roadmap to identify safety initiatives and actions that support national and regional programmes and work collaboratively with the aim of enhancing safety in a coordinated manner.

4. HOW TO USE THE ROADMAP

4.1 It is expected that States, regions (supported primarily by the RASGs) and industry will use the roadmap individually and collectively as the basis to develop action plans that define the specific activities which should take place in order to improve safety at the regional or sub-regional and national levels. The national, regional and industry safety plans will help stakeholders prioritize actions to achieve the objectives set out in the GASP and address the global safety priorities.

4.2 Step 1 — Conduct self-analysis

4.2.1 In conjunction with an initial review of the roadmap, States, regions and industry should first conduct a self-analysis to understand the current operational environment. The analysis needs to assess established capabilities, system size and level of complexity, and available resources. Safety deficiencies should be identified and will indicate the EI score and assist stakeholders to recognize which GASP objective, and associated timelines, is an appropriate starting point in the roadmap. The analysis should also identify key stakeholders with supporting capabilities, additional resources and other strengths or opportunities (external funding, support from the RASGs, etc.). Stakeholders will be involved in developing, implementing and sustaining the safety initiatives included in the roadmap.

4.2.2 Stakeholders in Phase I

Stakeholders may wish to take advantage of the suite of electronic safety tools available on the ICAO integrated safety trend analysis and reporting system (iSTARS) to develop a baseline understanding of their current safety oversight capabilities and operational safety environment. The protocol question tester, safety audit information and State safety briefing applications, as well as the USOAP continuous monitoring approach (CMA) online framework tools, may be particularly useful to determine the EI score and identify existing deficiencies. States and regions lacking the capability to complete an effective self-analysis are encouraged to seek assistance and support from other States and regions (e.g. through the RASGs and RSOOs).

4.2.3 Stakeholders in Phase II

4.2.3.1 Prerequisite criteria for sustainable SSP implementation should be assessed during this step. Besides an EI score of above 60 per cent, there are other general criteria which should be met for successful implementation of an SSP. A State moving into SSP implementation should conduct an SSP gap analysis to ensure it is ready to begin SSP implementation. Detailed guidance on conducting a gap analysis is presented in Doc 9859 — *Safety Management Manual (SMM)*, Third Edition, sections 4.3.3 and 5.4.3. States may also wish to consider using the ICAO iSTARS SSP gap analysis application to complete this process. Additionally, preparations to attain management commitment need to take place as the transition to an SSP will involve significant changes in the way in which the State conducts and organizes its activities. The scope and complexity of aviation activities strongly affect the nature of a particular SSP; it is not a “one-size fits all” approach.

4.2.3.2 During Phase II of the roadmap, the State should have established an initial acceptable level of safety performance (ALoSP) and matured it as the SSP implementation progresses. A State’s basic safety indicators (i.e.

ALoSP) generally consist of high-consequence safety indicators such as accident and serious incident rates for each sector of aviation activities. Subsequently, at a mature ALoSP stage, the State should develop lower-consequence safety indicators (see Appendix D). The same activities listed for individual States should be carried out at the regional level (e.g. establishment and monitoring of regional safety indicators).

4.2.4 Stakeholders in Phase III

4.2.4.1 States that have fully implemented an SSP should focus on the systemic identification of existing and emerging hazards and the mitigation of safety risks across the aviation system through the analysis of multiple data sources, with the goal of achieving predictive risk management. A predictive hazard identification methodology involves collecting data, in order to identify possible negative future outcomes or events; analysing system processes and the environment to identify potential future hazards; and initiating mitigating actions.

4.2.4.2 By Phase III, the State should be in a position to conduct data analysis and trending, to support a safety management approach. Safety indicators should be congruent with the State's safety objectives and safety policy and appropriate and relevant to the scope and complexity of the State's aviation activities. The State should monitor safety indicators for any undesirable trends, alert level breaches and achievement of targets. Effective safety oversight and a strong SSP with all elements implemented, and a strong safety reporting culture, are needed to gather and use data for predictive risk management. Safety information exchange among the State's regulatory and administrative organizations and service providers, as well as with other States and industry organizations, is also essential to the successful completion of Phase III which enables the risk-based allocation of resources.

4.3 Step 2 — Identify safety initiatives and actions

4.3.1 Once Step 1 has been completed, the State (or region) has sufficient information to identify the appropriate starting point within the roadmap. It can then select a series of safety initiatives that are needed to achieve the GASP objectives and address the global safety priorities. The safety initiatives that are selected become the basis for the national or regional safety action plan. By reviewing the identified deficiencies and/or results of the gap analysis in comparison to the selected safety initiatives, a list of potential safety enhancement actions can be identified and selected as relevant corrective actions or mitigations.

4.3.2 Stakeholders should endeavour to implement the applicable safety initiatives and actions in the roadmap within the timelines associated with the GASP objectives. In the event that the timelines proposed in the GASP may not be achievable, stakeholders are encouraged to develop attainable timelines in coordination with ICAO and other key aviation stakeholders, as appropriate.

4.3.3 Stakeholders in Phase I

The actions associated with each safety initiative are listed in order of priority according to the CEs to assist States that are working to implement an effective safety oversight system in creating a safety plan. States should start with the establishment of a safety oversight system (CE-1 to CE-5) then move to effective implementation (CE-6 to CE-8) before progressing to SSP implementation. States working to address very low EI scores may wish to seek assistance to perform those functions which cannot be performed when acting on their own, and take advantage of existing initiatives, such as the ICAO No Country Left Behind campaign for support.

4.3.4 Stakeholders in Phase II

Actions supporting SSP implementation in States that have successfully completed Sub-phases I-A and I-B (i.e. having successfully implemented all the CEs of a safety oversight system) are listed in order of priority to assist States in developing a safety plan.

4.3.5 Stakeholders in Phase III

States that have fully implemented an SSP and are moving into predictive risk management should prioritize safety risks and develop mitigation strategies on an on-going basis.

4.4 Step 3 — Develop the safety plan (all phases)

4.4.1 The safety enhancement actions selected in Step 2 define the national, regional or industry safety plan. The safety plan should be reviewed and the resources (human, financial, technical, training, stakeholder commitments, etc.) necessary to complete each of the applicable safety initiatives and actions should be identified. In addition to identifying necessary resources, the ability to make the changes must also be considered. This evaluation should include the political will to change and the availability of the technology and resources necessary to implement the change. A conclusion that implementation 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 impact of the hazard or identified safety deficiency.

4.4.2 The safety plan should be reviewed to evaluate the safety enhancement that would result from the implementation of each corrective action or mitigation in comparison to the resources required to implement each action or mitigation, using a quantitative approach. Where a quantitative approach is not feasible, reliance on the knowledge and expertise of an evaluation team will allow prioritizing the list of potential actions having the greatest impact on safety.

4.4.3 Once a list of prioritized actions has been developed according to the expected safety enhancement and necessary resources, the stakeholders should develop a plan for implementing the actions (e.g. a first step would be to focus on actions having the greatest potential safety enhancement while requiring the fewest resources to complete). The plan should cover a manageable set of actions that represent the steps necessary to move to the next level of maturity.

4.4.4 Once the safety plan is finalized, a responsible party or organization should be identified to lead the implementation of each action. Established regional activities and organizations (e.g. the RASGs) may be able to provide implementation strategies and support. Stakeholders are also encouraged to collaborate with other stakeholders at the national and regional levels to harmonize safety plans.

4.5 Step 4 — Monitor implementation (all phases)

4.5.1 After the safety plan has been finalized and transferred to the organizations or individuals responsible for leading the implementation, the 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. This process is best accomplished in a stepwise fashion to move to the next level of maturity. Once the safety plan's actions have been completed, the steps listed in this section should be repeated in order to identify the next safety enhancement actions stakeholders may need to implement.

4.5.2 States, regions and industry should report their progress in achieving the GASP objectives and addressing the global safety priorities. Safety initiatives presented in the roadmap, as part of the safety information exchange enabler, encourage States (initiative SXI-1) and regions (initiative RXI-1) to provide the primary source of safety information to ICAO by completing, submitting and updating all relevant documents and records (State aviation activity questionnaire, compliance checklists, etc.). Safety initiatives also request States (initiative SXI-2) and regions (initiative RXI-2) to maintain such information current to enable ICAO to monitor the progress made in implementing the roadmap initiatives in support of achieving the GASP objectives.

5. TEMPLATES

5.1 Phase I — Effective safety oversight

5.1.1 Sub-phase I-A — Establishment of a safety oversight framework (CE-1 to CE-5)

STATES

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	SSI-1 — Consistent implementation of ICAO SARPs at the national level
Phase	I-A
Stakeholder	States
Actions	☐ SSI-1A — Work at the national level to address significant safety concerns as a priority ☐ SSI-1B — Establish primary aviation law and regulations, to empower the competent authority to conduct regulatory oversight, this includes separation of oversight functions and service providers/operators (CE-1 and CE-2) ☐ SSI-1C — Increase the level of compliance with ICAO SARPs and the EI of CEs at the national level (CE-1 to CE-5) ☐ SSI-1D — Establish a process for the identification of differences with ICAO SARPs (CE-2)
References	SSI-1A and SSI-1C — Doc 9734, *Safety Oversight Manual*, Part A — *The Establishment and Management of a State's Safety Oversight System* — Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* — iSTARS safety audit information (log-in required) SSI-1B and SSI-1C — Doc 9734, *Safety Oversight Manual*, Part A — *The Establishment and Management of a State's Safety Oversight System*, section 3.3.3 — Canadian Aviation Regulations — Civil Aviation Safety Regulations of Australia — European Aviation Safety Rules — FAA Regulations — ICAO reference documents — iMPLEMENT — iSTARS State safety briefings (log-in required) — Latin American Aviation Regulations — Model Civil Aviation Regulations — Rules of the Civil Aviation Authority of New Zealand SSI-1C and SSI-1D — ICAO USOAP CMA and USOAP CMA Online Framework (log-in required)

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	SSI-2 — Development of a comprehensive regulatory oversight framework
Phase	I-A
Stakeholder	States
Actions	☐ SSI-2A — Establish and maintain an independent regulatory oversight authority, this includes separation of oversight functions and service providers (CE-3) ☐ SSI-2B — Develop guidance material needed to conduct regulatory oversight (CE-5) ☐ SSI-2C — Recruit, train and maintain a competent workforce to support regulatory oversight (see SRI-2) (CE-3 and CE-4)
References	SSI-2A — Doc 9734, *Safety Oversight Manual*, Part A — *The Establishment and Management of a State's Safety Oversight System*, section 3.4.1 SSI-2B and SSI-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)

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	SSI-3 — Establishment of an independent accident and incident investigation process, consistent with Annex 13 — *Aircraft Accident and Incident Investigation*
Phase	I-A
Stakeholder	States
Actions	☐ SSI-3A — Establish an independent accident and incident investigation process, as per Annex 13 requirements (CE-1 and CE-3) ☐ SSI-3B — Develop guidance material needed to conduct accident and incident investigations (CE-5) ☐ SSI-3C — Recruit, train and maintain a competent workforce to support accident and incident investigations (see SRI-2) (CE-3 and CE-4)
References	SSI-3A — Annex 13, *Aircraft Accident and Incident Investigation* — Doc 9734, *Safety Oversight Manual,* Part A — *The Establishment and Management of a State's Safety Oversight System*, section 3.4.5 — ICAO Model Aircraft Accident and Incident Investigation (AIG) Act — ICAO Model Aircraft Accident and Incident Investigation (AIG) Regulations SSI-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* SSI-3C — Cir 298, *Training Guidelines for Aircraft Accident Investigators*

GASP objective	Effective safety oversight
Safety performance enabler	Resources
Safety initiative	SRI-1 — Strategic allocation of resources to enable effective safety oversight
Phase	I-A
Stakeholder	States
Actions	☐ SRI-1A — Confirm executive or legislative mandate to receive and expend financial resources from government and other external sources (CE-1) ☐ SRI-1B — 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) ☐ SRI-1C — Use SSI-1 and SRI-2 to identify resource requirements (CE-1 to CE-5) ☐ SRI-1D — 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 Cooperation Bureau, or other means to provide 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 ☐ SRI-1E — Develop a process for assessing changing resource requirements and sustain necessary coordination with resource stakeholders for safety oversight improvements, as outlined in Phase I of the roadmap (CE-1 to CE-3)
References	— ICAO safety fund (SAFE) — ICAO Technical Cooperation Bureau — RASGs — RSOOs and COSCAPs

GASP objective	Effective safety oversight
Safety performance enabler	Resources
Safety initiative	SRI-2 — Qualified and competent technical personnel to support effective safety oversight
Phase	I-A
Stakeholder	States
Actions	☐ SRI-2A — Identify and track qualifications and currency of existing technical personnel (CE-4) ☐ SRI-2B — Identify the gaps in qualified technical personnel and training requirements necessary to implement the oversight mandate (CE-4) ☐ SRI-2C — Establish a compensation scheme for the retention of qualified technical personnel (CE-4) ☐ SRI-2D — Make use of RSOOs, RAIOs, or equivalent means, to secure qualified and competent technical personnel to perform those functions which cannot be performed by the State acting on its own (CE-4) ☐ SRI-2E — Establish audit processes to evaluate whether human resource plans support hiring and retention of the appropriate number of qualified and competent technical personnel required (CE-4) ☐ SRI-2F — Implement comprehensive training 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) ☐ SRI-2G — 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 SRI-1B (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

GASP objective	Effective safety oversight
Safety performance enabler	Collaboration
Safety initiative	SCI-1 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Phase	I-A
Stakeholder	States
Actions	☐ SCI-1A — 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) ☐ SCI-1B — Provide assistance via States, regions and industry to other States for primary aviation legislation development (in coordination with SSI-1B) (CE-1) ☐ SCI-1C — Provide assistance via States, regions and industry to other States for the development of national regulations (CE-2) ☐ SCI-1D — 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) ☐ SCI-1E — Collaborate with RASG and/or RSOO, other States, ICAO, industry joint programmes and/or technical school partnerships to recruit and train qualified, competent technical personnel and develop a strategy for their retention (CE-4) ☐ SCI-1F — Establish processes for the development of technical guidance, tools and provisions for 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 environment (CE-5) ☐ SCI-1G — While working to improve safety oversight, work with RASG and/or RSOO to address global safety priorities, as applicable to the State
References	SCI-1A to SCI-1F — Doc 9734, *Safety Oversight Manual* — ICAO Technical Cooperation Bureau — No Country Left Behind campaign — RASGs — RSOOs and COSCAPs SCI-1G — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

GASP objective	Effective safety oversight
Safety performance enabler	Safety information exchange
Safety initiative	SXI-1 — Provision of the primary source of safety information to ICAO by completing, submitting and updating all relevant documents and records
Phase	I-A
Stakeholder	States
Actions	☐ SXI-1A — Update USOAP corrective action plan items ☐ SXI-1B — Complete and submit the self-assessment checklist based on USOAP CMA protocol questions ☐ SXI-1C — Complete and submit the State aviation activity questionnaire ☐ SXI-1D — Complete and submit the compliance checklists on EFOD system ☐ SXI-1E — 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 (log-in required) — USOAP CMA Workshops

REGIONS

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	RSI-1 — Consistent implementation of ICAO SARPs at the regional level
Phase	I-A
Stakeholder	Regions
Actions	☐ RSI-1A — Work together with States at the regional level to assist States with low EI and/or significant safety concerns: ○ Provide support to those shortfalls in roadmap safety 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 RRI-1B) ☐ RSI-1B — Strive to increase the level of compliance with ICAO SARPs and the EI of CEs within the region (CE-1 to CE-5): ○ Monitor the progress of the roadmap implementation in the region and safety indicators/benchmarks that are utilizing regional resources ☐ RSI-1C — Develop and standardize regulations and guidance materials in the region, consistent with ICAO SARPs (CE-2 and CE-5) ☐ RSI-1D — Develop and standardize training requirements to harmonize competencies of technical personnel needed to support effective safety oversight at the regional level (CE-4) ☐ RSI-1E — Work regionally through RASG, RSOO and ICAO Regional Office to enhance safety in a sustainable manner ☐ RSI-1F — Harmonize international audits aimed at States
References	— Doc 7192, *Training Manual* (all parts) — Doc 9734, *Safety Oversight Manual,* Part B — *The Establishment and Management of a Regional Safety Oversight System* — 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 campaign safety implementation resources

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	RSI-2 — Establishment of an independent regional accident and incident investigation process, consistent with Annex 13 — *Aircraft Accident and Incident Investigation*
Phase	I-A
Stakeholder	Regions
Actions	☐ RSI-2A — Establish a RAIO, if necessary (See RSI-1B) (CE-3) ☐ RSI-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) ☐ RSI-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 RSI-1A) (CE-3 and CE-4)
References	RSI-2A — Doc 9946, *Manual on Regional Accident and Incident Investigation Organization* RSI-2C — Annex 13, *Aircraft Accident and Incident Investigation* — Doc 9734, *Safety Oversight Manual,* Part A — *The Establishment and Management of a State's Safety Oversight System,* section 3.4.5 and Part B — *The Establishment and Management of a Regional Safety Oversight System* — 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

GASP objective	Effective safety oversight
Safety performance enabler	Resources
Safety initiative	RRI-1 — Regional safety initiatives to support consistent coordination of regional and sub-regional programmes in establishing adequate safety oversight capabilities
Phase	I-A
Stakeholder	Regions
Actions	☐ RRI-1A — Identify resources that are available to support roadmap safety initiatives for States in the region (all CEs, emphasis on CE-1 to CE-5) ☐ RRI-1B — Use the roadmap and RASG and/or RSOO specific 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-1 to CE-5) ☐ RRI-1C — Facilitate the provision of financial and technical assistance between 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 SRI-1) (all CEs, emphasis on CE-1 to CE-5) ☐ RRI-1D — Establish an RSOO or equivalent means, to perform those functions which cannot be performed by the State acting on its own. ☐ RRI-1E — Strengthen existing RSOO, if necessary (CE-1 to CE-5)
References	— Doc 9734, *Safety Oversight Manual,* Part B — *The Establishment and Management of a Regional Safety Oversight System* — Aviation Safety Implementation Assistance Partnership (ASIAP)

GASP objective	Effective safety oversight
Safety performance enabler	Collaboration
Safety initiative	RCI-1 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Phase	I-A
Stakeholder	Regions
Actions	☐ RCI-1A — 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) ☐ RCI-1B — Provide assistance via States, regions and industry to States for primary aviation legislation development (in coordination with SSI-1B) (CE-1) ☐ RCI-1C — Provide assistance via States, regions and industry to States for the development of national regulations (CE-2) ☐ RCI-1D — 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) ☐ RCI-1E — Collaborate with RASG and/or RSOO, States, ICAO, industry joint programmes and/or technical school partnerships to recruit and train qualified, competent technical personnel and develop a strategy for their retention (CE-4) ☐ RCI-1F — Establish processes for the development of technical guidance, tools and provisions for 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) ☐ RCI-1G — While working to improve safety oversight, work with RASG and/or RSOO to address global safety priorities, as applicable to the region
References	RCI-1A to RCI-1F — Doc 9734, *Safety Oversight Manual* — ICAO Technical Cooperation Bureau — iMPLEMENT — No Country Left Behind campaign — RASGs — RSOOs and COSCAPs RCI-1G — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

GASP objective	Effective safety oversight
Safety performance enabler	Safety information exchange
Safety initiative	RXI-1 — Provision of the primary source of regional safety information to ICAO by asking States to complete, submit and update all relevant documents and records
Phase	I-A
Stakeholder	Regions
Actions	☐ RXI-1A — Assess if States in the region have provided their primary source of safety information to ICAO ☐ RXI-1B — Solicit States in the region to complete and submit their USOAP corrective action plan ☐ RXI-1C — Solicit States in the region to complete and submit their self-assessment checklist based on USOAP CMA protocol questions ☐ RXI-1D — Solicit States in the region to complete and submit their State aviation activity questionnaire ☐ RXI-1E — Solicit States in the region to complete and submit their compliance checklists on the EFOD system ☐ RXI-1F — Encourage States in the region to update documents and records, as required, in a timely manner ☐ RXI-1G — 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,* sections 2.8, 2.14 and 2.15 — iSTARS — USOAP-CMA Computer-based Training — USOAP CMA Online Framework (log-in required) — USOAP CMA Workshops

INDUSTRY

Note.— There are no safety initiatives under the enablers "standardization", "resources" and "safety information exchange" aimed at industry in this sub-phase of the roadmap.

GASP objective	Effective safety oversight
Safety performance enabler	Collaboration
Safety initiative	ICI-1 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Phase	I-A
Stakeholder	Industry
Actions	ICI-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) ICI-1B — Provide input to States, as applicable, for the development of national regulations (CE-2) ICI-1C — Participate in regional activities for sharing of best practices, mentoring and conducting follow-up actions (CE-3) ICI-1D — Address global safety priorities, as applicable, in coordination with regional groups
References	ICI-1A to ICI-1C — Doc 9734, *Safety Oversight Manual* — RASGs — RSOOs and COSCAPs ICI-1D — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

5.1.2 Sub-phase I-B — Implementation of a safety oversight system (CE-6 to CE-8)

STATES

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	SSI-4 — Consistent implementation ICAO SARPs at the national level
Phase	I-B
Stakeholder	States
Actions	□ SSI-4A — Work at the national level to address significant safety concerns as a priority □ SSI-4B — 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 (log-in required)

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	SSI-5 — Continued implementation of and compliance with ICAO SARPs at the national level
Phase	I-B
Stakeholder	States
Actions	☐ SSI-5A — Work together with industry to ensure compliance with applicable regulations (CE-6 to CE-8) ☐ SSI-5B — Implement regulatory oversight and enforcement processes (CE-7 and CE-8) ☐ SSI-5C — Resolve safety concerns identified via accident and incident investigations, safety reports and other means (CE-8) ☐ SSI-5D — Work on the global safety priorities, as applicable to the State
References	SSI-5B — Doc 8335, *Manual of Procedures for Operations Inspection, Certification and Continued Surveillance* SSI-5C — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* SSI-5D — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

GASP objective	Effective safety oversight
Safety performance enabler	Resources
Safety initiative	SRI-3 — Strategic allocation of resources to enable effective safety oversight
Phase	I-B
Stakeholder	States
Actions	☐ SRI-3A — Use SSI-1 and SRI-2 to identify resource requirements (CE-6 to CE-8) ☐ SRI-3B — Leverage regional groups such as the RASG to identify additional resources.
References	— ICAO safety fund (SAFE) — ICAO Technical Cooperation Bureau — RASGs

GASP objective	Effective safety oversight
Safety performance enabler	Collaboration
Safety initiative	SCI-2 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Phase	I-B
Stakeholder	States
Actions	☐ SCI-2A — 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) ☐ SCI-2B — Provide assistance via RASG and/or RSOO to other States for the conduct of surveillance activities (CE-7) ☐ SCI-2C — Use technical guidance, tools and provisions for safety-critical information, developed in collaboration with other States, RSOO, ICAO and/or other stakeholders, to assist in safety oversight functions (CE-6 to CE-8) ☐ SCI-2D — While working to improve safety oversight, continue to work with RASG and/or RSOO to address global safety priorities, as applicable to the State.
References	SCI-2A to SCI-2C — RASGs — RSOOs and COSCAPs SCI-2D — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

GASP objective	Effective safety oversight
Safety performance enabler	Safety information exchange
Safety initiative	SXI-2 — Continued provision of the primary source of safety information to ICAO by updating all relevant documents and records as progress is made
Phase	I-B
Stakeholder	States
Actions	☐ SXI-2A — Update USOAP corrective action plan items ☐ SXI-2B — Update and submit the self-assessment checklist based on USOAP CMA protocol questions ☐ SXI-2C — Update and submit the State aviation activity questionnaire ☐ SXI-2D — Update and submit the compliance checklists on the EFOD system ☐ SXI-2E — 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

REGIONS

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	RSI-3 — Continued implementation of and compliance with ICAO SARPs at the regional level
Phase	I-B
Stakeholder	Regions
Actions	☐ RSI-3A — Work together with States in the region to assist States with low EI and/or significant safety concerns: o Provide support to those shortfalls in roadmap safety 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 RRI-2B) ☐ RSI-3B — Increase the level of compliance with ICAO SARPs and the EI of CEs within the region (CE-6 to CE-8) o Monitor the progress of the roadmap implementation in the region and safety indicators/benchmarks that are utilizing regional resources ☐ RSI-3C — 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) ☐ RSI-3D — Work with stakeholders to resolve safety concerns identified via accident and incident investigations, safety reports and other means (CE-8) ☐ RSI-3E — Continue work on the global safety priorities, as applicable to the region
References	RSI-3A to RSI-3C — Doc 8335, *Manual of Procedures for Operations Inspection, Certification and Continued Surveillance* — Doc 9735, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* RSI-3D — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* RSI-3E — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

GASP objective	Effective safety oversight
Safety performance enabler	Resources
Safety initiative	RRI-2 — Regional safety initiatives to support consistent coordination of regional and sub-regional programmes in implementing adequate safety oversight capabilities
Phase	I-B
Stakeholder	Regions
Actions	☐ RRI-2A — Identify resources that are available to support roadmap safety initiatives for States in the region (all CEs, emphasis on CE-6 to CE-8) ☐ RRI-2B — 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) ☐ RRI-2C — Facilitate the provision of financial and technical assistance between 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 SRI-3 (all CEs, emphasis on CE-6 to CE-8) ☐ RRI-2D — Strengthen existing RSOO, if necessary (CE-6 to CE-8)
References	— Aviation Safety Implementation Assistance Partnership (ASIAP)

GASP objective	Effective safety oversight
Safety performance enabler	Collaboration
Safety initiative	RCI-2 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Phase	I-B
Stakeholder	Regions
Actions	☐ RCI-2A — 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) ☐ RCI-2B — Provide assistance via RASG and/or RSOO to States for the conduct of surveillance activities (CE-7) ☐ RCI-2C — Use technical guidance, tools and provisions for 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) ☐ RCI-2D — Resolve safety concerns identified via accident and incident investigations, safety reports and other means (CE-8) ☐ RCI-2E — While working to improve safety oversight, continue to work with RASG and/or RSOO to address global safety priorities, as applicable to the region
References	RCI-2 to RCI-2C — RASGs — RSOOs and COSCAPs RCI-2D — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* RCI-2E — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

GASP objective	Effective safety oversight
Safety performance enabler	Safety information exchange
Safety initiative	RXI-2 — 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
Phase	I-B
Stakeholder	Regions
Actions	☐ RXI-2A — Assess if States in the region have updated their primary source of safety information to ICAO ☐ RXI-2B — Solicit States in the region to complete and submit their USOAP corrective action plan ☐ RXI-2C — Solicit States in the region to update and submit their self-assessment checklist based on USOAP CMA protocol questions ☐ RXI-2D — Solicit States in the region to update and submit their State aviation activity questionnaire ☐ RXI-2E — Solicit States in the region to update and submit their compliance checklists on the EFOD system ☐ RXI-2F — Continue to encourage States in the region to update documents and records, as required, in a timely manner ☐ RXI-2G — 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*, sections 2.8, 2.14 and 2.15 — iMPLEMENT — iSTARS

INDUSTRY

Note.— There are no safety initiatives under the enabler "safety information exchange" aimed at industry in this sub-phase of the roadmap.

GASP objective	Effective safety oversight
Safety performance enabler	Standardization
Safety initiative	ISI-1 — Improvement of industry compliance with applicable regulations
Phase	I-B
Stakeholder	Industry
Actions	ISI-1A — Work together within industry to ensure compliance with applicable regulations (CE-6 to CE-8) ISI-1B — Encourage compliance through partnership, via management, industry and relevant associations (CE-8) ISI-1C — Encourage the active participation of industry in the RASGs to assist with the implementation of safety initiatives (CE-6 to CE-8)
References	— ACI Airport Excellence (APEX) in Safety — CANSO Standard of Excellence in Safety Management Systems — IATA Operational Safety Audit (IOSA) — IATA Safety Audit for Ground Operations (ISAGO)

GASP objective	Effective safety oversight
Safety performance enabler	Resources
Safety initiative	IRI-1 — Allocation of industry resources to enable effective safety oversight
Phase	I-B
Stakeholder	Industry
Actions	☐ IRI-1A — Identify resources that are available to support roadmap safety initiatives for States and regions (all CEs, emphasis on CE-6 to CE-8) ☐ IRI-1B — Participate in regional and international government/industry collaborative safety initiatives ☐ IRI-1C — Participate in State-sponsored surveys
References	— Aviation Safety Implementation Assistance Partnership (ASIAP)

GASP objective	Effective safety oversight
Safety performance enabler	Collaboration
Safety initiative	ICI-2 — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner
Phase	I-B
Stakeholder	Industry
Actions	☐ ICI-2A — 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) ☐ ICI-2B — Assist in resolving safety concerns identified via accident and incident investigations, safety reports and other means (CE-8) ☐ ICI-2C — Continue to work with regional groups to address global safety priorities, as applicable
References	ICI-2A — RASGs — RSOOs and COSCAPs ICI-2B — Doc 9756, *Manual of Aircraft Accident and Incident Investigation* ICI-2C — Annex 13, *Aircraft Accident and Incident Investigation,* Attachment C — *List of examples of serious incidents*

5.2 Phase II — State safety programme (SSP) implementation

STATES

GASP objective	SSP implementation
Safety performance enabler	Standardization
Safety initiative	SSI-6 — Start of SSP implementation at the national level
Phase	II
Stakeholder	States
Actions	☐ SSI-6A — Secure State-level commitment to improve safety ☐ SSI-6B — Conduct initial SSP gap analysis (checklist) then the detailed SSP self-assessment ☐ SSI-6C — Identify an SSP accountable executive and establish an SSP implementation team ☐ SSI-6D — Develop and execute an implementation plan for the SSP ☐ SSI-6E — Issue SMS regulations for service providers and assure SMS implementation ☐ SSI-6F — Identify safety management best practices in coordination with other States ☐ SSI-6G — While working on SSP implementation, continue to work on the global safety priorities, as applicable to the State
References	SSI-6A, B and D — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual (SMM)*, Third Edition, Appendix 7 to Chapter 4 — ICAO USOAP CMA Online Framework (log-in required) — iSTARS SSP gap analysis (log-in required) — Safety Management International Collaboration Group (SM ICG), *10 Things You Should Know About SMS* SSI-6A, C and E — SM ICG, *The Frontline Manager's Role in SMS* — SM ICG, *The Senior Manager's Role in SMS* SSI-6E — SM ICG, *SMS Evaluation Tool* SSI-6F — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators* SSI-6G — Annex 13, *Aircraft Accident and Incident Investigation*, Attachment C — *List of examples of serious incidents*

GASP objective	SSP implementation
Safety performance enabler	Resources
Safety initiative	SRI-4 — Strategic allocation of resources to start SSP implementation
Phase	II
Stakeholder	States
Actions	☐ SRI-4A — Establish a process for planning and allocation of resources to enable SSP implementation and identify areas where resources are needed ☐ SRI-4B — Obtain resources from national and appropriate authorities' leadership and stakeholders within the State to support SSP implementation ☐ SRI-4C — Work with the ICAO Regional Office to make use of available means (e.g. Technical Cooperation Bureau) to provide assistance needed for SSP implementation ☐ SRI-4D — Work with RSOO, other States and other organizations, as appropriate (e.g. the RASG), to train qualified and competent technical personnel to fulfil their duties and responsibilities regarding SSP implementation
References	SRI-4A and B — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 4 including all appendices SRI-4C — ICAO Technical Cooperation Bureau regional coordinator SRI-4D — SM ICG, SMS Inspector Competency Guidance

GASP objective	SSP implementation
Safety performance enabler	Collaboration
Safety initiative	SCI-3 — Strategic collaboration with key aviation stakeholders to start SSP implementation
Phase	II
Stakeholder	States
Actions	☐ SCI-3A — Identify areas where collaboration/support is needed as part of the SSP implementation plan (See SRI-4B) ☐ SCI-3B — Identify relevant collaborators from the key aviation stakeholders, including other States implementing or having implemented an SSP ☐ SCI-3C — Develop and execute an action plan to address the components/elements identified as missing or deficient during the SSP gap analysis (See SSI-6B) ☐ SCI-3D — 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 ☐ SCI-3E — 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 SRI-4D) ☐ SCI-3F — Establish a process for sharing technical guidance and tools related to SSP (e.g. advisory circulars, staff instructions), in collaboration with other States, RASG, RSOO, ICAO and/or other stakeholders
References	SCI-3A to SCI-3C — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 4, including all appendices — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) — ICAO USOAP CMA Online Framework (log-in required) — iSTARS SSP gap analysis (log-in required) — SM ICG, SSP Assessment Tool SCI-3 to SCI-3F — Aviation Safety Implementation Assistance Partnership (ASIAP) — ICAO Technical Cooperation Bureau regional coordinator — No Country Left Behind campaign safety implementation resources SCI-3E — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP)

GASP objective	SSP implementation
Safety performance enabler	Collaboration
Safety initiative	SCI-4 — Strategic collaboration with key aviation stakeholders to complete SSP implementation
Phase	II
Stakeholder	States
Actions	☐ SCI-4A — Work with collaborators (identified in SCI-3) to execute the action plan for implementation ☐ SCI-4B — Work with collaborators to ensure the SSP is present, suitable, operational and effective ☐ SCI-4C — Ensure continuous improvement of the SSP, in collaboration with other States, RASG, RSOO, ICAO and/or other stakeholders ☐ SCI-4D — Serve as a champion State to promote best practices among other States
References	SCI-4A — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) SCI-4B — SM ICG, SSP Assessment Tool SCI-4D — Aviation Safety Implementation Assistance Partnership (ASIAP) — ICAO Technical Cooperation Bureau regional coordinator — No Country Left Behind campaign safety implementation resources — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators*

GASP objective	SSP implementation
Safety performance enabler	Safety information exchange
Safety initiative	SXI-3 — Establishment of safety risk management at the national level (step 1)
Phase	II
Stakeholder	States
Actions	☐ SXI-3A — Establish a legal framework related to the protection of safety data, safety information and other related sources ☐ SXI-3B — Establish a State mandatory occurrences reporting system ☐ SXI-3C — Develop a safety database for monitoring system safety issues and hazard identification, in line with the principles of Doc 9859 — *Safety Management Manual (SMM)* ☐ SXI-3D — Establish and maintain a process to identify hazards from collected safety data ☐ SXI-3E — Establish and utilize a process to ensure the assessment of safety risks associated with identified hazards ☐ SXI-3F — Establish a State voluntary and confidential reporting system providing data to the safety database (see SXI-3C)
References	SXI-3A to SXI-3F — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 4 SXI-3B to SXI-3D — 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* SXI-3E — SM ICG, *Risk Based Decision Making Principles*

GASP objective	SSP implementation
Safety performance enabler	Safety information exchange
Safety initiative	SXI-4 — Establishment of safety risk management at the national level (step 2)
Phase	II
Stakeholder	States
Actions	☐ SXI-4A — Develop safety performance indicators via the established safety risk management process ☐ SXI-4B — Develop safety performance measurement methodologies, aligned with the harmonized safety metrics within the region, via the established safety risk management process (See SXI-3E) ☐ SXI-4C — Establish the acceptable level of safety performance to be achieved through the SSP ☐ SXI-4D — Encourage establishment of voluntary and mandatory safety reporting systems as part of service providers' SMS ☐ SXI-4E — 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 ☐ SXI-4F — Contribute safety information to regional reporting and monitoring mechanisms
References	SXI-4A to SXI-4F — Doc 9859*, Safety Management Manual (SMM)* SXI-4A to SXI-4C — SM ICG, *A Systems Approach to Measuring Safety Performance — The Regulator Perspective* — SM ICG, *Measuring Safety Performance Guidelines for Service Providers* SXI-4E and SXI-4F — RASG regional safety reports

REGIONS

GASP objective	SSP implementation
Safety performance enabler	Standardization
Safety initiative	RSI-4 — Start of promotion of SSP implementation at the regional level
Phase	II
Stakeholder	Regions
Actions	☐ RSI-4A — Identify entity in the region who will guide and support SSP implementation at the regional level (RASG, RSOO, ICAO Regional Office, etc.) ☐ RSI-4B — Guide and support SSP implementation at the regional level: ○ Assess EI scores and verify completion of Phase I 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 ☐ RSI-4C — Use the roadmap to align priorities of the RASG ☐ RSI-4D — Engage States at the regional level and focus activities in line with the roadmap ☐ RSI-4E — Continue work on the global safety priorities, as applicable to the region
References	RSI-4A and RSI-4B — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual (SMM)*, Third Edition, Appendix 7 to Chapter 4 — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) — ICAO USOAP CMA Online Framework (log-in required) — iSTARS SSP gap analysis (log-in required) — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators* — SM ICG, *SMS Evaluation Tool* RSI-4E — Annex 13, *Aircraft Accident and Incident Investigation*, Attachment C — *List of examples of serious incidents*

GASP objective	SSP implementation
Safety performance enabler	Resources
Safety initiative	RRI-3 — Regional safety initiatives to support consistent coordination of regional and sub-regional programmes for SSP implementation
Phase	II
Stakeholder	Regions
Actions	☐ RRI-3A — Identify resources that are available to support SSP implementation by States in the region ☐ RRI-3B — 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 ☐ RRI-3C — Work with the ICAO Regional Office to facilitate available technical assistance, between RASG, RSOO and other stakeholders, to provide assistance needed for SSP implementation ☐ RRI-3D — Monitor the progress of SSP implementation (via iSTARS) and adjust regional resource priorities continuously
References	RRI-3B to RRI-3D — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 4 including all appendices RRI-3C — Doc 9734, *Safety Oversight Manual,* Part B — *The Establishment and Management of a Regional Safety Oversight System* — Aviation Safety Implementation Assistance Partnership (ASIAP) — ICAO Technical Cooperation Bureau regional coordinator RRI-3D — iSTARS SSP gap analysis (log-in required)

GASP objective	SSP implementation
Safety performance enabler	Collaboration
Safety initiative	RCI-3 — Strategic collaboration with key aviation stakeholders to support SSP implementation
Phase	II
Stakeholder	Regions
Actions	☐ RCI-3A — Identify areas where collaboration/support is needed as part of States' SSP implementation plans (See SRI-4B) ☐ RCI-3B — Identify relevant collaborators from the key aviation stakeholders, including States implementing or having implemented an SSP ☐ RCI-3C — Develop and implement a consistent and harmonized strategy to address the common components/elements identified as missing or deficient during the SSP gap analysis of States in the region ☐ RCI-3D — 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 ☐ RCI-3E — 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) (see SRI-4D) ☐ RCI-3F — Establish and implement a process for sharing technical guidance and tools related to SSP (e.g. advisory circulars, staff instructions), in collaboration with States, RASG, RSOO, ICAO and/or other stakeholders ☐ RCI-3G — Work with States in the region to ensure their SSPs are present, operational and effective and promote continual improvement
References	RCI-3A to RCI-3C — Annex 19, *Safety Management,* Chapter 3 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 4 including all appendices — ICAO Safety Management Training Programme: Safety Management Systems (SMS) and State Safety Programme (SSP) — ICAO USOAP CMA Online Framework (log-in required) — iSTARS SSP gap analysis (log-in required) RCI-3D to RCI-3G — ICAO Technical Cooperation Bureau regional coordinator — No Country Left Behind campaign safety implementation resources RCI-3F — SM ICG, SSP Assessment Tool RCI-3G — SM ICG, *How to Support a Successful SSP and SMS Implementation — Recommendations for Regulators*

GASP objective	SSP implementation
Safety performance enabler	Safety information exchange
Safety initiative	RXI-3 — Establishment of safety risk management at the regional level
Phase	II
Stakeholder	Regions
Actions	☐ RXI-3A — Encourage States and RSOOs 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 ☐ RXI-3B — Develop and adopt harmonized safety reporting systems, as part of service providers' SMS within the region (e.g. voluntary reporting systems) ☐ RXI-3C — Encourage States and industry within the region to share safety information and contribute to regional reporting and monitoring mechanisms ☐ RXI-3D — Use regional safety performance measurement methodologies (including harmonized safety metrics) for the RASG to conduct safety analysis in coordination with RSOO or RAIO ☐ RXI-3E — Use standardized performance indicators at the regional level (within the RASG) ☐ RXI-3F — Establish regional safety risk registries to be integrated in States' risk mitigation plans
References	RXI-3A — iSTARS RXI-3B to RXI-3F — Doc 9734, *Safety Oversight Manual*, Part B — *The Establishment and Management of a Regional Safety Oversight System* — Doc 9859, *Safety Management Manual (SMM)*, Third Edition, Appendix 2 to Chapter 2 — 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*

INDUSTRY

GASP objective	SSP implementation
Safety performance enabler	Standardization
Safety initiative	ISI-2 — Improvement of industry compliance with applicable SMS requirements
Phase	II
Stakeholder	Industry
Actions	ISI-2A — Implement an SMS commensurate to the size and complexity of the service provider, as required by national regulations ISI-2B — 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 ISI-2C — Utilize available guidance material (e.g. from States or international organizations) to assist with SMS implementation
References	ISI-2A to ISI-2C — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 5 ISI-2A — State's national SMS requirements ISI-2C — SM ICG, *SMS for Small Organizations*

GASP objective	SSP implementation
Safety performance enabler	Resources
Safety initiative	IRI-2 — Resources for service providers to effectively implement SMS
Phase	II
Stakeholder	Industry
Actions	☐ IRI-2A — Work in collaboration with State and industry associations to advance SMS implementation and identify expectations that cannot be resourced efficiently ☐ IRI-2B — Identify areas where resources are needed as part of the SMS implementation plan developed following the SMS gap analysis ☐ IRI-2C — Establish a process for resource planning and allocation to enable SMS implementation, including budget and personnel which may be obtained from industry organizations ☐ IRI-2D — Obtain commitment from the accountable executive within the service provider for the necessary resources to enable SMS implementation ☐ IRI-2E — 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 (SMM)*, Third Edition, Chapter 5

GASP objective	SSP implementation
Safety performance enabler	Collaboration
Safety initiative	ICI-3 — Strategic collaboration with key aviation stakeholders to complete SSP implementation
Phase	II
Stakeholder	Industry
Actions	☐ ICI-3A — Help identify relevant collaborators from the key aviation stakeholders involved in implementing SSP ☐ ICI-3B — Work with collaborators to support action plan for SSP implementation: o Support SSP through sharing and supporting harmonization of SMS among industry ☐ ICI-3C — 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 ☐ ICI-3D — Provide input to the process for sharing technical guidance and tools related to SSP (e.g. advisory circulars, staff instructions), in collaboration with States, RASG, RSOO, ICAO and/or other stakeholders ☐ ICI-3E — Promote SSP implementation ☐ ICI-3F — Support continuous improvement of SSP, in collaboration with States, RASG, RSOO, ICAO and/or other stakeholders ☐ ICI-3G — Continue to work with regional groups to address global safety priorities, as applicable
References	ICI-3A to ICI-3F — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 5 — State's national SMS requirements ICI-3G — Annex 13, *Aircraft Accident and Incident Investigation*, Attachment C — *List of examples of serious incidents*

GASP objective	SSP implementation
Safety performance enabler	Safety information exchange
Safety initiative	IXI-1 — Establishment of safety risk management at the service provider level (step 1)
Phase	II
Stakeholder	Industry
Actions	☐ IXI-1A — Establish mandatory safety reporting systems ☐ IXI-1B — Provide information from the service provider to the State mandatory safety reporting system, as required ☐ IXI-1C — Establish internal mechanisms related to the protection of safety data, safety information and related sources for the purpose of safety improvement ☐ IXI-1D — Establish voluntary and confidential hazard/occurrence reporting systems as part of the SMS ☐ IXI-1E — Establish and maintain a safety database for technical personnel to monitor system safety issues within the service provider ☐ IXI-1F — Establish and utilize a safety risk management process
References	IXI-1A to IXI-1F — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 5 — State's national SMS requirements IXI-1A — 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*

GASP objective	SSP implementation
Safety performance enabler	Safety information exchange
Safety initiative	IXI-2 — Establishment of safety risk management at the service provider level (step 2)
Phase	II
Stakeholder	Industry
Actions	☐ IXI-2A — Develop safety performance measurement methodologies, aligned with harmonized safety metrics within industry, via the established safety risk management process ☐ IXI-2B — Develop safety performance indicators and associated targets/alert settings, via the established safety risk management process ☐ IXI-2C — Encourage sharing and use of information from within industry to identify hazards and mitigate safety risks
References	IXI-2A to IXI-2C — Annex 19, *Safety Management,* Chapter 4 — Doc 9859, *Safety Management Manual (SMM),* Third Edition, Chapter 5 — State's national SMS requirements IXI-2A and IXI-2B — SM ICG, *A Systems Approach to Measuring Safety Performance — The Regulator Perspective* — SM ICG, *Measuring Safety Performance Guidelines for Service Providers* IXI-2B — Safety performance indicators developed by international organizations: ○ ACI ○ CANSO ○ IATA ○ IBAC ○ ICCAIA

5.3 Phase III — Predictive risk management

STATES

Note.— There are no safety initiatives under the enabler "standardization" aimed at States in this phase of the roadmap.

GASP objective	Predictive risk management
Safety performance enabler	Resources
Safety initiative	SRI-5 — Acquisition of resources to increase predictive risk management capabilities
Phase	III
Stakeholder	States
Actions	☐ SRI-5A — Identify needed resources to support safety intelligence collection and processing, advanced data analysis and information sharing ☐ SRI-5B — Obtain resources to develop predictive risk management capabilities ☐ SRI-5C — Recruit, train, and retain qualified technical personnel to specialize in risk modelling and safety data analysis and engineering ☐ SRI-5D — Train safety inspector workforce to focus on safety oversight of service providers that have deployed advanced SMS within the SSP framework
References	N/A

GASP objective	Predictive risk management
Safety performance enabler	Collaboration
Safety initiative	SCI-5 — Strategic collaboration with key aviation stakeholders to support transition to predictive risk management
Phase	III
Stakeholder	States
Actions	☐ SCI-5A — Identify areas where collaboration/support is needed to ensure the State and national and industry aviation stakeholders understand and implement safety culture concepts to fully embrace an open, just culture and non-punitive safety reporting ☐ SCI-5B — 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 sharing of best practices, to support safety culture development and the transition to predictive risk management ☐ SCI-5C — Foster and participate in public-private partnerships similar to the commercial/general aviation safety teams concept to identify and implement system safety enhancements ☐ SCI-5D — 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	SCI-5A — CANSO Guidelines on Just Culture — CANSO Safety Culture Definition and Enhancement Process — SKYbrary Safety Culture and Just Culture resources and tools SCI-5B — EASA Network of Analysts SCI-5C — Commercial Aviation Safety Team — European Strategic Safety Initiative — General Aviation Joint Steering Committee — International Helicopter Safety Team — RASGs SCI-5D — Aviation Safety InfoShare

GASP objective	Predictive risk management
Safety performance enabler	Safety information exchange
Safety initiative	SXI-5 — Advancement of safety risk management at the national level
Phase	III
Stakeholder	States
Actions	☐ SXI-5A — 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.) ☐ SXI-5B — Develop safety risk modelling capabilities to support monitoring system safety issues and accident/incident prevention
References	SXI-5A — EUROCONTROL Voluntary ATM Incident Reporting (EVAIR) — European Authorities Coordination Group on Flight Data Monitoring (EAFDM) — FAA Aviation Safety Information Analysis and Sharing Program — IATA Flight Data eXchange (FDX) — IATA STEADES Global Aviation Safety Data Sharing Program — iMPLEMENT

REGIONS

Note.— There are no safety initiatives under the enabler "standardization" aimed at the regions in this phase of the roadmap.

GASP objective	Predictive risk management
Safety performance enabler	Resources
Safety initiative	RRI-4 — Regional allocation of resources to support continued development of predictive risk management capabilities
Phase	III
Stakeholder	Regions
Actions	□ RRI-4A — Work with States and organizations to leverage available technologies and expertise within the region to enhance safety analysis and monitoring for risk modelling and mitigation strategies □ RRI-4B — Identify and pool qualified USOAP auditor candidates from within the region with experience in safety oversight of service providers that have deployed advanced SMS □ RRI-4C — Work with the ICAO Regional Office(s) and donor organizations to make use of available means (e.g. Technical Cooperation Bureau) to provide assistance in developing predictive risk management capabilities
References	N/A

GASP objective	Predictive risk management
Safety performance enabler	Collaboration
Safety initiative	RCI-4 — Regional collaboration with key aviation stakeholders to support transition to predictive risk management
Phase	III
Stakeholder	Regions
Actions	☐ RCI-4A — Support States in understanding and implementing safety culture concepts by sharing best practices and facilitating mentoring programmes to support safety culture development and the transition to predictive risk management ☐ RCI-4B — Promote the sharing and exchange of safety information and best practices within a confidential and non-punitive environment among States and stakeholders ☐ RCI-4C — Encourage and support State public-private partnerships similar to the commercial/general aviation safety team concept to identify and implement system safety enhancements ☐ RCI-4D — 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	RCI-4A and RCI-4B — CANSO Guidelines on Just Culture — CANSO Safety Culture Definition and Enhancement Process — EASA Network of Analysts — SKYbrary Safety Culture and Just Culture resources and tools RCI-4C — Commercial Aviation Safety Team — European Strategic Safety Initiative — General Aviation Joint Steering Committee — International Helicopter Safety Team RCI-4D — Aviation Safety InfoShare — ICAO Safety Information Monitoring Service (SIMS) — RASGs

GASP objective	Predictive risk management
Safety performance enabler	Safety information exchange
Safety initiative	RXI-4 — Advancement of safety risk management at the regional level
Phase	III
Stakeholder	Regions
Actions	☐ RXI-4A — Establish data sharing connectivity and integration among States and stakeholders to enable high-level regional monitoring and modelling activities ☐ RXI-4B — Identify requirements for establishing inter-regional and global data sharing and connectivity
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

INDUSTRY

Note.— There are no safety initiatives under the enabler "standardization" aimed at industry in this phase of the roadmap.

GASP objective	Predictive risk management
Safety performance enabler	Resources
Safety initiative	IRI-3 — Allocation of industry resources to support continuous improvement of SSP and SMS
Phase	III
Stakeholder	Industry
Actions	IRI-3A — Ensure competent technical personnel are allocated, at the service provider level, to support the requirements of the SSP infrastructure in place IRI-3B — Provide safety analysis results from service providers to support requirements of the State's SSP
References	N/A

GASP objective	Predictive risk management
Safety performance enabler	Collaboration
Safety initiative	ICI-4 — Strategic collaboration with key aviation stakeholders to support transition to predictive risk management
Phase	III
Stakeholder	Industry
Actions	☐ ICI-4A — Work with industry stakeholders to leverage best practices with safety information analysis ☐ ICI-4B — Share safety risk identification with stakeholders for mitigation and monitoring strategies ☐ ICI-4C — Actively participate with States and organizations engaged in predictive risk analysis
References	— Aviation Safety InfoShare — Commercial Aviation Safety Team — European Strategic Safety Initiative — General Aviation Joint Steering Committee — International Helicopter Safety Team — RASGs

GASP objective	Predictive risk management
Safety performance enabler	Safety information exchange
Safety initiative	IXI-3 — Advancement of safety risk management at the service provider level
Phase	III
Stakeholder	Industry
Actions	☐ IXI-3A — Verify that a legal framework related to the protection of safety data, safety information and other related sources is implemented and effective ☐ IXI-3B — Develop safety risk modelling capabilities to support monitoring system safety issues and accident/incident prevention ☐ IXI-3C — Monitor safety information exchange networks for continuous improvements
References	IXI-3A — FAA Aviation Safety Information Analysis and Sharing Program — IATA Flight Data eXchange (FDX) — IATA STEADES Global Aviation Safety Data Sharing Program

Appendix B

IMPLEMENTATION RESOURCES AVAILABLE TO STATES

1. GENERAL

This appendix presents implementation resources available to States. These resources include 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 may be used by stakeholders to assist in the implementation of safety initiatives in support of the GASP objectives.

2. NO COUNTRY LEFT BEHIND (NCLB) CAMPAIGN

2.1 The ICAO Council determined that ICAO should focus its implementation activities on States with higher accident rates or security threats and review what it could do 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 NCLB campaign coordinates ICAO's and stakeholder's efforts 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. 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.

2.3 The NCLB campaign also underscores ICAO's endeavours to resolve significant safety concerns (SSCs) brought to light through ICAO's safety oversight audits as well as other safety, security and emissions-related objectives. Further information about the campaign can be found on the ICAO website at www.icao.int/about-icao/NCLB/Pages/default.aspx.

3. IMPLEMENTATION ACTIVITIES

3.1 ICAO has put in place a series of implementation activities which are available to States, including but not limited to the following:

a) the next generation of aviation professionals (NGAP) programme;

b) the integrated safety trend analysis and reporting system (iSTARS);

c) the safety fund (SAFE);

d) coordination and collaboration with aviation safety partners;

e) the collaborative arrangement for the prevention and management of public health events in civil aviation (CAPSCA) programme; and

f) performance-based navigation (PBN) products and services.

3.2 Detailed guidance on each of these programmes can be found in sections 3 to 8.

4. NEXT GENERATION OF AVIATION PROFESSIONALS PROGRAMME

4.1 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. 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 to exposing possible shortages or surpluses globally and by region.

4.2 Since 2009, ICAO has been working with key stakeholders, under the next generation of aviation professionals (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 (Doc 9956 refers). 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 compound the problem.

4.3 ICAO is working to raise awareness on the impending shortages of personnel, forecast both global and regional personnel needs, and assist the global aviation community in attracting, educating, training and retaining the next generation of aviation professionals. In addition, ICAO has developed material for the implementation of competency-based training and assessment approaches specific to aviation professionals. Further information about the NGAP programme can be found on the ICAO website at: www.icao.int/ngap.

5. INTEGRATED SAFETY TREND ANALYSIS AND REPORTING SYSTEM

5.1 The future aviation system will become increasingly automated and far more complex. Safety oversight under these future circumstances will require the use of proactive and predictive 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.

5.2 ICAO has improved and expanded online access to real-time safety information through the integrated safety trend analysis and reporting system (iSTARS). The current version of iSTARS (iSTARS 2.0, also referred to as SPACE) has evolved from a safety trend analysis and reporting system to include a range of additional aviation data. The goal of this initiative is to support the evolution to 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 2.0 at the ICAO portal 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.

6. SAFETY FUND

6.1 During the past decade, ICAO's aviation safety implementation initiatives experienced significant growth. Accordingly, ICAO created the safety fund (SAFE) to allow the collection and use of voluntary contributions from States and other donors.

6.2 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 the universal safety oversight audit programme (USOAP) as a part of the GASP;

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

c) safety-related projects which are currently unfunded.

6.3 In order to mobilize resources for replenishment of SAFE, ICAO developed a strategy to reach out to donor States as well as the private sector for continued contributions to increase assistance to States. Further information about SAFE can be found on the ICAO website at www.icao.int/safety/scan/Pages/Safety-Fund-SAFE.aspx.

7. COORDINATION AND COLLABORATION WITH AVIATION SAFETY PARTNERS

ICAO is leading efforts to foster partnerships with States, international organizations, regional safety organizations, financial institutions and industry, in order to increase the capacity to assist States in managing civil aviation. During the second High-level Safety Conference held in 2015 (HLSC 2015), ICAO established a new arrangement with stakeholders built upon the existing safety collaboration assistance network (SCAN), namely, the Aviation Safety Implementation Assistance Partnership (ASIAP). 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 strengthens and will contribute to improving aviation safety at the global and regional levels. Further information about SCAN and ASIAP can be found on the ICAO website at www.icao.int/safety/scan.

8. COLLABORATIVE ARRANGEMENT FOR THE PREVENTION AND MANAGEMENT OF PUBLIC HEALTH EVENTS IN CIVIL AVIATION PROGRAMME

8.1 Major public health events can adversely affect safe air travel through transmission of communicable disease to passengers and crews. They may also have a direct effect on the availability of safety-critical personnel in the event of a local outbreak. In addition, the air transport system is the most likely mode by which such disease may be widely disseminated.

8.2 The global collaborative arrangement for the prevention and management of public health events in civil aviation (CAPSCA) programme consists of five regional projects and brings relevant stakeholders together, especially those in the public health and aviation sectors, to synergistically reduce the risk posed by public health emergencies and potential emergencies such as pandemic influenza, the Severe Acute Respiratory Syndrome (SARS) and the Ebola virus.

8.3 More than half of ICAO's Member States participate in one of the regional projects and are working with ICAO's main partners (Airports Council International (ACI), the International Air Transport Association (IATA) and the World Health Organization (WHO)) to develop and implement harmonized public health preparedness and response plans. These plans include the public health component of the aerodrome emergency plan and associated standard operating procedures. Such work is essential to reduce the future risk to aviation and to the health of human populations since both sectors remain vulnerable to future public health events.

9. PERFORMANCE-BASED NAVIGATION PRODUCTS AND SERVICES

9.1 The HLSC 2015 urged States to implement Assembly Resolution A37-11, which addresses global performance-based navigation (PBN) goals, with emphasis on areas where maximum safety benefits can be gained. The HLSC 2015 called upon States to expedite full implementation of PBN regulatory oversight by making full use of all available resources to improve the effectiveness of their PBN oversight function.

9.2 Many safety benefits can be gained from PBN implementation. For example, the implementation of PBN approaches with vertical guidance (APV) on runways that only have non-precision approaches (no vertical guidance) can help reduce the probability of runway excursions. Additionally, the implementation of PBN approaches with APV on runways that only have non-precision approaches can help reduce the probability of controlled flight into terrain (CFIT).

9.3 ICAO has developed various products and services to assist States with PBN implementation. They include assistance in instrument procedure and airspace design training, implementation and planning, PBN business case development and funding coordination. Further information can be found on the ICAO website at www.icao.int/pbn.

Appendix C

GLOBAL AVIATION SAFETY PLAN
GOVERNANCE AND EVOLUTION

1. ROLE OF THE ICAO ASSEMBLY AND THE COUNCIL

The GASP is under the authority of the ICAO Council so as to ensure consistency between the GASP and the ICAO strategic objectives. The Council approves the GASP and its amendments prior to eventual budget-related developments and endorsement by the ICAO Assembly.

2. THE GASP AND SAFETY REGIONAL/NATIONAL PLANNING

Although the GASP presents a global perspective, its content may need to be adjusted to meet regional or national needs. Regional and national safety plans should be developed in alignment with the GASP. As illustrated in Figure C-1, the regional aviation safety groups (RASGs) are integral parts of the planning process. Regional and national safety policies should be adapted based on issues faced by the States concerned.

3. GASP UPDATE PROCESS

3.1 Aviation is an ever-changing and challenging industry. Therefore, the GASP is reviewed and updated prior to each session of the Assembly. ICAO reviews the GASP every three years through an established and transparent process (see Figure C-2). The Air Navigation Commission (ANC) reviews the GASP as part of its work programme and consults States on proposed amendments. 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 State safety programmes/safety management systems, as well as any relevant risk mitigations;

b) recommendations by RASGs;

c) lessons learned by States and industry;

d) possible changes in future aviation needs, regulatory context, 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.

3.2 After approval by the Council, amendments to the GASP are presented to the following session of Assembly for endorsement by Member States.

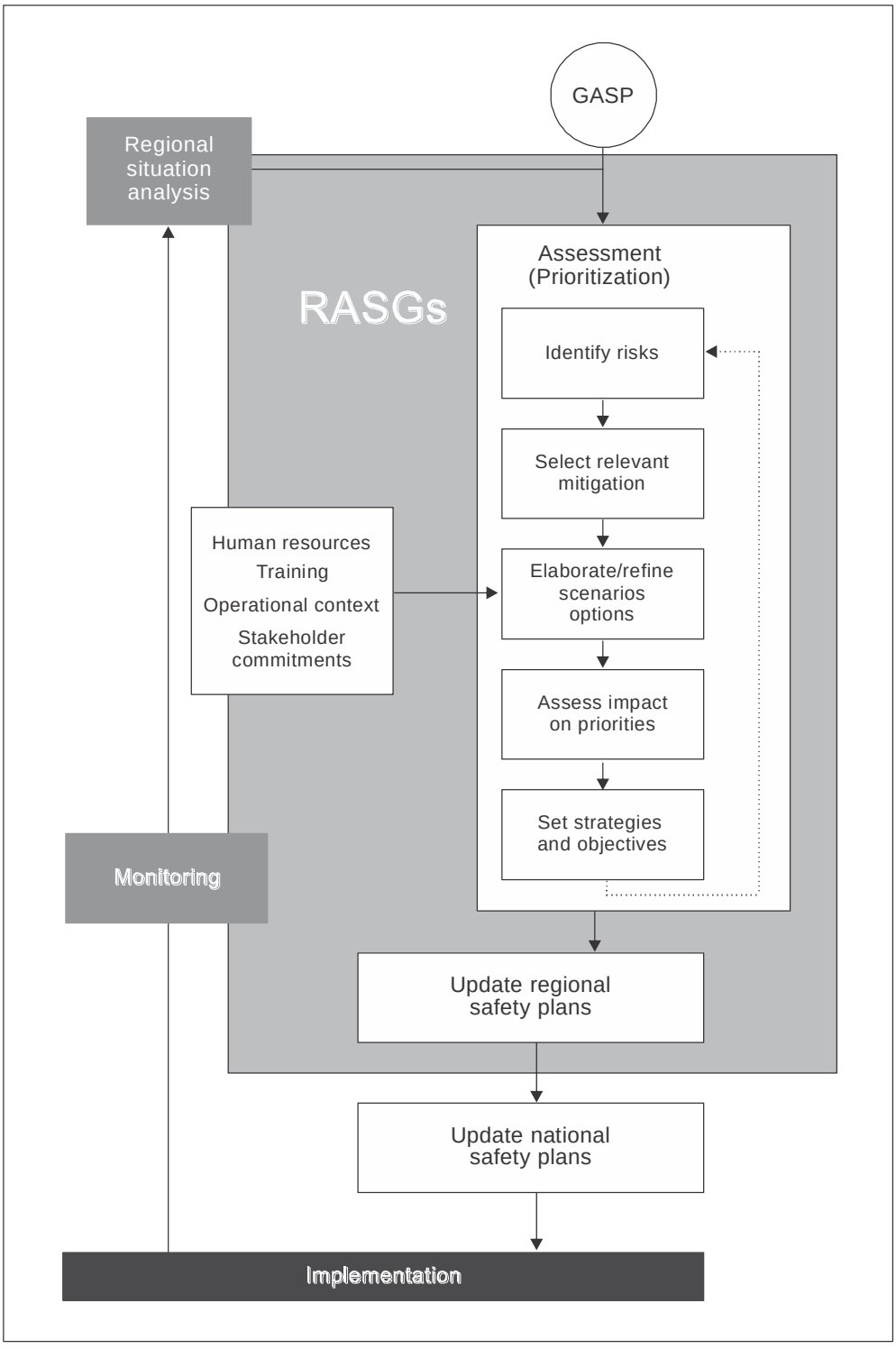

Figure C-1. GASP and safety regional/national planning

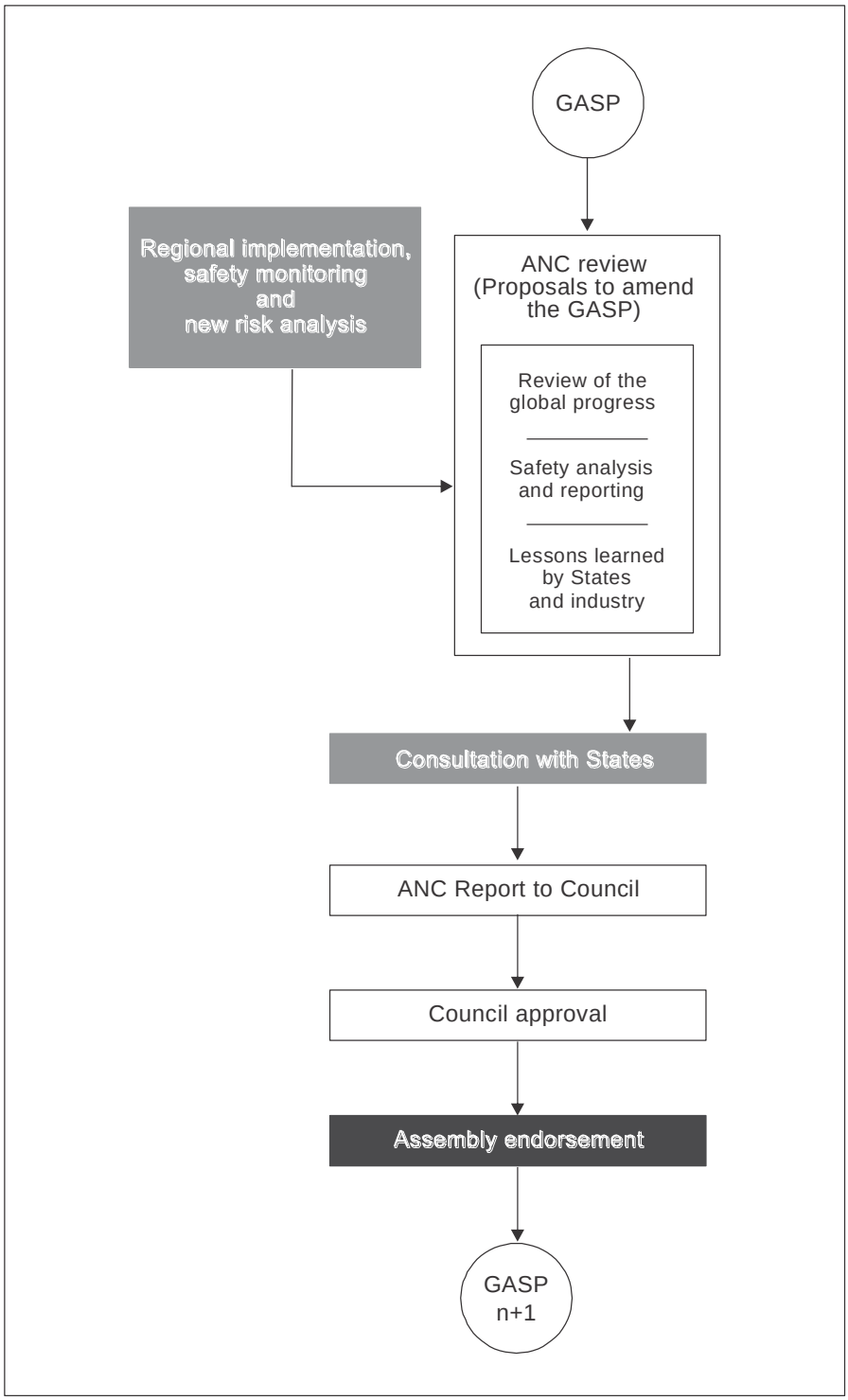

Figure C-2. GASP update process

Appendix D

STATE SAFETY PERFORMANCE INDICATORS

1. PERFORMANCE-BASED APPROACH

1.1 Safety performance is a State's or service provider's safety achievement as defined by its safety performance targets and safety performance indicators (SPIs). An SPI is a data-based parameter used for monitoring and assessing safety performance. A performance-based approach that defines safety performance levels should be adopted to support a global improvement in safety. This approach enables States and regions to review the safety performance of their systems and to take action, if needed, to address discrepancies between existing and desired performance levels.

1.2 The first High-level Safety Conference held in 2010 (HLSC 2010) identified a need for a harmonized methodology for the development of SPIs to enable States to develop and establish an acceptable level of safety related to a State safety programme (SSP). The HLSC 2010 also recommended ICAO work with States and regions to create a common methodology for the development of SPIs. As a follow-up to the HLSC 2010, ICAO worked with States and industry to identify harmonized safety metrics. The goal of such metrics is to enable analysis to identify and mitigate safety risks as well as to facilitate the exchange of information. To provide further support, ICAO developed tools to gather, analyse and share operational safety data at the international level. Harmonized SPIs are needed to facilitate the exchange of safety information at the regional and international levels. At the regional level, the regional aviation safety groups (RASGs) are to monitor regional SPIs, coordinate regional initiatives and provide practical assistance to States in their respective regions. The information gathered via SPIs, when aggregated at regional and international levels, supports ICAO and the regions in setting priorities. Future updates of the GASP will provide an enhanced global framework designed to support the progressive safety performance at the different levels (i.e. national, regional, international).

Note.— The Safety Management Manual (SMM) *(Doc 9859) contains guidance material related to the development of States' and service providers' SPIs and the acceptable level of safety performance (ALoSP) concept.*

2. PHASED-APPROACH TO IMPLEMENTATION

2.1 ICAO's safety management provisions emphasize the importance of a performance-based approach to managing safety. The ALoSP concept complements the traditional approach to safety oversight, which is primarily focused on prescriptive regulatory compliance, with a performance-based approach that defines actual safety performance levels within an SSP framework. A fully developed ALoSP monitoring and measurement process needs to identify all the safety-critical sectors and the SPIs that define the level of safety in these sectors. ICAO encourages States to start (or progress) the implementation of a performance-based approach to managing safety. The primary focus is to achieve compliance with ICAO Standards and Recommended Practices (SARPs) and to reduce high-consequence events where such issues are evident. The focus should progress to areas where States are concerned with continuous improvement in safety performance.

2.2 As States and regions have different needs and maturity levels in performance monitoring, ICAO proposes a set of SPIs designed to address these different needs and maturity levels. Tables D-1 and D-2 contain examples of SPIs which States and regions may adopt. These SPIs were shared with the international aviation community during the

second High-level Safety Conference held in 2015 (HLSC 2015), through an information paper (IP/01) entitled *Safety data, performance metrics and indicators*. ICAO will further develop and may modify these SPIs, in cooperation with stakeholders, in order to refine their relevance. States are encouraged to further develop their SPIs and share them at the regional and international levels.

Table D-1. Sample set of State safety performance indicators

#	*Indicators and metrics*	*Type*	*Usage*
1.	**Effective implementation of State safety oversight system** *Metrics:* • USOAP EI Scores overall • USOAP EI Scores by technical area • USOAP EI Scores by critical element	Predictive	Target
2.	**Progress in SSP implementation** *Metrics:* • Percentage of completed gap analysis questions • Percentage of implemented gap analysis questions overall • Percentage of implemented gap analysis questions by element	Predictive	Target
3.	**Progress in SMS implementation** *Metrics:* • Percentage of completed gap analysis questions by operator • Percentage of implemented gap analysis questions overall by operator • Percentage of implemented gap analysis questions by element and by operator	Predictive	Target
4.	**Frequency and severity of accidents and incidents** *Metrics:* • Number and distribution of occurrences by severity level (accident, serious incidents, etc.) and the ICAO Accident/Incident Data Reporting System (ADREP) occurrence category • Number and distribution of fatalities by ADREP occurrence category • Occurrence per number of departures (rate) *Note.— Occurrences should be limited to specific categories of aircraft and operations, such as aircraft above 5 700 kg operating scheduled commercial flights.*	Reactive/ proactive	Target

#	*Indicators and metrics*	*Type*	*Usage*
5.	**Certification of aerodromes** *Metrics:* • Number and percentage of certified international aerodromes overall and by airspace	Predictive	Target
6.	**Significant safety concerns** Metrics: • Number and duration of USOAP CMA significant safety concerns by technical area	Predictive	Target
7.	**Presence of notable hazardous conditions** *Metrics:* • Number, duration and distribution of safety-related NOTAMs by the *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400), Q-code categories	Predictive	Monitor
8.	**Fleet modernization** *Metrics:* • Average age of all registered and operated aircraft and their distribution by operator • Percentage of all registered and operated aircraft above 20 years and their distribution by operator	Predictive	Monitor
9.	**Effectiveness of foreign operator safety assessment programmes** *Metrics:* • Compliance scores by foreign and national operator	Predictive	Monitor
10.	**Industry certification** *Metrics:* • Number and percentage of operators holding industry certificates by type (IOSA, ISAGO, IS-BAH, IS-BAO, etc.)	Predictive	Monitor
11.	**Extent of environmental hazards** *Metrics:* • Average terrain elevation around airports • Percentage of METARs indicating low ceiling or visibility by month and location	Predictive	Be aware

Table D-2. Sample set of State level of activity indicators

#	*Indicators and metrics*	*Type*	*Usage*
1.	**Fleet size** *Metrics:* • Number and distribution of aircraft models overall • Number and distribution of aircraft models by operator • Number of aircraft registered and operated and their distribution by operator	Level of activity	Monitor
2.	**Traffic volume** *Metrics:* • Number of monthly and annual departures by operator, airport and route • Number of destinations overall and by airport • Number of departures per destination overall and by airport • Number of flights handled by airspace	Level of activity	Be aware

Appendix E

CODE OF CONDUCT ON THE SHARING AND USE OF SAFETY INFORMATION

1. INTRODUCTION

1.1 The High-level Safety Conference 2010 (HLSC 2010) recognized that mutual trust between States, as well as public confidence in the safety of air transportation, is contingent upon access to adequate information regarding the implementation of international Standards and Recommended Practices (SARPs). Transparency and the sharing of safety information are, therefore, fundamental tenets of a safe air transportation system and one of the objectives of sharing information is to ensure a consistent, fact-based and transparent response to safety concerns at the State and global levels.

1.2 The HLSC 2010 highlighted that the use of safety information for other than safety-related purposes might inhibit the future sharing of such information, with an adverse effect on aviation safety. Consequently, the HLSC 2010 recognized the need to develop principles of confidentiality and transparency to ensure that safety information is used in an appropriate, fair and consistent manner, solely to improve aviation safety and not for inappropriate purposes, including for the purpose of gaining economic advantage.

1.3 The HLSC 2010 recommended that the principles of confidentiality and transparency mentioned above be included in a code of conduct which would guide Member States, regional safety oversight organizations (RSOOs), regional aviation safety groups (RASGs), the aviation industry and other international and regional aviation organizations on the sharing and use of safety information.

1.4 The 37th Session of the Assembly of ICAO expressed unanimous support for the development of a code of conduct on the sharing and use of safety information. The Code of Conduct Multidisciplinary Task Force was established in November 2010 to assist the Secretariat in developing the code of conduct.

1.5 In preparing this code of conduct, the Secretariat and the Multidisciplinary Task Force have considered the working papers and discussions on the subject from the HLSC 2010 and the 37th Session of the ICAO Assembly. Specifically, this code of conduct has been largely based on a set of high-level principles included in Resolution A37-1. These principles were designed to facilitate the transparency and exchange of various types of safety-related information while ensuring that such information is used solely to improve safety.

2. NATURE AND SCOPE

2.1 This code of conduct is an ICAO policy that States are encouraged to follow. This code of conduct is without prejudice to matters already covered under international law and/or provisions that have been given binding effect by means of other obligatory legal instruments.

2.2 This code of conduct includes principles and standards applicable to the sharing and use of aviation safety-related information. It is global in scope and is directed toward ICAO Member States, RSOOs, RASGs, the aviation industry and other international and regional aviation organizations.

3. OBJECTIVES

The objectives of this code of conduct are to:

a) establish principles governing the collection, sharing and use of information related to the safety of civil aviation;

b) provide a reference to assist States, RSOOs and RASGs to establish or improve their legal and institutional frameworks governing the use of safety information;

c) provide guidance which may be used where appropriate in the formulation and implementation of international agreements and other legal instruments, both binding and voluntary;

d) facilitate and promote the sharing of aviation safety information by providing reassurance regarding how this information will be used; and

e) provide standards of conduct for all persons and organizations in receipt of information relating to the safety of international civil aviation.

4. PRINCIPLES

The code of conduct is based on the following principles:

a) transparency – the sharing and use of relevant and appropriate safety information with a view to ensuring: 1) the effective discharge of individual and collective responsibilities for the safety of international civil aviation, and 2) public confidence in the safety of air transportation;

b) compliance with the Convention on International Civil Aviation (Chicago Convention) and its Annexes: safety information is used to assist in ensuring that international civil aviation is conducted in full compliance with applicable SARPs and other regulations; and

c) appropriate use: shared safety information shall be used in an appropriate, fair and consistent manner, solely to improve aviation safety.

5. STANDARDS OF CONDUCT

ICAO, its Member States, RSOOs, RASGs, the aviation industry and other international and regional aviation organizations will:

a) collect and exchange relevant and appropriate safety information in a transparent way to ensure that they can effectively discharge their individual and collective responsibilities for the safety of international civil aviation;

b) ensure that shared safety information is used in an appropriate, fair and consistent manner, solely to improve aviation safety and not for inappropriate purposes, including for the purpose of gaining economic advantage;

c) utilize safety information to ensure that operations under their oversight are conducted in full compliance with the Chicago Convention and all applicable ICAO SARPs;

d) use caution in disclosing information, keeping in mind equally the need for transparency, ensuring the effectiveness of the exercise of safety oversight and the possibility that disclosure may inhibit the future provision of such information;

e) provide levels of confidentiality and uphold principles for disclosure equivalent to those provided by the State, RSOO or RASG generating the information; and

f) ensure that the release of any safety information to the public or media is carried out in accordance with this code of conduct and in compliance with the laws and regulations applicable to the release of such information.

6. OTHER PROVISIONS

Any changes to this code of conduct require approval by the Council of ICAO.

— END —

ISBN 978-92-9258-118-3