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Doc 10162

Manual on Monitoring Implementation of Regional and National Aviation Safety Plans

First Edition, 2023



Approved by and published under the authority of the Secretary General

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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

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FOREWORD

Assembly Resolution A41-6: ICAO global planning for safety and air navigation calls for each State to develop and implement a national aviation safety plan (NASP) in line with the *Global Aviation Safety Plan* (GASP, Doc 10004) goals, targets and the global high-risk categories of occurrences (G-HRCs). The NASP should contain indicators to monitor its implementation and to measure progress towards achieving the respective NASP goal(s).

While the GASP establishes a global safety strategy, including goals, targets and indicators, regional aviation safety plans (RASP) should be developed and coordinated through the regional aviation safety groups (RASGs) to address specific regional safety issues, in line with the GASP goals and targets. The RASP should contain indicators to measure progress towards achieving the respective RASP goal(s).

This manual was developed to provide States and regions with guidance on data sources for indicators used to measure the achievement of the NASP and RASP goals, respectively. It includes a GASP Indicator Form, developed for each indicator, to provide States and regions with clear guidance and definitions, and to ensure ICAO collects consistent, reliable data.

This manual should be used in conjunction with the *Global Aviation Safety Plan* (Doc 10004) the *Global Aviation Safety Roadmap* (Doc 10161) (forthcoming) and the *Manual on the Development of Regional and National Aviation Safety Plans* (Doc 10131).

This manual was developed with input from experts from civil aviation authorities, industry, as well as regional and international organizations, and thereafter submitted for extensive peer review, taking into account feedback from the expert community. ICAO gratefully acknowledges the contributions of the ICAO Global Aviation Safety Plan Study Group (GASP-SG) and individual experts who provided support, advice and input for this manual.

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GLOSSARY

Contributing factors. Actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

Hazard. A condition or an object with the potential to cause or contribute to an aircraft incident or accident.

Incident. An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Note.— The types of incidents which are of main interest to the International Civil Aviation Organization for accident prevention studies are listed in Annex 13 – Aircraft Accident and Incident Investigation, Attachment C.

Maximum mass. Maximum certificated take-off mass.

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 enhancement initiative (SEI). One or more actions to eliminate or mitigate operational safety risks or to address an identified safety issue.

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.

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

ABBREVIATIONS AND ACRONYMS

ACI	Airports Council International
ADREP	Accident/Incident Data Reporting
CAP	Corrective action plan
CANSO	Civil Air Navigation Services Organisation
CE	Critical element
CFIT	Controlled flight into terrain
EFOD	Electronic Filing of Differences
EI	Effective implementation
EUROCONTROL	European Organisation for the Safety of Air Navigation
GASP	Global aviation safety plan
G-HRC	Global high-risk category of occurrence
HRC	High-risk category of occurrence
IATA	International Air Transport Association
LOC-I	Loss of control in-flight
MAC	Mid-air collision
NASP	National aviation safety plan
OAG	Official Airline Guide
OVSG	Occurrence Validation Study Group
PQ	Protocol Question
RASG	Regional aviation safety group
RASP	Regional aviation safety plan
RE	Runway excursion
RI	Runway incursion
RSOO	Regional Safety Oversight Organization
SARPs	Standards and Recommended Practices
SDCPS	Safety data collection and processing systems
SEI	Safety enhancement initiative
SPI	Safety performance indicators
SSC	Significant safety concern
SSP	State safety programme
SSPIA	State safety programme implementation assessment
USOAP	Universal Safety Oversight Audit Programme

Chapter 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 Safety is aviation's top priority and Assembly Resolution A41-6: ICAO global planning for safety and air navigation recognizes the importance of a global framework in support of the Safety Strategic Objective of the International Civil Aviation Organization (ICAO). The *Global Aviation Safety Plan* (GASP, Doc 10004), available at www.icao.int/gasp, presents the global strategy for the continuous improvement of aviation safety. Its purpose is to continually reduce fatalities, and the risk of fatalities associated with accidents, by guiding the harmonized development and implementation of regional and national aviation safety plans.

1.1.2 The GASP establishes a global safety strategy, including goals, targets and indicators. The GASP goals are the results towards which efforts in aviation safety are directed. They present the desired outcomes that ICAO's Safety Strategy (as presented in the GASP) aims to produce. The GASP goals are high-level outcomes that States, regions or industry aim to achieve, with each containing specific targets. Targets are specific desired outcomes from the actions taken by States, regions and industry to achieve the goals, at a certain point in time. The GASP targets identify to whom the specific actions are directed (for example, States). Each GASP target also includes examples of indicators that stakeholders may use to measure progress towards achieving the respective GASP goal. Some goals contain more than one target and each GASP target is linked to a series of sample indicators. Indicators are a measurement index used to evaluate whether the GASP yields the expected results by States, regions and industry. While targets are intended to be specific, indicators may not be an exact measurement of the goal, but rather, an indirect means to measure the achievement of the goal by providing general information related to it. For example, one GASP goal relates to achieving a continuous reduction of operational safety risks through the associated target aiming to maintain a decreasing trend of the global accident rate. However, it may be difficult to measure the accident rates for every sector of aviation. Therefore, the accident numbers may be one of the indicators to measure progress towards achieving this goal.

1.1.3 Although the GASP provides a global perspective, regional aviation safety plans (RASP) should be developed and coordinated through the regional aviation safety groups (RASGs) to address specific regional safety issues, in line with the GASP goals and targets. The RASP should contain indicators to measure progress towards achieving the respective RASP goal(s).

1.1.4 Assembly Resolution A41-6 also calls for each State to develop and implement a national aviation safety plan (NASP), in line with the GASP goals, targets and the global high-risk categories of occurrences (G-HRCs). The NASP should also be developed having close regard for the RASP, while acknowledging that each State may have its own specific safety issues and priorities, including addressing significant safety concerns (SSCs). The NASP presents the strategic direction for the management of aviation safety at the national level, for a set period (for example, over the next five years). It should contain indicators to monitor its implementation and to measure progress towards achieving the respective NASP goals.

1.1.5 Indicators being used to measure safety performance of a RASP or NASP should be consistent with, or linked to those in, the GASP. However, the indicators presented in the GASP are only examples, unlike the goals and targets. When the GASP is adapted at the regional and national levels, respectively, regions and States may use the examples of indicators to develop regional and national indicators found in the RASP and NASP. However, not all indicators presented in the GASP need to be duplicated in a RASP or NASP.

Note.— In the context of the GASP and the RASP, the term “region” refers to a group of States and/or entities working together to enhance aviation safety within a geographic area. The RASG is the regional entity responsible for the development and implementation of the RASP.

1.1.6 Feedback received on the 2020-2022 edition of the GASP included States needing assistance on how to use GASP indicators in the context of their NASP and national safety performance measurement. It also included requests for additional guidance on how to measure each GASP indicator and clarify data sources or calculations. GASP indicators were even mistakenly viewed as mandatory; these are only examples (refer to 1.1.5).

1.2 PURPOSE

This document provides States and regions with guidance on data sources for indicators used to measure the achievement of the NASP and RASP goals, respectively. To address the feedback received, ICAO and its GASP Study Group (GASP-SG) conducted a review of all the indicators in the 2023-2025 edition of the GASP. The review showed that the majority of GASP indicators were clear and readily measurable – the “who, when and how” were known and the information needed to measure them is provided by ICAO or other international organizations who run industry programmes. Several GASP indicators are fully available and readily measurable. A few GASP indicators were identified as needing more work to make them clear and readily measurable – this included guidance on how to measure them and how to gather the data. A GASP Indicator Form was developed for each indicator to provide States and regions with clear guidance and definitions, and to ensure that ICAO collected consistent, reliable data.

1.3 APPLICABILITY

The content of this document is presented as guidance and should not be considered as the sole means to develop and use indicators to measure safety performance in the context of a NASP or RASP. States should consult specific requirements within their region and align their efforts with their respective RASP, where applicable.

Chapter 2

GASP INDICATORS

2.1 GENERAL

This chapter provides additional guidance for States and regions (and the regional aviation safety group (RASGs)) to gather data for each indicator and measure the progress made towards achieving the goals and targets, presented in national aviation safety plan (NASPs) and regional aviation safety plan (RASPs), respectively. It clarifies the use of the Global Aviation Safety Plan (GASP) indicators, which serve as examples to measure progress in achieving goals and targets, in line with the GASP.

2.2 CONTENT

The GASP indicators provide evidence about whether the desired outcomes occurred and measure the progress in the activities related to the GASP targets. They are written in a manner that references quantitative data (for example, number or percentage). Some indicators refer to occurrences (for example, number of accidents) that are deemed an outcome of deficient management of aviation safety. Others refer to activities conducted by States or other stakeholders (for example, completion of corrective action plans (CAPs)), deemed to improve the management of aviation safety. Ultimately, the indicators measure the achievement of the GASP goals. Data sources are needed to measure the status of GASP indicators and subsequently, for those of NASPs and RASPs. Currently, some data sources are readily available to ICAO, while others reside with individual States, regional entities or industry. Challenges in obtaining this data may render the measurement of safety performance difficult. Therefore, a series of the GASP Indicator Forms are presented in this document.

2.3 LAYOUT OF INDICATORS

The appendix to this chapter presents the GASP indicator (GASP-I) form. Indicator forms were created for all 36 indicators presented in the 2023-2025 edition of the GASP. Use of this form is not mandatory and is not intended to replace any existing Standards and Recommended Practices (SARPs). Below is guidance on how to complete the form and on the terms presented in it:

- a) rationale: an explanation of how the indicator connects to a specific GASP target and what the measurement and monitoring of the indicator supports;
- b) limitations: the scope or the extent of the variable or entity that the indicator measures;
- c) definition of terms: if applicable, a definition of any technical, specific or project-related terminology used in naming or defining the indicator that may not be widely known or understood;
- d) calculation method: if applicable, the specific or technical formula available for the calculation of the indicator value;

- e) data set(s): the data that is needed for measuring the indicator;
 - f) availability: the listed datasets may have different levels of availability, varying from “1” for unavailable data, “2” for partially available data and “3” for fully available data; and
 - g) provider: the provider of the data or the source where the data comes from.
-

Appendix A to Chapter 2

GLOBAL AVIATION SAFETY PLAN INDICATOR (GASP-I) FORMS

GASP Indicator (GASP-I) Form
GASP-I.1.1.01

<i>GASP-I.1.1.01</i>	<i>Number of accidents</i>
Rationale	Related to Global Aviation Safety Plan (GASP) Target 1.1: Maintain a decreasing trend of global accident rate. The number of accidents is a key reactive safety indicator. States in which accidents occur are required to notify ICAO if the aircraft is of maximum mass of over 2 250 kg.
Limitations	– The State of Occurrence shall forward a notification of an accident to ICAO when the aircraft involved is of a maximum mass of over 2 250 kg or is a turbojet-powered aeroplane, as required by Annex 13 – <i>Aircraft Accident and Incident Investigation</i>, paragraph. 4.1. – The State conducting the investigation shall send Accident/Incident Data Reporting (ADREP) to ICAO for accidents to aircraft over 2 250 kg, as required by Annex 13, Chapter 7. – ICAO maintains an ADREP database with the notifications and ADREPs it receives. – A validation of the ADREP database is performed annually by a group of experts (the Occurrence Validation Study Group (OVSG)) only for accidents and some serious incidents involving civil-operated fixed-wing aircraft of a maximum mass of over 5 700 kg. This validation does not include, as of April 2020, helicopter accidents or aircraft between 2 250 kg and 5 700 kg. – Validated ADREP data for year n is available in March of year $n+1$.
Definition of terms	– The term “accident” is defined in Annex 13, Chapter 1, Definitions. – ADREP: Accident/Incident Data Reporting
Calculation method	Count the accidents involving scheduled commercial operations if: a) the date of occurrence is between 1 January and 31 December of the year in question; b) a notification and/or an ADREP report was forwarded to and received by ICAO; c) the circumstances of the accidents match those defined for “accident” in Annex 13; and d) the aircraft involved in the accident is of maximum mass of over 5 700 kg.

<i>GASP-I.1.1.01</i>	<i>Number of accidents</i>
Data sets	Notifications and ADREP reports sent by States to ICAO under Annex 13 obligations.
Availability (1-3)	3: Accident notification and ADREP reports are already available in the ICAO ADREP database. No further reporting by States is required.
Provider	ICAO ADREP database

GASP Indicator (GASP-I) Form
GASP-I.1.1.02

<i>GASP-I.1.1.02</i>	<i>Number of accidents per million departures (accident rate)</i>
Rationale	Related to Global Aviation Safety Plan (GASP) Target 1.1: Maintain a decreasing trend of global accident rate. This safety indicator has been widely used by ICAO since 2008. It can be found in the global Annual Safety Reports and on the ICAO public website. It is the most common reactive indicator measuring safety levels and is connected to risk exposure (number of million departures).
Limitations	– The State of Occurrence shall forward a notification of an accident to ICAO when the aircraft involved is of a maximum mass of over 2 250 kg or is a turbojet-powered aeroplane, as required by Annex 13 – <i>Aircraft Accident and Incident Investigation</i>, paragraph. 4.1. – The State conducting the investigation shall send Accident/Incident Data Reporting (ADREP) to ICAO for accidents to aircraft over 2 250 kg, as required by Annex 13, Chapter 7. – ICAO maintains an ADREP database with the notifications and ADREPs it receives. – A validation of the ADREP database is performed annually by a group of experts (the Occurrence Validation Study Group (OVSG)) only for accidents and some serious incidents involving civil-operated fixed-wing aircraft of a maximum mass of over 5 700 kg. This validation does not include, as of April 2020, helicopter accidents or aircraft between 2 250 kg and 5 700 kg. – Validated ADREP data for year <i>n</i> is available in March of year <i>n+1</i>. – The Official Airline Guide (OAG) makes available to ICAO traffic data for scheduled operations with aircraft > 5 700 kg. – Validated OAG traffic data for year <i>n</i> is available in March of year <i>n+1</i>.
Definition of terms	The term "accident" is defined in Annex 13, Chapter 1. Definitions ADREP: Accident/Incident Data Reporting
Calculation method	Indicator = N/D, where: a) <i>N</i> is the number of accidents involving scheduled commercial operations with aircraft of maximum mass of over 5 700 kg for the year in question; and b) <i>D</i> is the number of scheduled commercial departures (from iSTARS 'State Traffic' application), divided by 1 000 000.
Data sets	Notifications and ADREP reports sent by States to ICAO under Annex 13 obligations. OAG dataset for ICAO.

<i>GASP-I.1.1.02</i>	<i>Number of accidents per million departures (accident rate)</i>
Availability (1-3)	3: Accident notification and ADREP reports are already available in the ICAO ADREP database. No further reporting by States is required.
Provider	– ICAO ADREP database – iSTARS Application "ADREP et al." – iSTARS Application "State Traffic"

GASP Indicator (GASP-I) Form
GASP-I.1.1.03

<i>GASP-I.1.1.03</i>	<i>Number of fatal accidents</i>
Rationale	Related to Global Aviation Safety Plan (GASP) Target 1.1: Maintain a decreasing trend of global accident rate. The number of accidents is a key reactive safety indicator. States in which accidents occur are required to notify ICAO if the aircraft involved is of maximum mass of over 2 250 kg or is a turbojet-powered aeroplane.
Limitations	– The State of Occurrence shall forward a notification of an accident to ICAO when the aircraft involved is of a maximum mass of over 2 250 kg or is a turbojet-powered aeroplane, as required by Annex 13 – <i>Aircraft Accident and Incident Investigation</i>, paragraph. 4.1. – The State conducting the investigation shall send Accident/Incident Data Reporting (ADREP) to ICAO for accidents to aircraft over 2 250 kg, as required by Annex 13, Chapter 7. – ICAO maintains an ADREP database with the notifications and ADREPs it receives. – A validation of the ADREP database is performed annually by a group of experts (the Occurrence Validation Study Group (OVSG)) only for accidents and some serious incidents involving civil-operated fixed-wing aircraft of a maximum mass of over 5 700 kg. This validation does not include, as of April 2020, helicopter accidents or aircraft between 2 250 kg and 5 700 kg. – Validated ADREP data for year n is available in March of year n+1.
Definition of terms	– The term “accident” is defined in Annex 13, Chapter 1, Definitions. – ADREP: Accident/Incident Data Reporting. – A fatal accident is an accident in which a person is fatally injured as a result of: a) being in the aircraft; or b) direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or c) direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew. – For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.