National Aviation Safety Plan
Nepal

2023 to 2025 Edition

Civil Aviation Authority of Nepal

National Aviation Safety Plan, Nepal

Published by Civil Aviation Authority of Nepal

2018 to 2022 Edition – June, 2018

RECORD OF AMENDMENTS

Amendment No.	Date	Entered By

ABBREVIATIONS and ACRONYMS

ACAS- Airborne Collision Avoidance System

AGA- Aerodrome and Ground Aid

AIIA- Accident and Incident Investigation Authority

AIP- Aeronautical Information Publication

ANS- Air Navigation Services

ANSP- ANS Provider

ANSSSD- Air Navigation Services Safety Standards Department

AOC- Air Operators Certificate

AP RASP- Asia Pacific Regional Aviation Safety Plan

ARC- Abnormal Runway Contact

ASSD- Aerodrome Safety Standards Department

ATC- Air Traffic Control

ATO- Approved Training Organizations

ASSRD- Aviation Safety and Security Regulation Directorate

CAAN- Civil Aviation Authority of Nepal

CAP- Corrective Action Plan

CEs- Critical Elements

CFIT- Controlled Flight Into Terrain

CICTT- CAST/ ICAO Common Taxonomy Team

CMA- Continuous Monitoring Approach

CRM- Crew Resource Management

EI- Effective Implementation

FH- Flying Hours

FM- Flight Movement

FSSD- Flight Safety Standards Department

GASP- Global Aviation Safety Plan

GPWS- Ground Proximity Warning System

HRCs- High Risks Categories

IOSA- IATA Operational Safety Audit

ISAGO- IATA- Safety Audit for Ground Operations

LOC-I- Loss of Control In flight

MAC- Mid Air Collision

MoCTCA- Ministry of Culture, Tourism and Civil Aviation

MORs- Mandatory Occurrence Reports

MOU- Memorandum of Understanding

MSAW- Minimum Safety Altitude Warning

NASP- National Aviation Safety Plan

OLF- On Line Framework

OPS- Operations

ORG- Organization

PDCA- Plan Do Check Act

PQs- Protocol Questions

QMS- Quality Management System

RAIO- Regional Accident and Incident Investigation Organization

RASG- Regional Aviation Safety Group

RE- Runway Excursion

RI- Runway Incursion

RSOO- Regional Safety Oversight Organization

RSP- Runway Safety Programme

RST- Runway Safety Team

SEIs- Safety Enhancement Initiatives

SMD- Safety Management Division

SMS- Safety Management System

SOI- Safety Oversight Index

SOP- Standard Operating Procedure

SPI- Safety performance Indicator

SPT- Safety Performance Target

SRM- Safety Risk Management

SSCs- Significant Safety Concerns

SSP- State Safety Programme

TAWS- Terrain Awareness Warning System

USOAP- Universal Safety Oversight Audit Programme

VORs- Voluntary Occurrence Reports

WS- Wildlife Strike

TABLE OF CONTENTS

SECTION 1: INTRODUCTION

1.1 Overview of the NASP

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

The NASP of Nepal is in alignment with the ICAO Global Aviation Safety Plan (GASP, Doc 10004) and the Asia Pacific Regional Aviation Safety Plan (AP- RASP) 2023-2025.

.....

Er. Pradeep Adhikari

Director General of Civil Aviation Authority of Nepal

1.2 Structure of the NASP

This NASP presents the strategy for enhancing aviation safety for a period of 3 years. It is comprised of six sections. NASP includes six sections namely, introduction, the purpose of the NASP, Nepal's strategic approach to managing aviation safety, the national operational safety risks identified for the period of 2023 to 2025, other safety issues addressed in the NASP, and a description of how the implementation of the safety enhancement initiatives (SEIs) listed in the NASP are going to be monitored.

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

This NASP addresses operational safety risks presented in the ICAO GASP and AP-RASP, in the absence of mature safety data analysis (SDA) aspects, as described in the ICAO State Safety Programme Implementation Assessment (SSPIA), in Nepal. Initiatives listed in this NASP address organizational challenges and aim to enhance organizational capabilities related to effective safety oversight.

1.4 Responsibility for the NASP Development, Implementation and Monitoring

The Civil Aviation Authority of Nepal (CAAN) is responsible for the development, implementation and monitoring of the NASP, in collaboration with Ministry of Culture, Tourism and Civil Aviation (MoCTCA) and with the national aviation industry. The NASP has been developed in consultation with national operators and other stakeholders, and in alignment with the 2023 to 2025 edition of the GASP and the AP RASP 2023-2025 (as approved by RASG).

1.5 National Safety Issues, Goals and Targets

The NASP addresses the following national safety issues:

A. Operational Safety Risks
   1. Controlled Flight into Terrain (CFIT)
   2. Loss of Control - In Flight (LOC-I)
   3. Mid Air Collision (MAC)
   4. Runway Excursion (RE)
   5. Runway Incursion (RI)
   6. Abnormal Runway Contact (ARC) including hard landing and tail strike landing
   7. Wildlife Strike (WS) on and in the vicinity of Aerodrome

B. Deficient critical elements and areas

   Critical Elements (CEs)

   a. CE-3: State System and Functions
   b. CE-8: Resolution of Safety Issues
   c. CE-7: Surveillance obligations *(Regional deficient element)*

   Areas

   a. AIG: Accident and Incident Investigation
   b. ORG: Organization
   c. AGA Aerodrome and Ground Aids *(Regional deficient Area)*

In order to address the issues listed above and enhance safety at the national level, the 2023 to 2025 NASP contains the following goals and targets:

1) **Goal 1**: Achieve a continuous reduction of operational safety risks
   Target 1.1: Maintain a decreasing trend of National accident rate.

2) **Goal 2**: Strengthen safety oversight capabilities of Nepal
Target 2.1: Nepal to improve its score for the effective implementation (EI) of the critical elements (CEs) of the State's safety oversight system (with focus on priority PQs) as follows:
a) by 2024 – 75 per cent EI score
b) by 2026 – 85 per cent EI score
c) by 2030 – 95 per cent EI score

3) **Goal 3:** Implement effective State Safety Programme (SSP).
Target 3.1: Nepal to implement the foundation of its SSP by 2023
Target 3.2: Nepal to work towards an effective SSP as follows:
a) by 2023 – Present
b) by 2025 – Present and effective

4) **Goal 4**: Increase collaboration at the regional level
Target 4.1: Nepal to use a regional safety oversight mechanism, another State or other safety oversight organization's ICAO recognized functions in seeking assistance to strengthen its safety oversight capabilities or SSP implementation by 2023.
Target 4.2: Nepal to contribute information on operational safety risks, including SSP safety performance indicators (SPIs), and emerging issues, to the Asia Pacific Regional Aviation Safety Group (AP- RASG) by 2025

5. Goal 5: Expand the use of industry programmes and safety information sharing networks by service providers
Target 5.1: Maintain an increasing trend in industry's contribution in safety information sharing networks to State and region to assist in the development and update of NASP and RASP by 2025

6. Goal 6: Ensure the appropriate infrastructure is available to support safe operations
Target 6.1: Maintain an increasing trend with air navigation and aerodrome infrastructure that meet relevant ICAO Standards by 2025.

1.6 Operational Context

There are 5 certified aerodromes in Nepal, including three international aerodromes. The airspace of Nepal is classified into Class C and G.

There were 1,333,835 of movements in Nepal over the period of 6 years (2016 to 2021). There are currently 21 air operator certificates (AOCs) issued by Nepal, and of those there are 5 issued to operators conducting international commercial air transport operations. Nepal also has common challenges that include:

- Topography;
- Meteorology;
- Infrastructure;
- Heterogeneous fleet.

SECTION 2: PURPOSE OF NEPAL AVIATION SAFETY PLAN (NASP)

NASP is the master planning document containing the strategic direction of Nepal for the management of aviation safety for a period of 3 years (2023 - 2025). This plan lists national safety issues, sets national aviation safety goals and targets, and presents a series of safety enhancement initiatives (SEIs) to address identified safety deficiencies and achieve the national safety goals and targets.

The NASP has been developed using international safety goals and targets and G-HRCs from both the GASP and the AP-RASP. These are highlighted in the text, where applicable. The SEIs listed in the NASP support the improvement of safety at the wider regional and international levels and include several actions to address specific safety risks and recommended SEIs for individual States set out in the AP- RASP. Nepal has adopted these SEIs and has included them in this plan.

SECTION 3: NEPAL'S STRATEGIC DIRECTION FOR THE MANAGEMENT OF AVIATION SAFETY

The NASP presents the SEIs that were developed based on the organizational challenges (ORG) and operational safety risks (OPS) roadmaps, as presented in the ICAO Global Aviation Safety Roadmap (Doc 10161), Region-specific issues identified by AP- RASP as well as State-specific issues identified by State Safety Data Collection and Processing System (SDCPS). This plan is developed and maintained by Civil Aviation Authority of Nepal, in coordination with MoCTCA and other key aviation stakeholders and is updated at least every 3 years.

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

Goal	Targets	Indicators	Link to GASP and AP-RASP
Goal 1: Achieve a continuous reduction of operational safety risks	1.1 Maintain a decreasing trend of global accident rate.	• Number of accidents • Number of accidents per 1000 departures • Number of fatal accidents • Number of fatal accidents per 1000 departures • Number of fatalities • Number of fatalities per passengers carried (fatality rate) • Percentage of occurrences related to high-risk categories (HRCs)	This goal is inked with Goal 1 and Target 1.1 of the GASP and linked to Goal 1 and Target 1.1 of the AP-RASP
Goal 2: Strengthen States' safety oversight and compliance	2.1 Nepal to improve its score for the effective implementation (EI) of the critical elements (CEs) of the State's safety oversight system (with focus on priority PQs) as follows:	• Percentage of EI score as per the timelines; • Number of priority PQs fully implemented; • Percentage of required corrective action plans (CAPs) submitted by (using OLF) • Percentage of completed CAPs per (using OLF)	This goal is directly linked to Goal 2 and Target 2.1 of the GASP and linked to Goal 2 and Target 2.1 of the AP – RASP

	○ by 2024 – 75 per cent EI score ○ by 2026 – 85 per cent EI score ○ by 2030 – 95 per cent EI score		
Goal 3: Implement effective State safety programmes (SSP)	3.1: Nepal to implement the foundation of an SSP by 2023.	• Percentage of implementation of SSP foundation PQs • Percentage of required CAPs related to the SSP foundation PQs submitted by States (using OLF) • Percentage of required CAPs related to the SSP foundation PQs completed per State (using OLF)	This goal is directly linked to Goal 3 and Target 3.1 of the GASP and Target T12 of AP-RASP.
	3.2: Nepal to work towards an effective SSP as follows: ○ by 2023 – Present • by 2025 – Present and effective	• The level (Present, Present and effective) of SSP implementation in Nepal • Level of SMS implementation by applicable service providers in Nepal	This goal is directly linked to Goal 3 and Target 3.3 of the GASP.
Goal 4: Increase collaboration at the regional level	4.1: Nepal to seek assistance to strengthen their safety oversight capabilities or facilitate SSP implementation by 2023.	• Number of assistance sought by Nepal regarding safety oversight capability or SSP implementation, by using a regional safety oversight mechanism, another State's or other safety oversight organization's ICAO-recognized functions.	This goal is directly linked to Goal 4 and Target 4.1 of the GASP.
	4.2: Nepal to contribute information on operational safety risks, including SSP safety performance	• Number of reports reported to AP RASG via the Secure Portal on Operational Safety Risks and Emerging Issues.	This goal is directly linked to Goal 4 and Target 4.3 of GASP.

	indicators (SPIs), and emerging issues, to its Asia Pacific RASG by 2025	• Number of SSP SPIs shared with AP-RASG	
Goal 5: Expand the use of industry programmes and safety information sharing networks by service providers	5.1: Maintain an increasing trend in industry's contribution in safety information sharing networks to State and region to assist in the development of NASP and RASP by 2025	• Number of service providers using globally harmonized metrics for their SPIs • Percentage of service providers participating in the corresponding ICAO-recognized industry assessment programmes • The level of reporting increased and improved for safety information by industry to assist in the development and improvement of NASP and RASP • State having established safety data collection and processing systems (SDCPS) to facilitate participation in a safety information-sharing network • Number of service providers contributing to an SDCPS or a safety information sharing network	This goal is directly linked to Goal 5 and Target 5.1 of the GASP.
Goal 6: Ensure the appropriate infrastructure is available to support safe operations.	6.1: Nepal to maintain an increasing trend with air navigation and aerodrome infrastructure that meet relevant ICAO Standards by 2025.	• Number or percentage of infrastructure-related air navigation deficiencies by Nepal, against the regional air navigation plans • Number or percentage Nepal having implemented infrastructure-related PQs linked to the basic building blocks.	This goal is directly linked to Goal 6 and Target 6.1 of GASP

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

The NASP also addresses emerging issues. Emerging issues include concepts of operations, technologies, public policies, business models or ideas that might impact safety in the future, for which insufficient data exists to complete typical data-driven analysis. It is important that Nepal remain vigilant on emerging issues to identify potential safety risks, collect relevant data and proactively develop mitigations to address them. The NASP addresses the following emerging issues, which were identified by analysis of historical data.

1. Unmanned Aerial Vehicle (UAV) operating in the vicinity of aerodromes

SECTION 4. NATIONAL OPERATIONAL SAFETY RISKS

The NASP includes SEIs that address national operational safety risks, derived from lessons learned from operational occurrences and from a data-driven approach. These SEI may include actions such as: rule-making, policy development, targeted safety oversight activities, safety data analysis, and safety promotion. Separate sections are provided to address commercial air transport, in order to make the information more accessible to stakeholders.

Civil Aviation Authority of Nepal (CAAN) publishes an Annual Safety Report, available in the CAAN website (http://www.caanepal.gov.np/publication/aviation-safety-report). The summary of accidents and serious incidents that occurred in Nepal and those for aircraft registered in Nepal involved in commercial air transport and aircraft involved in general aviation is shown in the table below.

Commercial air transport occurrences in Nepal			
Year	**Fatal accidents**	**Non-fatal accidents**	**Serious incidents**
2016 to 2021	9	9	59

Occurrences involving commercial air transport aircraft registered in States other than Nepal			
Year	**Fatal accidents**	**Non-fatal accidents**	**Serious incidents**
2016 to 2021	1	-	1

The following 7 National High Risk Categories (N-HRCs) of occurrences in the context of Nepal were considered of the utmost priority because of the number of fatalities and risk of fatalities associated with such events. They were identified based on analysis of mandatory and voluntary reports over the past 6 years, accident and incident investigation reports over the past 10 years (2012 to 2021) and on the operational safety risks described in the GASP and AP-RASP. These N-HRCs are in line with those listed in the 2023 to 2025 edition of the GASP, as well as the 2023 to 2025 edition of AP-RASP:

1) Controlled Flight Into Terrain (CFIT)
2) Loss of Control – In flight (LOC-I)
3) Mid Air Collision (MAC)
4) Runway Excursion (RE)
5) Runway Incursion (RI)
6) Abnormal Runway Contact (ARC) including Hard Landing and Tail Strike Landing *(Regional HRC)*

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

1) Wildlife Strike (WS) on and in the vicinity of Aerodrome

The aviation occurrence categories from the CAST/ICAO Common Taxonomy Team (CICTT) were used to assess risk categories in the process of determining national operational safety risks. The CICTT Taxonomy is found on the ICAO website at https://www.icao.int/safety/airnavigation/AIG/Pages/Taxonomy.aspx

In order to address the national operational safety risks listed above, CAAN identified the following contributing factors leading to N- HRCs and will implement a series of SEIs, some of which are derived from the ICAO OPS roadmap (Doc. 10161), contained in the GASP and AP-RASP:

N-HRC 1: CFIT

1) Critical terrain and rapidly deteriorating weather condition.
2) Violation of SOP
3) Improper pilot response to stall warning.
4) Excess load on the front bench seat in the helicopters.
5) Loss of situational awareness of pilots.
6) Insufficient operational oversight from the organization.
7) Inadequate pre-flight planning and lack of consideration on individual load while preparing load and trim sheet.

N-HRC 2: LOC-I

1) Violation of SOP by pilots
2) Inadequate pre-flight planning and lack of consideration on individual hand and load checked
3) baggage while preparing load and trim sheet.
4) Inadequate training requirements relating to engine malfunction and proper loading of aircraft.
5) Insufficient oversight by regulatory especially in the field of periodic check of load sheet.
6) Insufficient wildlife control programme.

N-HRC *3*: MAC

1) Traffic Volume and pattern
2) Adequate trainings to ATCOs and Pilots
3) Lack of SOPs/MOUs for effective coordination
4) Violations of existing MOUs/SOPs and agreements

N-HRC 4: RE

1. Loss of Situational awareness
2. Violation of SOP by pilots
3. lack of training (before landing in contaminated runway, and CRM)
4. lack of procedure (to operate in contaminated runway and experience of pilot for night flying)

N-HRC *5*: RI

1) Loss of Situational awareness of ATCs and pilots
2) Violation of SOP by ATCs and pilots
3) lack of training (communication and CRM)
4) Insufficient wildlife control programme.

N-HRC *6*: ARC

It is a Regional HRC

N-HRC *7*: WS

1) Insufficient wildlife control programme in Aerodrome.

2) Violation of regulations (/butcher/slaughter houses near of airports/within 3 km of airport)

3) Lack of study on wildlife habitat management near aerodromes.

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

SECTION 5. ORGANIZATIONAL CHALLENGES

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

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

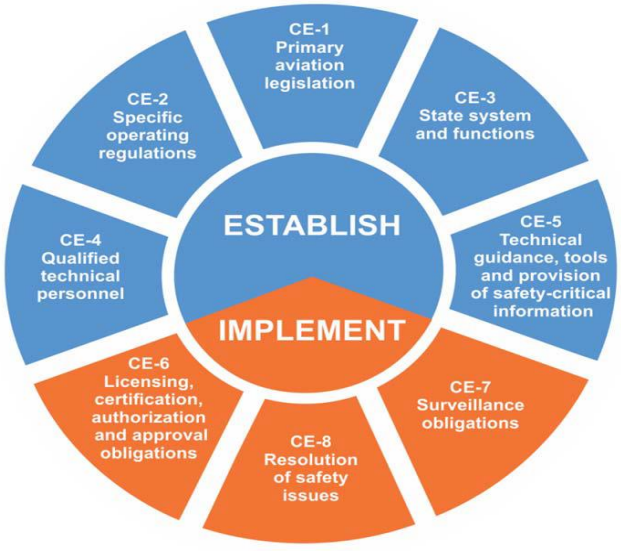

Figure 1. Critical elements of a State's safety oversight system

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

Overall EI score							
70.10 %							
EI score by CE							
CE-1	**CE-2**	**CE-3**	**CE-4**	**CE-5**	**CE-6**	**CE-7**	**CE-8**
75%	72.53%	46.67%	65.12%	69.03%	77.89%	80.39%	42.86%

EI score by audit area[1]							
LEG	**ORG**	**PEL**	**OPS**	**AIR**	**AIG**	**ANS**	**AGA**
76.19 %	45.45%	78.41%	82.20%	83.65%	21.69%	77.5%	67.74%

The following (CEs -2 and Areas- 2) 4 organizational challenges in the Nepali context were considered of the utmost priority because these CEs and areas scored percentage lower than 60% (Global Benchmark) and also they impact the effectiveness of safety risk controls. They were identified based on analysis from latest USOAP data. These issues are typically systemic in nature and relate to challenges associated with the conduct of States' safety oversight functions, implementation of SSP at the national level and the level of SMS implementation by national service providers. They take into consideration organizational culture, policies and procedures within CAAN, MoCTCA and those of service providers. These organizational challenges are in line with those listed in the 2023 to 2025 of the GASP, as well as the AP-RASP:

Critical Elements

1) State System and Functions (CE 3) is the critical element of priority because of the State received the lower EI score than the global benchmark (60%) during the most recent ICAO USOAP audit and was therefore placed as a high priority issues to resolve.
2) Resolution of Safety Issues (CE 8) is another critical element of priority because of the State received the lower EI score than the global benchmark (60%) during the most recent ICAO USOAP audit and was therefore placed as a high priority issues to resolve.

[1] 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).

Areas

1. Aircraft Accident and Incident Investigation (AIG), is the area of utmost priority because of the State received the lowest EI score during the most recent ICAO USOAP audit and was therefore placed as a highest priority issues to resolve.
2. Organization (ORG), is another the area of priority because of the State received the lower EI score than the global benchmark (60%) during the most recent ICAO USOAP audit and was therefore placed as a high priority issues to resolve.

To address the organizational challenges listed above, CAAN and MoCTCA will implement a series of SEIs, some of which are derived from the ICAO ORG roadmap, contained in the ICAO Global Aviation Safety Roadmap (Doc 10161). The full list of the SEIs is presented in the appendix A and B to the NASP.

SECTION 6. MONITORING IMPLEMENTATION

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

In addition to the above, CAAN will review the NASP every 3 years or earlier, if required, to keep the identified operational safety risks, safety issues and selected SEIs updated and relevant. The CAAN will periodically review the safety performance of the initiatives listed in the NASP to ensure the achievement of national safety goals and targets. If required, CAAN will seek the support of *RASG, RSOO and industry* to ensure the timely implementation of SEIs to address safety deficiencies and mitigate risks. Through close monitoring of the SEIs, CAAN will make adjustments to the NASP and its initiatives, if needed, and update the NASP accordingly.

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

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

Nepal adopted a standardized approach to provide information at the regional level, for reporting to the AP-RASG (Nepal's safety information is shared with RASG through the designated focal point, ASSRD). This allows the region to receive information and assess safety risks using common methodologies.

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

Civil Aviation Authority of Nepal (CAAN)
Babarmahal, Kathmandu, Nepal
Telephone: +977-1-4262416
Fax: +977-1-4262516
Email: dgca@caanepal.gov.np
Website: http://www.caanepal.gov.np

APPENDIX A
DETAILED SEIs: NATIONAL OPERATIONAL SAFETY RISKS

Issue No. 1: Operational Safety Risks

N- HRC 1: Controlled Flight Into Terrain (CFIT)

Goal 1: Achieve a continuous reduction of operational safety risks
Target 1.1: Maintain a decreasing trend of the national accident rate

Safety enhancement initiative	Action	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring Activity
GASP OPS SEI on CFIT (State) — Mitigate contributing factors to the risk of CFIT	1. Implement the following CFIT safety actions: a. Ensure aircraft are equipped with terrain awareness and warning system (TAWS) in accordance with Annex 6.	FSSD	Implemented	ANSSD ANSP FSSD Air Operators	Number of CFIT Accident/incident per 10,000 flight movements.	High	Surveillance of operator, ANSP activities Safety reporting (MOR/ VOR)
	b. Promote the wider use of TAWS beyond the requirements of Annex 6.	FSSD	Implemented				
	c. Issue a Safety Advisory to increase adherence to TAWS warning procedures	FSSD	Implemented				
	d. Promote the use of GPS-derived position data to feed TAWS	FSSD	Implemented				

	e. Model Regulation on Ground Proximity Warning System (GPWS)	FSSD	Implemented				
	f. Guidance for Operators to Ensure Effectiveness of GPWS Equipment	FSSD	Implemented				
	g. Guidance for Operators on Training Programme on the use of GPWS	FSSD	Implemented				
	h. Promote greater awareness of approach risks.	ANSSSD/FSSD	Implemented				
	i. Instrument Approach Procedures Using Continuous Descent Final Approach Techniques (CDFA)	FSSD	Implemented				
	j. Implement minimum safe altitude warning (MSAW) systems	ANSSSD	2023				
	k. Issuance of Terrain or Obstacle Alert Warning	FSSD	Implemented				
	l. Ensure the timeliness of updates and accuracy of Electronic Terrain and Obstacle Data (eTOD)	ANSSSD	2025				
	m. Guidance on the Establishment of a Flight Data Analysis Programme (FDAP)	FSSD	Implemented				

	n. Advisory Circular — Crew Resource Management Training Programme (CRM) o. Advisory Circular — Controlled Flight into Terrain (CFIT) and Approach and Landing Accident Reduction (ALAR) Training Programme. p. Guidance for Air Operators in Establishing a Flight Safety Documents System	FSSD FSSD FSSD	Implemented Implemented Implemented				
	2. Validate the effectiveness of the safety enhancement initiatives (SEIs) presented in this roadmap through the analysis of mandatory occurrence reporting (MORs) and voluntary occurrence reporting systems (VORs) and accident/incident investigations (apply safety management methodologies).	FSSD/ANSSSD	Continuous process	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrences reports via MOR and VOR systems per 10,000 FMs.	High	Surveillance of operator, ANSP activities Safety reporting (MOR/ VOR)

	3. Identify additional contributing factors: a. Flight in adverse environmental conditions b. Approach design and documentation (e.g. approaches with vertical guidance (APV) or localizer performance with vertical guidance (LPV) approaches) c. Phraseology used (standard vs. non-standard) d. Pilot fatigue and disorientation	ANSSSD/FSSD ANSSSD FSSD/ANSSSD FSSD	Implemented implemented implemented Implemented	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrence per 10,000 FMs	High	
	4. Conduct continuous evaluations of the performance of the SEIs.	ANSSSD/FSSD	Cont. process	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrence per 10,000 FMs	High	Surveillance of operator, ANSP activities Safety reporting (MOR /VOR)

N- HRC 2: Loss of Control – In flight (LOC-I)							
Goal 1: Achieve a continuous reduction of operational safety risks **Target 1.1:** Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Responsible entity**	**Timeline**	**Stakeholders**	**Metrics**	**Priority**	**Monitoring Activity**
GASP OPS SEI on LOC-I (State) — Mitigate contributing factors to the risk of LOC-I accidents and incidents	1. Implement the following LOC-I safety actions: a. Develop guidance materials on upset prevention and recovery training in all full flight simulator type conversion and recurrent training programmes and ensure implementation. b. Require more time devoted to training for the pilot monitoring role. c. Model Advisory Circular — Air Operators Standard Operating Procedures for Flight Deck Crewmembers d. Guidance Material on Flight Crew Proficiency **e.** Advisory Circular — Mode Awareness and Energy State Management Aspects of Flight Deck Automation	FSSD FSSD FSSD FSSD FSSD	Implemented Implemented Implemented Implemented Implemented	Air Operators Flight simulator product and service providers CAA inspectors	Number of LOC-I Accident/incident per 10,000 flying hours.	High	Surveillance of operator and ATO training activities
	2. Validate the effectiveness of the SEIs in the industry through MORs and VORs systems and accident/incident investigations (apply safety management methodologies- PDCA)	FSSD	Continuous Process		LOC-I occurrence rates	High	MOR, VOR and AIG reports

	3. Identify additional contributing factors: a. Distraction b. Adverse weather c. Complacency d. Inadequate standard operating procedures (SOPs) for effective flight management e. Insufficient height above terrain for recovery f. Lack of awareness of or competence in procedures for recovery from unusual aircraft attitudes g. Inappropriate flight control inputs in response to a sudden awareness of an abnormal bank angle.	FSSD	Implemented	Air Operators Flight simulator product and service providers CAA inspectors	Stick-shaker activation events in FDA data LOC-I occurrence rates	High	Surveillance of operator and ATO training activities
	4. Conduct continuous evaluations of the performance of the SEIs.	FSSD	Continuous process		Number of LOC-I occurrence per 10,000 FHs	High	

N-HRC 3: Mid Air Collision (MAC)							
Goal 1: Achieve a continuous reduction of operational safety risks **Target 1.1:** Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Responsible entity**	**Timeline**	**Stakeholders**	**Metrics**	**Priority**	**Monitoring Activity**
GASP OPS SEI on MAC (State) — Mitigate contributing factors to risk of MAC accidents and incidents	1. Implement the following MAC safety actions: a. Establish guidance and regulations to ensure aircraft are equipped with airborne collision avoidance system (ACAS), in accordance with Annex 6 b. Ensure adherence to ACAS warning procedures c. Promote the improvement of air traffic control (ATC) systems, procedures and tools to enhance conflict management d. Promote the improvement of communications systems and procedures, such as controller-pilot datalink.	FSSD FSSD ANSSSD FSSD	Implemented Implemented Implemented Implemented	Air Operators ANS service provider CAA inspectors	Number of MAC events per 10,000 flying hours.	High	Surveillance of operator , ANSP activities Safety Reporting (MOR/ VOR)
	2. Validate the effectiveness of the SEIs through the analysis of MORs and VORs and accident/incident investigations (apply safety management methodologies)	ANSSSD/FSSD	Cont. Process				
	3. Identify additional contributing factors:				Number of MAC	High	Surveillance

	b. Traffic conditions - traffic density, complexity, mixture of aircraft types and capabilities, etc.	ANSSSD/FSSD	Continuous process	Air Operators	events per 10,000 flying hours.		of ANSP, air operator and ATO training activities
	c. ATC performance related to workload, competence, teamwork, procedures, commitment, etc., as well as the influence of air navigation services providers' (ANSP) safety management	ANSSSD	Continuous process	ANS service provider CAA inspectors			
	d. Flight crew training and corporate culture with workload, competence, teamwork, procedures, commitment etc., and the influence of aircraft operator's safety management	FSSD	Implemented				
	e. ATC systems - flight data processing, communication, short term conflict alert (STCA), etc., as well as the interaction with the human operators and the aircraft systems, and the procurement policy of the ANSP	ANSSSD	Implemented				
	f. Aircraft equipment - autopilots, transponders and ACAS, but also aircraft performance (e.g. rate-of-climb) and their physical size	FSSD	Implemented				
	g. Navigation infrastructure - both coverage and quality	ANSSSD	Implemented				
	h. Surveillance - both coverage and quality	ANSSSD	Implemented				
	i. Flight plan processing - efficiency and reliability of flight plan submission, approval and distribution	ANSSSD/FSSD	Implemented				

	j. Airspace - complexity of airspace design, route layout, extent of controlled or uncontrolled airspace, proximity of military operational or training areas, etc. k. Flight in adverse environmental conditions that may influence conflict management and collision avoidance	ANSSSD/FSSD ANSSSD/FSSD	Implemented Implemented				
	4. Conduct continuous evaluations of the performance of the SEI	ANSSSD/FSSD	Cont. Process		Number of MAC occurrence per 10,000 flying hours.	High	Surveillance of ANSP, air operator and ATO training activities

N-HRC 4: Runway Excursion (RE)

Goal 1: Achieve a continuous reduction of operational safety risks
Target 1.1: Maintain a decreasing trend of the national accident rate

Safety enhancement initiative	Action	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring Activity
GASP OPS SEI on RE (State) — Mitigate contributing factors to risk of RE accidents and incidents	1. Implement the following RE safety actions: a. Ensure the establishment and implementation of a State runway safety Programme (RSP) and runway safety teams (RST) in all certified aerodromes. b. Promote the establishment of policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds) c. Promote equipage of runway overrun awareness and alerting systems on aircraft d. Ensure effective and timely reporting of meteorological and aerodrome conditions (e.g. runway surface condition in accordance to the ICAO global reporting format in Annex 14,	ASSD FSSD FSSD ASSD	2023 Implemented Implemented 2023	Air Operators ANS service provider Aerodrome service providers CAA inspectors	Number of RE Accident/incident per 10,000 flying hours.	High	Surveillance of Aerodromes, ANSP, air operator and ATO Training activities Safety reporting (MOR/VOR)

	e. Volume I, braking action and revised declared distances)						
	f. Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, PANS-Aerodrome	ASSD	Implemented				
	g. Promote the installation of arresting systems if runway end safety area (RESA) requirements cannot be met.	ASSD	2023				
	h. Ensure that procedures to systematically reduce the rate of un-stabilized approaches to runways are developed and used	FSSD	Implemented				
	i. Runway Safety Maturity Checklist	ASSD/FSSD /ANSSSD	2023				
	j. Guidance material and training program for runway pavement, maintenance and operations from aerodrome operator's perspective	ASSD	2023				
	2. Validate the effectiveness of the SEI through the analysis of MORs, VORs and accident/incident investigations (apply safety management methodologies).	ASSD/ ANSSSD/ FSSD	Continuous Process				
	3. Identify additional contributing factors: a. Ineffective SOPs	ASSD/FSSD /ANSSSD	2023				
	b. Failure to adhere to the appropriate SOPs	ASSD/FSSD /ANSSSD	2023				
	c. Long/floated/bounced/firm/off-centre/crabbed landing	FSSD	Implemented				

	d. Inadequate approach procedures design e. Inadequate regulatory oversight	ANSSSD ASSD/FSSD /ANSSSD	Implemented Implemented				
	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RE	ANSSSD/ASSD/FSSD	2023				
	5. Conduct continuous evaluations of the performance of the SEI.	ASSD/FSSD /ANSSSD	Continue process				
N-HRC 5: Runway Incursion (RI)							
Goal 1: Achieve a continuous reduction of operational safety risks **Target 1.1:** Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Actions**	**Responsible entity**	**Timeline**	**Stakeholders**	**Metrics**	**Priority**	**Monitoring Activity**
GASP OPS SEI on RI (State) — Mitigate contributing factors to the risk of RI accidents and incidents	1. Implement the following RI safety actions: a. Ensure the establishment and implementation of a State runway safety programme (RSP) and runway safety teams (RST) b. Promote the establishment of policy, procedures and training that supports situational awareness for controllers, pilots and airside vehicle drivers	ASSD ASSD/ANSSSD/FSSD	2023 2023	Air Operators ANS service provider Aerodrome service providers	Number of RI Accident/incident per 10,000 flying hours.	High	Surveillance of Aerodromes, ANSP, air operator and ATO training activities Safety reporting (MOR/VOR)

	c. Ensure effective use of suitable technologies to assist the improvement of situational awareness, such as improved resolution airport moving maps (AMM), electronic flight bags (EFBs), enhanced vision systems (EVS) and head-up displays (HUD), advanced-surface movement guidance and control systems (A-SMGCS), stop bars, and runway incursion warning systems (ARIWS).	FSSD/ASSD /ANSSSD	2023	CAA inspectors			
	d. Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, PANS-Aerodrome	ASSD	Implemented				
	e. Ensure the use of standard phraseologies in accordance with applicable State regulations and ICAO provisions (e.g. Doc 9432, Manual of Radiotelephony)	ASSD/ANSSSD/FSSD	Implemented				
	f. Ensure the identification and publication in the aeronautical information publication (AIP) of hot spots at aerodromes	ASSD	2023				
	g. Ensure that suitable strategies to remove hazards or mitigate risks associated with identified hot spots are developed and executed	ASSD	2024				
	h. Runway Safety Maturity Checklist	ASSD/FSSD /ANSSSD	2023				
	i. Model Advisory Circular — Runway Incursion (RI) Prevention and Pilot Training	FSSD	Implemented				

	2. Validate the effectiveness of the SEIs through the analysis of MORs, VORs and accident/incident investigations (apply safety management methodologies)	ASSD/ANSSSD/FSSD	Continuous Process				
	3. Identify additional contributing factors: a. Operations in low visibility conditions	FSSD	Implemented				
	b. Complex or inadequate aerodrome design	ASSD	2024				
	c. Complexity of traffic (multiple simultaneous line-ups)	ANSSSD	implemented				
	d. Conditional clearances	ANSSSD/FSSD	Implemented				
	e. Simultaneous use of intersecting runways	FSSD/ASSD	NA				
	f. Late issue of or late changes to departure clearances	ANSSSD	Implemented				
	g. Phraseology use (e.g. non-standard vs. standard, call-sign confusion)	ANSSSD/FSSD	Implemented				
	h. Concurrent use of more than one language for ATC communications	ANSSSD	NA				
	i. English language competence despite the introduction by ICAO of a system of validating competence in aviation English	ANSSSD/FSSD	Implemented				
	j. Inadequate manoeuvring area driver training and assessment programme.	ASSD	2024				

	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any, for RI	ASSSD/FSSD/ASSD	2024				
	5. Conduct continuous evaluations of the performance of the SEIs	ASSD/ANSSSD/FSSD	Cont. process				

N-HRC 6: Abnormal Runway Contact (ARC)

Goal 1: Achieve a continuous reduction of operational safety risks
Target 1.1: Maintain a decreasing trend of the national accident rate

Safety enhancement initiative	Action	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring Activity
Mitigate contributing factors to the risk of ARC accidents and incidents	1. Implement the following ARC safety actions: a. Promote the establishment of policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds). b. Ensure effective and timely reporting of meteorological and aerodrome conditions (e.g. runway surface condition in accordance to the ICAO global reporting format in Annex 14, Volume I, braking action and revised declared distances) c. Runway Safety Maturity Checklist	FSSD ASSD ASSD/ANSSSD/FSSD	Implemented 2023 2023	Airline Operators Aerodrome Operators	No. of training provided No. of reports reported in standards format	High	Surveillance of Aerodromes, ANSP, air operator and ATO training activities Safety reporting (MOR/VOR)

	d. Tool Guidance material on Unstabilised Approach e. Guidance material and training program for runway pavement, maintenance and operations from aerodrome operator's perspective.	FSSD ASSD	Implemented 2023				
	2. Validate the effectiveness of the SEIs through the analysis of MORs, VORs and accident/incident investigations (apply safety management methodologies)	FSSD/ANSSSD ASSD	Continuous process				
	3. Identify additional contributing factors: a. Ineffective SOPs b. Failure to adhere to the appropriate SOPs c. Long/floated/bounced/firm/off-centre/crabbed landing d. Inadequate approach procedures design e. Inadequate regulatory oversight	 ASSD/FSSD/ANSSSD ASSD/FSSD/ANSSSD FSSD ANSSSD ASSD/FSSD/ANSSSD	 2023 2023 Implemented Implemented Implemented				
	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any.	ASSD/FSSD/ANSSSD	2023				
	5. Conduct continuous evaluations of the performance of the SEIs	ASSD/FSSD/ANSSSD	Cont. Process				
N-HRC 7: Wildlife Strike (WS) on and in the vicinity of Aerodrome							

Goal 1: Achieve a continuous reduction of operational safety risks **Target 1.1:** Maintain a decreasing trend of the national accident rate							
Safety enhancement initiative	**Action**	**Responsible entity**	**Timeline**	**Stakeholders**	**Metrics**	**Priority**	**Monitoring Activity**
Mitigate contributing factors to the risk of WS accidents and incidents	1. Implement the following WS safety actions: a. Observe bird activities and bird strikes at the airports and promote collecting, reporting, recording and analysis of data through various means. b. Ensure the better management of vegetation and land use at the airports. c. Ensure the implementation of effective bird distracting mechanisms at the airports. d. Ensure the implementation of Off-airport bird management activities in collaboration with local communities and other government agencies through National Airport Bird Control and Reduction Committee e. Encourage to use environment friendly chemical bird repellent technique at airports apart from the existing audio and visual repellent techniques.	ASSD/ANSSSD/FSSD ASSD ASSD ASSD ASSD	Implemented 2023 2023 2024 2023	Air Operators ANS service provider Aerodrome service providers CAA inspectors	Number of WS Accident/ incident per 10,000 flying hours.		Surveillance of Aerodromes, ANSP, air operator activities Safety reporting (MOR/VOR)

	f. Introduce Runway sweep-in vehicles to control the activity of birds and other wildlife due to presence of attractants on the surface of runway.	ASSD	2024				
	2. Validate the effectiveness of the SEI through the analysis of MORs, VORs and accident/incident investigations (apply safety management methodologies)	ASSD/ANSSD/FSSD	Continuous process				
	3. Identify additional contributing factors:	ASSD	2023				
	4. Develop and implement further SEIs to mitigate the risk of the identified contributing factors, if any.	ASSD	Contd. Process				
	5. Conduct continuous evaluations of the performance of the SEIs	ASSD/ANSSD/FSSD	Cont. Process				

APPENDIX – B
DETAILED SEIs: ORGANIZATIONAL CHALLENGES

Organization challenge no. 1: Establishment of a safety oversight framework
Focus on lower EI scores for categories namely

- CE-8: Resolution of safety Issues,
- CE-3: State System and Functions
- Organization (ORG)
- Aircraft and incident investigation (AIG),

Goal 2: Strengthen State safety oversight capabilities

Target 2.1: Nepal to improve its score for the effective implementation (EI) of the critical elements (CEs) of the State's safety oversight system (with focus on priority PQs) as follows:
a) by 2024 – 75 per cent EI score
b) by 2026 – 85 per cent EI score
c) by 2030 – 95 per cent EI score

Safety enhancement initiative	Action	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring Activity
GASP ORG SEI 1 (State) — Consistent implementation of ICAO SARPs at the national level	1. Work at the national level to address significant safety concerns as a priority 2. Address all priority protocol questions (PQs) of the USOAP CMA 3. Establish primary aviation law and regulations, to empower the competent authority to conduct regulatory oversight, this includes separation of oversight functions and service provision functions (CE-1 and CE-2)	ASSRD ASSRD CAAN	Continuous process 2023 2023	Air Operators ANS service provider Aerodrome service providers ASSRD	EI percentage State Safety index Rate of improvement in	High	Quality assurance of oversight functions Surveillance of Aerodromes, ANSP, air operator activities

	4. Increase the level of compliance with ICAO SARPs and the EI of CEs at the national level (CE-1 to CE-5) 5. Establish a process for the identification of differences with ICAO SARPs (CE-2)	ASSRD ASSRD	Continuous process Implemented		compliance Percentage of priority PQs addressed.		
GASP ORG SEI 2 (State) — Development of a comprehensive regulatory oversight framework	1. Establish and maintain an independent regulatory oversight authority, which includes separation of oversight functions from service provision functions where these exist within the authority (CE-3) 2. Develop an effective system to promulgate technical guidance and tools, and provide safety-critical information needed for technical personnel to effectively perform their safety oversight functions (CE-5). 3. Establish an effective system to attract, recruit, train and retain qualified and sufficient technical personnel to support regulatory oversight (see SEI-5) (CE-3 and CE-4).	CAAN ANSSSD/ ASSD/FSSD /SMD ASSRD	2023 2023 2023	Air Operators ANS service provider Aerodrome service providers ASSRD	Independent regulatory oversight authority Safety oversight functions	High	Quality assurance of oversight functions Surveillance of Aerodromes, ANSP, air operator activities

GASP ORG SEI-3 (State) — Establishment of an independent accident and incident investigation authority, consistent with Annex 13	1. Establish an independent accident and incident investigation authority, as per Annex 13 requirements (CE-1 and CE-3) 2. Develop an effective system to promulgate technical guidance and tools, and provide safety-critical information needed for technical personnel to effectively conduct accident and incident investigations (CE-5) 3. Establish an effective system to attract, recruit, train and retain qualified and sufficient technical personnel to support accident and incident investigations (see SEI-5) (CE-3 and CE-4)	MoCTCA MoCTCA MoCTCA	2023 2023 2023		Independent accident and incident investigation authority The required technical guidance and tools.		AIG reports Quality assurance regarding the AIG functions
GASP ORG SEI-4 (State) — Strategic allocation of resources to enable effective safety oversight	1. Confirm executive or legislative mandate to receive financial resources from government or other external sources and expend them (CE-1) 2. Establish a process for the resource planning and allocation in alignment with a competent authority's organizational structure, which is required to conduct effective safety oversight (CE-2 and CE-3). SEI-1 and SEI-5 could be used to identify resource requirements (CE-1 to CE-5) 3. 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:	CAAN ASSRD ASSRD	Implemented 2023 Cont. process	Air Operators ANS service provider Aerodrome service providers ASSRD	CAAN acts and regulations		Provisions and implementation of CAAN acts and regulations

	a. Utilize the ICAO Safety Fund (SAFE), Technical Co-operation Bureau, or other means to acquire technical and financial assistance in coordination with RASG/RSOO/ICAO Regional Office b. Seek assistance from more experienced States and other stakeholders in coordination with RASG/RSOO/ICAO Regional Office c. Seek assistance from sources of financing (World Bank, Asian Development Bank etc.) in coordination with RASG/RSOO/ICAO Regional Office 4. Develop a process for assessing changing resource requirements and sustain necessary coordination with resource stakeholders for safety oversight improvements, as outlined in Component 1 of this roadmap (CE-1 to CE-3)	ASSRD CAAN ASSRD	N/A Ongoing with APAC On going 2023				

GASP ORG SEI-5 (State) — Qualified technical personnel to support effective safety oversight	1. Establish an effective system to identify and track qualifications and training of existing technical personnel (CE-4) 2. Identify the gaps in qualified technical personnel and training requirements necessary to implement the oversight mandate (CE-4) 3. Establish a compensation scheme for the attraction and retention of qualified technical personnel (CE-4) 4. Make use of RSOOs, RAIOs, or equivalent means, to secure qualified technical personnel to perform those functions which cannot be performed by the State acting on its own (CE-4) 5. Establish human resource plans to support hiring and retention of the appropriate number of qualified technical personnel required (CE-4) 6. Implement training policies and programmes for technical personnel and verify that the type and frequency of training successfully completed (i.e. initial, recurrent, specialized and on-the-job training) are sufficient to acquire/maintain the required qualifications and level of competence corresponding to the assigned duties and responsibilities of technical personnel (CE-4) 7. Develop a process for assessing changing needs for qualified technical personnel requirements and develop procedures to update hiring, retention and training of personnel needs, in coordination with SEI-4B (CE-4)	ASSRD ASSRD CAAN ASSRD ASSRD ASSRD ASSRD	Implemented 2023 Implemented 2023 2023 2023 2023	Air Operators ANS service provider Aerodrome service providers CAAN inspectors	Qualified technical manpower		Quality assurance of oversight functions

Issue No. 3: Slow pace of SSP implementation, as well as understanding of newer safety management and performance-based concepts

Goal 3: Implement effective SSP

Target 3.1: Nepal to implement the foundation of its SSP by 2023.
Target 3.2: Nepal to work towards an effective SSP as follows:
a) by 2023 – Present
b) by 2025 – Present and effective

Safety enhancement initiative	Action	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring Activity
GASP ORG SEI-13 (State) — Start of SSP implementation at the national level	1. Secure State-level commitment to improve safety 2. Conduct initial SSP gap analysis (checklist) then the detailed SSP self -assessment 3. Establish an SSP implementation team 4. Develop an implementation plan for the SSP 5. Issue SMS regulations for service providers and verify SMS implementation. 6. Identify and share safety management best practices	DGCA SMD ASSRD SMD ASSRD ASSRD	Implemented Implemented Implemented Implemented Implemented Continuous process.	Air Operators ANS service provider Aerodrome service providers ASSRD	Level of SSP implementation Level of SMS implementation in service providers	High	ICAO ISTARs Quality assurance of oversight functions and SSP implementation
GASP ORG SEI-14 (State) — Strategic allocation of resources to	1. Establish a process for planning and allocation of resources to enable SSP implementation and identify areas where resources are needed.	ASSRD	2025		CAAN acts and regulations		Provisions and implementation of CAAN acts and regulations

start SSP implementation	2. Obtain resources from national and appropriate authorities' leadership and stakeholders within the State to support SSP implementation 3. Work with the ICAO Regional Office to make use of available means (e.g. Technical Co-operation Bureau) to acquire assistance needed for SSP implementation 4. Work with RSOO, other States and other organizations, as appropriate to train qualified technical personnel to fulfil their duties and responsibilities regarding SSP implementation	ASSRD DGCA ASSRD	Implemented Continuous process. Continuous process.				
GASP ORG SEI-15 (State) — Strategic collaboration with key aviation stakeholders to start SSP implementation	1. Identify areas where collaboration/support is needed as part of the SSP implementation plan (see SEI-14) 2. Identify relevant collaborators from key aviation stakeholders, including other States that are implementing or have implemented an SSP 3. Develop an action plan to address the elements identified as missing or deficient during the SSP gap analysis (see SEI-13B) 4. 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	SMD ASSRD SMD ASSRD	Continuous process. 2025 Implemented 2025	Air Operators ANS service provider Aerodrome service providers ASSRD Global and Regional bodies Other states	Number of collaborator identified Number of activities collaborated with identified collaborators		Monitoring and evaluating collaborative activities through Steering committees and regional forums ICAO ISTARs

	5. 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). 6. Establish and implement a process for sharing technical guidance, tools and safety-critical information related to SSP (e.g. advisory circulars, staff instructions, safety performance indicators), in collaboration with other States, RASG, RSOO, ICAO and/or other stakeholders.	ASSRD ASSRD	2025 2025				
GASP ORG SEI-16 (State) — Strategic collaboration with key aviation stakeholders to complete SSP implementation	1. Work with collaborators (identified in SEI-15) to execute the action plan for implementation 2. Work with collaborators to ensure all elements of the SSP are present, suitable, operational and effective 3. Establish a system for the continuous improvement of the SSP, in collaboration with all relevant stakeholders 4. Serve as a champion State to promote best practices among other States 5. Improve the sharing of best practices in safety management, safety data and analyses among regional platforms including APANPIRG Subgroups via RASG-APAC	ASSRD ASSRD ASSRD ASSRD	Implemented 2025 Implemented 2025 2025	Air Operators ANS service provider Aerodrome service providers ASSRD Regional bodies Other states	Number of activities collaborated with identified collaborators. Level of SSP implementation. Number of best practices shared with other states		Monitoring and evaluating collaborative activities through Steering committees and regional forums ICAO ISTARs

GASP ORG SEI-17 (State) — Establishment of safety risk management at the national level (step 1)	1. Establish a legal framework related to the protection of safety data, safety information and other related sources 2. Establish a State mandatory occurrence reporting system 3. Develop a safety database for monitoring system safety issues and hazards, in line with the principles of Doc 9859 — Safety Management Manual 4. Establish and maintain a process to identify hazards from collected safety data 5. Establish and utilize a process to ensure the assessment of safety risks associated with identified hazards 6. Establish a State confidential voluntary safety reporting system providing data to the safety database (see SEI-17C)	SMD ASSRD ASSRD ASSRD ASSRD ASSRD	Implemented Implemented Implemented Implemented Implemented Implemented	Air Operators ANS service provider Aerodrome service providers ASSRD	Number of mandatory and voluntary reports Legal framework regarding to hazard id and SRM Number of SRM conducted.		quality assurance of SRMs conducted Effectiveness of reporting systems
GASP ORG SEI-18 (State) — Establishment of safety risk management at the national level (step 2)	1. Develop safety performance indicators using the established safety risk management process 2. Develop safety performance measurement methodologies, aligned with the regional safety metrics, using the established safety risk management process (see SEI-17E)	ASSRD SMD	Implemented Implemented	Air Operators ANS service provider Aerodrome service providers	Number of mandatory and voluntary reports		quality assurance of SRMs conducted Effectiveness of reporting systems

	3. Establish the acceptable level of safety performance to be achieved through the SSP 4. Ensure the establishment of mandatory safety reporting systems by service providers. 5. Encourage establishment of voluntary safety reporting systems as part of service providers' SMS. 6. 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 7. Contribute information on safety risks and SSP safety performance indicators to the RASP.	ASSRD ASSRD ASSRD ASSRD ASSRD	2023 Implemented Implemented Implemented 2023	CAAN inspectors	Legal framework regarding to hazard id and SRM Number of SRM conducted. Number of SPIs and SPTs defined		Quality of of SPIs and SPTs defined Contribution of SPIs to AP RASP
GASP ORG SEI-19 (State) — Acquisition of resources to increase the proactive use of risk modelling capabilities	1. Identify resources needed to support safety intelligence collection and processing, advanced data analysis, risk modelling and information-sharing capabilities 2. Attract, recruit, train, and retain qualified technical personnel to specialize in risk modelling 3. Ensure that the Civil Aviation Safety Inspector workforce is trained to perform safety oversight of service providers that have implemented SMS	ASSRD ASSRD ASSRD	2025 2023 Implemented	Air Operators ANS service provider Aerodrome service providers ASSRD	Number of qualified technical personnel For SSSP implementation. Resource allocated to SSP implementation		Quality assurance of SSP implementation related activities

GASP ORG SEI-20 (State) — Strategic collaboration with key aviation stakeholders to support the proactive use of risk modelling capabilities	1. Identify areas where collaboration/support is needed to ensure that stakeholders understand and implement safety culture concepts to fully embrace an open, just culture and non-punitive safety reporting 2. Establish a process via RASG and/or RSOO (or other regional bodies) for a mentoring system, including providing assistance to States/industry, as well as the sharing of best practices, to support safety culture development and the proactive use of risk modelling 3. Foster and participate in public-private partnerships similar to the commercial/general aviation safety teams' concept to identify and implement system safety enhancements. 4. 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	ASSRD ASSRD ASSRD ASSRD	2025 2025 Implemented Implemented		Number of areas identified for collaboration Number of assistance received and best practices shared		Surveillance of state risk modelling capabilities
GASP ORG SEI-21 (State) — Advancement of safety risk management at	1. 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.)	ASSRD	Implemented		Number of information shared among ANSSSD, ASSD,		Surveillance of state safety risk management

the national level	2. Develop risk modelling capabilities to support monitoring system safety issues and accident/incident prevention 3. Encourage information-sharing with industry	ASSRD ASSRD	2023 Implemented		FSSD, SMD and industry.		
Issue no. 4: Lack of resources and expertise to manage and collect data on a State level, and no formal mechanisms in place that allow for the sharing and benchmarking of information at the regional level.							
Goal 4: Increase collaboration at the regional level **Target 4.1**: Nepal to seek assistance to strengthen their safety oversight capabilities or facilitate SSP implementation by 2023. **Target 4.2:** Nepal to contribute information on operational safety risks, including SSP safety performance indicators (SPIs), and emerging issues, to its Asia Pacific RASG by 2023							
Safety enhancement initiative	**Action**	**Responsible Entity**	**Timeline**	**Stakeholders**	**Metrics**	**Priority**	**Monitoring Activity**
GASP ORG SEI-6 (State) — Strategic collaboration with key aviation stakeholders to enhance safety in a coordinated manner	1. Based on the identified safety deficiencies (Implement), establish a mechanism to identify collaborators and develop an action plan for the resolution of those deficiencies (CE-6 to CE-8). 2. Based on the identified safety deficiencies (Establish), establish a mechanism to identify collaborators and develop an action plan for the resolution of those deficiencies (CE-1 to CE-5). 3. Use a regional safety oversight mechanism, or the services of another competent State or organization.	ASSRD ASSRD ASSRD	Implemented Implemented 2025 (if required)	ASSRD COSCAP-SA RSOOs	Number of collaborators identified for assistance. Number of assistance		State safety oversight capability and effectiveness by State Quality assurance.

	4. 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)	ASSRD	2023		received to strengthen oversight of state from regional bodies or/and States.		
	5. Collaborate with RASG and/or RSOO, other States, ICAO, industry joint programmes and/or technical school partnerships to attract, recruit and train qualified and sufficient technical personnel and develop a strategy for their retention (CE-4)	ASSRD	2023				
	6. Establish and implement a process for the development and promulgation of technical guidance, tools and the provision of safety-critical information, in collaboration with other States, RSOO, ICAO and/or other stakeholders, with the understanding that these materials need to be tailored to each State's national regulations and operational environments (CE-5)	ASSRD	2023				
	7. While working to improve safety oversight, work with RASG and/or RSOO to address high-risk categories of occurrences (see OPS roadmap)	ASSRD	2023				
	8. Leverage regional groups such as the RASG to identify additional resources	ASSRD	2023				
	9. Use technical guidance, tools and safety-critical information, developed in collaboration with	ASSRD	2023				

	other States, RSOO, ICAO and/or other stakeholders, to enable technical personnel to perform their safety oversight functions effectively (CE-6 to CE-8) 10. While working to improve safety oversight, continue to work with RASG and/or RSOO to address high-risk categories of occurrences (see OPS roadmap 11. Work with the ICAO Regional Office to make use of available means (e.g. Technical Co-operation Bureau) to acquire assistance needed for SSP implementation. 12. Work with RSOO, other States and other organizations, as appropriate to train qualified technical personnel to fulfil their duties and responsibilities regarding SSP implementation	ASSRD ASSRD ASSRD	2023 2023 2023				
GASP ORG SEI-15 (State) — Strategic collaboration with key aviation stakeholders to implement SSP.	1. Identify areas where collaboration/support is needed as part of the SSP implementation plan (see SEI-14) 2. Identify relevant collaborators from key aviation stakeholders, including other States that are implementing or have implemented an SSP 3. Develop an action plan to address the elements identified as missing or deficient during the SSP gap analysis (see SEI-13B)	SMD ASSRD SMD	2023 2023 Implemented	Air Operators ANS service provider Aerodrome service providers ASSRD Regional bodies	Number of collaborators identified. Number of assistance received		Monitoring SSP implementation

	4. 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	ASSRD	2023	(identified collaborators)	to implement the SSP from regional bodies or/and other States.		
	5. Develop a process to provide training on SSP to relevant staff, in collaboration with RSOO and/or other States (e.g. initial, recurrent and advanced) (see SEI-14D)	ASSRD	2023				
	6. Establish and implement a process for sharing technical guidance, tools and safety-critical information related to SSP (e.g. advisory circulars, staff instructions, safety performance indicators), in collaboration with other States, RASG, RSOO, ICAO and/or other stakeholders	ASSRD	2023				
	7. Work with collaborators (identified in SEI-15) to execute the action plan for implementation	ASSRD	2023				
	8. Work with collaborators to ensure all elements of the SSP are present, suitable, operational and effective	ASSRD	2025				
	9. Establish a system for the continuous improvement of the SSP, in collaboration with all relevant stakeholders	ASSRD	Implemented				
	10. Contribute information on safety risks and SSP safety performance indicators to the RASG	ASSRD	2023				

	11. Establish a process via RASG and/or RSOO (or other regional bodies) for a mentoring system, including providing assistance to States/industry, as well as the sharing of best practices, to support safety culture development and the proactive use of risk modelling	ASSRD	2023				
	12. Support the robust implementation and continuous improvement of SMS and SSP	ASSRD	2023				

Issue No. 5: Slow pace of SMS implementation, as well as low number of participation of Service providers in the ICAO-recognized industry assessment programmes.

Goal 5: Expand the use of industry programmes

Target 5.1: Maintain an increasing trend in industry's contribution in safety information sharing networks to State and region to assist in the development of NASP and RASP

SEI	Actions	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring activities
GASP SMS SEI-5 Improvement of industry compliance with applicable SMS requirements.	1. Ensure implementation of a safety management system (SMS) commensurate to the size and complexity of the service provider, as required by national regulations and Annex 19. 2. Ensure utilization of available guidance material to assist with SMS implementation.	FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD	Implemented Implemented	Air Operators ANS service provider Aerodrome service providers ASSRD	-Level of SMS Implementation -No of guidance materials available -No. of discrepancies reported to authority	High	Surveillance of service providers' SMS implementation.
GASP SMS SEI-6 — Resources for service providers to	1. Ensure working in collaboration with the State and industry associations to advance SMS implementation and identify expectations that cannot be efficiently resourced.	FSSD/ASSD/ANSSSD/SMD	Implemented	Air Operators ANS service provider	No of areas identified for support	High	Surveillance of service providers' SMS implementation.

effectively implement SMS	2. Ensure identification of areas where resources are needed as part of the SMS implementation plan developed following the SMS gap analysis. 3. Ensure establishing a process for resource planning and allocation to enable SMS implementation, including resources which may be obtained from industry organizations 4. Ensure obtaining commitment from the accountable executive within the service provider for the necessary resources to enable SMS implementation	FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD	Implemented Implemented Implemented	Aerodrome service providers ASSRD	Level of Commitment from accountable manager		
GASP SMS SEI-7 — Strategic collaboration with key aviation stakeholders to complete SSP implementation.	1. Ensure working with the action plan of SSP implementation through sharing and supporting harmonization of SMS within industry 2. Ensure support for continuous improvement of SSP..	FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD	Implemented 2023	Air Operators ANS service provider Aerodrome service providers ASSRD	-No of collaborator identified -Level of information shared with state -Number and quality of defining HRCs	High	Surveillance of service providers' SMS implementation.
GASP SMS SEI-8 — Establishment of safety risk management at the service provider level	1. Ensure establishment of mandatory safety reporting systems 2. Ensure providing information from the service provider to the State mandatory safety reporting system, as required 3. Ensure establishment of internal mechanisms related to the protection of safety data, safety information and related	FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD	Implemented Implemented Implemented	Air Operators ANS service provider Aerodrome service providers	No of MOR and VOR received. Definition of SPIs and SPTs	High	Surveillance of service providers' SMS implementation.

	sources for the purpose of safety improvement 4. Ensure establishment of voluntary and confidential hazard/occurrence reporting systems as part of the SMS 5. Ensure establishment and maintenance of a safety database for technical personnel to monitor system safety issues within the service provider 6. Ensure establishment and utilization of a safety risk management process 7. Ensure development of safety performance measurement methodologies, aligned with harmonized safety metrics within industry, via the established safety risk management process 8. Ensure development of safety performance indicators and associated targets/alert settings, via the established safety risk management process 9. Encourage the use of globally harmonized metrics for the development and monitoring of safety performance indicators, as part of the service providers' SMS 10. Encourage sharing and use of information from within industry to identify hazards and mitigate safety risks	FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD	Implemented Implemented Implemented Implemented Implemented Implemented Continuous process	ASSRD	No Techniques used for measuring performance measurement.		
GASP SMS SEI-10 — Allocation of industry	1. Ensure competent technical personnel are allocated, at the service provider level, to support the requirements of the SSP infrastructure	FSSD/ASSD/ANSSSD/SMD	2023	Air Operators ANS service provider	Level of competence of staff allocated	High	Surveillance of service providers' SMS implementati

resources to support continuous improvement of SSP and SMS	2. Ensure providing safety analysis results from service providers to support the SSP	FSSD/ASSD/ANSSSD/SMD	Implemented	Aerodrome service providers ASSRD	for SMS implementation		on.
GASP SMS SEI-11 — Strategic collaboration with key aviation stakeholders to support the proactive use of risk modelling capabilities	1. Ensure working with industry stakeholders to leverage best practices with safety information analysis. 2. Ensure sharing of safety risk identification with stakeholders for mitigation and monitoring strategies 3. Ensure active participation with State and organizations engaged in risk modelling	FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD	Implemented Implemented Implemented	Air Operators ANS service provider Aerodrome service providers ASSRD	No of stakeholders identified and mechanism established to deal with them.	High	Surveillance of service providers' SMS implementation.
GASP SMS SEI-12 — Advancement of safety risk management at the service provider level	1. Ensure safety information and other related sources is implemented and effective 2. Ensure developing risk modelling capabilities to support the monitoring of system safety issues and accident/incident prevention 3. Ensure monitoring safety information exchange networks for continuous improvements	FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD FSSD/ASSD/ANSSSD/SMD	2023 2023 Implemented	Air Operators ANS service provider Aerodrome service providers ASSRD	No of Processes established and activities carried out for continuous improvement of SMS.	High	Surveillance of service providers' SMS implementation.

Issue no. 6: Increasing risks associated with airspace congestion, and the lack of appropriate infrastructure to support safe operations; lack of capacity of regulatory authority.

Goal 6: Ensure the appropriate infrastructure (physical and institutional) is available to support safe operation

Target 6.1: Nepal to maintain an increasing trend with air navigation and aerodrome infrastructure that meet relevant ICAO Standards by 2025.

SEI	Actions	Responsible entity	timeline	Stakeholders	Metrics	Priority	Monitoring activities
Implement the air navigation and airport core infrastructure and improve the EI percentage.	1. Establish a means for to informally share information and coordinate on operational issues in the USOAP Audit Areas of OPS, ANS and AGA 2. Implement safety-related initiatives from the APAC Seamless ANS Plan3 in a timely manner, as applicable 3. Establish an independent accident and incident investigation authority (AIIA) as required by Annex 13, as well as related investigation system and procedures	FSSD/ASSD/ANSSSD ANSSSD MoCTCA	Implemented 2023 2025	MoCTCA Air Operators ANS service provider Aerodrome service providers	Number of operational safety issues shared and coordinated. Level of Implementation of Safety related initiatives from the APAC Seamless ANS Plan 3. Number of AIG conducted in accordance with Annex 13.	High	Surveillance to ensuring the quality of operational information sharing and coordination mechanism, implementation of APAC Seamless ANS Plan 3 and AIG conduction.