

National Aviation Safety Plan, Nepal

2023 to 2025



Civil Aviation Authority of Nepal



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RECORD OF AMENDMENTS

ABBREVIATIONS and ACRONYMS

ACAS:	Airborne Collision Avoidance System	MORs:	Mandatory Occurrence Reports
AGA:	Aerodrome and Ground Aid	MOU:	Memorandum of Understanding
AIIA:	Accident and Incident Investigation Authority	MSAW:	Minimum Safety Altitude Warning
AIP:	Aeronautical Information Publication	N-HRC:	National HRC
ANS:	Air Navigation Services	NASP:	National Aviation Safety Plan
ANSP:	ANS Provider	OLF:	On Line Framework
ANSSD:	ANS Safety Standards Department	OPS:	Operations
AOC:	Air Operators Certificate	ORG:	Organization
AP RASP:	Asia Pacific Regional Aviation Safety Plan	PDCA:	Plan Do Check Act
ARC:	Abnormal Runway Contact	PQ:	Protocol Questions
ASSD:	Aerodrome Safety Standards Department	QMS:	Quality Management System
ATC:	Air Traffic Control	R-HRC:	Regional HRC
ATO:	Approved Training Organizations	RAIO:	Regional Accident and Incident Investigation Organization
ASSRD:	Aviation Safety and Security Regulation Directorate	RASG:	Regional Aviation Safety Group
CAAN:	Civil Aviation Authority of Nepal	RE:	Runway Excursion
CAP:	Corrective Action Plan	RI:	Runway Incursion
CEs:	Critical Elements	RSOO:	Regional Safety Oversight Organization
CFIT:	Controlled Flight Into Terrain	RSP:	Runway Safety Programme
CICTT:	CAST/ ICAO Common Taxonomy Team	RST:	Runway Safety Team
CMA:	Continuous Monitoring Approach	SEIs:	Safety Enhancement Initiatives
CRM:	Crew Resource Management	SMD:	Safety Management Division
EI:	Effective Implementation	SMS:	Safety Management System
FH:	Flying Hours	SOI:	Safety Oversight Index
FM:	Flight Movement	SOP:	Standard Operating Procedure
FSSD:	Flight Safety Standards Department	SPI:	Safety performance Indicator
G-HRC:	Global HRC	SPT:	Safety Performance Target
GASP:	Global Aviation Safety Plan	SRM:	Safety Risk Management
GPWS:	Ground Proximity Warning System	SSCs:	Significant Safety Concerns
HRCs:	High Risks Categories	SSP:	State Safety Programme
IOSA:	IATA Operational Safety Audit	TAWS:	Terrain Awareness Warning System
ISAGO:	IATA Safety Audit for Ground Operations	USOAP:	Universal Safety Oversight Audit Programme
LOC-I:	Loss of Control In flight	VORs:	Voluntary Occurrence Reports
MAC:	Mid Air Collision	WS:	Wildlife Strike
MoCTCA:	Ministry of Culture, Tourism and Civil Aviation		

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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

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:

Goal 1: Achieve a continuous reduction of operational safety risks

Target 1.1: Maintain a decreasing trend of National accident rate.

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

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

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

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

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 NATIONAL 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.	<ul style="list-style-type: none"> • 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 linked 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: ○ by 2024 – 75 per cent EI score ○ by 2026 – 85 per cent EI score ○ by 2030 – 95 per cent EI score	<ul style="list-style-type: none"> ● 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
Goal 3: Implement effective State safety programmes (SSP)	3.1: Nepal to implement the foundation of an SSP by 2023.	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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.	<ul style="list-style-type: none"> ● 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 indicators (SPIs), and emerging issues, to its Asia Pacific RASG by 2025	<ul style="list-style-type: none"> ● Number of reports reported to AP RASG via the Secure Portal on Operational Safety Risks and Emerging Issues. ● Number of SSP SPIs shared with AP- RASG 	This goal is directly linked to Goal 4 and Target 4.3 of GASP.

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	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • 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 (<i>Regional HRC</i>) |

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							
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.

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.

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).

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 to 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 its initiatives, and further requests for information may be addressed to the following:

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APPENDIX A

DETAILED SEIS: NATIONAL OPERATIONAL SAFETY RISKS

Issue No. 1: Operational Safety Risks							
N-HRC 1: Controlled Flight Into Terrain (CFIT)		Action Plan					
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	<p>1. Implement the following CFIT safety actions:</p> <ul style="list-style-type: none"> a. Ensure aircraft are equipped with terrain awareness and warning system (TAWS) in accordance with Annex 6. b. Promote the wider use of TAWS beyond the requirements of Annex 6. c. Issue a Safety Advisory to increase adherence to TAWS warning procedures d. Promote the use of GPS-derived position data to feed TAWS e. Model Regulation on Ground Proximity Warning System (GPWS) f. Guidance for Operators to Ensure Effectiveness of GPWS Equipment g. Guidance for Operators on Training Programme on the use of GPWS h. Promote greater awareness of approach risks. 	<p>FSSD</p> <p>FSSD</p> <p>FSSD</p> <p>FSSD</p> <p>FSSD</p> <p>FSSD</p> <p>FSSD</p>	<p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p>	<p>ANSSSD</p> <p>ANSP</p> <p>FSSD</p> <p>Air Operators</p>	<p>Number of CFIT Accident/ incident per 10,000 flight movements.</p>	High	<p>Surveillance of operator, ANSP activities</p> <p>Safety reporting (MOR/ VOR)</p>

	i. Guidance for Air Operators in Establishing a Flight Safety Documents System	FSSD	Implemented
	j. Instrument Approach Procedures Using Continuous Descent Final Approach Techniques (CDFA)	ANSSSD	2023
	k. Implement minimum safe altitude warning (MSAW) systems	FSSD	Implemented
	l. Issuance of Terrain or Obstacle Alert Warning	ANSSSD	2025
	m. Ensure the timeliness of updates and accuracy of Electronic Terrain and Obstacle Data (eTOD)	FSSD	Implemented
	n. Guidance on the Establishment of a Flight Data Analysis Programme (FDAP)	FSSD	Implemented
	o. Advisory Circular — Crew Resource Management Training Programme (CRM)	FSSD	Implemented
	p. Advisory Circular — Controlled Flight into Terrain (CFIT) and Approach and Landing Accident Reduction (ALAR) Training Programme.	FSSD	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, ANS activities Safety reporting (MOR/ VOR)
3.	Identify additional contributing factors:	ANSSSD/ FSSD	Implemented	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrence per 10,000 FMs	High
a.	Flight in adverse environmental conditions	ANSSSD	Implemented	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrence per 10,000 FMs	High Surveillance of operator, ANS activities Safety reporting (MOR/ VOR)
b.	Approach design and documentation (e.g. approaches with vertical guidance (APV) or localizer performance with vertical guidance (LPV) approaches)	FSSD/ ANSSSD	Implemented	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrence per 10,000 FMs	High Surveillance of operator, ANS activities Safety reporting (MOR/ VOR)
c.	Phraseology used (standard vs. non-standard)	FSSD	Implemented	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrence per 10,000 FMs	High Surveillance of operator, ANS activities Safety reporting (MOR/ VOR)
d.	Pilot fatigue and disorientation	ANSSSD/ FSSD	Continuous process	ANSSSD ANSP FSSD Air Operators	Number of CFIT occurrence per 10,000 FMs	High Surveillance of operator, ANS activities Safety reporting (MOR/ VOR)
4.	Conduct continuous evaluations of the performance of the SEIs.					

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	<p>1. Implement the following LOC-I safety actions:</p> <ul style="list-style-type: none"> 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 <p>2. Validate the effectiveness of the SEIs in the industry through MORs and VORs systems and accident/incident investigations (apply safety management methodologies- PDCA)</p>	FSSD	Implemented	Air Operators	<p>Number of LOC-I Accident/ incident per 10,000 flying hours.</p> <p>Flight simulator product and service providers</p> <p>CAA inspectors</p>	<p>Surveillance of operator and ATO training activities</p> <p>High</p>	MOR, VOR and AIG reports

	FSSD	Implemented		
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.	Stick-shaker activation events in FDA data Air Operators	LOC-I occurrence rates Flight simulator product and service providers	Surveillance of operator and ATO CAA inspectors	High Number of LOC-I occurrence per 10,000 FHs High training activities

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	<p>1. Implement the following MAC safety actions:</p> <ul style="list-style-type: none"> 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. <p>2. Validate the effectiveness of the SEIs through the analysis of MORs and VORs and accident/incident investigations (apply safety management methodologies)</p>	FSSD FSSD FSSD 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)	

3. Identify additional contributing factors:	a. Traffic conditions - traffic density, complexity, mixture of aircraft types and capabilities, etc.	ANSSSD/ FSSD	Continuous process							

N-HRC 4: Runway Excursion (RE)		2023 to 2025		2023		2023		2023	
GASP OPS SEI on RE (State) — Mitigate contributing factors to risk of RE accidents and incidents		1. Implement the following RE safety actions:		ASSD		FSSD		FSSD	
a. Ensure the establishment and implementation of a State runway safety programme (RSP) and runway safety teams (RST) in all certified aerodromes.		a. Ensure the establishment and implementation of a State runway safety programme (RSP) and runway safety teams (RST) in all certified aerodromes.		ASSD		FSSD		FSSD	
b. Promote the establishment of policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds)		b. Promote the establishment of policy and training on rejected landings, go-arounds, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds)		Air Operators		Implemented		Implemented	
c. Promote equipage of runway overrun awareness and alerting systems on aircraft		c. Promote equipage of runway overrun awareness and alerting systems on aircraft		ANS service provider		2023		2023	
d. Ensure effective and timely reporting of meteorological and aerodrome conditions (e.g. runway surface condition in accordance to the ICAO global reporting format in Annex 14, Volume I, braking action and revised declared distances)		d. Ensure effective and timely reporting of meteorological and aerodrome conditions (e.g. runway surface condition in accordance to the ICAO global reporting format in Annex 14, Volume I, braking action and revised declared distances)		ANS service provider		Number of RE Accident/ incident per 10,000 flying hours.		High	
e. Volume I, braking action and revised declared distances)		e. Volume I, braking action and revised declared distances)		Aerodrome service providers		2023		2023	
f. Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, PANS-Aerodrome		f. Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, PANS-Aerodrome		Aerodrome service providers		Implemented		Safety reporting (MOR/ VOR)	
g. Promote the installation of arresting systems if runway end safety area (RESA) requirements cannot be met.		g. Promote the installation of arresting systems if runway end safety area (RESA) requirements cannot be met.		CAA inspectors		2023		2023	
h. Ensure that procedures to systematically reduce the rate of un-stabilized approaches to runways are developed and used		h. Ensure that procedures to systematically reduce the rate of un-stabilized approaches to runways are developed and used		FSSD		2023		2023	
i. Runway Safety Maturity Checklist		i. Runway Safety Maturity Checklist		ASSD/FSSD/ ANSSSD		2023		2023	
j. Guidance material and training program for runway pavement, maintenance and operations from aerodrome operator's perspective		j. Guidance material and training program for runway pavement, maintenance and operations from aerodrome operator's perspective							

2.	Validate the effectiveness of the SEI through the analysis of MCORs, 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	ANSSSD	Implemented	
e.	Inadequate regulatory oversight	ASSD/ FSSD/ ANSSSD	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	

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	<p>1. Implement the following RI safety actions:</p> <ul style="list-style-type: none"> 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 c. Ensure effective use of suitable technologies to assist the improvement of situational awareness, such as improved resolution airport moving maps (AMM), electronic flight bags (EFBs), enhanced vision systems (EVS) and head-up displays (HUD), advanced-surface movement guidance and control systems (A-SMGCS), stop bars, and runway incursion warning systems (ARIWS). d. Certify aerodrome in accordance with ICAO Annex 14, Volume I as well as Doc 9981, PANS-Aerodrome 	<p>ASSD</p> <p>ASSD/ ANSSSD/ FSSD</p> <p>FSSD/ ASSD/ ANSSSD</p> <p>ASSD</p>	<p>2023</p> <p>2023</p> <p>2023</p> <p>2023</p>	<p>Air Operators</p> <p>ANS service provider</p> <p>Aerodrome service providers</p> <p>CAA inspectors</p>	<p>Number of RI Accident/ incident per 10,000 flying hours.</p>	<p>High</p>	<p>Surveillance of Aerodromes, ANSP, air operator and ATO training activities Safety reporting (MOR/ VOR)</p>

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	ASSD/ FSSD/ASSD	2024	
5.	Conduct continuous evaluations of the performance of the SEIs	ASSD/ ANSSSD/ FSSD	Continuous process	

Safety enhancement initiative	Action	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring Activity
Mitigate contributing factors to the risk of ARC accidents and incidents	<p>1. Implement the following ARC safety actions:</p> <ul style="list-style-type: none"> 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 d. Tool Guidance material on Unstabilised Approach e. Guidance material and training program for runway pavement, maintenance and operations from aerodrome operator's perspective. 	<p>FSSD</p> <p>ASSD</p> <p>ASSD/ANSSSD/ FSSD</p> <p>FSSD</p>	<p>Implemented</p> <p>2023</p> <p>2023</p> <p>Implemented</p>	<p>Airline Operators</p> <p>Aerodrome Operators</p> <p>Aerodrome Operators</p>	<p>No. of training provided</p> <p>No. of reports reported in standards format</p> <p>No. of reports reported in standards format</p>	<p>High</p>	<p>Surveillance of Aerodromes, ANSP, air operator and ATO training activities</p> <p>Safety reporting (MOR/VOR)</p>

	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	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	ANSSSD	Implemented			
	e. Inadequate regulatory oversight	ASSD/ FSSD/ ANSSSD	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	Continuous Process			

Safety enhancement initiative	Action	Responsible entity	Timeline	Stakeholders	Metrics	Priority	Monitoring Activity
Mitigate contributing factors to the risk of WS accidents and incidents	<p>1. Implement the following WS safety actions:</p> <ul style="list-style-type: none"> 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. 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. 	<p>ASSD/ ANSSSD/ FSSD</p> <p>ASSD</p> <p>ASSD</p> <p>ASSD</p> <p>ASSD</p> <p>ASSD</p>	<p>Implemented</p> <p>2023</p> <p>2023</p> <p>2024</p> <p>2023</p> <p>2024</p>	<p>Air Operators</p> <p>ANS service provider</p> <p>Aerodrome service providers</p> <p>CAA inspectors</p>	<p>Number of WS Accident/ incident per 10,000 flying hours.</p>		<p>Surveillance of Aerodromes , ANSP, air operator activities</p> <p>Safety reporting (MOR/ VOR)</p>

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:	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/ ANSSSD/ FSSD	Continuous 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:

- by 2024 – 75 per cent EI score
- by 2026 – 85 per cent EI score
- 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	<p>1. Work at the national level to address significant safety concerns as a priority</p> <p>2. Address all priority protocol questions (PQs) of the USOAP CMA</p> <p>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)</p> <p>4. Increase the level of compliance with ICAO SARPs and the EI of CEs at the national level (CE-1 to CE-5)</p> <p>5. Establish a process for the identification of differences with ICAO SARPs (CE-2)</p>	ASSRD CAAN	Continuous process 2023	Air Operators ANS service provider	State Safety index Aerodrome service providers	EI percentage Rate of improvement in compliance	Quality assurance of oversight functions Surveillance of Aerodromes, ANSP, air operator activities 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)	CAAN	2023	Air Operators	Independent regulatory oversight authority	Quality assurance of oversight functions
	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).	ANSSSD/ ASSD/ FSSD/ SMD	2023	ANS service provider	Safety oversight functions	Surveillance of Aerodromes, ANSP, air operator activities
	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).	ASSRD	2023	Aerodrome service providers ASSRD		
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)	MoCTCA	2023		Independent accident and incident investigation authority	AIG reports
	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)	MoCTCA	2023		The required technical guidance and tools.	Quality assurance regarding the AIG functions
	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	2023			

GASP ORG SEI-4 (State) — Strategic allocation of resources to enable effective safety oversight	<p>1. Confirm executive or legislative mandate to receive financial resources from government or other external sources and expend them (CE-1)</p> <p>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)</p> <p>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:</p> <ul style="list-style-type: none"> 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 <p>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)</p>	<p>CAAN ASSRD</p> <p>CAAN ASSRD</p> <p>CAAN ASSRD</p> <p>CAAN ASSRD</p> <p>CAAN ASSRD</p>	<p>Implemented 2023</p> <p>Continuous process</p> <p>N/A</p> <p>Ongoing with APAC</p> <p>On going</p>	<p>CAAN acts and regulations</p> <p>Air Operators ANS service provider</p> <p>Aerodrome service providers</p> <p>ASSRD</p> <p>ASSRD</p>	Provisions and implementation of CAAN acts and regulations

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)	ASSRD	Implemented	Quality assurance of oversight functions
	2. Identify the gaps in qualified technical personnel and training requirements necessary to implement the oversight mandate (CE-4)	ASSRD	2023	
	3. Establish a compensation scheme for the attraction and retention of qualified technical personnel (CE-4)	CAAN	Implemented	
	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)	ASSRD	2023	
	5. Establish human resource plans to support hiring and retention of the appropriate number of qualified technical personnel required (CE-4)	ASSRD	2023	
	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)	ASSRD	2023	
	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	2023	

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	<ol style="list-style-type: none"> 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 Aerodrome service providers ASSRD	High	ICAO iSTARS Quality assurance of oversight functions and SSP implementation

GASP ORG SEI-14 (State) — Strategic allocation of resources to start SSP implementation	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
	2. Obtain resources from national and appropriate authorities' leadership and stakeholders within the State to support SSP implementation	ASSRD	Implemented		
	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	DGCA	Continuous process.		
	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	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 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.	SMD	Continuous process.	Air Operators	Number of collaborator identified	Monitoring and evaluating collaborative activities through Steering committees and regional forums	
		ASSRD	2025	Implemented	ANS service provider	Number of activities collaborated with identified collaborators	ICAO iSTARS
		ASSRD	2025	Aerodrome service providers	ASSRD	Global and Regional bodies	Other states

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	ASSRD	Implemented	Air Operators ANS service provider	Number of activities collaborated with identified collaborators.	Monitoring and evaluating collaborative activities through Steering committees and regional forums
	2. Work with collaborators to ensure all elements of the SSP are present, suitable, operational and effective	ASSRD	2025	Aerodrome service providers	Level of SSP implementation.	ICAO iSTARS
	3. Establish a system for the continuous improvement of the SSP, in collaboration with all relevant stakeholders	ASSRD	Implemented	Aerodrome service providers	Number of best practices shared with other states	ICAO iSTARS
	4. Serve as a champion State to promote best practices among other States	ASSRD	2025	ASSRD		
	5. management, safety data and analyses among regional platforms including APANPIRG Subgroups via RASG-APAC	ASSRD	2025	Regional bodies	Other states	

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	Implemented		Number of mandatory and voluntary reports	SRMs conducted	quality assurance of SRMs conducted
		ASSRD	Implemented	Air Operators	ANS service provider	Legal framework regarding to hazard id and SRM	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	ASSRD	Implemented		Number of mandatory and voluntary reports	quality assurance of SRMs conducted
	2. Develop safety performance measurement methodologies, aligned with the regional safety metrics, using the established safety risk management process (see SEI-17E)	SMD	Implemented	Air Operators	Legal framework regarding hazard id and SRM	Effectiveness of reporting systems
	3. Establish the acceptable level of safety performance to be achieved through the SSP	ASSRD	2023	ANS service provider		
	4. Ensure the establishment of mandatory safety reporting systems by service providers.	ASSRD	Implemented	Aerodrome service providers	Number of SRM conducted.	Quality of SPIs and SPTs defined
	5. Encourage establishment of voluntary safety reporting systems as part of service providers' SMS.	ASSRD	Implemented	CAAN inspectors	Number of SPIs and SPTs defined	Contribution of SPIs to AP RASP
	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	ASSRD	Implemented			
	7. Contribute information on safety risks and SSP safety performance indicators to the RASP.	ASSRD	2023			

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	ASSRD	2025	Air Operators ANS service provider	Number of qualified technical personnel For SSSP implementation.	Quality assurance of SSP implementation related activities
	2. Attract, recruit, train, and retain qualified technical personnel to specialize in risk modelling	ASSRD	2023	Aerodrome service providers	Resource allocated to SSP implementation	
	3. Ensure that the Civil Aviation Safety Inspector workforce is trained to perform safety oversight of service providers that have implemented SMS	ASSRD	Implemented	ASSRD		

GASP ORG SEI-20 (State)	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	ASSRD	2025	Number of areas identified for collaboration	Surveillance of state risk modelling capabilities
				Number of assistance received and best practices shared	
GASP ORG SEI-20 (State) — Strategic collaboration with key aviation stakeholders to support the proactive use of risk modelling capabilities	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	Implemented	ASSRD	Implemented

GASP ORG SEI-21 (State) — Advancement of safety risk management at the national level	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.) 2. Develop risk modelling capabilities to support monitoring system safety issues and accident/ incident prevention 3. Encourage information-sharing with industry	ASSRD	Implemented	Number of information shared among ANSSSD, ASSD, FSSD, SMD and industry.	Surveillance of state safety risk management
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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	<p>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).</p> <p>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).</p> <p>3. Use a regional safety oversight mechanism, or the services of another competent State or organization.</p> <p>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)</p> <p>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)</p>	ASSRD	Implemented		Number of collaborators identified for assistance.		State safety oversight capability and effectiveness by State Quality assurance.

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 other States, RSOO, ICAO and/or other stakeholders, to enable technical personnel to perform their safety oversight functions effectively (CE-6 to CE-8)	ASSRD	2023	
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)	ASSRD	2023	
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.	ASSRD	2023	
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	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	2023	Number of collaborators identified. Number of assistance received to implement the SSP from regional bodies or/and other States.	Monitoring SSP implementation
		ASSRD	2023		
	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	Implemented		
	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	Air Operators	
	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	ANS service provider	
	7. Work with collaborators (identified in SEI-15) to execute the action plan for implementation	ASSRD	2023	Aerodrome service providers	
	8. Work with collaborators to ensure all elements of the SSP are present, suitable, operational and effective	ASSRD	2025	ASSRD	
	9. Establish a system for the continuous improvement of the SSP, in collaboration with all relevant stakeholders	ASSRD	Implemented	Regional bodies (identified collaborators)	
	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	<p>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.</p> <p>2. Ensure utilization of available guidance material to assist with SMS implementation.</p>	FSSD/ASSD/ ANSSD/ SMD	Implemented	Air Operators ANS service provider	<ul style="list-style-type: none"> -Level of SMS Implementation -No of guidance materials available 	High	<p>Surveillance of service providers' SMS implementation.</p>

GASP SMS SEI-6 — Resources for service providers to effectively implement SMS	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	No of areas identified for support	High	Surveillance of service providers' SMS implementation.
	2. Ensure identification of areas where resources are needed as part of the SMS implementation plan developed following the SMS gap analysis.	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Aerodrome service providers	Level of Commitment from accountable manager		
	3. Ensure establishing a process for resource planning and allocation to enable SMS implementation, including resources which may be obtained from industry organizations	FSSD/ASSD/ ANSSSD/ SMD	Implemented	ASSRD			
	4. Ensure obtaining commitment from the accountable executive within the service provider for the necessary resources to enable SMS implementation	FSSD/ASSD/ ANSSSD/ SMD	Implemented				
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	Implemented	Air Operators	-No of collaborator identified	High	Surveillance of service providers' SMS implementation.
		FSSD/ASSD/ ANSSSD/ SMD	2023	ANS service provider	-Level of information shared with state		
				Aerodrome service providers	-Number and quality of defining HRCs		
				ASSRD			

GASP SMS SEI-8 — Establishment of safety risk management at the service provider level	1. Ensure establishment of mandatory safety reporting systems	FSSD/ASSD/ ANSSSD/ SMD	Implemented	No of MOR and VOR received.	High	Surveillance of service providers' SMS implementation.
	2. Ensure providing information from the service provider to the State mandatory safety reporting system, as required	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Definition of SPIs and SPTs		
	3. Ensure establishment of internal mechanisms related to the protection of safety data, safety information and related sources for the purpose of safety improvement	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Air Operators		
	4. Ensure establishment of voluntary and confidential hazard/occurrence reporting systems as part of the SMS	FSSD/ASSD/ ANSSSD/ SMD	Implemented	ANS service provider		
	5. Ensure establishment and maintenance of a safety database for technical personnel to monitor system safety issues within the service provider	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Aerodrome service providers		
	6. Ensure establishment and utilization of a safety risk management process	FSSD/ASSD/ ANSSSD/ SMD	Implemented	ASSRD		
	7. Ensure development of safety performance measurement methodologies, aligned with harmonized safety metrics within industry, via the established safety risk management process	FSSD/ASSD/ ANSSSD/ SMD	Implemented			
	8. Ensure development of safety performance indicators and associated targets/alert settings, via the established safety risk management process	FSSD/ASSD/ ANSSSD/ SMD	Implemented			
	9. Encourage the use of globally harmonized metrics for the development and monitoring of safety performance indicators, as part of the service providers' SMS	FSSD/ASSD/ ANSSSD/ SMD	Implemented			
	10. Encourage sharing and use of information from within industry to identify hazards and mitigate safety risks	FSSD/ASSD/ ANSSSD/ SMD	Continuous process			

GASP SMS SEI-10 — Allocation of industry resources to support continuous improvement of SSP and SMS	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 for SMS implementation	High	Surveillance of service providers' SMS implementation.
	2. Ensure providing safety analysis results from service providers to support the SSP	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Aerodrome service providers ASSRD			
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.	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Air Operators ANS service provider	No of stakeholders identified and mechanism established to deal with them.	High	Surveillance of service providers' SMS implementation.
	2. Ensure sharing of safety risk identification with stakeholders for mitigation and monitoring strategies	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Aerodrome service providers ASSRD			
	3. Ensure active participation with State and organizations engaged in risk modelling	FSSD/ASSD/ ANSSSD/ SMD	Implemented	Aerodrome service providers ASSRD			
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	FSSD/ASSD/ ANSSSD/ SMD	2023	Air Operators	No of Processes established and activities carried out for continuous improvement of SMS.	High	Surveillance of service providers' SMS implementation.
	2. Ensure developing risk modelling capabilities to support the monitoring of system safety issues and accident/ incident prevention	FSSD/ASSD/ ANSSSD/ SMD	2023	ANS service provider			
	3. Ensure monitoring safety information exchange networks for continuous improvements	FSSD/ASSD /ANSSSD/ SMD	Implemented	Aerodrome service providers ASSRD			

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.	<ul style="list-style-type: none"> 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/ANSSD ANSSD	Implemented MoCTCA 2023 MoCTCA	Air Operators ANS service provider Aerodrome service providers	<p>Number of operational safety issues shared and coordinated.</p> <p>Level of Implementation of Safety related initiatives from the APAC Seamless ANS Plan 3.</p> <p>Number of AIG conducted in accordance with Annex 13.</p>	High	Surveillance to ensuring the quality of operational information sharing and coordination mechanism, implementation of APAC Seamless ANS Plan 3 and AIG conduction.



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