



National Aviation Safety Plan (2023-2025)

Published by:

Bhutan Civil Aviation Authority

Paro International Airport

www.bcaa.gov.bt

INTENTIONALLY LEFT BLANK

Executive Summary

Air transport is essential to Bhutan's economy, community and market access as being a landlocked country. A safe aviation system contributes to Bhutan's confidence in our air transport network. Maintaining high safety standards will be integral to restoring passenger confidence as civil aviation recovers from the severe operational and financial impacts resulting from the coronavirus disease 2019 (COVID-19) pandemic.

This includes addressing the safety challenges arising out of recommencing operations after a period of extraordinarily low activity for aviation personnel, equipment and supporting infrastructure. Throughout the recovery from COVID-19 it will be important that the Bhutan aviation industry grows in a safe and sustainable way, and that we strengthen our safety oversight capabilities.

This National Aviation Safety Plan (NASP) details Bhutan's commitment to continuously improve aviation safety management capabilities in order to reduce the risks of aviation operations. It complements the State Safety Program (SSP). Through the NASP and SSP, aviation stakeholders affirm their commitment to the ongoing improvement of aviation safety, sufficient resourcing of activities and increased collaboration at the global, regional and State level. The NASP establishes Bhutan's safety goals, targets and initiatives consistent with the International Civil Aviation Organization's Global Aviation Safety Plan and the Asia Pacific Regional Aviation Safety Plan. The NASP is subject to a triennial review cycle.

Bhutan's six aviation safety goals for 2023–2025 are to:

1. Improve the safety of Bhutan's aviation operations across all sectors;
2. Strengthen Bhutan's safety oversight capabilities;
3. Embed an effective State Safety Program that delivers an acceptable level of safety performance;
4. Reduce the likelihood of Bhutan being involved in an aviation accident outside of Bhutan by supporting and influencing global aviation safety;
5. Expand the use of industry safety programs; and
6. Ensure Bhutan has the appropriate aviation infrastructure to support safe operations.

To achieve these goals, Bhutan has developed operational and organisational 'roadmaps' comprising a range of defined safety enhancement initiatives and actions. Success will be measured against accompanying safety performance indicators and targets. The Bhutan Aviation Safety Team, comprising the representatives from key aviation agencies, is responsible for overseeing the National Aviation Safety Plan.

Table of Contents

Executive Summary	II
Table of Contents	III
Abbreviations	1
1. INTRODUCTION.....	3
1.1 Overview.....	3
1.2 Structure of the NASP.....	3
1.3 Relationship between the NASP and the State Safety Program (SSP).....	3
1.4 Responsibility for the NASP development, implementation and monitoring	3
1.5 National safety issues, goals and targets.....	3
1.6 Operational Context	4
2. PURPOSE OF NATIONAL AVIATION SAFETY PLAN	5
3. BHUTAN’S APPROACH TO MANAGING AVIATION	6
4. NATIONAL OPERATIONAL SAFETY RISKS.....	8
5. OTHER SAFETY ISSUES.....	11
6. MONITORING IMPLEMENTATION	13
Appendix A	14
<i>DETAILED SEIS: NATIONAL OPERATIONAL SAFETY RISKS</i>	14
Appendix B	21
<i>DETAILED SEIS: Organizational Challenges(ORG)</i>	21

INTENTIONALLY LEFT BLANK

Abbreviations

ACAS	Airborne Collision Avoidance System
ADs	Airworthiness Directives
ADS-B	Automatic Dependent Surveillance Broadcast
AGA	Aerodrome and Ground Aid
AIP	Aeronautical Information Publication
ALoSP	Acceptable Level of Safety Performance
AMO	Approved Maintenance Organization
AMP	Aircraft Maintenance Programme
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
AOC	Air Operators Certificate
AP RASP	Asia Pacific Regional Aviation Safety Plan
APV	Approaches with vertical guidance
ARC	Abnormal Runway Contact
ASR	Air Safety Report
ATM	Air Traffic Management
ATS	Air Traffic Services
ATC	Air Traffic Control
ATO	Approved Training Organizations
BAS	Bhutan Air Service
BCAA	Bhutan Civil Aviation Authority
BOC	Bhutan Oil Corporation
CAMO	Continuing Airworthiness Management Organization
CAP	Corrective Action Plan
CE	Critical Element
CFIT	Controlled Flight into Terrain
CMA	Continuous Monitoring Approach
COSC AP-SA	Cooperative Development of Operational Safety and Continuing Airworthiness Programme - South Asia
CRM	Crew Resource Management
DoAT	Department of Air Transport
EI	Effective Implementation
EU-SA APP	EU - South Asia Aviation Partnership Project
GANP	Global Air Navigation Plan
GASP	Global Aviation Safety Plan
GPWS	Ground Proximity Warning System
HEMS	Emergency Medical Services
HoA	Head of Authority
HRCs	High Risks Categories
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
iSTARS	integrated Safety Trend Analysis and Reporting System
LOC-I	Loss of Control in-flight
MAC	Mid Air Collision
MPD	Maintenance Programme Document
MEL	Minimum Equipment List
MOR	Mandatory Occurrence Report
NASP	National Aviation Safety Plan

ORG	Organizational
PANS	Procedures for Air Navigation Services
PCDS	Position Competency Development Scheme
PQ	Protocol Question
RAIO	Regional Accident and Incident Investigation Organization
RASG	Regional Aviation Safety Group
RCSC	Royal Civil Service Commission
RE	Runway Excursion
RI	Runway Incursion
RSOO	Regional Safety Oversight Organization
SARPs	Standards and Recommended Practices
SEI	Safety Enhancement Initiatives
SMS	Safety Management System
SOPs	Standard Operating Procedures
SPI	Safety Performance Indicator
SSC	Significant Safety Concern
SSP	State Safety Programme
USOAP	Universal Safety Oversight Audit Programme
WS	Wild Strike

1. INTRODUCTION

1.1 Overview

Bhutan is committed to enhancing aviation safety and to the resourcing of supporting activities. The purpose of this national aviation safety plan (NASP) 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 Bhutan and its industries.

The NASP promotes the effective implementation of Bhutan's safety oversight system, a risk-based approach to managing safety, as well as a coordinated approach to collaboration between Bhutan 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 Bhutan is in alignment with the ICAO Global Aviation Safety Plan (GASP, Doc 10004) and the Asia Pacific Regional Aviation Safety Plan (AP-RASP)

1.2 Structure of the NASP

This NASP presents the strategy for enhancing aviation safety for a period of three years (2023-2025). It comprises six sections, namely: introduction, the purpose of NASP, Bhutan's strategic approach to managing aviation safety, the national Operational Safety Risks (OPS) identified for 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 is going to be monitored.

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

This NASP addresses operational safety risks identified in the ICAO GASP and the AP-RASP consistent the SSP. Bhutan is committed to fully implement the SSP by 2025 as a State's responsibilities for the management of safety comprise both safety oversight and safety management, collectively implemented through an SSP. 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 BCAA is responsible for the development, implementation and monitoring of the NASP, in collaboration with the national aviation industry. The NASP was developed in consultation with national operators and other stakeholders, and in alignment with the ICAO Global Aviation Safety Plan (GASP) and the Asia Pacific Regional Aviation Safety Plan (AP-RASP).

1.5 National safety issues, goals and targets

The NASP addresses the following national safety issues:

A. Operational Safety Risks

1. Loss of Control In-flight (LOC-I)
2. Runway Excursion (RE)
3. Runway Incursion (RI)
4. Mid Air Collision (MAC)

5. Control Flight Into Terrain (CFIT)
6. Wildlife Hazard (WH) on and in the vicinity of Aerodrome

B. Organizational Challenges

1. Surveillance Obligations
2. Resolution of Safety Issues
3. Aircraft Accident and Serious Incident Investigation (AIG)

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

Goal 1: Achieve a continuous reduction of operational safety risks

- Target 1.1: Maintain zero fatal accident
- Target 1.2: Reduce serious incidents

Goal 2: Strengthen Bhutan's safety oversight capabilities

- Target 2.1: Increase the score Effective Implementation to 60%
- Target 2.2: Resolution of SSC by 2023

Goal 3: Implement State Safety Program

- Target 3.1: By 2023, implement the foundation of the SSP
- Target 3.2: By 2025, implement an effective SSP, as appropriate to its aviation System complexity

Goal 4: Focuses on appropriate infrastructure needed to support safe operations

- Target 4.1: By 2025, maintain an increasing trend of States with air navigation and aerodrome infrastructure that meet relevant ICAO Standards.

1.6 Operational Context

There are four certified aerodromes in Bhutan, including one international aerodrome. The airspace of Bhutan is classified into Class D and G.

There are currently three air operator certificates (AOCs) issued by BCAA, and of those there are two issued to operators conducting international commercial air transport operations. Bhutan also has one Helicopter operator that operates domestic commercial operations primarily for passenger, sight-seeing, external-load operations and Emergency Medical Services (HEMS).

Bhutan also has some common challenges that include mountainous areas, meteorology, Infrastructure etc.

2. PURPOSE OF NATIONAL AVIATION SAFETY PLAN

The NASP is the master planning document containing the strategic direction of Bhutan for the management of aviation safety for a period of three years (2023 to 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 High Risk Categories (HRCs) from both the GASP (www.icao.int/gasp) and the AP-RASP region. 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 operational safety risks and recommended SEIs for individual States set out in the AP-RASP. Bhutan has adopted these SEIs and has included them in this plan.

3. BHUTAN'S APPROACH TO MANAGING AVIATION

The NASP presents the SEIs that were developed based on the organizational challenges (ORG) and operational safety risks (OPS) as presented in the ICAO global aviation safety roadmap, as well as State-specific issues identified by Bhutan. This plan is developed and maintained by BCAA in coordination with all stakeholders and is updated at least every three 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	Target	Indicators	Link to GASP and Rasp
Goal 1 Achieve a continuous reduction of operational safety risks.	1.1: Maintain zero fatal accident	❖ Zero fatal accident	This goal is directly linked to Goal 1 and Target 1.1 of the GASP and linked to Goal 1 and Target 1.1 of AP-RASP
	1.2: Reduce serious incidences	❖ Number of serious incident Air Operator (AOC) per year. ❖ Percentage of occurrences related to High-Risk Categories (HRCs)	
Goal 2 Strengthen Bhutan's safety oversight capabilities	2.1: Increase the score Effective Implementation to 60 %	❖ Overall EI score ❖ % of priority PQs related to a safety oversight system implemented by Bhutan. ❖ % of required CAPs submitted by Bhutan (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
	2.2 Resolution of SSC by 2023	❖ Bhutan's SSC on ANS is resolved by ICAO	This goal is directly linked to GASP Goal 2 and AP-RASP Target T8
Goal 3 Implement State Safety Programmes	3.1: By 2023 Bhutan to implement the foundation of an SSP.	❖ Amend and publish SSP	This goal is directly linked to Goal 3 and Target 3.1 of the GASP and Target T12 of AP-RASP.
	3.2 By 2025 Implement an effective SSP, as appropriate to its	❖ Percentage of satisfactory SSP foundational PQs	

	aviation system complexity	<ul style="list-style-type: none"> ❖ Percentage of each subject area implemented ❖ All applicable service providers under BCAA’s to implement an effective SMS. ❖ Percentage of required CAPs related to the SSP foundation PQs submitted 	
Goal 4 Focuses on the appropriate infrastructure to support safe operations.	4.1: By 2025, maintain an increasing trend of States with air navigation and aerodrome infrastructure that meet relevant ICAO Standards.	<ul style="list-style-type: none"> ❖ ADS-B installation progress 	This goal is directly linked to Goal 6 and Target 6.1 of GASP

The SEIs in this plan are implemented through Bhutan’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 aviation safety globally. The full list of the SEIs is presented in the appendix A and B to the NASP.

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.

The summary of accidents and serious incidents that occurred in Bhutan and those for aircrafts registered in Bhutan involved in commercial air transport is shown in the tables below.

Aircraft with Maximum Takeoff Weight (MTOW) above 5,700 kilograms			
Year	Fatal accidents	Non-fatal accidents	Serious incidents
2016-2020	0	0	3
2020-till now	0	0	3

Aircraft with Maximum Takeoff Weight (MTOW) below 5,700 kilograms			
Year	Fatal accidents	Non-fatal accidents	Serious incidents
2016-2020	0	0	1
2020-till now	0	0	0

The following six are national high-risk categories of occurrences (HRCs) in the Bhutan's context 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 analyses from mandatory and voluntary reporting systems, accident and incident investigation reports, safety oversight activities over the past five years, as well as on the basis of regional analysis conducted by RASG-APAC and on the operational safety risks described in the GASP. These HRCs are in line with those listed in the ICAO GASP, as well as the AP-RASP.

HRC 1: Loss of Control In-flight (LOC-I)

HRC 2: Runway Excursion (RE)

HRC 3: Runway Incursion (RI)

HRC 4: Mid Air Collision (MAC)

HRC 5: Control Flight into Terrain (CFIT)

HRC 6: Wildlife Hazard (WH) 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>.

To address the national operational safety risks listed above, Bhutan identified the following contributing factors leading to HRCs and will implement a series of SEIs, some of which are derived from the ICAO OPS roadmap, contained in the GASP:

HRC 1: Loss of Control In-flight (LOC-I)

Identified contributing factor, as follows:

- 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 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

HRC 2: Runway Excursion (RE)

Identified contributing factor as follows:

- a. Ineffective SOPs
- b. Meteorological information regarding CB and windshear to pilot
- c. Failure to adhere to the appropriate SOPs
- d. Long/floated/bounced/firm/off-centre/crabbed landing
- e. Non-stabilized approach
- f. Poor awareness of effective landing distance

HRC 3: Runway Incursion (RI)

Identified contributing factor as follows:

- a. Operations in low visibility conditions
- b. Complex or inadequate aerodrome design
- c. Phraseology use (e.g. non-standard vs. standard, call-sign confusion)
- d. English language competence despite the introduction by ICAO of a system of validating competence in aviation English
- e. Inadequate manoeuvring area driver training and assessment program
- f. Non-adherence or non-compliance to ATC clearance or instruction
- g. Inadequate coordination between controllers

HRC 4: Mid Air Collision (MAC)

Identified contributing factor with Risk Collision as follows:

Air Navigation Contributing

- a. ATC Situational Awareness
- b. Inadequate coordination between controllers
- c. Readback-Hear back Issue
- d. Non-compliance with ATC Operational Procedures

Aircraft Operation Contributing

- a. Pilot not comply with ATC Instruction (Lack of situational awareness with ATC

- instruction)
- b. Pilot delay to execute ATC Instruction
- c. Aircraft Instrument Error
- d. Incorrect Altitude setting
- e. Lack of situational awareness for pilot to follow AIC no. 2/ 2016 “Vertical rates adjustment”

HRC 5: Control Flight into Terrain (CFIT)

Identified contributing factor as follows:

- a. Flight in adverse environmental conditions (weather and topography)
- b. Pilot fatigue and disorientation
- c. Absence of TAWS warning
- d. Deviation from VFR route

HRC 6: Wildlife Hazard (WH) on and in the vicinity of Aerodrome

Identified contributing factor as follows:

- e. Insufficient wildlife control programme in Aerodrome
- f. No adequate perimeter fencing
- g. Poor land management in and around the aerodrome
- h. Lack of study on wildlife habitat management near

The full list of the SEIs national Operational Safety Risks (OPS) roadmap is presented in the Appendix A to the NASP.

5. OTHER SAFETY ISSUES

In addition to the national operational safety risks listed in the NASP, Bhutan 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 Bhutan'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. Bhutan is committed to the effective implementation of these eight CEs, as part of its overall safety oversight responsibilities, which emphasize Bhutan's commitment to safety in respect of its aviation activities. The eight CEs are presented in Figure 1 below.

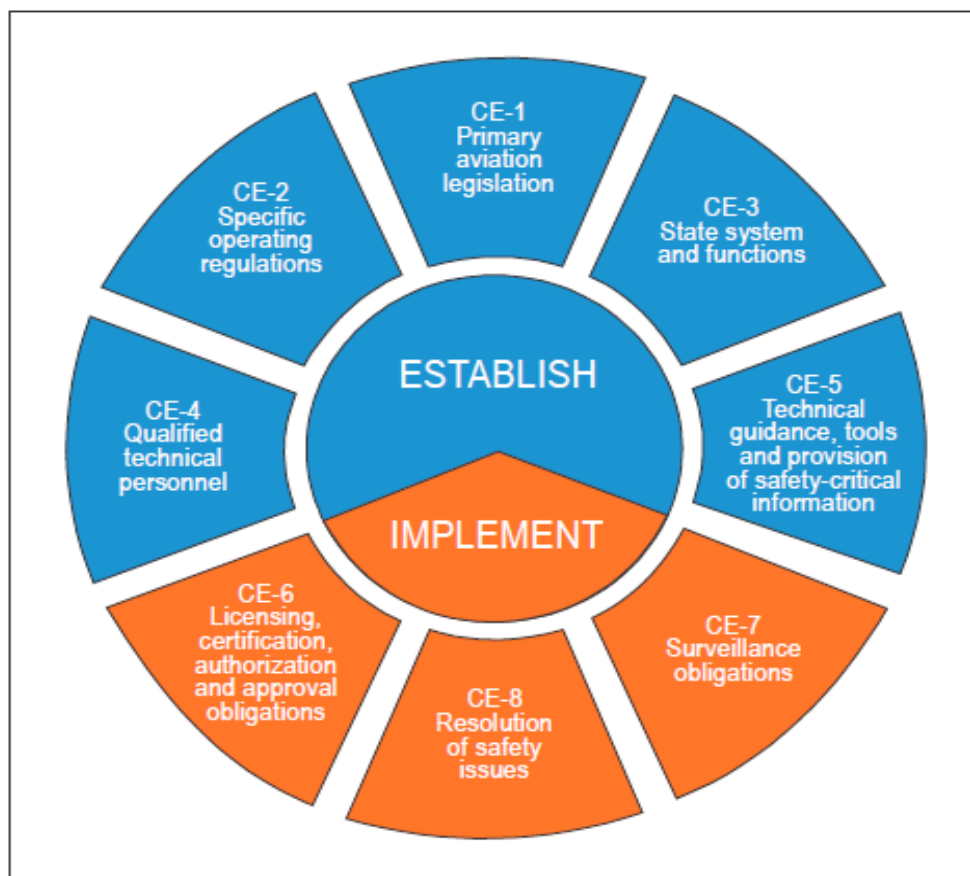


Figure 1. Critical elements of a State's safety oversight system

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

Overall EI score							
54.30 %							
EI score by CE							
CE-1	CE-2	CE-3	CE-4	CE-5	CE-6	CE-7	CE-8
66.67 %	67.21 %	56.60 %	52.78 %	38.38 %	58.78 %	51.19 %	50.00%
EI score by audit area ^a							
LEG	ORG	PEL	OPS	AIR	AIG	ANS	AGA
66.67%	14.29 %	59.26 %	49.49 %	60.00 %	16.67 %	53.06 %	78.10%

The other safety issues of Organizational Challenges (ORG) in the Bhutanese context were considered of the utmost priority because they are systemic issues, which impact the effectiveness of safety risk controls as below.

They were identified based on analysis from USOAP data. These issues are typically organizational 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 BCAA and those of service providers. These safety issues are in line with those listed in the ICAO Global Aviation Safety Plan (GASP) and the Asia Pacific Regional Aviation Safety Plan (AP-RASP):

1. The USOAP audits conducted at different time periods (2006-CMA Audit, 2018 - ICVM) identified that Critical Element 8 (CE-8, Resolution of Safety Issues), and Critical Element 7 (CE-7, Surveillance Obligation), as weak elements and the Aircraft Accident and Incident Investigation (AIG) areas have been identified as safety deficient areas.
2. To address the issues listed above, BCAA will implement a series of SEIs, some of which are derived from the ICAO ORG roadmap, contained in the GASP. The full list of the SEIs is presented in the appendix B to the NASP.

In order to address the issues listed above, Bhutan will implement a series of Safety Enhancement Initiatives (SEIs), some of which are derived from the ICAO ORG roadmap, contained in the GASP. The full list of the SEIs Organizational Challenges (ORG) roadmap is presented in the Appendix B to the NASP.

6. MONITORING IMPLEMENTATION

Bhutan 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, BCAA will review the NASP every three years or earlier, if required, to keep the identified operational safety risks, safety issues and selected SEIs updated and relevant. The BCAA 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, BCAA will seek the support of AP-RASGs to ensure the timely implementation of SEIs to address safety deficiencies and mitigate risks. Through close monitoring of the SEIs, BCAA will make adjustments to the NASP and its initiatives, if needed, and update the NASP accordingly.

BCAA 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 safety review meeting will be coordinated with stakeholders to provide 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 Bhutan identifies critical operational safety risks, reasonable measures will be taken to mitigate them as soon as practicable, possibly leading to an unscheduled revision of the NASP.

Bhutan adopted a standardized approach to provide information at the regional level, for reporting to the AP-RASGs. This allows the region to receive information and assess operational safety risks using common methodologies.

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

Head of the Authority
Bhutan Civil Aviation Authority
Paro: Bhutan
Email:kinleyw@bcaa.gov.bt

Appendix A

DETAILED SEIs: NATIONAL OPERATIONAL SAFETY RISKS

Issue No. 1: Operational Safety Risks							
HRC 1: Loss of Control In-flight (LOC-I)							
Goal 1: Achieve a continuous reduction of Operational Safety Risks. Target 1.1: Maintain zero fatal accident; Target 1.2: Reduce serious incidents;							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Mitigate contributing factors to the risk of LOC-I accidents and incidents	1.Develop Regulation and Standard Guidance for Upset Prevention and Recovery Training (UPRT)	2023	BCAA	Air Operators	Number of approved regulation and guidance	High	-Administrative review of BCAA’s regulations and requirements
	2.Implement Upset Prevention and Recovery Training (UPRT) in all full flight simulator type conversion and recurrent training programmes	2024	Air Operators, BCAA	Air Operators	URPT training Incorporated in the Training Manuals	High	Surveillance of Air Operators training activities.
	3.Validate the effectiveness of the SEIs through the analysis of MORs and VORs and accident/incident investigations	Real time	BCAA	Air Operators	Number LOC-I occurrence rates in MOR and VOR	High	MOR and VOR

	4.Regulatory UPRT training for BCAA inspectors	2023	BCAA	BCAA	Number of Inspectors trained on UPRT	High	Monitor the training plan of BCAA.
HRC 2: Runway Excursion (RE)							
Goal 1: Achieve a continuous reduction of Operational Safety Risks. Target 1.1: Maintain zero fatal accident; Target 1.2: Reduce serious incidents;							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Mitigate contributing factors to the risk of RE accidents and incident	1.Ensure sufficient Runway strip and RESA	2025	DoAT	DoAT, BCAA	Number of incidents	High	Oversight by BCAA Aerodrome
	2.Training on the Runway Surface Condition (GRF).	2023	BCAA	DoAT, Air Operators	Number of incidents	High	Oversight by BCAA
	3.Re-Certification of Paro International Aerodrome as per annex 14 requirements	2023	BCAA	DoAT	Recertification	High	Oversight by BCAA Aerodrome
	4. Ensure the establishment and implementation of a runway safety Programme (RSP) and runway safety teams (RST) Paro International aerodromes.	2023	BCAA, DoAT	DoAT	Team formation and RSP development	High	Oversight by BCAA Aerodrome

	5.Develop Runway Safety Maturity Checklist	2023	BCAA	DoAT	Development and use of Checklist	High	Oversight by BCAA Aerodrome
HRC 3 : Runway Incursion (RI)							
Goal 1: Achieve a continuous reduction of Operational Safety Risks. Target 1.1: Maintain zero fatal accident; Target 1.2: Reduce serious incidents;							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Mitigate contributing factors to the risk of RI accidents and incidents	1.Develop and Promote establishment of SOP, training and create awareness for Pilots, ATC, Airside drivers and Maintenance engineers.	2024	DoAT, BCAA	Air Operators, DoAT, BAS, BOC	Number of incidents	High	Oversight of stakeholders' training activities.
	2.Ensure adequate parameter fencing which results in wild life (Dogs) activities on the runway.	2024	DoAT, BCAA	DoAT	Number of incidents	High	Oversight by BCAA
	3.Markings and signages for road holding positions at the Paro International airport.	2023	DoAT, BCAA	DoAT, Air Operators, BAS, BOC	Completion of marking and sinage	High	Oversight by BCAA (Aerodrome)

	4.Coordination between the stakeholders and the airport construction contractors	2023	DoAT	DoAT, Airport contractors, BCAA	Number of incidents	High	Oversight by BCAA
	5.Insufficient two way radio communication equipment and training on handling the radio	2023	DoAT, Air Operators, BAS, BOC	DoAT, Air Operators, BAS, BOC	Number of Incidents	High	Oversight by BCAA
	6. Ensure the use of standard phraseologies in accordance with applicable State regulations and ICAO provisions (e.g. Doc 9432, Manual of Radiotelephony)	2023	BCAA	Air Operators, DoAT	Number of Incidents	High	MoR/ASR

HRC 4 : Mid-Air Collision (MAC)

Goal 1: Achieve a continuous reduction of Operational Safety Risks.

Target 1.1: Maintain zero fatal accident;

Target 1.2: Reduce serious incidences;

Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Mitigate contributing factors to the risk of MAC accidents and	1. Ensure Air Navigation Service Provider(ANSP) and Air Operator (AOC) provide sufficient training related to	Real time	BCAA	Air Operators, DoAT	TCAS training Incorporated in the Training Manuals	High	Surveillance of stakeholders' training activities.

incidents	TCAS and how to avoid them.						
	2.Enhance coverage of 2-way communications systems in airspace of Bhutan	2024	DoAT	BCAA, DoAT	Radio coverage	Medium	Surveillance by BCAA
HRC 5 : Control Flight Into Terrain (CFIT)							
Goal 1: Achieve a continuous reduction of Operational Safety Risks. Target 1.1: Maintain zero fatal accident; Target 1.2: Reduce serious incidents;							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Mitigate contributing factors to the risk of CFIT	1. Ensure aircraft are equipped with terrain awareness and warning system (TAWS)	Real time	BCAA	Air Operators, BCAA	Number of CFIT Accident/Incident per year	High	Safety Oversight
	2. Ensure Training program on the use of TAWS/CFIT	Real time	BCAA	Air Operators, BCAA	Number of CFIT Accident/Incident per year	High	Monitor Air Operators Training Activities.
	3. Ensure implementation of a Flight Data Analysis Program	Continue process	BCAA	Air Operators, BCAA	Number of CFIT Accident/Incident per year	High	Safety Oversight

	4.Ensure implementation Standard Operating Procedures for Flight Deck Crewmembers	Continue process	BCAA	Air Operators, BCAA	Number of CFIT Accident/Incident per year	High	Safety Oversight
	5.Socialization, training, campaign & seminar CFIT for regulator and operator	2024	BCAA	Air Operators, BCAA	Number/percentage of pilots completing CFIT training	High	Surveillance of Air Operator and BCAA’s training activities
HRC 6 : Wildlife Strike (WS) on and in the vicinity of Aerodrome							
Goal 1: Achieve a continuous reduction of Operational Safety Risks. Target 1.1: Maintain zero fatal accident; Target 1.2: Reduce serious incidents;							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Mitigate contributing factors to the risk of WS accidents and incidents	1.Observe bird activities and bird strikes at the airports and promote collecting, reporting, recording and analysis of data through various means.	2024	DoAT, BCAA	DoAT	Number of WS Accidents/incidents reduced.	High	MOR/ASR Report
	2. Ensure the better management of vegetation and land use at the airports	2024	DoAT, BCAA	DoAT	Number of WS Accidents/incidents reduced.	High	MOR/ASR Report

	3. Ensure the implementation of effective bird distracting mechanisms at the airports	2025	DoAT, BCAA	DoAT	Number of WS Accidents/incidents reduced.	High	MOR/ASR Report
	4. Introduce Runway sweeping vehicle to control the activity of birds and other wildlife due to presence of attractants on runway surface	2024	DoAT,BCAA	DoAT	Number of WS Accidents/incidents reduced.	High	MOR/ASR Report

Appendix B

DETAILED SEIS: Organizational Challenges(ORG)

Issue No. 1 : State safety oversight system							
Goal 2 : Strengthen Bhutan's safety oversight capabilities.							
Target 2.1: Increase the score Effective Implementation to 60 % by 2025							
Target 2.2 Resolution of SSC by 2023							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Consistent implementation of ICAO SARPs at the national level	1.Work at the national level to address significant safety concerns on ANS Area as a priority	2023	BCAA/DoAT	DoAT,BCAA	Resolve SSC for ANS area	high	Update USOAP CMA OLF
	2.Address all priority protocol questions (PPQs) of the USOAP CMA	Continuous Process	BCAA	BCAA, DoAT,Air Operators	EI Percentage	High	USOAP CMA OLF
	3.Amend primary aviation legislation and regulations, to empower the competent authority to conduct regulatory oversight.	2025	BCAA	BCAA, MoIT	Amendment of Civil Aviation Act of Bhutan 2016	High	Administrative progress

	4. Amend procedure for the identification of differences with ICAO SARPs and amendment of BCAA rules and regulations	2024	BCAA	BCAA	Amendment of procedure manual for ICAO state letter and SARPs	Hight	Administrative record
	5. Complete CC/EFOD in all areas	real time	BCAA	BCAA	Completion status	Medium	CC/EFOD Reports on USOAP OLF
Development of a comprehensive regulatory oversight framework	1. Develop an effective system to promulgate technical guidance, tools and provide safety-critical information needed for technical personnel to effectively perform their safety oversight functions	2024	BCAA/ DoAT/ AIG Unit	BCAA/ DoAT/ AIG Unit	Number of Procedure manuals developed/amended	High	Administrative progress
Establishment of an independent accident and serious incident investigation authority, consistent with Annex 13	1. MOU with competent AIG authority and establish coordination units within the state.	2024	MoIT, AIG Unit	MoIT, AIG Unit	MoU	High	USOAP CMA EI of AIG
	2. Develop technical guidance, tools and procedure manuals.	2023	AIG Unit	MoIT, BCAA	Number of Procedure manuals and regulations	High	USOAP CMA EI of AIG

Qualified technical personnel to support effective safety oversight	1. Identify the gaps in qualified technical personnel and training requirements necessary to implement the oversight mandate	2024	BCAA	BCAA, RCSC	Effective training manual and HR policy	High	Human Resources Planning Activities.
	2. Establish human resource planning to support hiring and retention of the appropriate number of qualified technical personnel required	2025	BCAA	BCAA, RCSC	Adequate ad qualified technical personnel	High	Human Resources Planning Activities.
	3. 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	2025	BCAA	BCAA, RCSC	Effective HR policy and training programmes	High	Human Resources Planning Activities.

	responsibilities of technical personnel						
Issue No. 2 : Effective implementation of SSP							
Goal 3: Implement State Safety Programmes. Target 3.1: By 2023 Bhutan to implement the foundation of SSP. Target 3.2: By 2025 Implement an effective SSP as appropriate.							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Start of SSP implementation the national level	1. Secure State-level commitment to improve safety	2023	BCAA	BCAA, DoAT, Air Operators	SSP implementation Status	High	Safety Oversight and update during biennial NAST Meeting
	2. Issue SMS regulations for service providers and verify SMS implementation.	2023	BCAA	Air Operators, DoAT	SSP Implementation Status	High	Safety Oversight and update during biennial NAST Meeting
	3. Address prioritised SSP PQ	2025	BCAA	Air Operators, DoAT	Satisfactory SSP PQ	High	ICAO USOAP CMA OLF
	4. Work with the ICAO Regional Office to make use of available means (e.g. Technical	2023	BCAA	BCAA	SSP Implementation Status	high	Safety Oversight and update during biennial NAST Meeting

	Cooperation Bureau) to acquire assistance needed for SSP implementation						
<p>Issue No. 3: Increasing risks associated with airspace congestion, and the lack of appropriate infrastructure to support safe operations; lack of capacity of regulatory authority.</p>							
<p>Goal 4: Focuses on the appropriate infrastructure needed to support safe operations. Target 4.1: By 2025, maintain an increasing trend of States with air navigation and aerodrome infrastructure that meet relevant ICAO Standards.</p>							
Safety enhancement initiative	Action	Timeline	Responsible entity	Stakeholders	Metrics/ Indicators	Priority	Monitoring Activity
Implement the air navigation and airport core infrastructure and improve the EI percentage.	1.Establish aeronautical surveillance system (ADS-B)	2024	DoAT	BCAA, DoAT	Progress of ADS-B system implementation	Medium	Surveillance by BCAA


DIRECTOR
 Bhutan Civil Aviation Authority
 Paro, Bhutan

