

# AVIATION SAFETY REPORT 2019



**Civil Aviation Authority of Nepal**  
Babar Mahal, Kathmandu, Nepal


# FOREWORD



Air transportation plays a crucial role in the wider economic development of society. Its significance is higher in a geographically diverse country such as Nepal. It brings people and cultures closer and helps in assuaging the difficulties associated with remote areas. Therefore, it is vital that the air transportation operates with utmost safety. As a regulator of civil aviation activities in the country, the Civil Aviation Authority of Nepal (CAAN) is responsible for ensuring safety in Nepali aviation sector and its continuous improvement. Based on ICAO SARPs and Guidelines, CAAN develops requirements, directives, manuals and procedures for the maintenance of aviation safety at acceptable level. The air transport industry needs to deliver safe services in accordance to the regulatory framework setup by CAAN. For delivery of safe services, an effective safety management system needs to be in place so that inherent risk can be identified and managed to an acceptable level. CAAN verifies, as part of its oversight activities, that the aviation industry complies with the regulatory framework through certifications, assessments, validations, inspections and enforcement.

Management of safety, thus, is not the responsibility of CAAN alone. It demands equal focus and dedication from all the service providers. The industry needs to be responsible for the quality of service it has been providing for the people. Only shared efforts can help realize the objective of continuous improvement of aviation safety. CAAN is committed to put its best endeavors in promoting safety and inculcating 'safety as a culture' among all concerned.

This Safety Report is the third edition of the Aviation Safety Report that started being published from 2016. It is based on safety data (mandatory and voluntary) collected by state and operators, ICAO USOAP Audit Reports and Accident Reports of Investigations conducted by MoCTCA. It provides a brief overview of updates on safety indicators including the accidents that occurred during the last ten years (2009-2018), Nepal's status in USOAP Audit together with Nepal's position in SSP implementation.

  
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(Rajan Pokhrel)  
Director General

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# EXECUTIVE SUMMARY

The diverse topography of Nepal has gifted her with wide range of climates. Nepal's majestic mountains and capricious weather patterns have created a huge challenge to flight operations. Perhaps due to the geographical diversity ranging from 60 m AMSL to 8848 m AMSL, domestic aircraft operations include heterogeneous fleet. The challenge has been added up owing to the variety of aircraft-type in the domestic operations that range from small helicopters to Y-12E and to jets such as CRJ-7 operated by 19 different domestic airline companies. Small turbo-prop aircraft including DHC-6 300/400, LET 410, D228 together with helicopters ranging from B206, MI17, AS50 and Alo3 operate mostly in the airports that are located in narrow valleys or hill tops.

Civil aviation in Nepal has been expanding rapidly since last few years. The rate of growth of air traveller has increased by 13.85 in international sector and 15.45 in domestic sector in year 2018 compared to previous year.

The diversity of weather patterns together with hostile topography are the main challenges surrounding aircraft operations in Nepal due to which the number of accidents related to small aircraft having 19 seats or less and operating STOL airfields seems comparatively higher. The fatality rate in such aircraft was considerably higher during the period of 2010-2012. Most of these accidents were CFIT related and were associated with violation of VFR during en-route phase of flight in mountainous region. As a result of the continuous efforts of CAAN and airline operators, the trend of accident and fatality in these small multi-engine aeroplanes has registered a steep drop since last five years. However, helicopter operations still remain a challenge in the field of Nepali aviation due to topographical challenge and inevitability of helicopter operations for logistic and rescue purposes in mountainous terrain.

Total aircraft accidents (except recreational flights) from 2009 to 2018 in Nepalese sky have been classified into three categories as: Controlled Flight into Terrain (CFIT), Loss of Control in Flight (LOC-I) and Runway Excursion (RE). The most risky category of accident is CFIT as it accounts for 74% fatality and the second one is LOC-I as it stands for 26% of total fatality. Though 42% of accidents are related to RE, there is no fatality under this category of accident.

With regards to Altiport/STOLport operation, Luka is the most risky one on the basis of past 59 years' (1960 to 2018) safety data and information.

Creating an effective safety culture is an ongoing process and CAAN has remained focused on the activities that enhance safety culture among all in Nepali aviation. These efforts of CAAN have resulted in a positive attitude towards safety and an increase in the trend of hazard reporting. 414 mandatory occurrences were



## Nepal's heightened ICAO compliance results in Council President Certificate



reported and 512 hazards were identified collectively by service providers and regulators via different means and mechanisms during 2018.

Nepal has shown significant progress in the improvement in its safety oversight capability. Effective Implementation (EI) of ICAO safety standards and guidance has also been raised above the GASP benchmark (60%). The effective implementation (EI) by CAAN was 43%, 55% and 66.76% in 2009, 2013 and 2017 respectively. In 2018, Nepal received the prestigious 'ICAO Council President Certificate' from International Civil Aviation Organization (ICAO) for the progress made in the country's aviation safety, and for the success Nepal achieved in resolving safety oversight deficiencies and improving the effective implementation of ICAO Standards and Recommended Practices. ICVM 2017 identified CE4 and CE8 as safety deficient critical elements and ORG, AIG and ANS were identified as safety deficient Areas in the state oversight capability system. To overcome these deficiencies, CAAN has been working together with the industry partners and regional and international organizations.

In line with GASP, Nepal has prepared Nepal Aviation Safety Plan (2018-2022). Implementation plans for every action under the SEIs have been prepared by all concerned departments have been prepared for the effective implementation of NASP.

Nepal has started to implement SSP for effective state safety management. Now, CAAN has completed 72.31% of total required SSP foundation and achieved Level 2 SSP implementation as depicted by ICAO iSTARs SSP implementation dashboard. SMS audit of helicopter companies have also been carried out in the year 2018.

During 2018, CAAN performed various activities including an extensive safety campaign in collaboration with stakeholders for the enhancement of safety and inculcation of safety culture among all.





# ABBREVIATIONS AND ACRONYMS

AGA	Aerodrome and Ground Aids
AIG	Aircraft Accident and Incident Investigation
AIR	Airworthiness
Airpox	Aircraft Proximity
ANS	Air Navigation Services
APAC	Asia Pacific
ATM	Air Traffic Management
ATS	Air Traffic Services
CAAN	Civil Aviation Authority of Nepal
CAST	Commercial Aviation Safety Team
CE	Critical Element
CFIT	Controlled Flight Into Terrain
DHM	Department of Hydrology and Meteorology
EI	Effective Implementation
GASP	Global Aviation Safety Plan
HRC	High Risk Category
ICAO	International Civil Aviation Organization
ICVM	ICAO Coordinated Validation Mission
LEG	Legislation
LOC-I	Loss of Control- In Flight
MAC	Mid Air Collision
MoCTCA	Ministry of Culture, Tourism and Civil Aviation
MTOW:	Maximum Take Off Weight
NASP	Nepal Aviation Safety Plan
OPS	Operation
ORG	Organization
PEL	Personal Licensing
PQs	Protocol Questions
RASG	Regional Aviation Safety Group
RE	Runway Excursion
RI	Runway Incursion
RS	Runway Safety
Sch.	Scheduled
SARP	Standards and Recommended Practices
SEI	Safety Enhancement Initiative
SMSIGM	Safety Management System Implementation Guidance Material
SSP	State Safety Programme
STOL	Short Take- off and Landing
USOAP	Universal Safety oversight Audit Programme
WS	Wildlife Strike



# 1

## AIRCRAFT OPERATIONS IN NEPAL



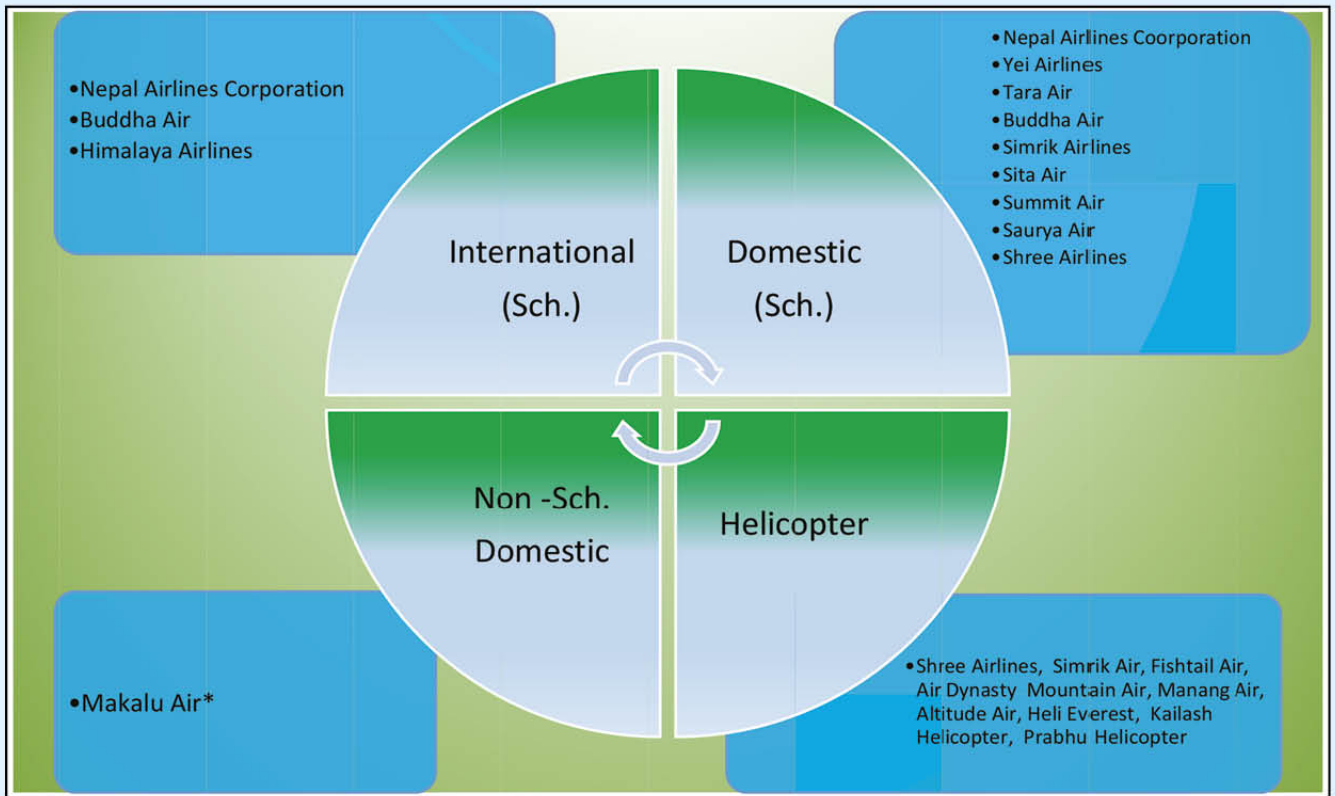
Heterogeneity is the peculiarity of Nepali aviation sector. Geographical complexity has rendered the air transportation inevitable in many of the remote places of Nepal. Similarly, due to geographical diversity, different types of aircraft ranging from Airbus 330, LET 410, various types of helicopters to ultralights are being operated in Nepali sky.

As of the date of publication of this report, 21 aeroplane and rotorcraft companies in total are operating

scheduled and non-scheduled flights in Nepal. Among them, two airlines are operating both domestic scheduled and international scheduled flights and one is involved in international flights only. Similarly, 4 ultralight companies are also operating flights related to aviation recreational and adventurous activities in different parts of Nepal. Considering the total number of aircraft being operated in Nepal, the number of airline operating companies is relatively higher.

Of all the aircraft operating companies, three are into international operations. Among these three, only one is an exclusive international operator while the other two are operating in the domestic sector as well. Thus nine operators are serving the domestic sector in total with seven exclusive domestic operators.

Ten helicopter operators are operating non-scheduled flights providing a wide range of services from rescue to high altitude operations and from cargo to sling operations.



\*not in operation.

This diverse nature of Nepali aviation is its beauty and above all a great necessity arising from its diverse geographical features with Mountain region (3000 m and above), Hilly region (below 3000 meters and above 1000 meters) and Terai region (below 1000 meters upto 60 meters above mean sea level). This signifies the importance of operating small aircraft such as single engine and helicopters in Nepali territory. Most of the aircraft that operate in the remote sector have MTOW of below 5700 kg.

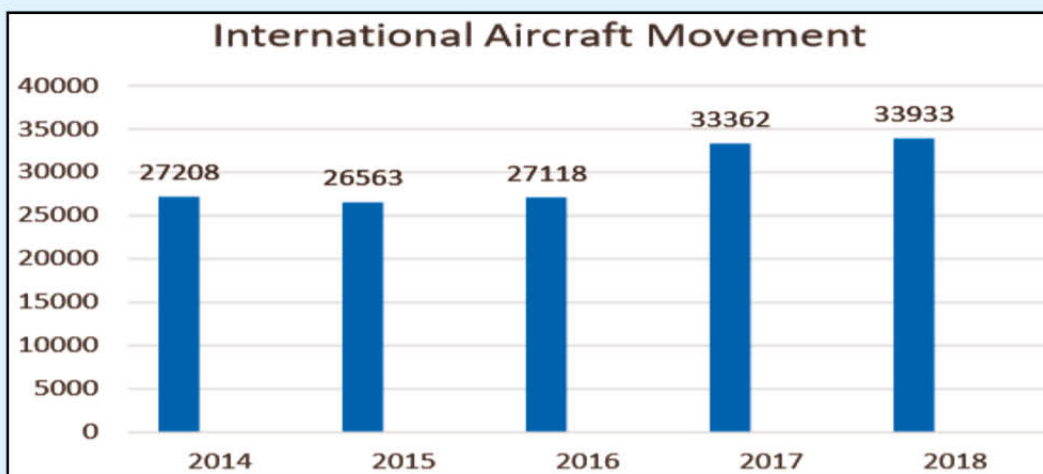


# 2

## AIR TRAFFIC MOVEMENT (2014 TO 2018)

### International

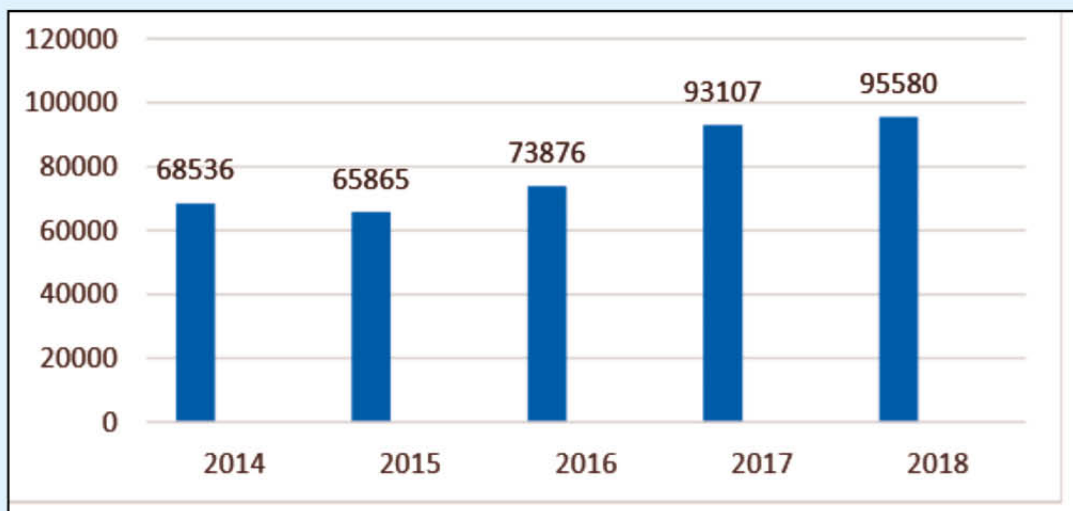
Air traffic movement in the international sector also shows a positive trend with an increase of 1.71% in the year 2018 compared to that in 2017. Two new airlines namely Thai Lion Air from Bangkok and Salam Air from Mascot commenced their operation to Nepal in 2018.



### Domestic (Tribhuvan International Airport)

Tribhuvan International Airport (TIA) is the main operating base for domestic traffic. Therefore, most of the domestic traffic movement originate from TIA.

The Domestic air traffic movement in TIA in the past five years shows generally an increasing trend since 2015 with a remarkable increase in 2017 compared to that in 2016.

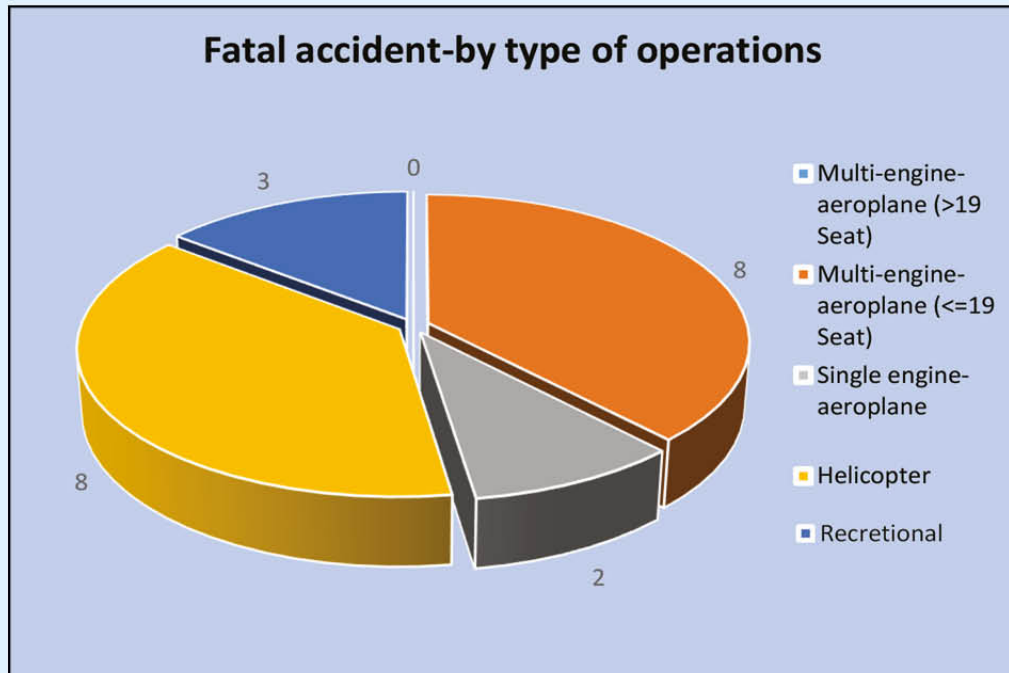




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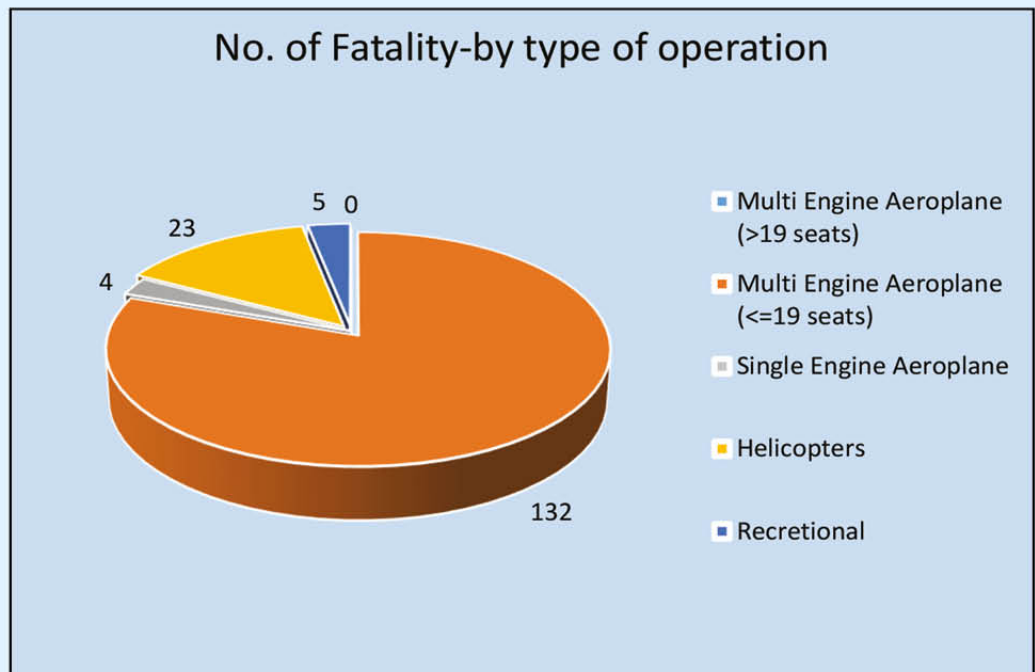
## REACTIVE SAFETY INFORMATION

### Fatal Accidents and fatalities (2009 to 2018)



In the past ten years total 21 fatal accidents occurred including 8 helicopter-accidents. Multi-engine aeroplane with seat capacity of more than 19 seats had no fatal accident whereas Multi-engine aeroplane with seat capacity of 19 or less seats witnessed 8 fatal accidents and 132 fatalities during the period. Helicopter accidents accounted for 23 fatalities.

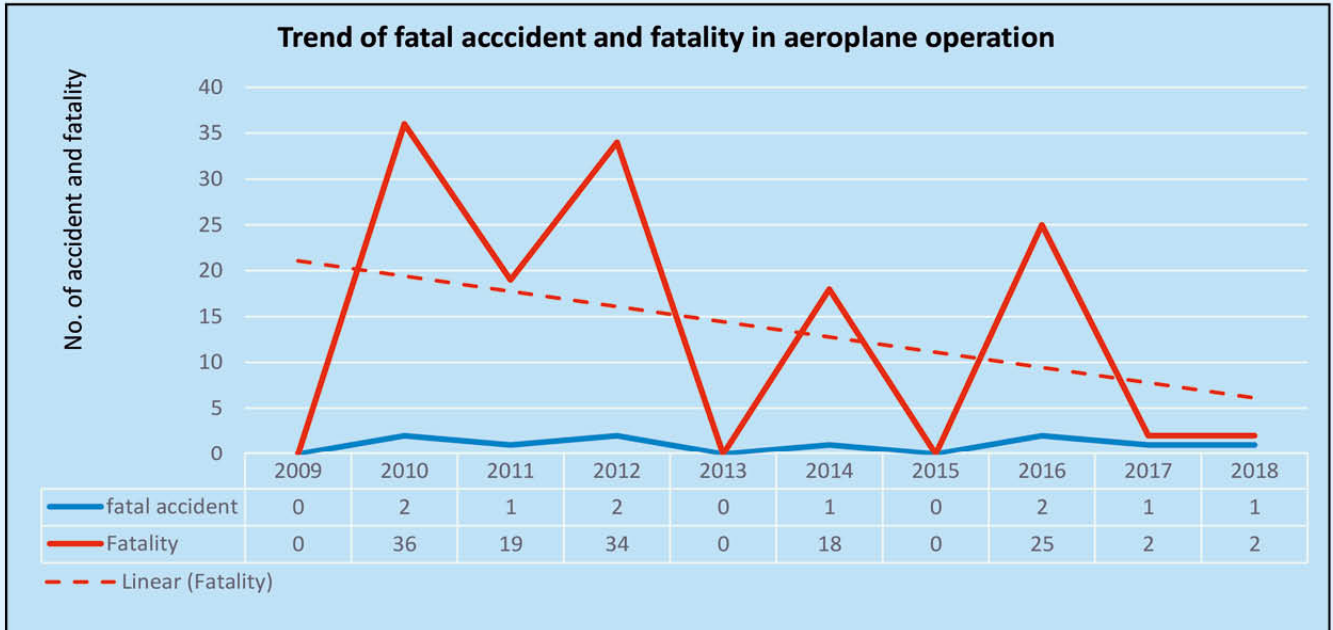
The diversity of weather patterns together with hostile topography are the main challenges surrounding aircraft operations in Nepal due to which the number of accidents related to helicopters and small aircraft having 19 seats or less and operating in STOL airfields seems comparatively higher.



## Trend of fatal accidents and fatalities (2009 to 2018)

### Aeroplane operation

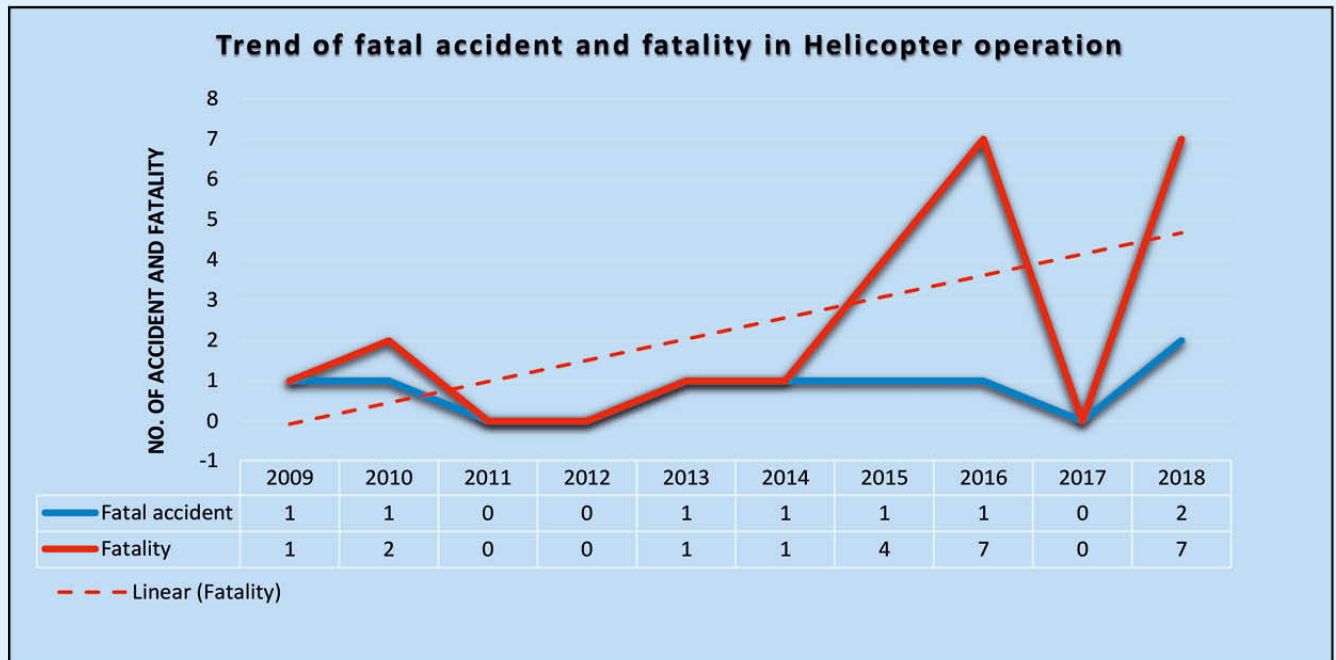
During the period of 2009-2018, highest number of accidents with aeroplane was observed in 2016 with 4 accidents. The trend of fatality related to aeroplane accident has registered a steep drop continuously.





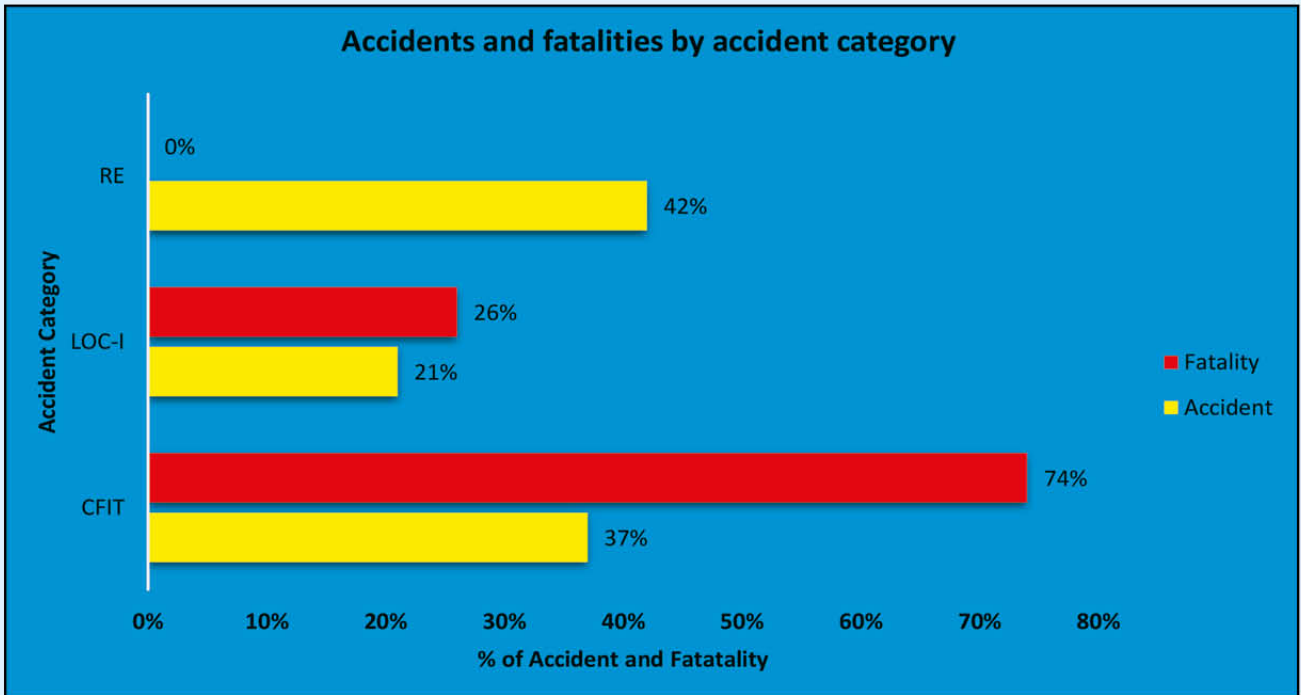
## Helicopter Operation

During the past ten years, increase in tourism activities has led to the increase in helicopter operation. Due to topographical challenge and inevitability of helicopter operations for logistic and rescue purposes in mountainous terrain, the accidents related to helicopter operations still remains a challenge in the field of Nepali aviation. The fatality related to helicopter accidents has undergone a rise in trend during 2009-2018.





## Accidents and Fatalities by accident category (2009 to 2018)\*

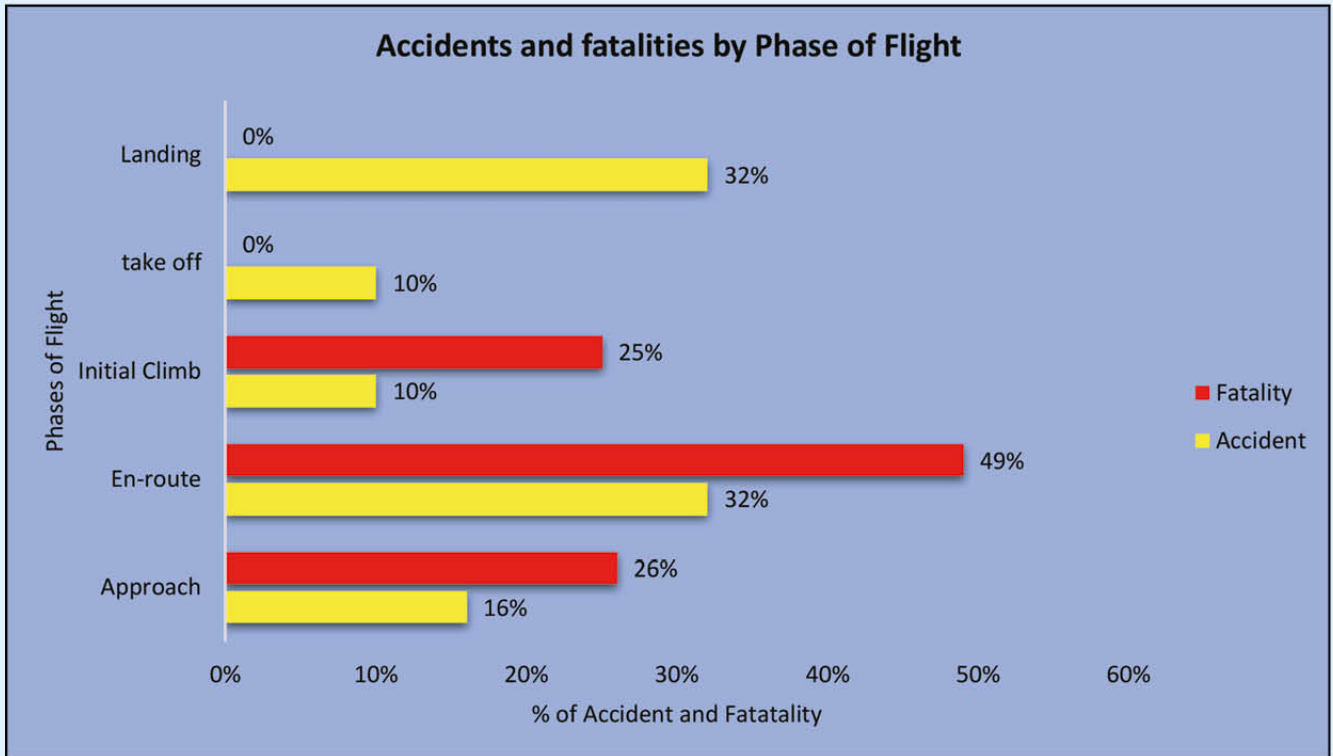


\*does not include helicopter and recreational aircraft accidents

CFIT is the most risky category of accident in Nepal because it accounts 74% of total fatality with 37% of accident in last 10 years. Similarly, RE is comparatively less risky among the three categories since it has not accounted for any fatality though the percentage of accident is more than CFIT.



## Accidents and Fatalities by Phase of Flight (2009 to 2018)\*

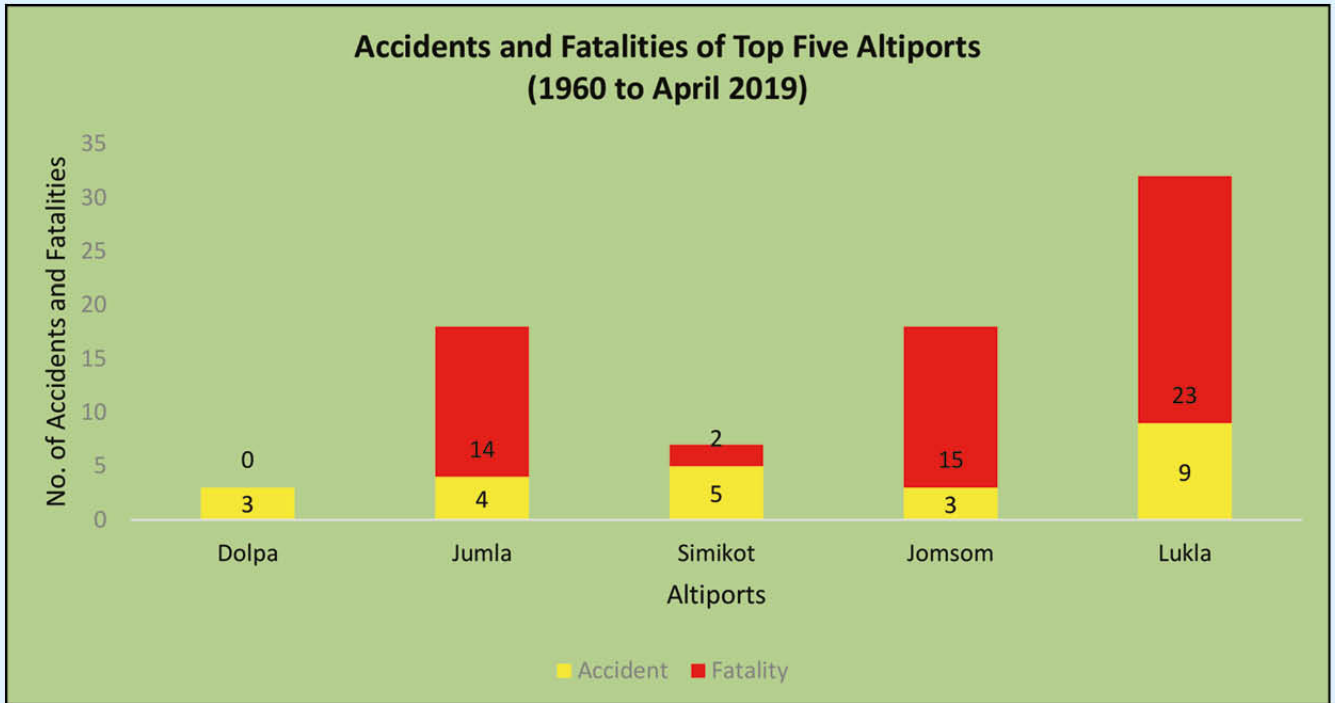


\*does not include recreational aircraft accidents

En-route phase of flight in STOL operation is the most risky phase in Nepal because it accounts for 49% of fatality with 32% of accident of total fatality and accident during the last 10 years. Similarly, Landing is less risky phase of since it does not count any fatality in spite of having 32% of accidents.



## Accident and Fatality in Altiports/STOLports

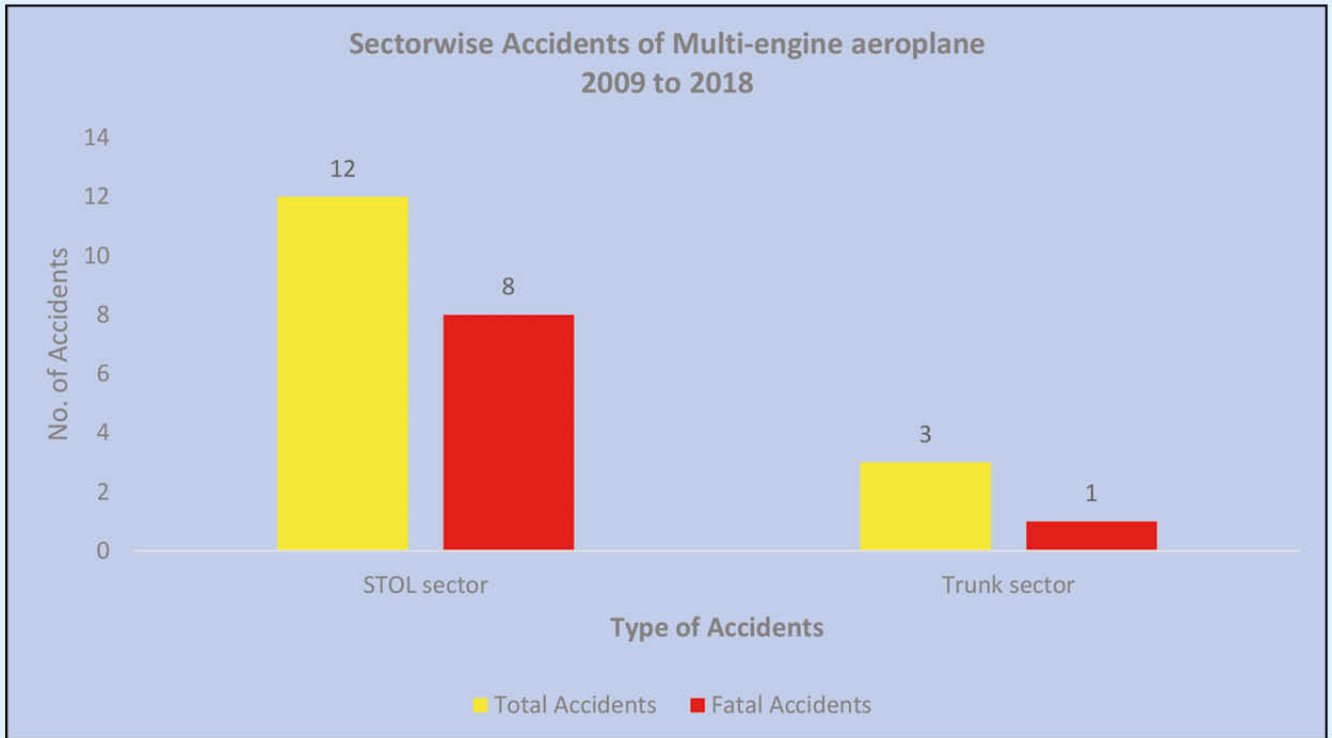


The data of past five years thus show that Jumla, Simikot and Lukla as the top 3 risky altiports/STOLports of Nepal. However, the history of civil aviation in Nepal has witnessed many accidents in the remote airports in Nepal. Taking into consideration the number of accident and fatality during the period of 1960 to April 2019, top five altiports can be named as Lukla, Jomsom, Simikot, Jumla and Dolpa.

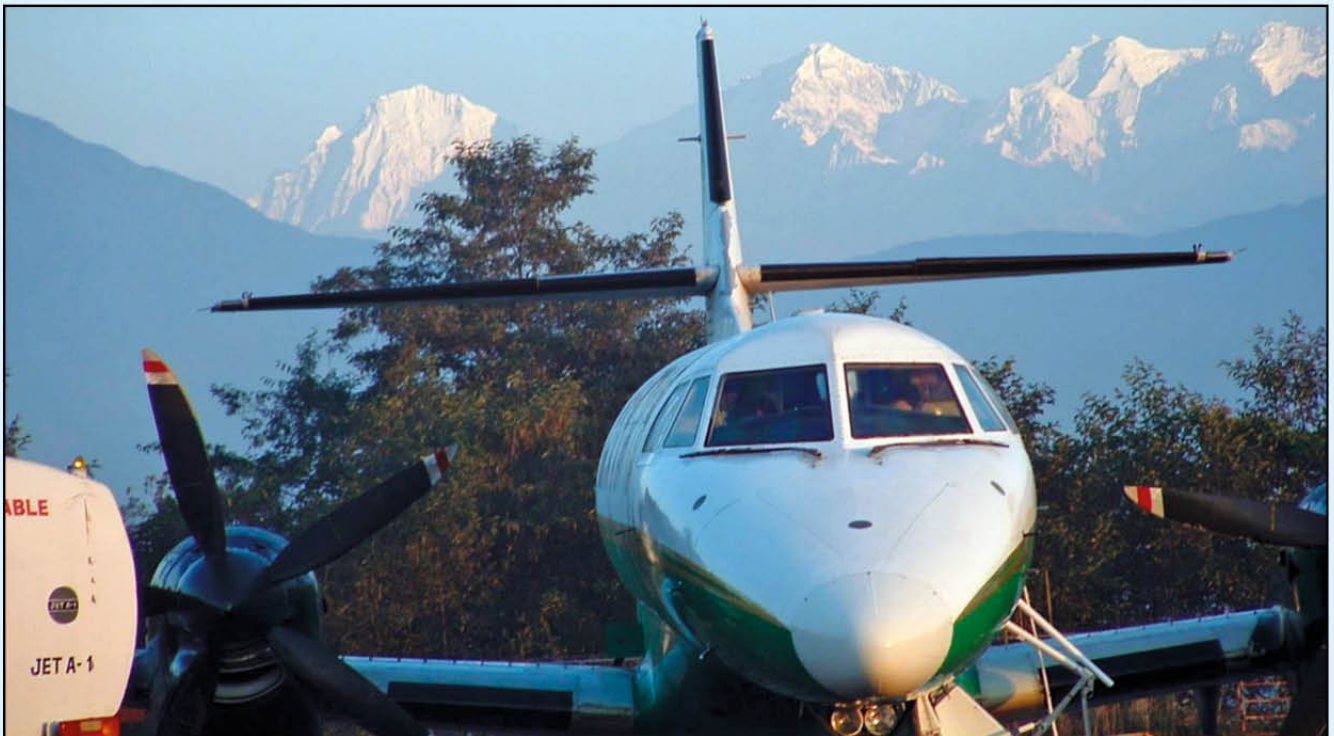




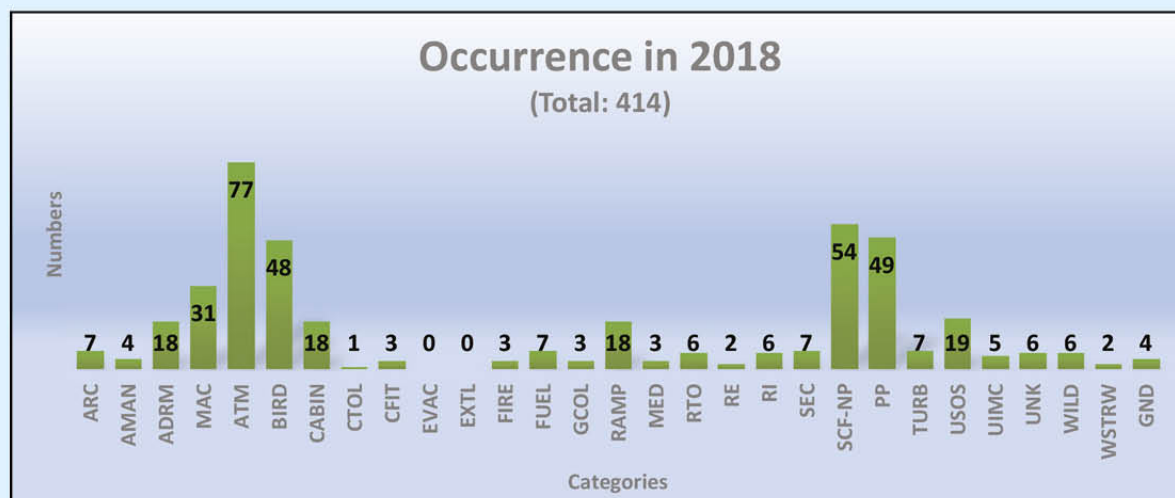
## Accidents and fatality by sector



During the last ten years, STOL sector has gone through comparatively more number of accidents than the trunk sector. Out of 15 accidents that occurred during this period, 12 occurred in the STOL sector rendering it comparatively riskier. Out of 12 accidents, 8 were fatal whereas trunk sector suffered only one fatal accident out of 3 accidents with turbo-prop multi-engine aircraft with capacity of more than 19 seats.



## Mandatory Occurrence Reporting in 2018



In 2018, 414 occurrences were reported mandatorily. Of these, maximum number of reports was related to Air Traffic Management. Secondly, 54 occurrences were related to System Component Failure-Non Power plant, 49 were related to power plant and 48 reports spoke of bird hazards. Other prominent sectors related to which occurrences had been reported in 2018 include airprox, aerodrome, cabin safety events, ramp safety events etc.

The Taxonomy adopted for the purpose of deriving information related to mandatory and voluntary occurrences and incidents is the one prepared by CAST/ICAO Common Taxonomy Team (CICTT). The CICTT includes experts from several air carriers, aircraft manufacturers, engine manufacturers, pilot associations, regulatory authorities, transportation safety boards, ICAO, and members from Canada, the European Union, France, Italy, Japan, the Netherlands, the United Kingdom, and the United States. The CICTT is chaired by a representative from ICAO and CAST. The taxonomy for occurrences has been given below:

### ICAO/CAST Taxonomy for Occurrences

Abnormal Runway Contact (ARC)	Medical (MED)
Abrupt Maneuver (AMAN)	Rejected Take off (RTO)
Aerodrome (ADRM)	Runway excursion (RE)
Airprox, Mid Air Collision (MAC)	Runway incursion (RI)
ATM/CNS (ATM)	Security related (SEC)
Bird Strike (BIRD)	System/Component Failure or Malfunction (SCF-NP)
Cabin Safety Events (CABIN)	System/Component Failure or Malfunction (PP)
Collision with obstacle (s) during take off and landing (CTOL)	Turbulence encounter (TURB)
Controlled flight into terrain (CFIT)	Undershoot/overshoot (USOS)
Evacuation (EVAC)	unintended flight in IMC (UIMC)
External Load Related (EXTL)	unknown or undetermined (UNK)
Fire/Smoke (FIRE)	Wildlife (WILD)
Fuel Related (FUEL)	Wind shear or Thunderstorm (WSTRW)
Ground Collision (GCOL)	Ground Injury (GND)
Ground Handling (Ramp)	

# 4

## PROACTIVE SAFETY INFORMATION

### Hazard Reported in 2018

One of the proactive measures of collection of safety information has been the hazard reporting system. After introduction of SMS assessment, safety awareness has relatively improved. As a result, 512 hazards have been reported in the year 2018 with a remarkable 211 hazards related to "human." 106 environmental hazards and 105 technical hazards together with 91 organizational hazards were reported during the period.





# 5

## OPERATIONAL SAFETY RISKS IN NEPAL

Nepal Aviation Safety Plan (NASP), 2018-2022 developed in congruence with the Global Aviation Safety Plan (GASP), Doc. 10004.NASP (2018-2022) has identified six areas of operational safety risk, viz. Controlled Flight into Terrain (CFIT), Loss of Control in Flight (LOC-I), Mid Air Collision (MAC), Runway Incursion (RI), Runway Excursion (RE) and Wildlife Strike (WS)



# 6

## STATUS OF IMPLEMENTATION OF RECOMMENDATIONS (2009 TO 2018)

### Overall Effective Implementation:

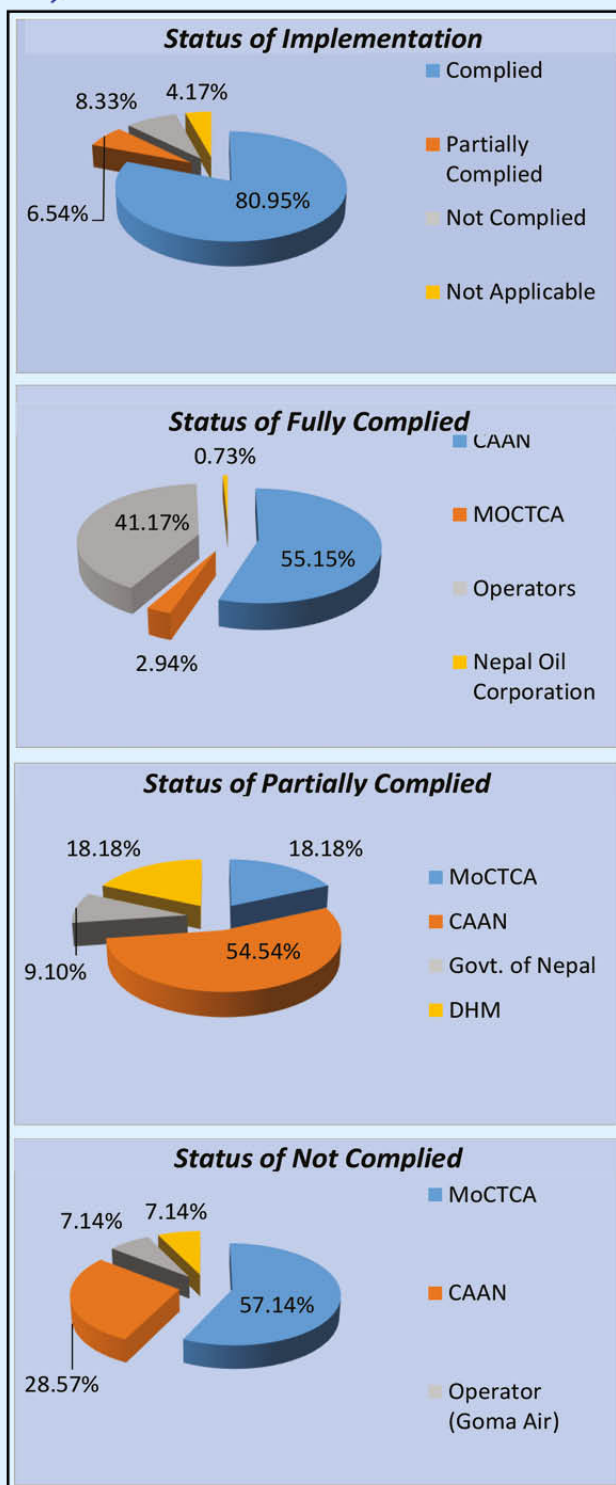
Total Recommendations:	168
Complied:	136
Partially complied:	11
Not Complied:	14
Not Applicable*:	7

Total Complied:	136
CAAN:	75
MoCTCA:	4
Operator:	56
Nepal Oil Corporation:	1

Partial Complied:	11
MoCTCA:	2
CAAN:	6
Govt. of Nepal:	1
DHM	2

Not Complied:	14
CAAN:	4
MoCTCA:	8
Dept. of Hydrology and Meteorology:	1
Operators:	1

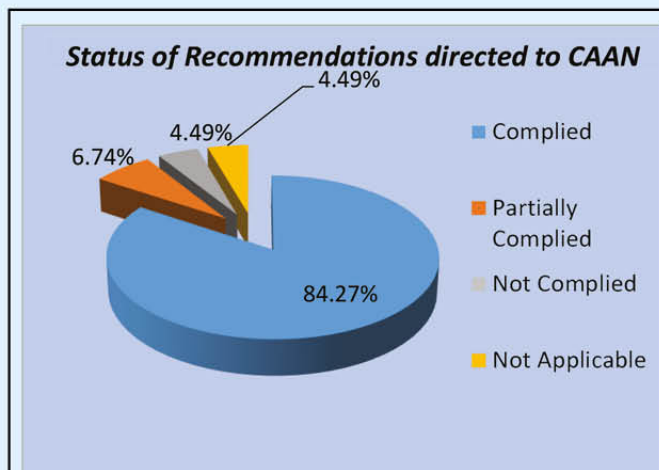
\* Has not been counted for any entity



## Status of Implementation of Recommendations directed to CAAN, MOCTCA and others agencies+ and Airline Operators.

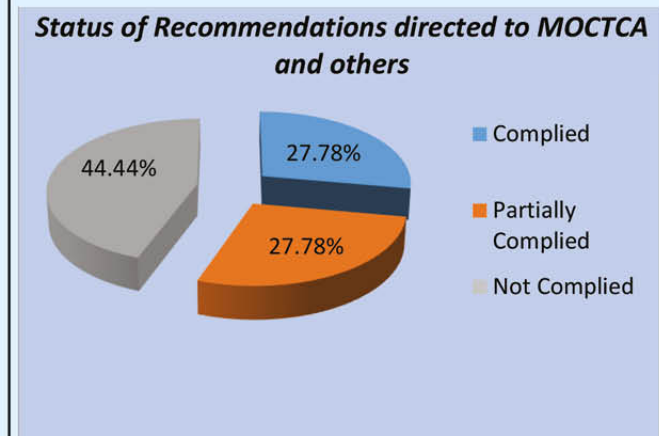
### Directed to CAAN

Total Recommendations:	89
Complied:	75
Partially complied:	6
Not Complied:	4
Not Applicable	4



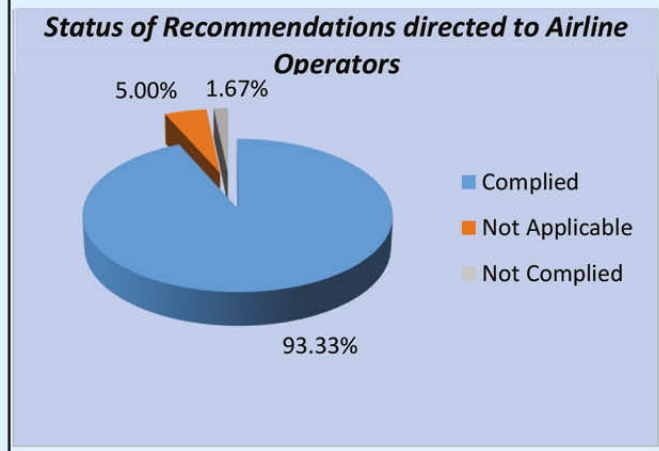
### Directed to MoCTCA and others agencies

Total Recommendations:	18
Complied:	5
Partially complied:	5
Not Complied:	8



### Directed to Airline Operators

Total recommendations:	60
Complied:	56
Not applicable:	3
Not Complied:	1



+ Nepal Oil Corporation & Department of Hydrology & Meteorology

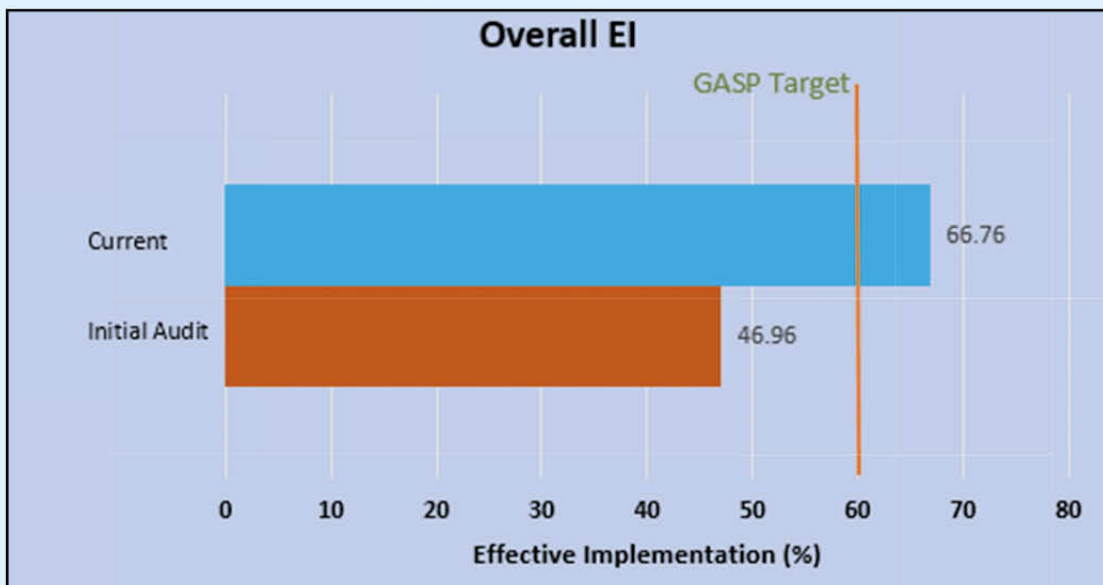


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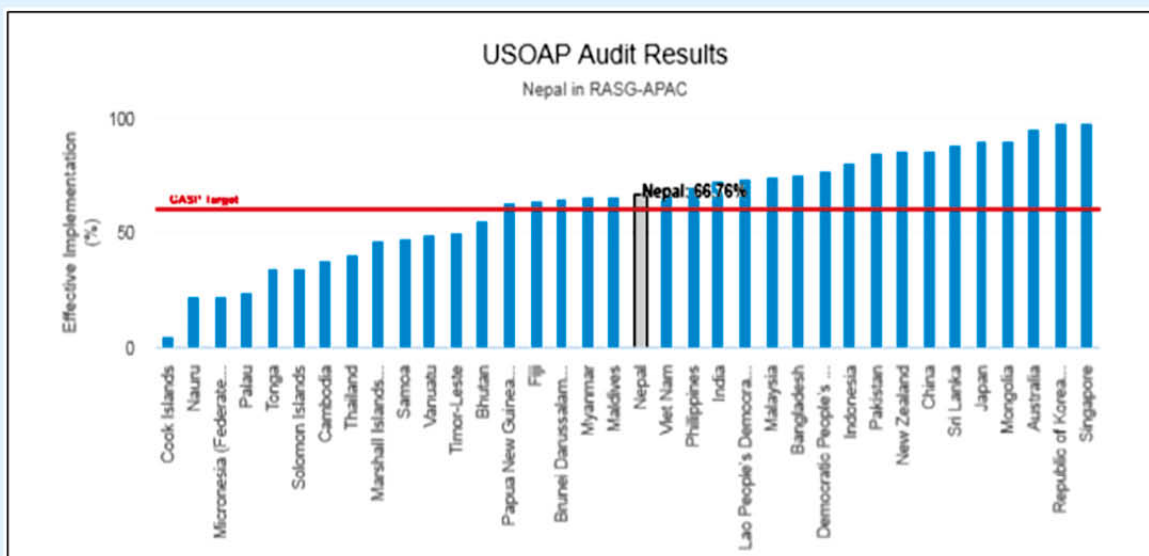
## STATE SAFETY OVERSIGHT INFORMATION

### Overall Effective Implementation:

The Effective Implementation of Nepal in the last USOAP audit is 66.76 which is above the benchmark of 60% set by ICAO through its Global Aviation Safety Plan (GASP). Nepal has made a significant progress in its oversight capability since the initial audit in 2009.

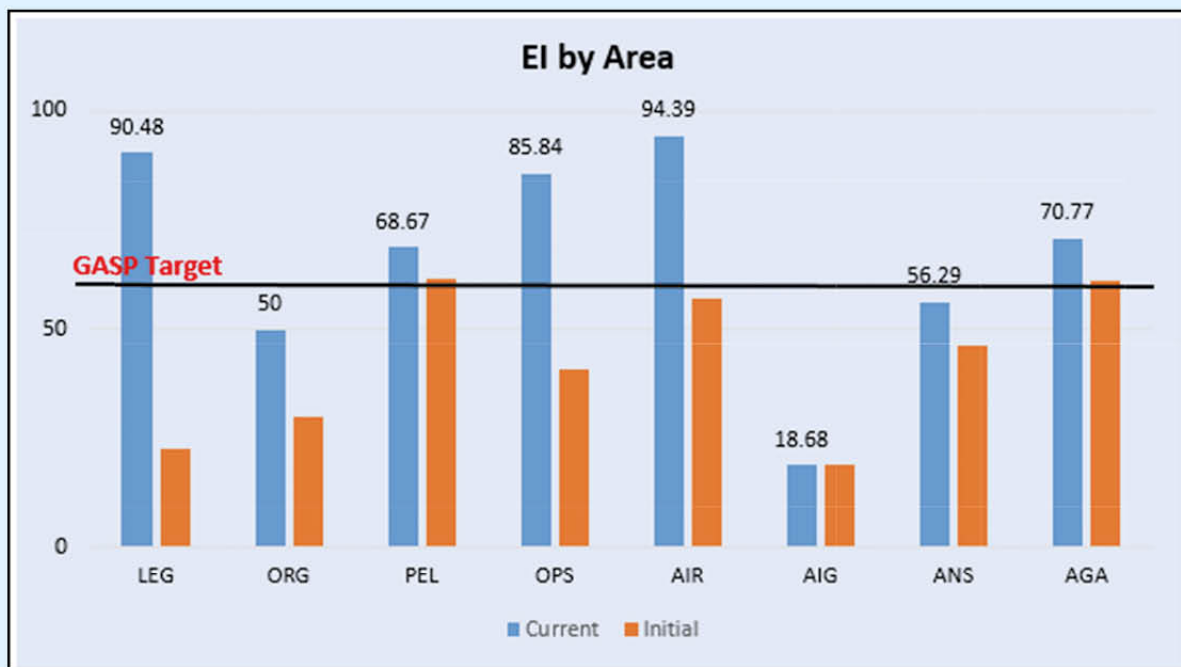


Nepal is ranked 18th in RASG-APAC with respect to overall effective implementation within this group. In this region, 63.89% have reached the target of 60% with average of 63.26. Nepal rates above the average of RASG-APAC.



## Effective Implementation by Area

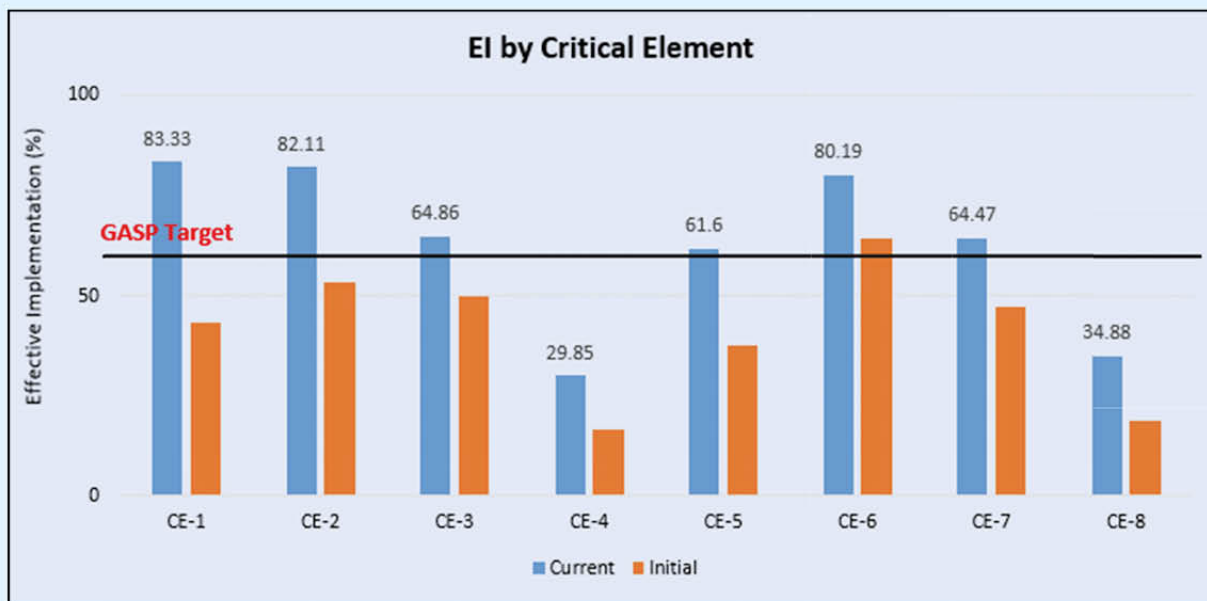
Currently, Nepal has 5 areas and 6 critical elements above the GASP target of 60% EI.



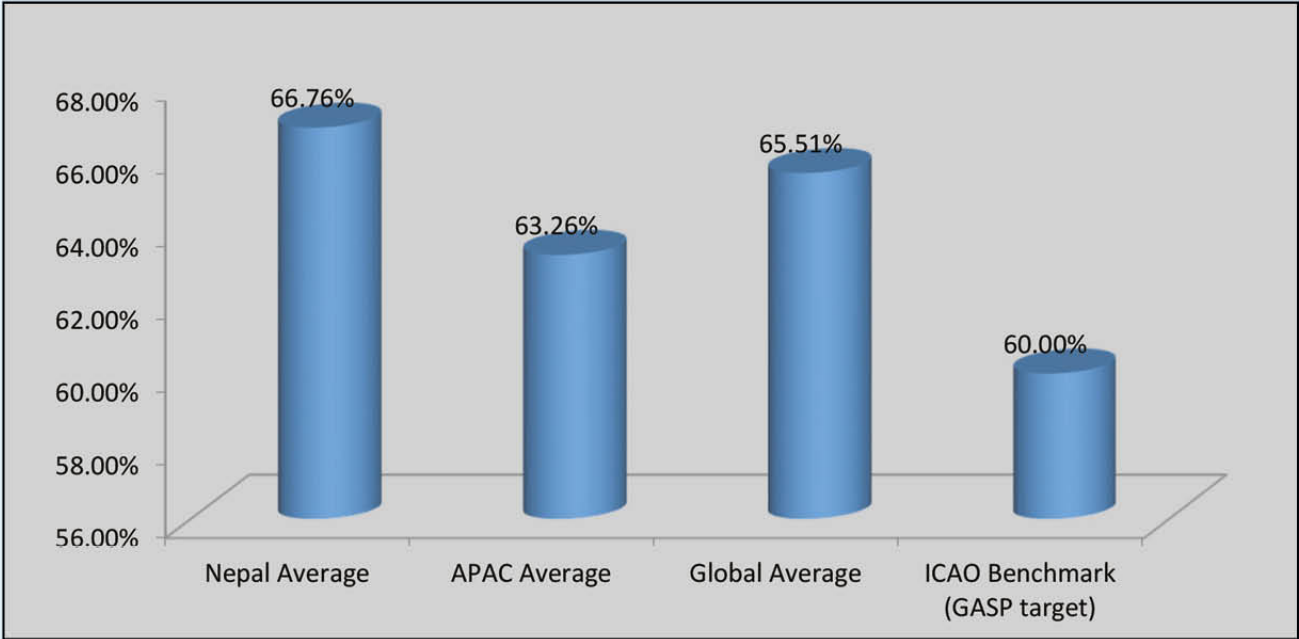
The strongest area of Nepal is, thus, AIR with 94.39% of effective implementation. AIG is the area which has not been audited so far.

With regards to critical elements, CE1, CE2 and CE6 stand as stronger elements. CE4 and CE8 are the weakest elements.

## Effective Implementation by Critical Element



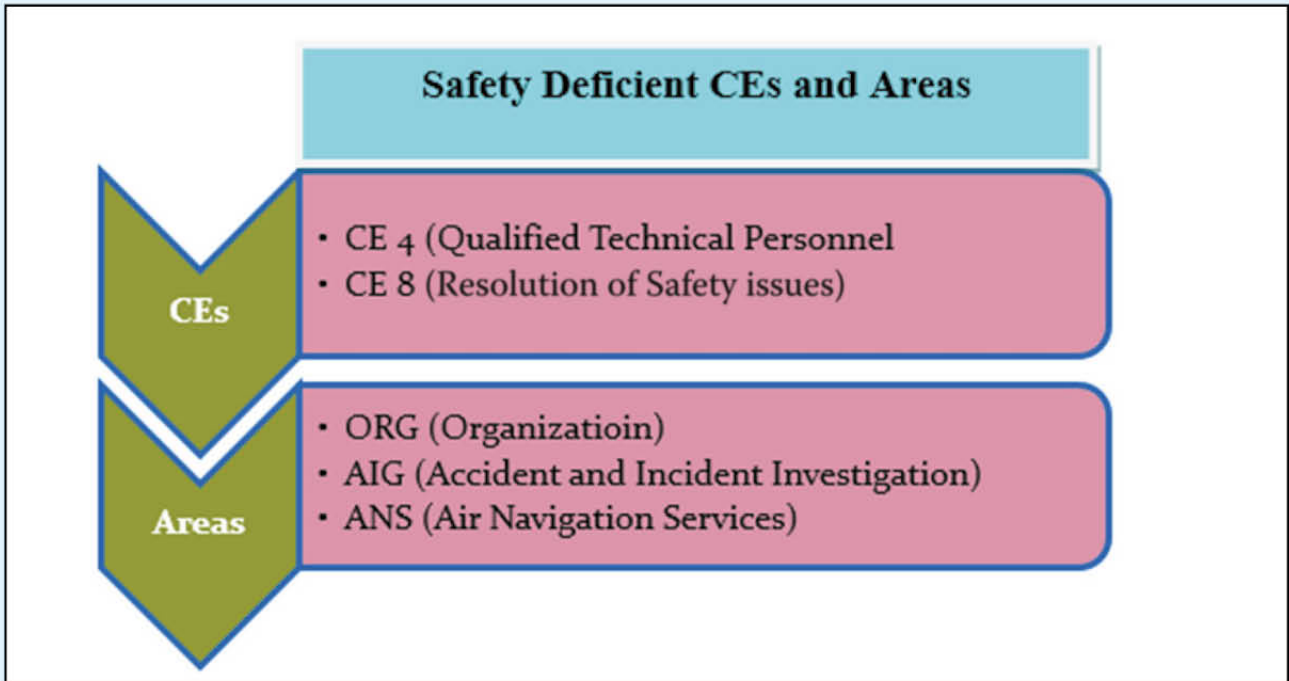
Current Nepal's EI (66.76%) is higher than APAC (63.26%) and Global (65.51%) averages and ICAO benchmark (60%) (GASP target).





## Safety Deficient CEs and Areas

USOAP 2017 identified CE4 and CE8 as safety deficient critical elements and ORG, AIG and ANS were identified as safety deficient areas in the state oversight capability system.



Nepal currently has 240 open USOAP protocol findings. The highest number of protocol findings (39) concern Technical Guidance, Tools and the Provision of Safety-Critical Information (CE-5) in the area of Accident Investigation (AIG).

	LEG	ORG	PEL	OPS	AIR	AIG	ANS	AGA
CE-1		1				4		
CE-2	2		3	1		7	2	2
CE-3		4	1	1	1	7	10	2
CE-4			4	4	1	6	29	3
CE-5			1		1	39	3	4
CE-6			10	4	1		17	10
CE-7			4	4	1		8	10
CE-8			3	2	1	11	4	7

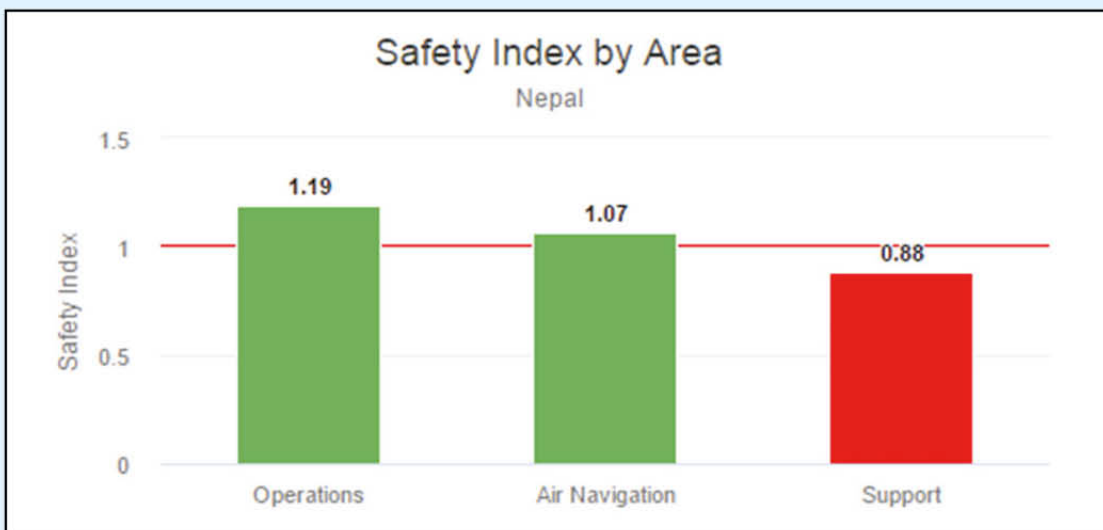
*Protocol findings by Area and Critical Element intersection*

## Safety Index by Areas

Safety Indexes provide a risk-based prioritization of operational, air navigation and support related USOAP areas. A State with a positive safety index would be considered to have sufficient regulatory controls in place to cover its existing traffic volume. A State with a negative safety index would be considered to have an insufficient oversight system taking into consideration its traffic volume.

Nepal has a positive Safety index in only two areas.

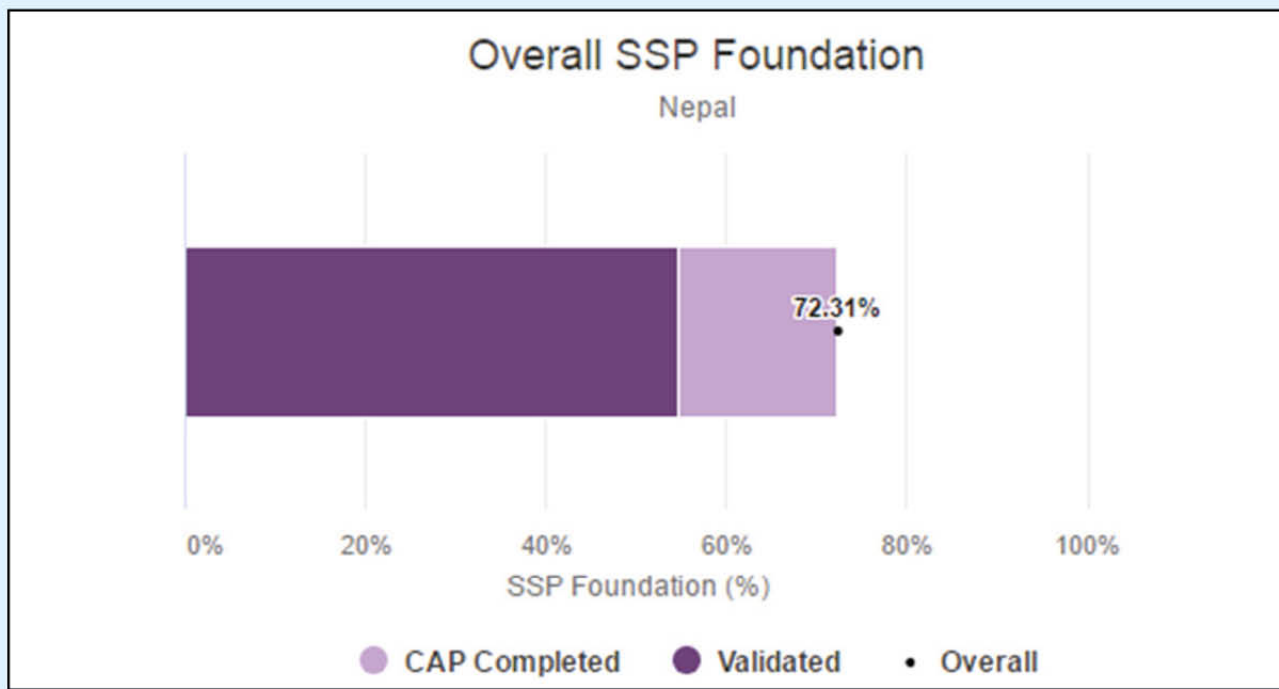
In the area of Support (LEG/ORG/AIG), the EI should be increased at least by 7.39%.



## SSP Foundation

The SSP Foundation indicator is calculated, as the percentage of a subset of 311 USOAP Protocol Questions considered as the foundation for a SSP implementation.

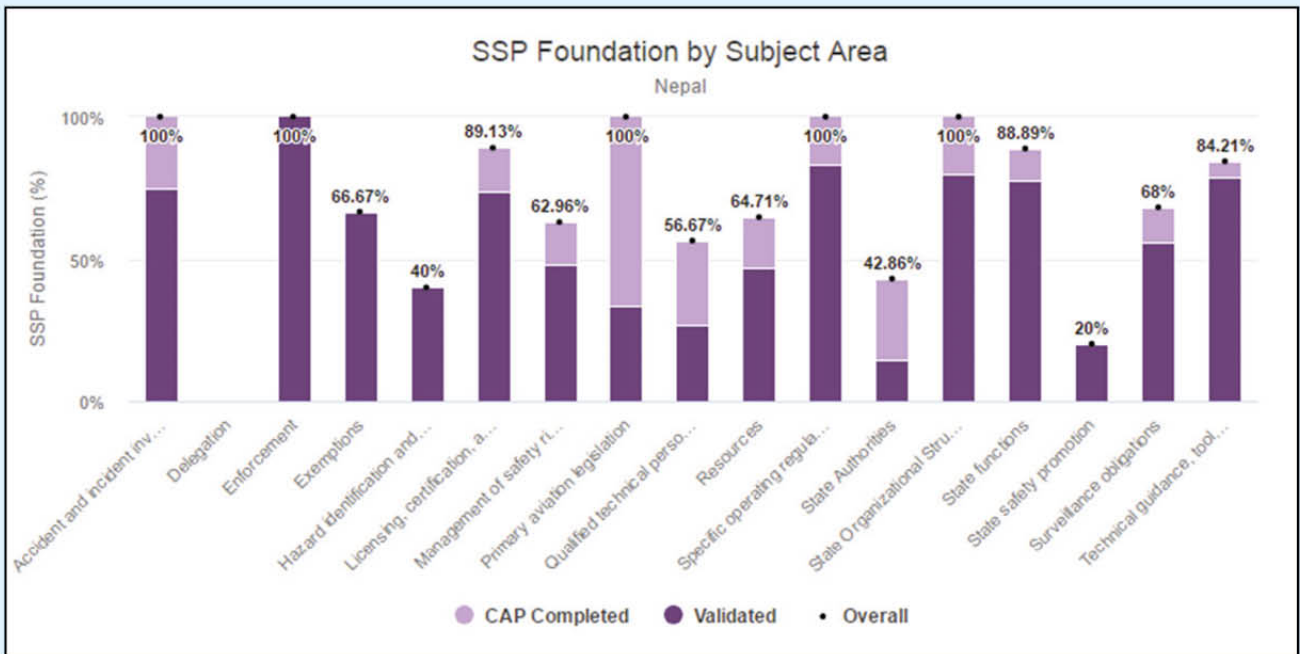
Currently Nepal has overall (Validated and CAP completed) 72.31% of SSP foundation implementation.



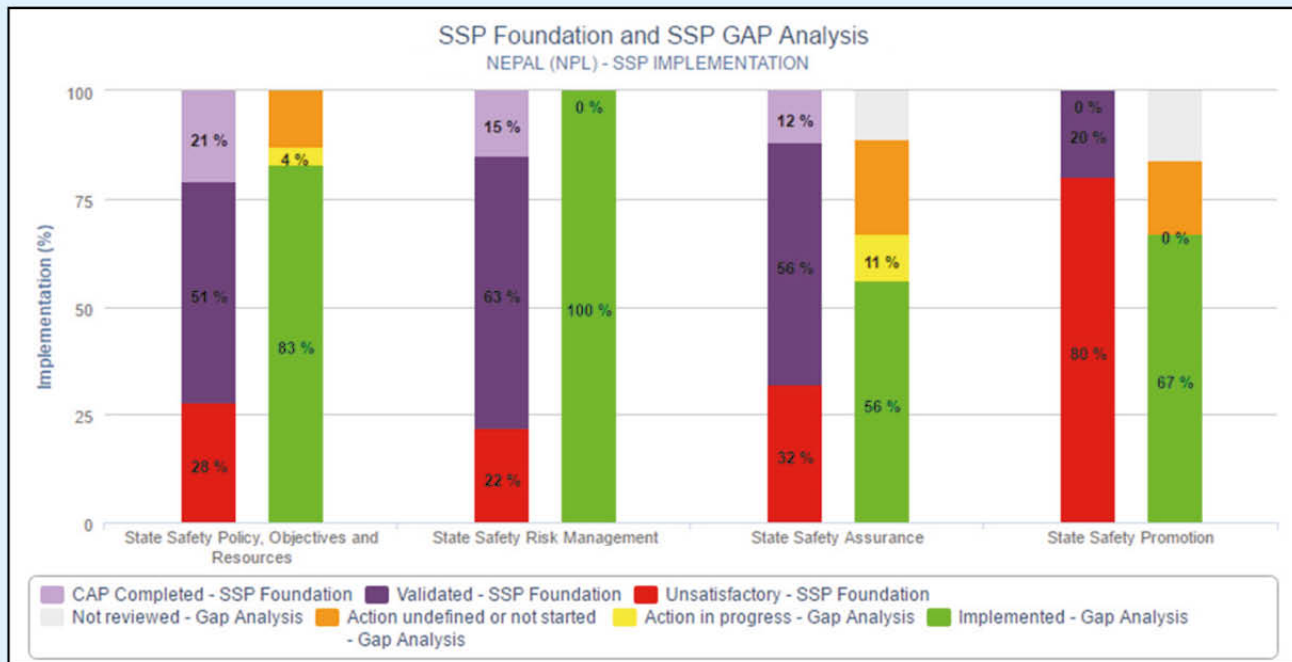


## SSP Foundation by Subject Area

The sub-set of PQs are grouped by 17 subjects as shown below. The grouping is based on Annex 19, second edition and Safety Management Manual, fourth edition.



## Nepal's performance in SSP foundation and GAP analysis



Nepal has started the processes related to SSP implementation and has already completed its GAP Analysis. SSP Implementation plan has been prepared addressing those gaps.



# 8

## IMPLEMENTATION OF NEPAL AVIATION SAFETY PLAN (NASP), 2018 TO 2022

### SSP implementation

3.3.i.a Conduct initial SSP gap analysis (SEI-13 B)

- *Gap analysis conducted.*

3.3.i.b Develop an Implementation plan for the SSP (SEI-13D)

- *SSP Implementation plan developed.*

3.3.i.c Issue SMS regulations for service providers and verify SMS implementation through SMS audit by 2018 (SEI- 13E)

- *CAR 19 has been updated in accordance to Annex 19, second edition.*
- *SSP Nepal 2011 has been revised and is pending approval from the Board of Directors for further processing.*
- *First round of SMS audit of all aeroplane and helicopter operators has been completed.*
- *SMS implementation Guidance Material has been developed and communicated to all service providers.*

3.3.i.d identify and share safety management best practices (SEI-13F).

- *Few safety management best practices have been identified and shared through NAST-aeroplane and SMSIGM.*

3.3.iii.c Develop an action plan to address the elements identified as missing or deficient during the SSP Gap analysis (SEI-15C).

- *SSP implementation plan has been developed addressing the gaps identified through Gap analysis.*

3.3.v.a Establish a legal framework related to the protection of safety data, safety information and other related sources (SEI-17B).

- *Protection of safety data, safety information and other related sources has been provisioned in CAR 19 second edition, 2019, Appendix 3.*

3.3.v.b Establish a mandatory occurrence reporting system (SEI-17B)

- *Mandatory occurrence reporting procedure, 2016 has been developed and brought into implementation for the mandatory occurrence reporting system in Nepal.*

3.3.v.f establish a State confidential voluntary reporting system providing data to safety database (SEI-17F).

- *Voluntary reporting system has been established in 2017 and hazards are being reported in the system. (<http://caanepal.gov.np/virs>).*



## Operational Safety Risks

### 1. Controlled Flight into Terrain (CFIT)

S.No.	Actions	Responsible Dept.	Implementation Plan
a.	Issue Safety Advisory to increase adherence to TAWS warning procedures.	FSSD	FOR-A has requirements for TAWS in Chapter 6.15 and FOR Appendix-1 Part A General.
b.	Ensure that ATC surveillance system is improved for the provision of Minimum Safety Altitude Warning (MSAW) system by 2020.	ANSSSD	Stakeholder's meeting has been conducted. ANSP has initiated process for effectively implementing MSAW system by 2020.
c.	Ensure that the timeline of updates and accuracy of Electronic Terrain and Obstacle Data (ETOD) by 2021.	ANSSSD	Stakeholder's meeting has been conducted. ANSPCAIMD has initiated process for effectively implementing ETOD by 2021.
d.	Promote the use of GPS-derived position data to feed into TAWS by 2019.	FSSD	FOR-A has requirements for TAWS in Chapter 6.15. TAWS equipment once installed in aircraft are updated automatically every 28 days

### 2. Loss of Control in- Flight (LOC-I)

S.No.	Actions	Responsible Dept.	Implementation Plan
a.	Ensure the requirement of upset prevention and recovery training (UPRT) in all full flight simulator type conversion and recurrent training programmes by 2019.	FSSD	- UPRT provision is already in place for initial type rating. - FOR-A Chapter 9.3.1(d) includes this provision by FOR 5 <sup>th</sup> Edition dated January 2011..
b.	Ensure that ATC surveillance system is improved for the provision of Minimum Safety Altitude Warning (MSAW) by 2020.	ANSSSD	Stakeholder's meeting has been conducted. ANSP has initiated process for effectively implementing MSAW system by 2020
c.	Ensure that the pilot trainings extensively incorporate human factors such as distraction, complacency, situational awareness etc by 2018.	FSSD	FOR-A Chapter 9.3.1(h) includes this provision by FOR Amendment 8 dated 17 <sup>th</sup> July 2016
d.	Evaluate the existing SOPs to insure the effective flight management during adverse weather and recovery unusual aircraft attitudes by 2018.	FSSD	FOR-A Chapter 9.3.1(d) includes this provision by FOR 5 <sup>th</sup> Edition dated January 2011.



### 3. Mid Air Collision (MAC)

S.No.	Actions	Responsible Dept.	Implementation Plan
a.	Establish guidance and regulations to ensure all type of aircraft operating within Nepalese airspace are equipped with airborne collision avoidance system (ACAS), in accordance with Annex 6 by 2022.	FSSD	TCAS- B1900, Do-228 and DHC6 by September 2020. FOR-A Chapter 6.18 includes this provision by FOR 5th Edition dated January 2011.
b.	Mandate the airline operators to adhere to ACAS warning.	FSSD	- ACAS warning SOP to be strictly followed up by all applicable operators by September 2020. - FOR-A Appendix 7 includes this provision by FOR Amendment 2 dated June 2013.
c.	Promote the improvement of air traffic control (ATC) systems, procedures and tools to enhance conflict management.	ANSSSD	EMSSR has already been introduced with STCA system in TIA to enhance conflict resolution as well as management.
d.	Ensure that the ATC system is properly equipped of and is in effective implementation of short term conflict alert (STCA) by 2022.	ANSSSD	EMSSR has already been introduced with STCA system in TIA.

### 4. Runway Incursion (RI)

S.No.	Actions	Responsible Dept.	Implementation Plan
a.	Ensure establishment and implementation of Nepal Runway Safety Programme (NRSP) and Runway Safety Teams (RST) by 2019.	ASSD	Runway safety programme (RSP) shall be developed and Runway Safety Teams (RST) shall be formed and implemented in all certified aerodromes by December 2019.
b.	Develop policy, procedures and trainings that support situational awareness for controllers, pilots, airside-vehicle drivers and other airport users by 2020.	ANSSSD, ASSD, FSSD	- ANSSSD: Policy, procedures and training that support situational awareness for controllers will be developed by 2020. - ASSD shall ensure the development of Policy, Procedures and Training that support situational awareness for airside vehicle drivers and other airport users in all certified aerodromes by December 2019. - FSSD shall ensure the development of Policy, Procedures and Training that support situational awareness for pilots by December 2019.



c.	Ensure effective use of suitable technologies to assist the improvement of situation 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) by 2022.	FSSD, ASSD	<ul style="list-style-type: none"> <li>- FSSD: EFB, EVS, HUD,SVS, CVS requirements are included in FOR-A 6.23 and 6.24 and Attachment B.</li> <li>- ASSD shall establish surface movement guidance and control system (A-SMGCS) of all certified aerodrome based on CAAN guidance materials by December 2019.</li> <li>- ASSD shall use of all modern applicable technologies to improve stop bars and runway incursion warning system by December 2019.</li> </ul>
d.	Certify International and Regional hub aerodromes in accordance with ICAO Annex 14, Vol. I as well as Doc 9981, PANS-Aerodrome by 2022.	ASSD	<ul style="list-style-type: none"> <li>- Process will be carried out to all remaining Hub aerodromes by 2022.</li> </ul>
e.	Ensure the identification and publication in the aeronautical information publication (AIP) of hot spots at aerodromes.	ASSD	<ul style="list-style-type: none"> <li>- The identification and publication of hot spots of aerodrome in AIP shall be done in all regional hub aerodromes by <u>2022</u></li> </ul>
f.	Conduct the risk assessment of identified hot spots of aerodrome and develop and execute suitable strategies to remove hazards or mitigate risks associated with those hot spots by 2019.	ASSD	<ul style="list-style-type: none"> <li>- Risk assessment of identified hot spots of aerodrome with suitable safety strategies to remove hazards or mitigate risk associated with those hot spots shall be completed in all regional hub aerodromes by 2019.</li> <li>- Those safety strategies shall be effectively executed to remove the hazards or mitigate risk associated with those hot spots in all regional hub aerodromes by 2019.</li> </ul>

## 5. Runway Excursion (RE)

S.No.	Actions	Responsible Dept.	Implementation Plan
a.	Certify International and Regional Hub aerodromes in accordance with ICAO Annex 14, Vol I, Doc 9981 and PANS-Aerodrome by 2022.	ASSD	Process shall be carried out to certify all regional hub aerodromes by 2022.
b.	Promote the establishment of policy and training on rejected landings, go-around, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds)	FSSD	Requirements for and training on rejected landings, go-around, crosswind and tailwind landings (up to the maximum manufacturer-demonstrated winds) is included in FOR-A Appendix-2.
c.	Encourage equipage of runway overrun awareness and alerting systems on aircraft by 2022.	FSSD	<ul style="list-style-type: none"> <li>- FSSD is consulting with Stake holder for feasibility of runway overrun awareness and alerting systems before December 2022. .</li> </ul>



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 Vol I, braking action and revised declared distances) by 2020.	ASSD	Following actions shall be completed by 2020: <ul style="list-style-type: none"> <li>• Introduction of pavement management system</li> <li>• Assessment and reporting the surface condition will be carried out as per the pavement management system.</li> <li>• Periodical rubber removal plan will be implemented.</li> <li>• Obligation to maintain the frequency of Runway friction test.</li> <li>• Obligation to maintain visual aids.</li> </ul>
e.	Ensure the installation of arresting systems if runway end safety area (RESA) requirements cannot be met by 2022.	ASSD	<ul style="list-style-type: none"> <li>• Assessment of existing conditions of runway and safety area of aerodromes as per ICAO requirement.</li> <li>• Recommendation to the aerodromes to ensure the RESA as per CAR-14.</li> <li>• If not possible to construct RESA within 2022, recommend to the aerodromes to install the arresting system.</li> </ul>
f.	Ensure that procedures for the systematic reduction of the rate of unstablized approaches to runways are developed and implemented by 2022	ANSSSD	Significant reduction in rate of unstablized approach has already been achieved by the introduction of RNP AR APCH at TIA for further reduction of such rate new RNP ARAPCH for RWY20 and RWY 02 will be developed and implemented by 2020.

## 6. Wildlife Strike (WS)

S.No.	Actions	Responsible Dept.	Implementation Plan
a.	Promote collecting, reporting, recording and analysis of data on Wildlife strikes and observed wildlife and formulate the strategies for Wildlife strike management	ASSD, ANSSSD, FSSD	<ul style="list-style-type: none"> <li>- FSSD: shall complete work by December 2019.</li> <li>- ASSD shall complete work in all aerodromes with more than 30 seater aircraft operation by 2019</li> <li>- ANSSSD: Bird Strike Reporting Form and mechanism has already been developed and implemented. Reporting form is available in CAAN website <a href="http://www.caanepal.gov.np">www.caanepal.gov.np</a></li> </ul>
b.	Ensure the better management of vegetation and land use at the airports.	ASSD	Vegetation Management and Land use planning shall be completed in all aerodromes by 2019.
c.	Ensure the implementation of effective wildlife distracting mechanisms at the airports by 2019	ASSD	Suitable wildlife distracting mechanism shall be installed in aerodromes with more than 30 seats aircraft operation by 2018.

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	ASSD	<ul style="list-style-type: none"> <li>- At each airport wildlife control and coordination committee shall be formed by 2018.</li> <li>- Education and outreach programmes for public awareness for garbage control around airport shall be conducted in all aerodromes by 2018.</li> </ul>
e.	Encourage to use environment friendly chemical bird repellent technique at airports apart from the existing audio and visual repellent techniques.	ASSD	The use of suitable mechanism to reduce the bird activities in aerodromes with more than 30 seater aircraft operation shall be ensured by 2018.
f.	Introduce Runway sweep-in vehicles by 2020 to control the activity of birds and other wildlife due to presence of attractants on the surface of runway	ASSD	Runway seep-in vehicles shall be ensured in all aerodromes with more than 30 seater aircraft operation by 2020.



# 9

## AVIATION SAFETY ACTIVITIES IN 2018/2019

Following safety activities were conducted by CAAN and other aviation stakeholders from January 2018 to end of June 2019.

1. TRI Theoretical Knowledge Continuity Training (12-13 June 2019) conducted by Airbus Helicopter.
2. SARI Part-145 Implementation Visit (10-14 June 2019) conducted by SARI
3. SARI Part-66 7 147 Implementation Visit (13-17 May 2019) conducted by SARI.
4. FOI Introductory Course (7-12 May 2019) by CAA Nepal.
5. Safety Awareness on 'Safety Data Reporting' in Pokhara on 26th March 2019
6. NCAR Part-M Workshop (21-22 March 2019) conducted by EU-APP project.
7. DCP Course (18-22 Feb 2019) conducted by COSCAP-SA.
8. Airworthiness Induction Course (11-15<sup>th</sup> Feb 2019) conducted by CAA Nepal.
9. Safety awareness programme in Nepalganj on 28th January 2019
10. Safety awareness programme in Dhangadhi on 13th January 2019
11. Safety awareness programme in Bharatpur on 26th December 2018
12. Safety awareness programme in Dolpa on 7th October 2018
13. Safety awareness programme in TIACAO on 2nd September 2018
14. Aviation Safety Campaign- Flight Data Analysis (12-14 Aug 2018) organized by CAA Nepal and AOAN.
15. Aviation Safety Campaign- Fatigue Risk Management (12-14 Aug. 2018) organized by CAA Nepal and AOAN.
16. Aviation Safety Campaign- Root Cause Analysis (12-14 Aug 2018) organized by AOAN and CAA Nepal, WFP and AOAN.





## Appendix-1 Record of multi-engine

S.N.	Date	Registration	Type of A/C	Operator	Operation	Place	Fatality	Survival
1	5 Nov 1960	9N-AAD	DC-3	Nepal Airlines	Scheduled	Bhairahwa	4	None
2	1 Aug 1962	9N-AAH	DC-3	Nepal Airlines	Scheduled	TulachanDhuri	10	None
3	12 July 1969	9N-AAO	DV-3	Nepal Airlines	Scheduled	Near Heatauda	35	None
4	25 Jan 1970	9N-AAR	F-27	Nepal Airlines	Scheduled	New Delhi	1	22
5	15 Oct 1973	9N-ABG	DHC-6/300	Nepal Airlines	Scheduled	Lukla	None	6
6	22 Dec 1984	9N-ABH	DHC-6	Nepal Airlines	Scheduled	Cheklatidanda	15	8
7	02 May 1986	9N-ABI	DHC-6	Nepal Airlines	Scheduled	Sanfebagar irport	None	
8	19 Aug 1987	9N-ABB	DHC-6	Nepal Airlines	Scheduled	Dolpa	None	
9	9 Jun 1991	9N-ABA	DHC-6	Nepal Airlines	Scheduled	Lukla	None	
10	28 Jun 1991	9N-ABS	DHC-6	ATSC,DCA	Charter	Simikot	None	
11	26 Sep 1992	9N-ACI	Y-12	Nepal Airways	Scheduled	Lukla	None	
12	08 Nov 1993	9N-ACS	Y-12 II	Nepal Airways	Scheduled	Jomsom	None	
13	31 Jul 1993	9N-ACL	DO-228	Everest Air	Scheduled	Solighopte	18	None
14	14 Jan 1995	9N-ABI	DHC-6	Nepal Airlines	Scheduled	Kathmandu Airport	2	23
15	15 Jul 1995	9N-ADB	Y-12	Nepal Airways	Scheduled	Bharatpur	None	
16	25 Apr 1996	9N-ABR	HS-748	Nepal Airlines	Scheduled	Meghauli	None	
17	28 Jul 1996	9N-ACC	DHC-6/300	ATSC,DCA	Charter	Simikot	None	
18	23 Dec 1996	9N-ACF	Y-12	Nepal Airways	Scheduled	Dolpa	None	
19	21 Aug 1998	9N-ACC	DHC-6	Sangrila Air	Scheduled	ChuchcheKhark, Myagdi	18	None
20	05 Sept	9N-AEG	HS-748	Necon Air	Scheduled	Thankot, Kathmandu	15	
1999	1999	9N-AEG	HS-748	Necon Air	Scheduled	Thankot, Kathmandu	15	
21	25 Dec 1999	9N-AFL	DHC-6	Skyline Airways	Scheduled	Burjo Lake, Makwanpur	10	
22	26 Feb 2000	9N-ABO	DHC-6	Nepal Airlines	Scheduled	Bajhang	1	
23	27 Jul 2000	9N-ABP	DHC-6	Nepal Airlines	Scheduled	Jogbuda, Dadeldhura	25	None
24	03 Nov 2000	9N-ACV	DO-228	Gorkha Airlines	Scheduled	Lukla	None	
25	19 Nov 2000	9N-AFS	DO-228	Cosmic Air	Scheduled	Tumlingtar	None	
26	05 Apr 2001	9N-AEV	DHC-6/300	Yeti Airlines	Scheduled	Tumlingtar	None	3

27	17 Jul 2002	9N-AGF	DHC-6/300	Skyline Airlines	Scheduled	GadgadeDanda, Surkhet	4	None
28	22 Aug 2002	9N-AFR	DHC-6/300	Shangrila Air	Scheduled	Pokhara	18	None
29	21 Apr 2004	9N-AEK	B 1900D	Buddha Air	Scheduled	TIA Airport	1	None
30	25 May 2004	9N-AFD	DHC-6/300	Yeti Airlines	Scheduled	Lamjura, Solukhumbu	3	None
31	30 June 2005	9N-AEO	DO-228	Gorkha Airlines	Scheduled	Lukla Airport	None	12
32	12 June 2006	9N-AEQ	DHC-6/310	Yeti Airlines	Scheduled	Jumla Airport	9	None
33	03 July 2006	9N-AFE	DHC-6/310	Yeti Airlines	Scheduled	Bajura Airport	None	3
34	08 Oct 2008	9N-AFE	DHC-6/300	Yeti Airlines	Scheduled	Lukla Airport	18	1
35	24 Aug 2010	9N-AHE	DO-228	Agni Air	Scheduled	Sikharpur, Makawanpur	14	None
36	15 Dec 2010	9N-AFX	DHC-6/300	Tara Air	Scheduled	Okhaldhunga,	22	None
37	25 Sept 2011	9N-AEK	Beech 1900D	Buddha Air	Scheduled	Kotdanda, Lalitapur	19	None
38	14 May 2012	9N-AIG	DO-228	Agni Air	Scheduled	Jomsom Airport	15	6
39	21 Sept 2012	9N-ABQ	Do-228	Tara Air	Scheduled	Dolpa	None	7
40	28/ Sept 2012	9N-AHA	DO-228	Sita Air	Scheduled	Manohara, Bhaktapur	19	None
41	16 May 2013	9N-ABO	DHC-6/300	Nepal Airlines	Scheduled	Jomsom Airport	None	22
42	01 June 2013	9N-AHB	DO-228	Sita Air	Scheduled	Simikot Airport	None	7
43	16 Feb 2014	9N-ABB	DHC-6/300	Nepal Airlines	Scheduled	Masinelek, Arghakhanchi	18	None
44	24 Feb 2016	9N-AHH	DHC-6/400	Tara Air	Scheduled	Dana, Myagdi	23	None
45	24 Sept 2016	9N-AIB	J 41	Yeti Airlines	Scheduled	Bhairahawa	None	32
46	27 May 2017	9N-AKY	Let 410	Summit Air	Cargo	Lukla Airport	2	1
47	28 Nov 2017	9N-ABM	DHC-6/300	Tara Air	Scheduled	Simikot	None	16
48	9 June 2018	9N-AEV	DHC-6/300	Tara Air	Scheduled	Jumla	None	21
49	14 April 2019	9N-AMH	LET 410	Summit Air	Scheduled	Lukla Airport	1+2	2





## Appendix-2

### Record of single-engine aeroplane accident in Nepal

S.N.	Date of Accident	A/C Reg. No.	Type of A/C	Operator/ Owner	Type of operation	Place	Fatality	Survival
1	31 Mar 1975	9N-AAZ	PC-6	Nepal Airlines	Charter	Bouddha, Kathmandu	5	None
2	30 Oct 1981	9N-ABJ	PC-6	Nepal Airlines	Charter	Biratnagar	10	None
3	20 Nov 1998	9N-ABK	PC-6/B2-H4	Nepal Airlines	Charter	Phakding	1	None
4	17 Jan 1999	9N-ADA	Cessna-208	Necon Air	Charter	Jumla	5	7
5	21 Nov 2011	9N-AJM	Cessna-208	Makalu Air	Cargo	Talcha Airport	None	None
6	26 Feb 2016	9N-AJB	PAC750XL	Air Kashthamandap	Charter	Chilkhaya Kalikot	2	9
7	08 Apr 2016	9N-AKC	Cessna-208	Makalu Air	Cargo	Near Simikot	None	2
8	16 May 2018	9N-AJU	Cessna-208	Makalu Air	Cargo	Simikot Pass	2	None





### Appendix-3 Record of helicopters accident in Nepal

S.N.	Date of Accident	A/C Reg. No.	Type of A/C	Operator/ Owner	Place of Accident	Fatality	Survival
1	27 Dec 1979	9N-RAE	Allutte-III	VVIP	Langtang	6	None
2	27 Apr 1993	9N-ACK	Bell-206	Himalayan Helicopter	Langtang	None	
3	24 Jan 1996	9N-ADM	MI-17	Nepal Airways	Sotang	None	3
4	30 Sep 1997	9N-AEC	AS-350	Karnali Air	Thupten Choling	1	4
5	13 Dec 1997	9N-ADT	MI-17	Gorkha Airlines	Kalikot	None	
6	04 Jan 1998	9N-RAL	Bell-206	VVIPFlight	Dipayal		
7	24 Oct 1998	9N-ACY	AS-350B	Asian Airlines	MulKhark	3	None
8	30 Apr 1999	9N-AEJ	AS-350BA	Karnali Air	Lisunkhu, Sindhupalchowk	None	
9	31 May 1999	9N-ADI	AS-350B2	Manakamana Airways	Ramechhap	None	
10	11 Sep 2001	9N-ADK	MI-17	Air Ananya	Mimi	None	5
11	12 Nov 2001	9N-AFP	AS-350B	Fishtail Air	Rara Lake, Mugu	4	2
12	12 May 2002	9N-AGE	AS 350B2	Karnali Air	Makalu Base Camp	None	1
13	30 Sep 2002	9N-ACU	MI-17	Asian Airlines	Sholumkhumbu*	11	None
14	(MI8-MTV)	Asian Airlines	Sholumkhumbu*	11	None	2	6
15	28 may 2003	9N-ADP	MI-17 IV	Simrik Air	Everest Base Camp	2	6
16	04 Jan 2005	9N-AGG	AS-350BA	Air Dynasty HeliService	Thhose VDC, Ramechhap	3	None
17	02 Jun 2005	9N-ADN	MI-17	Shree Airlines	Everest Base Camp.	None	7
18	07 May 2006	9N-ADT	MI-17 MTV1	HeliHansaServices	Dhawalagiri Base Camp	None	7
19	08 Aug 2006	9N-AGS	MI-17	Karnali Air	TI Airport, KTM	None	5
20	03 Sep 2006	9N-ACR	AS-350BA	Air Dynasty HeliService	Dhawalagiri Base Camp	None	1
21	23 Sep 2006	9N-AHJ	MI-17	Shree Airlines	Ghunsa, Taplejung	24	None
22	23 Nov 2006	9N-ADO	MI-17	Simrik Air	Raralihi, Jumla	None	4
23	29 Jun 2008	9N-AIA	AS-350	Fishtail Air	Annapurna Base Camp	None	4
24	07 Nov 2010	9N-AIX	AS 350B3	Fishtail Air	Amadablam Mountain	2	None
25	29 Nov 2011	9N-AIK	AS 350B	Fishtail Air	Solukhumbu	None	2
26	19 Jun 2013	I-VIEW	AS 350B3	Fishtail Air	Simikot, Muchu	1	5
27	03 Aug 2014	9N-AJI	AS 350B3	Fishtail Air	Sindhupalchok	1	None
28	02 Jun 2015	9N-AJP	AS 350B3	Mountain Helicopter	Yamuna Danda, Sindhupalchok	4	None
29	22 Jun 2015	9N-AKF	AS 350B3e	Simrik Air	Samdo, Gorkha	None	5
30	17 Mar 2016	9N-AJI	AS 350B3	Fishtail Air	Langtang	None	1
31	08 Aug 2016	9N-AKA	AS 350B3	Fishtail Air	Betani, Nuwakot	7	None
32	30 June 2018	9N-ALR	AS 350B2	Simrik Air	Grandy Roof-topHelipad	None	1
33	14 Aug. 2018	9N-AHV	AS350 B	Manang Air	Hilsa, Humla	1	6
34	8 Sept. 2018	9N-ALS	AS350 B3	Altitude Air	Dhading	6	1
35	27 Feb. 2019	9N-AMI	AS350 B3 E	Air Dynasty	Pathivara, Taplejung	7	None
36	14 April 2019	9N-ALC	AS350	Manang Air	Lukla Airport	None	1

## Appendix- 4

### Record of foreign registered aircraft accident in Nepal

S.No.	Date	Registration	Type	Operation	Airline	Place of accident	Fatality	Survival
1	30 Aug 1955	VT-AZX	DC-3	Scheduled	Kalinga Air	Simara	2	1
2	15 May 1956	VT-DBA	DC-3	Scheduled	Indian airlines	Kathmandu	14	19
3	24 Mar 1958	VT-CYN	DC-3	Scheduled	Indian Airlines	Patnebhajyang	20	None
4	10 May 1972	HS-TGU	DC-8-33	Scheduled	Thai Airways International	TIA	0+1	110
5	31 Jul 1992	HS-TID	A 310	Scheduled	Thai Airways	Gyangphedi	113	None
6	28 Sep 1992	AP-BCP	A 310	Scheduled	Pakistan International Airlines	Bhattedanda	167	None
7	07 Jul 1999	VT-LCI	B727(200)	Cargo	Lufthansa	Bhasmasur Hill, Kathmandu	5	None
8	4 Mar 2015	TC-JOC	A330-300	Scheduled	Turkish Airlines	TIA	None	235
9	12 Mar 2018	S2 - AGU	DHC 8 D	Scheduled	US Bangla	TIA	51	20





## Appendix- 5

### Record of recreational aircraft accident in Nepal

S.No.	Date	Registration	Type	Operation	Airline	Place of accident	Fatality	Survival
1	03 Oct 2013	9N-AJY	A-22L2	Sports	Avia Club	Santi Stupa, Pokhara	2	None
2	10 Aug 2015	9N-ALI	Aeros 2	Sports	Pokhara Ultralight	Machhapuchhre VDC, Kaski	2	None
3	23 Nov 2016	9N-ALL	Ultralight	Sports	Avia club	Pokhara	1	1







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