



ICAO

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SAFETY TEAM (APRAST/15)

Bangkok, Thailand, 24 to 25 June 2020 via Video Conference

APRAST/15-WP/9

Agenda Item 4

Agenda Item 4: Presentations – State / Industry / ICAO (Issues arising from the COVID-19 Pandemic could be a focus for the WP/IP)

**INCREASE COLLABORATION AT THE REGIONAL LEVEL –
ANNUAL SAFETY REVIEW 2019**

(Presented by India)

SUMMARY

- ICAO Annex 19 Edition 2 provides that a State can achieve an acceptable level of safety through the implementation and maintenance of the SSP as well as safety performance indicators and targets. It also stipulates that States should evaluate the effectiveness of their individual SSPs to maintain or continuously improve their overall level of safety performance.
- Since year 2015 India has State Safety Plan/National Aviation Safety Plan in Place consisting of safety performance indicators, targets and safety action plan.
- The performance is evaluated and published as Annual Safety review
- In compliance of GASP Goal 4, India is sharing the Annual Safety review 2019

1. INTRODUCTION

1.1 State Safety Programme (SSP) – India, a higher level document provides direction in the implementation of State Safety Programme at the State level and SMS at the service provider level. It provides a framework to meet the safety management provisions contained in ICAO Annex 19 and to progressively improve safety performance across all applicable aviation service providers.

1.2 Para 3.4.2.1 of ICAO Annex 19 Edition2 states that “*States shall establish the acceptable level of safety performance to be achieved through their SSP*”. Note 1. to this standard states that “*An acceptable level of safety performance for the State can be achieved through the implementation and maintenance of the SSP as well as safety performance indicators and targets showing that safety is effectively managed and built on the foundation of implementation of existing safety-related SARPs.*”

1.3 In compliance with ICAO Annex 19 standards, guidance provided in ICAO DOC9858, GASP and the State Safety Programme-India, based on the analysis of the aggregate safety data, DGCA-India has identified Eight State Safety priorities along with associated performance indicators, safety objectives and the safety action plan to meet the objectives. This is documented in the Second Edition of National Aviation Safety Plan/State Safety Plan, titled “NASP-2018-2022”. The First edition of NASP/SSP issued in the year 2014 was titled as “SSP2015-2016”.

1.4 Para 3.4.2.3 of ICAO Annex 19 Edn. recommends that “*States should evaluate the effectiveness of their individual SSPs to maintain or continuously improve their overall level of safety performance.*” In accordance with the procedure established and based on the analysis of the aggregate

safety data, the performance of the Key Safety Priorities and associated safety performance indicators has been assessed. This has given input for identifying the areas of greater concern, adjust the safety action plan and the targets.

1.5 GASP 2020-22, Goal 4 calls for States to increase collaboration at the regional level to enhance safety. One of the target associated with this goal requires all States to contribute information on safety risks, including SSP SPIs, to their respective RASGs by 2022.

1.6 Air Safety Review 2019 is attached as appendix to this paper. It presents the analysis of the aggregate safety data derived from the DGCA database, and external sources such as ICAO iSTARS, official websites of Accident Investigation Authorities of different countries and stake holders.

2. DISCUSSION

2.1 Acceptable level of Safety:

2.1.1 The NASP 2018-2022 defines the acceptable level of Safety for aviation in India in terms of:

- a) Effective Implementation of ICAO SARPs
- b) Effective implementation of SPIs and targets
- c) No fatal Accident

2.2 Key Safety Priorities:

2.2.1 The eight Key Safety Priorities established taking into consideration the Global Aviation Safety Plan, Regional Aviation Safety Plan, and our own experience, supported by data from the State Safety Database, are as follows:

- a) Airborne conflict
- b) Controlled flight into terrain
- c) Runway excursions and overruns
- d) Wildlife and bird strikes
- e) Loss of control in flight
- f) Ground collisions and Ramp safety
- g) Deficient maintenance
- h) Aviation Procedures & Documentation

2.3 Performance Evaluation of Key Safety Priorities:

- a) While the number of risk bearing Airprox per million flights over Indian Airspace has increased, the total number of Airprox leading to loss of separation per million flights over the Indian airspace have decreased. The main causative factor for Airprox incidents is ATC/system failures. A detailed analysis indicates conflict detection/resolution is a leading factor and it is followed by updation of the data by the ATC personnel. Due to effective measures the Airprox due to “pilot not complying” with the ATC instructions have decreased.

- b) The number of unstabilised approaches that continue to land per ten thousand approaches have increased and exceeded the target. The performance indicator “runway excursions per ten thousand” approaches is within the target.
- c) The number of reported bird strikes per ten thousand movement shows an increasing trend but within the target. Never the less it needs reviewing the processes at the effected airports.
- d) Loss of control, Key safety priority have shown an increase, and has emerged as the area of focus.
- e) The number of runway incursion by aircraft and vehicle per ten thousand movements have increased and breached the target. Analysis has shown that the loss of situation awareness by pilots, non-familiarization with the aerodrome layout and complicated airport design/ taxiway is the major contributory factor in runway incursions.
- f) The SPI “Ramp incidents” have shown increase and has breached the target.
- g) The SPI “Incident involving component/system failures per ten thousand flight hours” shows deceasing trend and is within the target.
- h) The Key Safety priority “Aviation Procedure and Documents” identified based on the analysis of the safety data obtained from the regulatory audits has shown satisfactory performance.

2.4 Sharing of Data on Helicopter accidents and serious incidents:

2.4.1 Helicopter operation forms an important component of Civil Aviation transportation due to the versatility of their operations. However, the safety data related to helicopter operation is not readily available.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

- a) Note the information contained in this Paper.
- b) Encourage States to share information on safety risks, including SSP SPIs.
- c) Encourage States to share safety data pertaining to helicopter operations.



सत्यमेव जयते

**DIRECTORATE GENERAL
OF CIVIL AVIATION**



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CONTENTS

Reproduction or use of content & Disclaimer	VI
Foreword	VII
Executive Summary	VIII
Chapter 1. Safety Analysis and National Aviation Safety Plan	1
1.1 Introduction	2
1.2 Performance of National Aviation Safety Plan 2018-2022	3
1.2 Acceptable Level of Safety	3
1.3.2 Key Safety Priorities	4
1.3.2.1 Airborne Conflict	4
1.3.2.2 Controlled Flight Into Terrain	6
1.3.2.3 Runway Excursions and Overrun	8
1.3.2.4 Wildlife and Bird Strikes	10
1.3.2.5 Loss of Control in Flight	13
1.3.2.6 Ground Collision and Ramp Safety	14
1.3.2.7 Deficient Maintenance	16
1.3.2.8 Aviation Procedures & Documentation	18
1.3.3 Number of Fatal Accidents	19

Chapter 2. Global Safety Scenario	20
2.1 Introduction	21
2.2 Review of Worldwide Fatal Accidents 2018	21
2.3 Worldwide commercial air transport fatal Accidents above 5700kg for the year 2018	22
Chapter 3. Indian Safety Scenario	25
3.1 Introduction	26
3.2 Review of Scheduled Aircraft Accident 2018	26
3.3 Indian Scheduled Aircraft Accidents above 5700kgs for the year 2018	26
3.4 Classification of accidents as per ICAO taxonomy	27
3.5 Indian Non-Scheduled Aircraft Accident above 5700kgs	28
Chapter 4. Helicopter Analysis	29
4.1 Introduction	30
4.2 Indian Helicopter Accidents for the year 2018	30
4.3 Helicopter Accidents According to Type of Operations	31
4.4 Classification of Accidents as per ICAO Taxonomy	32
4.5 Worldwide Helicopter Accident for the year 2018	33
Chapter 5. Commercial and General Aviation, AUW≤5700kg	36
5.1 Introduction	37

5.2 Analysis of Accidents to Fixed Wing Aircraft, AUW≤ 5700kg involved in commercial operation	37
5.3 Classification of Accidents as per ICAO Taxonomy	37
5.4 General Aviation Accidents	38
5.5 Classification of Accidents as per ICAO Taxonomy for “State Government/BSF and Private Aircraft”	39
5.6 Analysis of Flying Training Organisation Aircraft Accident from 2008 to 2018	40
5.7 Classification of Accidents as per ICAO Taxonomy for “Flying Training Organisation Aircraft”	42
5.8 Indian NSOP Accident for the Year 2018	43
5.9 Accident to Flying Training Organisation Accident for the year 2018	44
Chapter 6. Incidents Analysis	45
6.1 Introduction	46
6.2 Review and Analysis of Safety Database for the year 2018	46
6.2.1 Mandatory Incidents Reporting	46
6.3 Analysis of Incidents Pertaining to Scheduled Airlines	46
6.4 Incidents per 10000 Departures	47
6.5 Analysis of Operational incidents	47
6.6 Fleet wise Engineering incident Analysis	48
6.7 Classification of Incidents as per ICAO Taxonomy	48

7. Aerodromes	50
7.1 Introduction	51
7.2 Study on Wildlife Strike for the Year 2018	51
7.3 Ground Incidents	52
7.4 Runway Incursions	53
7.5 Causative factors of runway incursion	53
Chapter 8. Air Traffic Management	55
8.1 Introduction	56
8.2 Year wise AIRPROX on the basis of errors	56
8.3 Classification in Accordance with ECCAIRS Taxonomy	57
Chapter 9. State Safety Oversight	59
9.1 Introduction	60
9.2 Areas of Safety Oversight	60
9.3 Directorates Participating in the Safety Oversight Program	60
9.4 Overview of Safety Oversight	61
9.5 Areas of Safety concern	61
9.6 Areas of Safety concern in Aerodrome	63
Chapter 10. State Safety Promotion	66
10.1 Collection of Safety Information	67
10.1.1 Mandatory Occurrence Reporting	67
10.1.2 Voluntary/confidential Reporting System	67

10.2 Internal Training, Communication and Dissemination of Safety information	67
10.3 External Training, Communication and Dissemination of Safety information	67
10.4 Areas of Concern	68
10.4.1 Unstabilised Approaches which continued to land	68
10.4.2 Wildlife Hazard Management	68
10.4.3 Airprox incidents	68
10.4.4 Runway Incursion	68
10.5 Way Forward	68
10.5.1 State Safety Oversight-Performance Based Oversight	68
10.5.2 Progressive Adoption of Safety Culture	69
10.5.3 Safety Management System Implementation by Operators	69
10.5.4 Management of Operational Safety Risk	69
Glossary	70
List of Table	72
List of Figures	73

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FOREWORD

Managing safety is a continuous process of identifying the weakness in the system and developing a measurable matrix for evaluating our success in applying corrections to those identified weaknesses, it also involves sharing of the safety information. The Annual Safety Review is an excellent vehicle for carrying forward our safety programme and objectives. The document also sets standard for the aviation industry to measure their respective safety performance vis a vis the State aggregate data.

Since its first issue in the year 2016, it has been modified and updated to capture new concerns. I take pleasure in releasing the 4th Edition of the Annual Safety Review containing analysis of Indian Aviation safety data and globally significant safety events for the year 2018.

Past three years, there have been no fatal accident involving scheduled commercial operation. The accident rate for Indian scheduled commercial operations is far below the world commercial accident rate. Nevertheless, there have been challenges in the year 2018, which we as an organisation are working towards mitigating by taking numerous initiatives.

The previous edition have been well received by the aviation community. This safety review highlights potential safety risks and aims to spread awareness amongst the stakeholders.

Sd-
(Arun Kumar)
Director General, Civil Aviation

EXECUTIVE SUMMARY

The 4th Annual Safety Review presents the analysis of the aggregate safety data derived from the DGCA database, and external sources such as ICAO iSTARS, official websites of Accident Investigation Authorities of different countries and stake holders. The safety review covers the period 2008-2018. The data for the period from 2008 to 2017 is reference for the evaluation of the data for the year 2018.

Acceptable level of safety-Performance of State Safety Priorities:

The report contains the performance review of State Safety Plan for the year 2018 in terms of safety priorities and the matrix of their performance indicators.

- While the number of risk bearing Airprox per million flights over Indian Airspace has increased, the total number of Airprox leading to loss of separation per million flights over the Indian airspace have decreased. The main causative factor for Airprox incidents is ATC/system failures .A detailed analysis in chapter 8 indicates conflict detection/resolution is a leading factor and it is followed by updation of the data by the ATC personnel. Due to effective measures the Airprox due to “pilot not complying” with the ATC instructions have decreased.
- The number of unstabilised approaches that continue to land per ten thousand approaches have increased and exceeded the target. The performance indicator “runway excursions per ten thousand” approaches is within the target.
- The number of reported bird strikes per ten thousand movement shows an increasing trend but within the target. Never the less it needs reviewing the processes at the effected airports.
- Loss of control, Key safety priority have shown an increase, and has emerged as the area of focus.
- The number of runway incursion by aircraft and vehicle per ten thousand movements have increased and breached the target. Analysis has shown that the loss of situation awareness by pilots, non-familiarization with the aerodrome layout and complicated airport design/ taxiway is the major contributory factor in runway incursions.
- The SPI “Ramp incidents” have shown increase and has breached the target.
- The SPI “Incident involving component/system failures per ten thousand flight hours” shows deceasing trend and is within the target.
- The Key Safety priority “Aviation Procedure and Documents” identified based on the analysis of the safety data obtained from the regulatory audits has shown satisfactory performance.

Acceptable Level of Safety- No Fatal Accident

In the year 2018 two fatal accident occurred. One fatal accident was in the category of commercial helicopter operation and other was in the category of commercial fixed wing operation of aircraft with AUW 5700 kg and below.

Analysis of Worldwide and Indian Aircraft Accident Data (Schedule Commercial Transport and aircraft with all up weight more than 5700 Kgs)

Continuous efforts of DGCA has brought improvements in safety across almost every operational domain in scheduled commercial operations. This is evident from the safety review 2018, Indian Accident Rate per million departures is far less than World Accident Rate. Also there has been no fatal accident in the last three consecutive years.

Helicopter Analysis

In the year 2018 two helicopter accidents occurred. One was during the commercial offshore operation and the other was during a search and rescue mission. The analysis of the helicopter accident data for a period of ten years indicates that most of the helicopter accidents have occurred during commercial operations and loss of control in flight is a major occurrence category followed by the accident due to CFIT.

Fixed Wing Aircraft with AUW ≤ 5700 kgs in commercial and General Aviation operation, Analysis of Accident Data

The safety review includes the data on accidents which took place in India to fixed wing aircraft with AUW ≤ 5700 kgs, involved in Commercial and General Aviation (GA) operation. In the year 2018 two accident occurred to aircraft in commercial operation and three accidents occurred to aircraft operated by the flying training organisation. For the purpose of analysis the general aviation accident data has been divided two categories (1) State Government Aircraft, BSF aircraft and Private category aircraft. (2) Flying Training Organisation aircraft.

Analysis of commercial operation indicates that the highest occurrence category is abrupt maneuver. The other significant category are fuel starvation, loss of control and runway excursion.

Analysis of accidents to flying training organisation the accidents are in to the occurrence category Low Altitude Flying, Loss of Control Inflight (LOC-I), Controlled flight into terrain, Abrupt Maneuver. The causative factors were (a) Action performed incorrectly (b) Deviation from intended flight path (c) deficiency in Flight planning and preparation.

State Safety Oversight

The regulatory/surveillance finding for the year 2018 have been analysed and categorized in multiple factors. The major deficiencies is in the area of “workplace manuals, procedures, documentation and which constitutes about 60% of the regulatory audit findings.

Surveillance in the area of AGA (Aerodrome and Ground Aids) the highest number of deficiencies is regarding markings on Runway/taxiway markings, apron marking. The other areas with significant findings are Procedures, workplace manual, environment, lights etc.

CHAPTER 1

Safety Analysis and National Aviation Safety Plan



1.1 Introduction

ICAO Annex 19 places responsibility on a State to implement State Safety Programme (SSP) that is commensurate with the size and complexity of the State's Civil Aviation System. As part of State Safety Programme, States are required to ensure implementation of Safety Management System among the applicable service providers. ICAO through its Standards and Recommended Practices, as contained in Annex 19, has adopted the concept of Acceptable Level of Safety (ALoS) in aviation. This provides a structured and balanced approach for managing the risks, which are existing in a state/ organisation.

An acceptable level of safety performance for the State can be achieved through the implementation and maintenance of the SSP as well as safety performance indicators and targets showing that safety is effectively managed and built on the foundation of implementation of existing safety-related SARPs.

India established its State Safety Programme in the year 2010 and published higher level document SSP-India. This document defines the SSP-India together with the relevant regulations which provides a framework to meet the safety management provisions contained in ICAO Annexes and to progressively improve safety performance across all affected aviation service providers. The SSP-India requires measurement of safety performance by establishing safety performance indicators and their targets.

DGCA India issued/published the first edition of the State Safety Plan in the year 2014. In the first edition, the targets for Seven State Safety Priorities were defined for the year 2015 and 2016 based on the data analyzed for the year 2013. The target were fixed with 5% reduction in each year. This State Safety Plan was further extended for the year 2017. For more realistic approach, the targets for year 2017 have been set based on the data analyzed for the year 2016 with 5% reduction. These safety priorities provided a focus for the DGCA and the aviation fraternity during the year 2015, 2016 and 2017.

Each of these safety priorities is linked to the more detailed operational measures called "Safety Performance Indicators" for a drill-down capability to provide the supporting details for effective monitoring.

Further, DGCA India has issued its National Aviation Safety Plan 2018-2022 (i.e. 2nd edition of earlier known State Safety Plan). It is an outcome of analysis of the safety data and conclusion derived from the State Safety Plan 2014-2016 in accordance with State Safety Programme-India. It has been supported by the work undertaken by the stakeholders in development and implementation of their Safety Management System (SMS). It sets out the State's Acceptable level of Safety including Safety Priorities, Objectives, Safety Performance Indicators(SPIs) and associated action plans with the sole aim of further improving safety across the Civil Aviation industry.

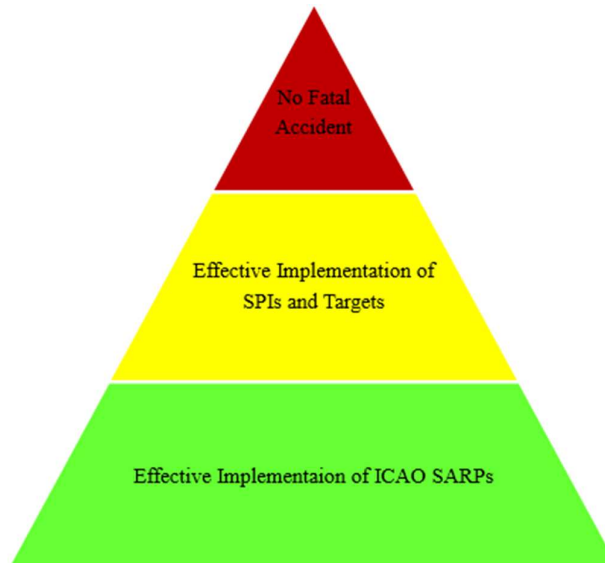
Based on the above requirements, India has identified Eight “State Safety Priorities” along with associated performance indicators, their objectives, targets and the safety action plan in partnership with the stakeholders.

1.2 Performance of National Aviation Safety Plan 2018-2022

Based on the data collected, safety performance of National Aviation Safety Plan for the year 2018 has been evaluated and presented in the subsequent paras.

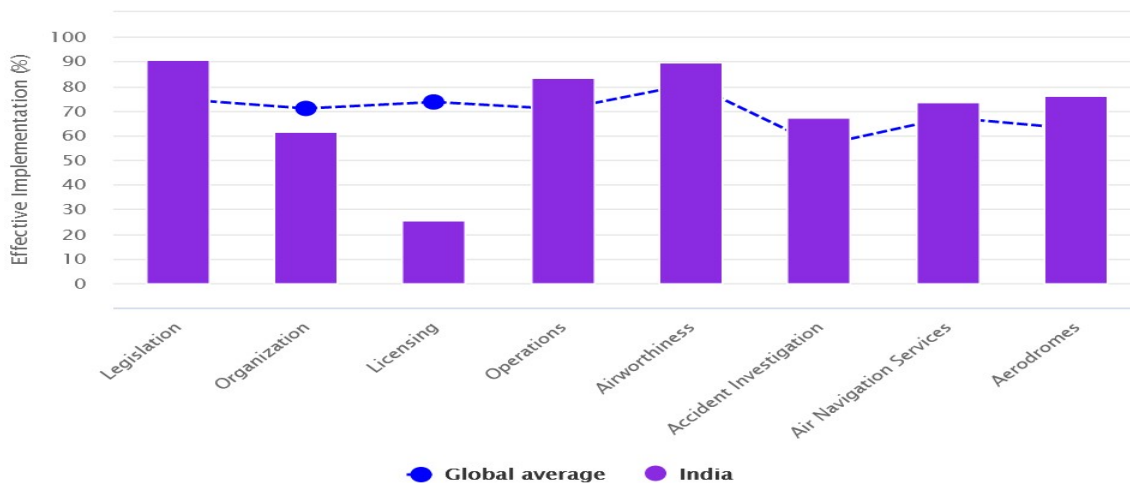
1.3 Acceptable Level of Safety:

Elements of acceptable level of Safety are as follows:



1.3.1 Effective Implementation of ICAO SARPs

The outcome of ICAO USOAP Audit- ICVM 2018 has shown increase in the effective implementation of the ICAO SARPs. The Effective Implementation (EI) in various categories covered under ICAO’s Universal Safety Oversight Audit Programme (USOAP) as compared to world average is given below:



1.3.2 Key Safety Priorities

Taking into consideration the Global Aviation Safety Plan, Regional Aviation Safety Plan, initiatives by other states and our own experience, supported by data from the State Safety Database, the DGCA has established eight State Safety Priorities, which are as follows:

- a) Airborne conflict
- b) Controlled flight into terrain
- c) Runway excursions and overruns
- d) Wildlife and bird strikes
- e) Loss of control in flight
- f) Ground collisions and Ramp safety
- g) Deficient maintenance
- h) Aviation Procedures & Documentation

1.3.2.1 Airborne Conflict

Safety objective is to reduce the risk of airborne conflict occurring through tracking and actively managing events that can lead to a collision.

Performance achieved along with targets set for the year 2018 is given in Table 1.1.

Table 1.1 Target Performance vs Achieved Performance			
No.	Performance Indicators	Target	Achieved Performance
1	Number of risk bearing AIRPROX per 10,00,000 flights over Indian airspace	1.8	2.76
2	Number of TCAS RA in controlled airspace leading to breach of separation per 10,00,000 flight over Indian airspace	16.57	16.19
3	Number of aircraft not or incorrectly complying with ATC instructions (including level bust) per 10,00,000 flights over Indian airspace	3.25	2.76
4	Number of AIRPROX attributable to ATC/system failure per 10,00,000 flights over Indian airspace	7.92	14.46

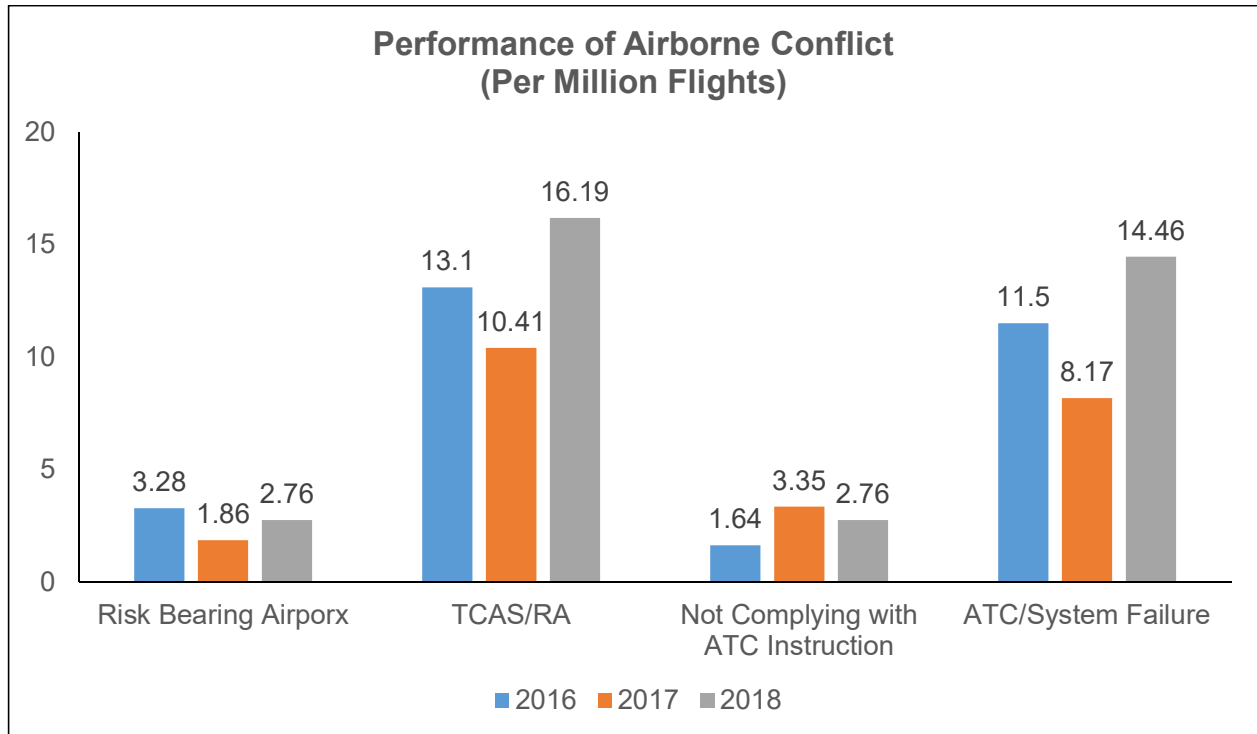


Fig. 1.1

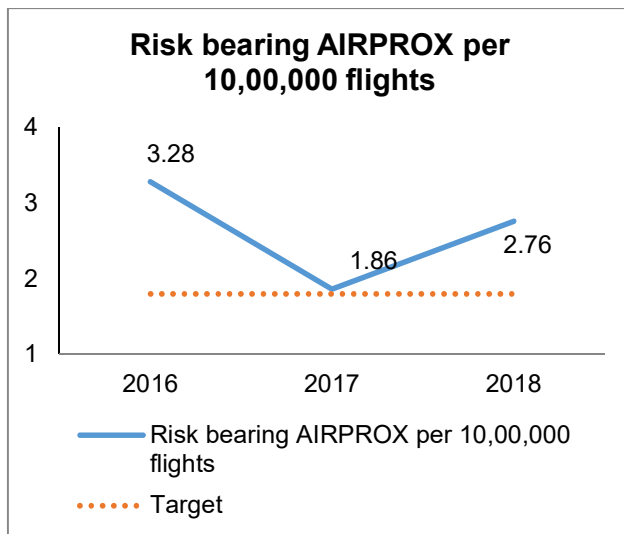


Fig 1.1(a)

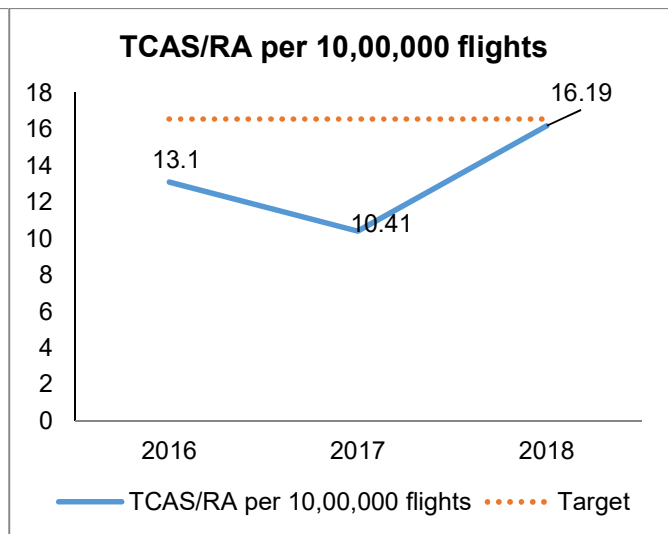


Fig 1.1(b)

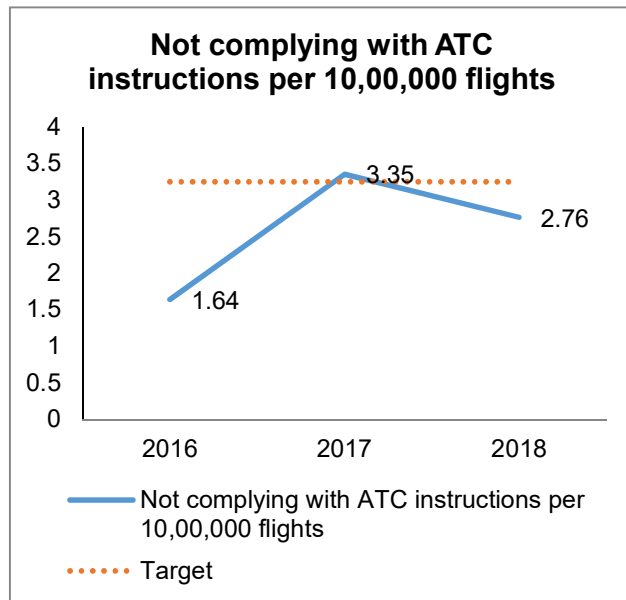


Fig 1.1(c)

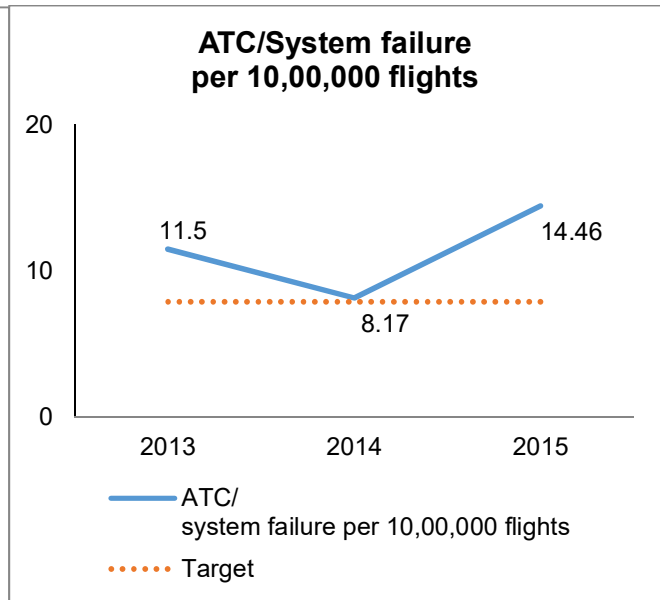


Fig 1.1(d)

Risk bearing Airprox have increased and total number of Airprox leading to loss of separation have decreased.

The causative factors from the above data indicate:

- (a) Airprox due to “pilots not complying with ATC instructions has decreased and are below the target. After the previous year outcome, all airlines were advised to include strict adherence of ATC instructions in their respective pilot refresher trainings.
- (b) Airprox due to ATC/system failure have increased and surpassed the target. Accordingly the ANSP has been advised to review and come out with the action plan.

1.3.2.2 Controlled Flight into Terrain

Safety objective was to further reduce the risk of CFIT events occurring through tracking and actively managing events that can lead to a collision. Performance achieved along-with targets set for the year 2018 is given in Table 1.2.

No.	Performance Indicators	Target	Achieved Performance
1	Number of GPWS/EGPWS warnings (Scheduled airlines) per 10,000 departures	3.21	4.67
2	Number of helicopter VFR flights that make emergency landing due to degraded visual environment per 10,000 departures	1.32	0.19

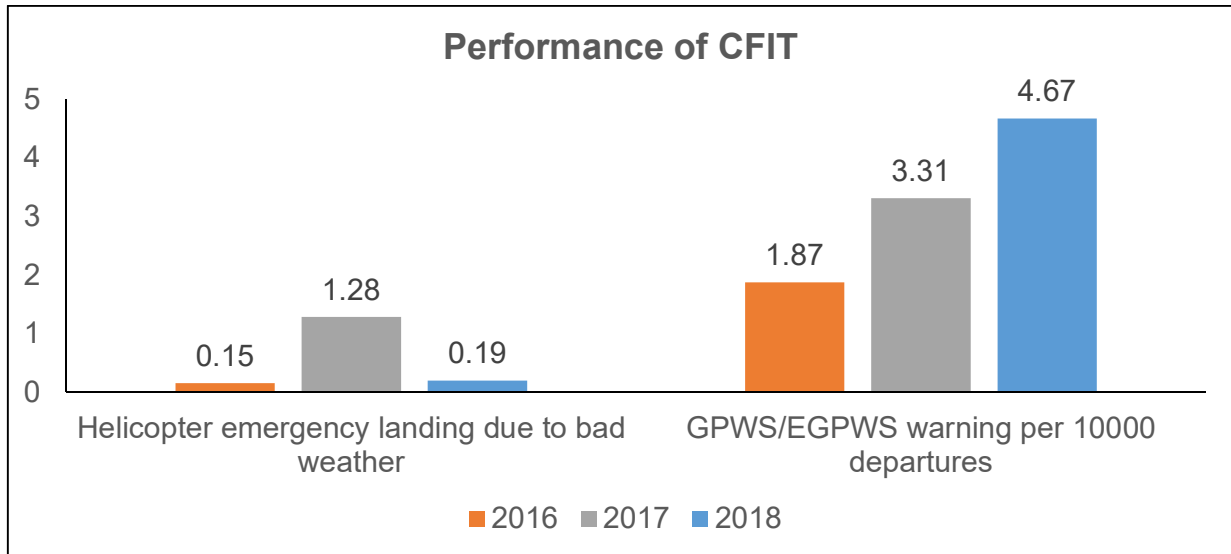


Fig 1.2

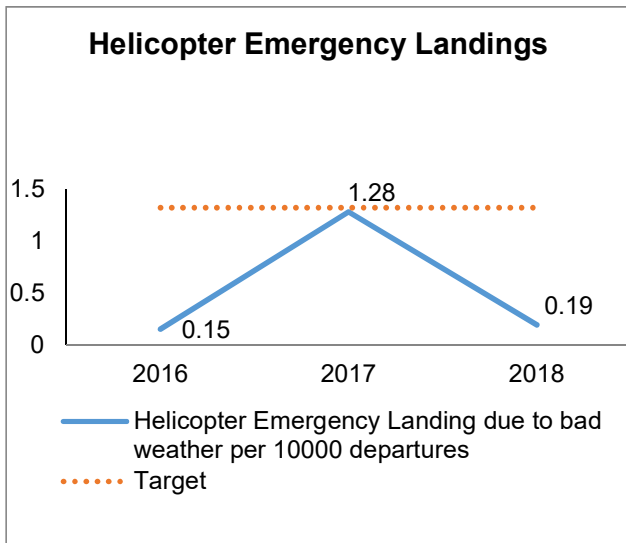


Fig 1.2(a)

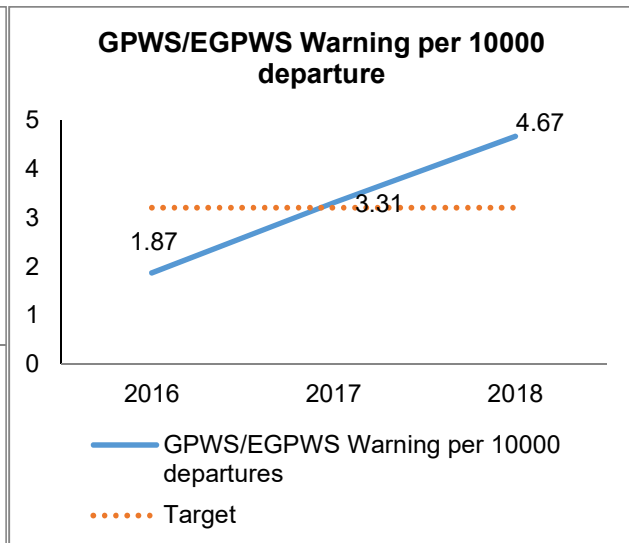


Fig 1.2(b)

- Precautionary landing of helicopters due to bad weather which reflects a positive step towards a proactive approach by the operating crew.

1.3.2.3 Runway Excursions and Overrun

The safety objective is to reduce number of runway excursions at airports in India. Performance achieved along-with targets set for the year 2018 is given in Table 1.3.

Table 1.3 Target Performance vs Achieved Performance

No.	Performance Indicators	Target	Achieved Performance
1	Number of unstablised approaches per 10,000 approaches	-	7.79
2	Number of unstablised approaches that continue to land per 10,000 approaches	6.45	7.07
3	Number of unstablised approaches when performing a precision approach per 10,000 approaches.	3.41	4.26
4	Number of unstablised approaches when performing a non-precision approach (no vertical guidance) per 10,000 approaches.	1.86	1.82
5	Number of unstablised approaches when performing a visual approach per 10,000 approaches	0.73	1.69
6	Number of 'near' runway excursions per 10,000 approaches	0.01	0.01
7	Number of runway excursions per 10,000 approaches	0.06	0.02

**Performance of Runway Excursions and Overruns
(Per 10000 Approaches)**

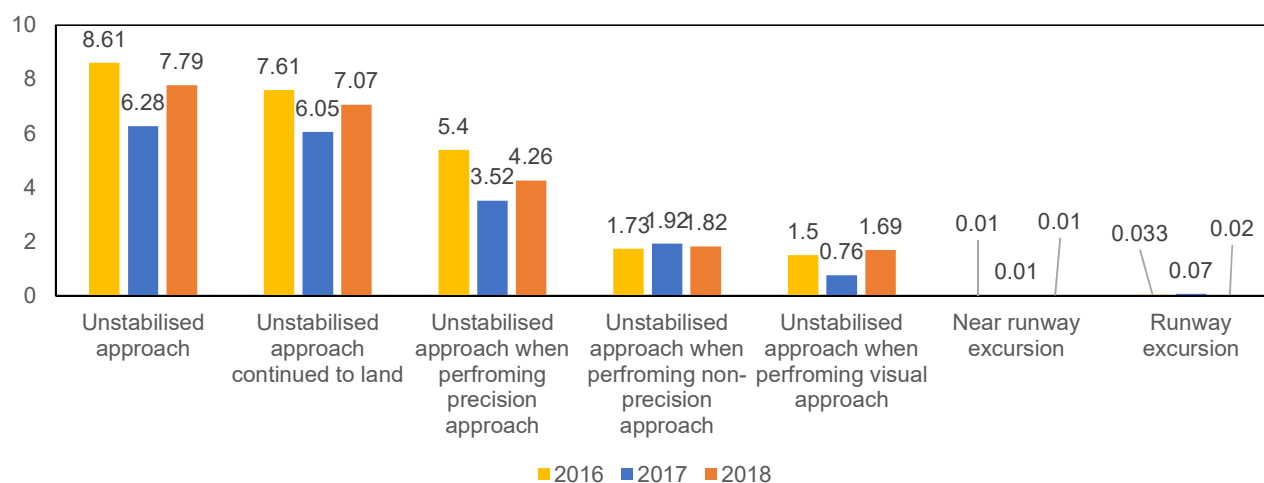


Fig 1.3

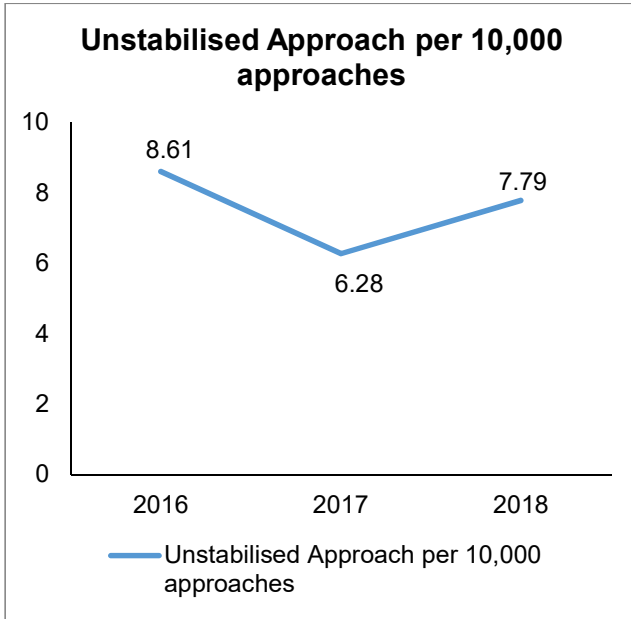


Fig 1.3(a)

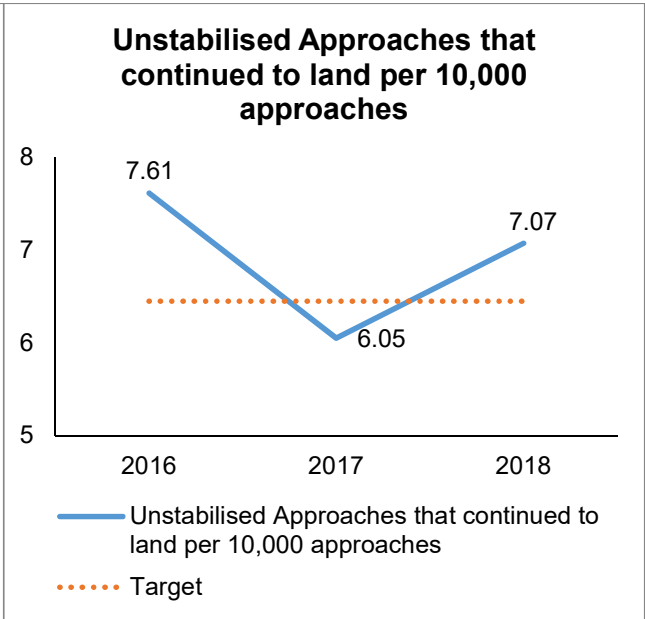


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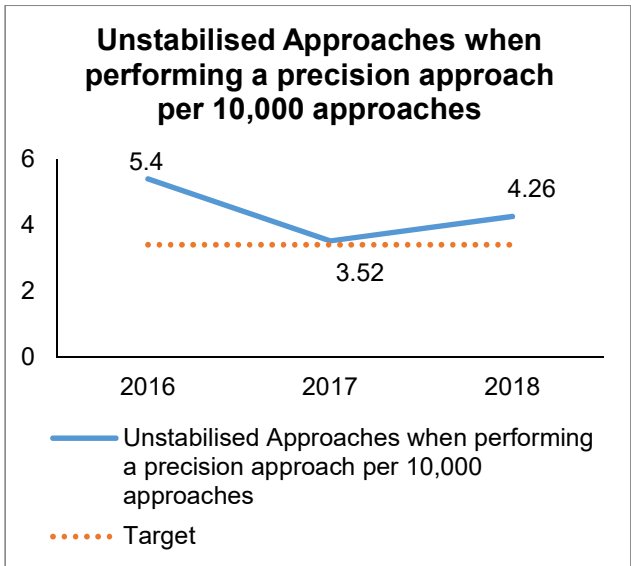


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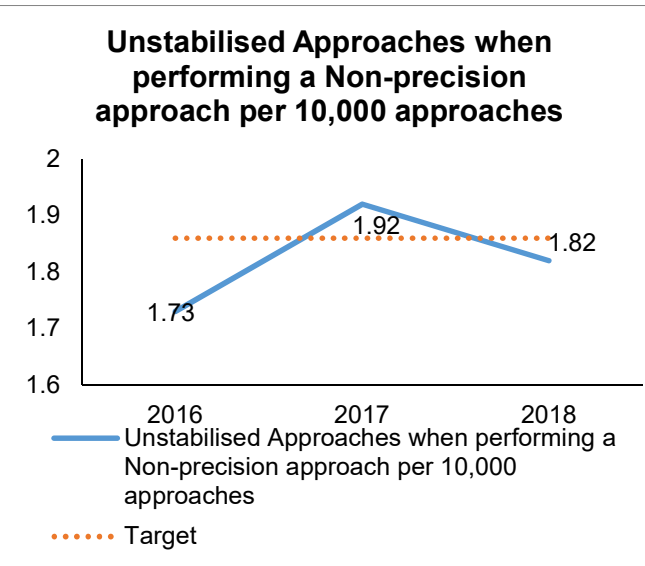


Fig 1.3(d)

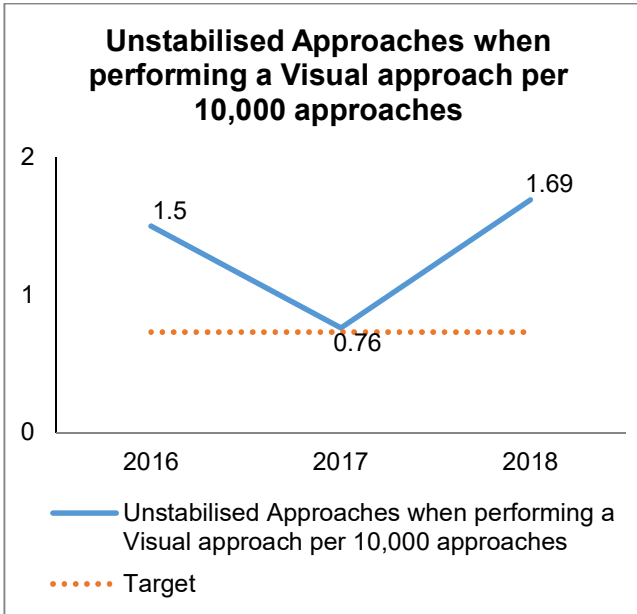


Fig 1.3(e)

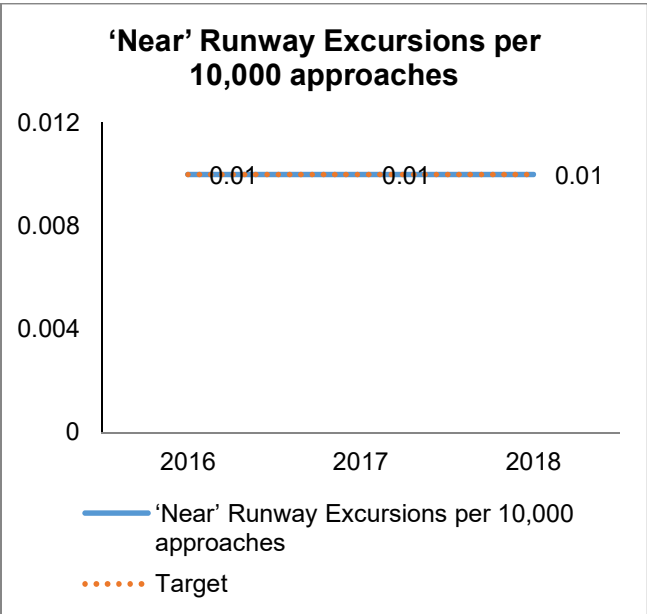


Fig 1.3(f)

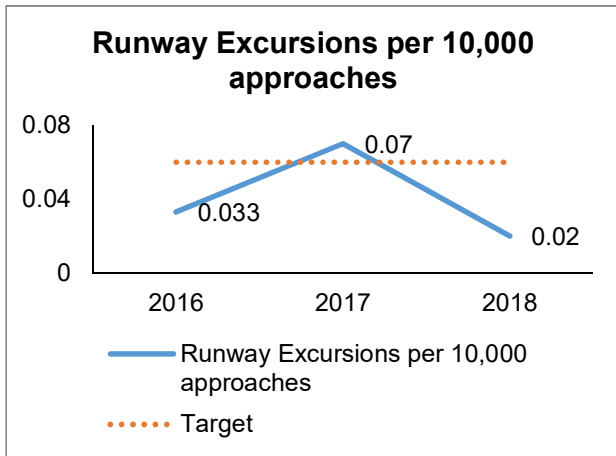


Fig 1.3(g)

- Unstabilised approaches which continue to land form large proportion of total number of unstabilised approaches.
- Unstabilised approach during precision and visual approach have increased.
- There is decrease in runway excursion and are within target limits.

1.3.2.4 Wildlife and Bird strikes

The safety objectives is to reduce the number of wildlife and bird strike events at Indian airports. Performance achieved along-with targets set for the year 2018 is given in Table 1.4

Table 1.4 Target Performance vs Achieved Performance

No.	Performance Indicators	Target	Achieved Performance
1	Number of reported bird strikes at Indian airports per 10,000 movements (movements only for 18 Major Airports in India)	4.825	4.91
2	Number of reported wildlife strikes at all Indian airports per day.	5.15	5.14
3	Number of runway incursions by wildlife at all Indian airports per day	0.21	0.21

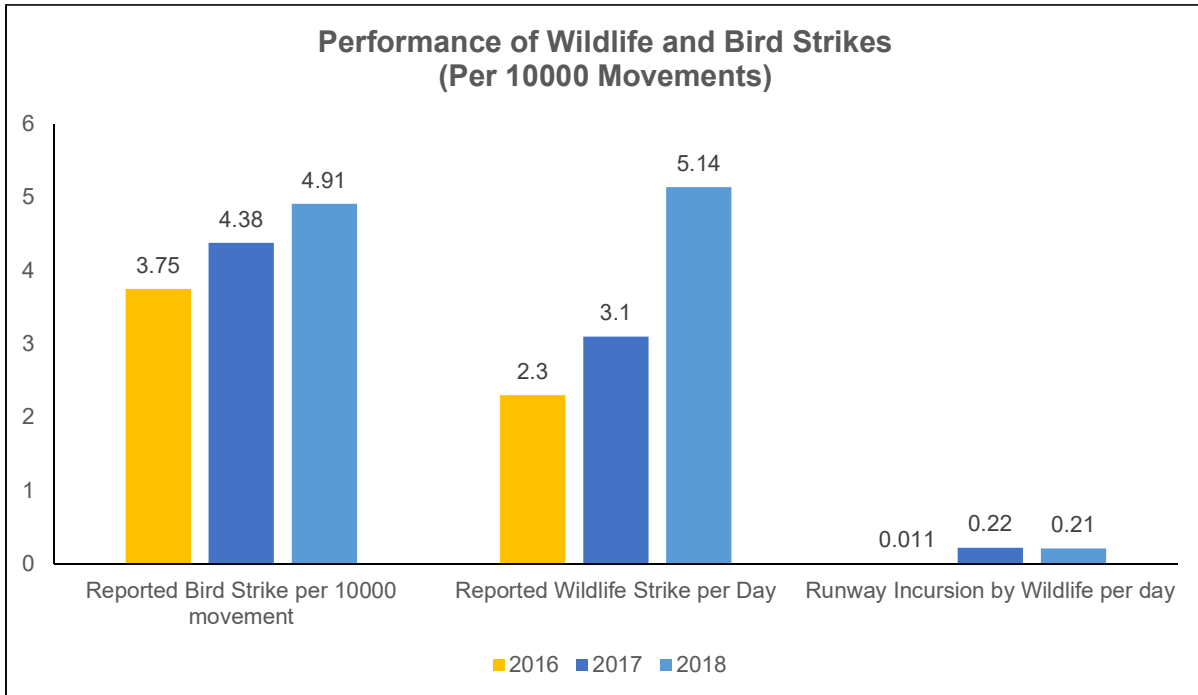


Fig 1.4

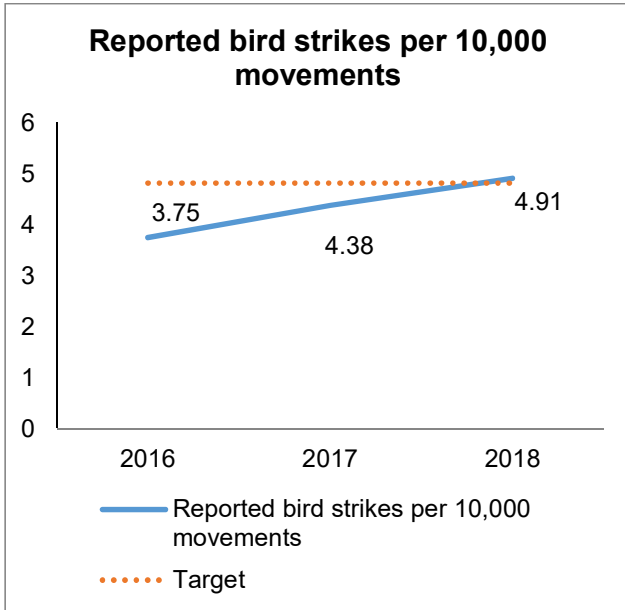


Fig 1.4(a)

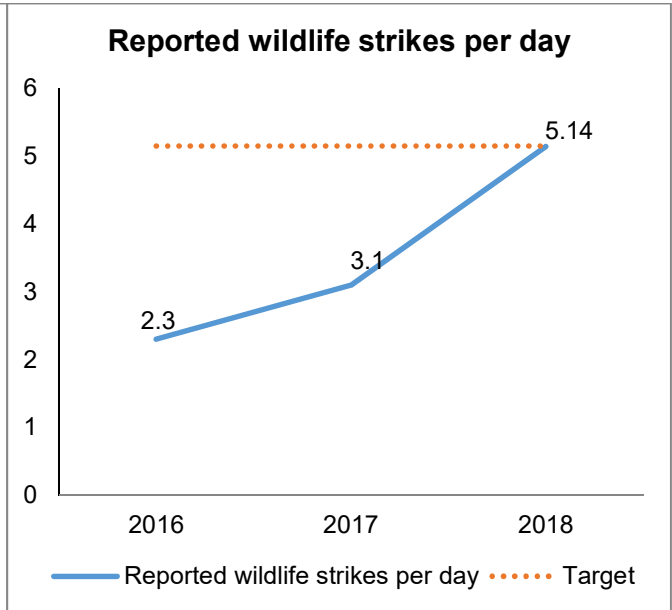


Fig 1.4(b)

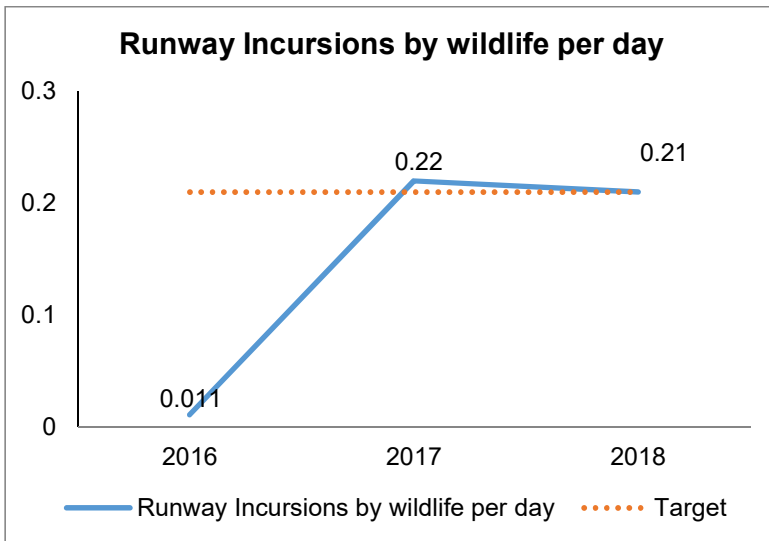


Fig 1.4(c)

- The SPI Bird Strikes per ten thousand movement shows an increasing trend but is within the target.
- The SPI Wild Life Strike per day is also showing an increasing trend, though it is with in the target.
- Runway incursion by the wild life has decreased and is within the limits.
- This Safety Priority needs focus.

1.3.2.5 Loss of Control in Flight

Safety objective is to reduce the number of loss of control precursor events. Performance achieved along-with targets set for the year 2018 is given in Table 1.5

Table 1.5 Target Performance vs Achieved Performance			
No.	Performance Indicators	Target	Achieved Performance
1	Loss of control precursor events per 10000 departures: <ul style="list-style-type: none">▪ Actual stick-shake/ alpha floor▪ Low speed during approach events▪ Low speed during cruise events▪ Bank angle exceeding maximum permitted as per AFM for aircraft type▪ Wind shear below 500 feet	0.62	1.54

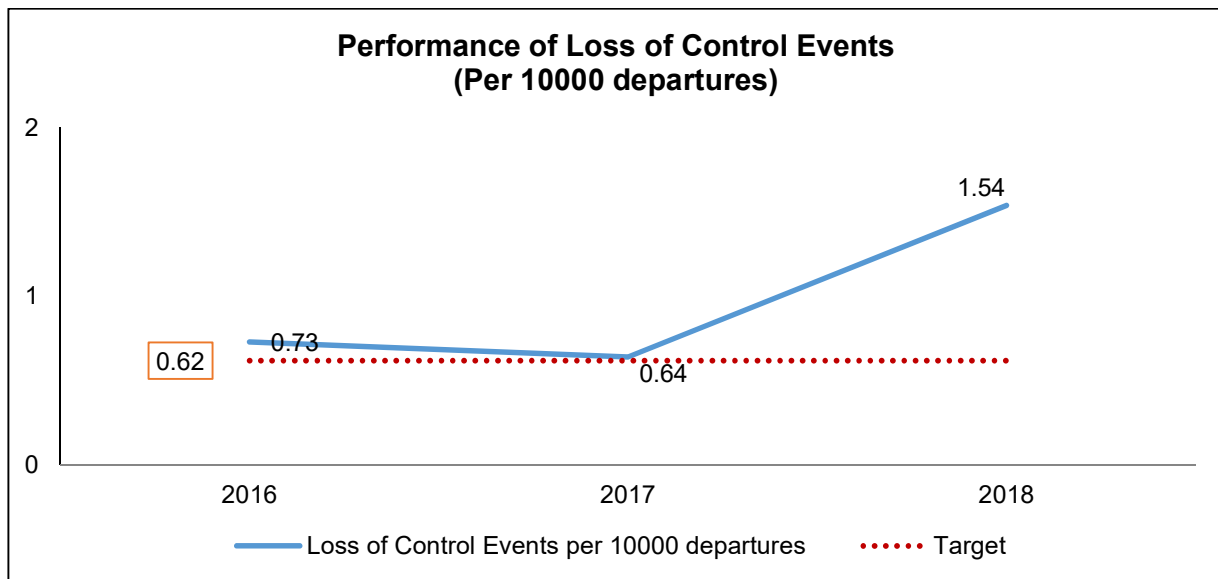


Fig 1.5

Loss of control event has shown increase and has emerged as an area of focus.

1.3.2.6 Ground Collision and Ramp Safety

The safety objective is to reduce the number of ground collisions between aircraft, ground collisions between vehicles and aircraft and the number of fatalities and serious injuries occurring on the ramp. Performance achieved along-with targets set for the year 2018 is given in Table 1.6.

Table 1.6 Target Performance vs Achieved Performance			
No.	Performance Indicators	Target	Achieved Performance
1	Number of runway incursions (aircraft) per 10,00,000 movements	7.71	12.79
2	Number of runway incursions (vehicle) per 10,00,000 movements	0.4	2.71
3	Number of runway incursions (person) per 10,00,000 movements	1.62	0
4	Number of runway incursion incidents involving loss of situational awareness by pilots, non- familiarization with aerodrome layout, distraction per 10,00,000 movements	2.02	4.26
5	Number of ramp incidents that result in damage to aircraft, vehicles or loss of life/serious injury to personnel per 10,00,000 movements	24.37	31.39

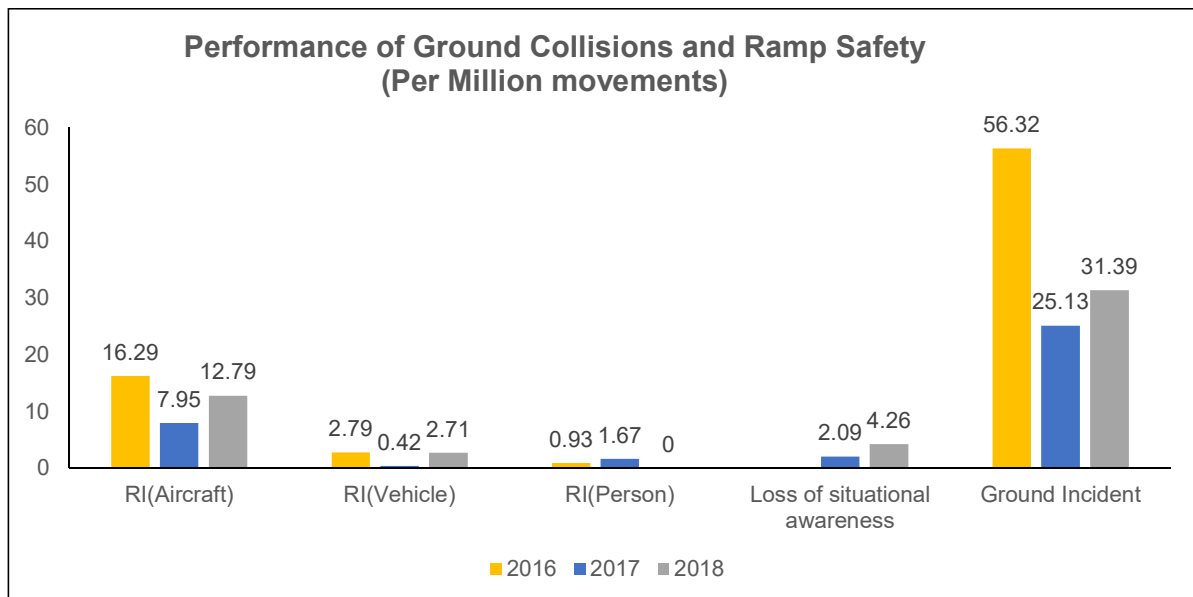


Fig 1.6

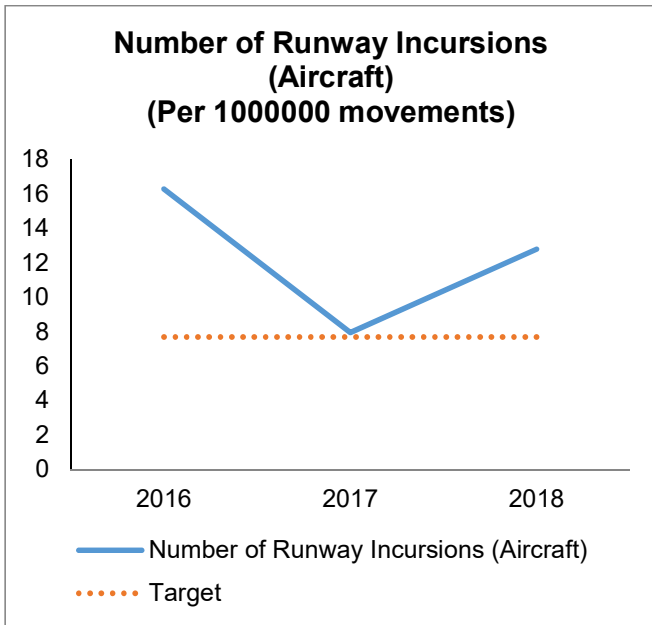


Fig 1.6(a)

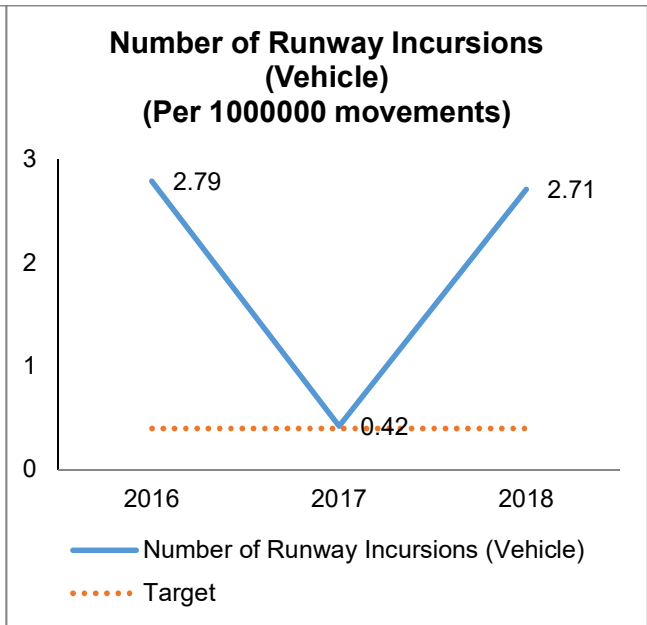


Fig 1.6(b)

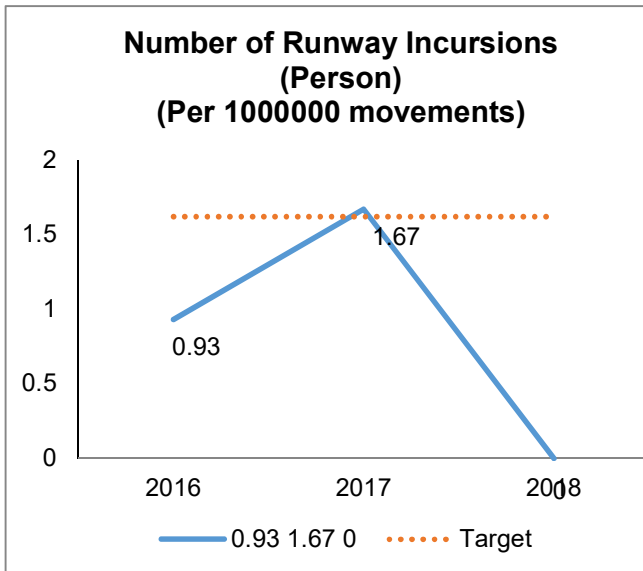


Fig 1.6(c)

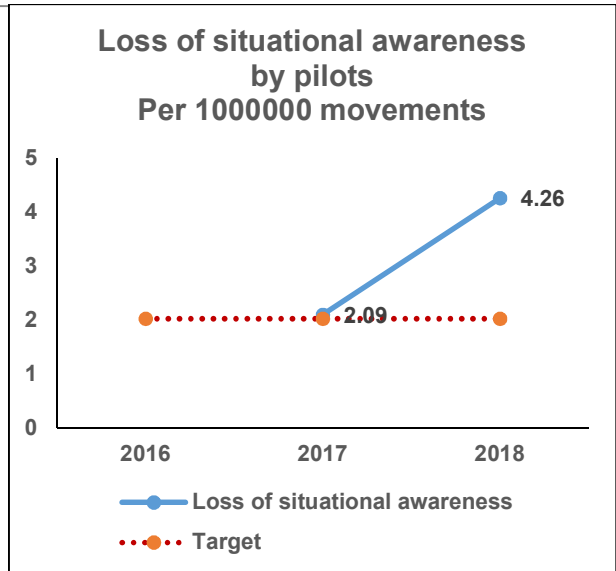


Fig 1.6(d)

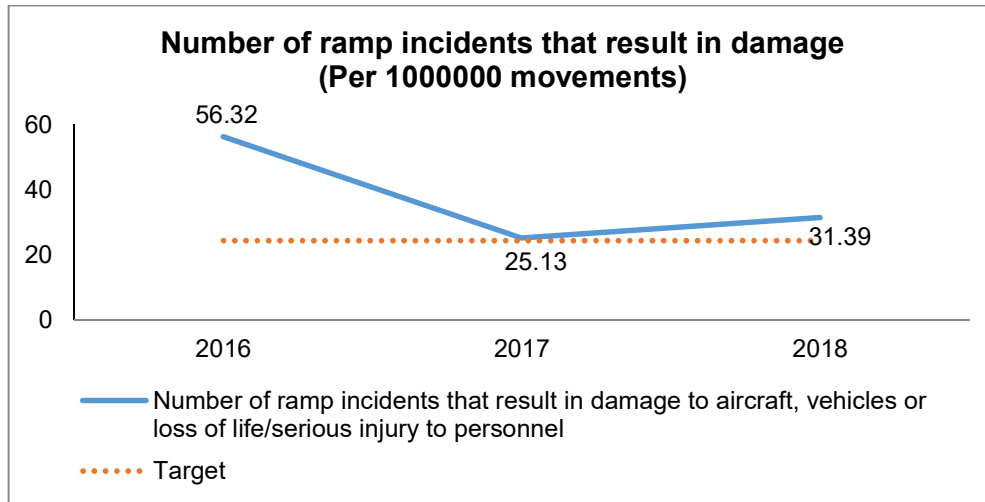


Fig 1.6(e)

- Runway incursion due to aircraft have increased and have breached the target. This continues to be an area of concern along with the runway incursion due to vehicles.
- Ramp incidents have shown increase and have breached the target and therefore continues to be an area of concern.

1.3.2.7 Deficient Maintenance

The safety objective is to improve the maintenance of Indian registered passenger carrying aircraft, thereby reducing the number of incidents relating to maintenance issues. Performance achieved along-with targets set for the year 2018 is given in Table 1.7.

No.	Performance Indicators	Target	Achieved Performance
1	Incident involving component/system failure per 10,000 flights hours	2.23	2.1
2	Number of Maintenance errors per 10,000 flights hours	1.48	0.81

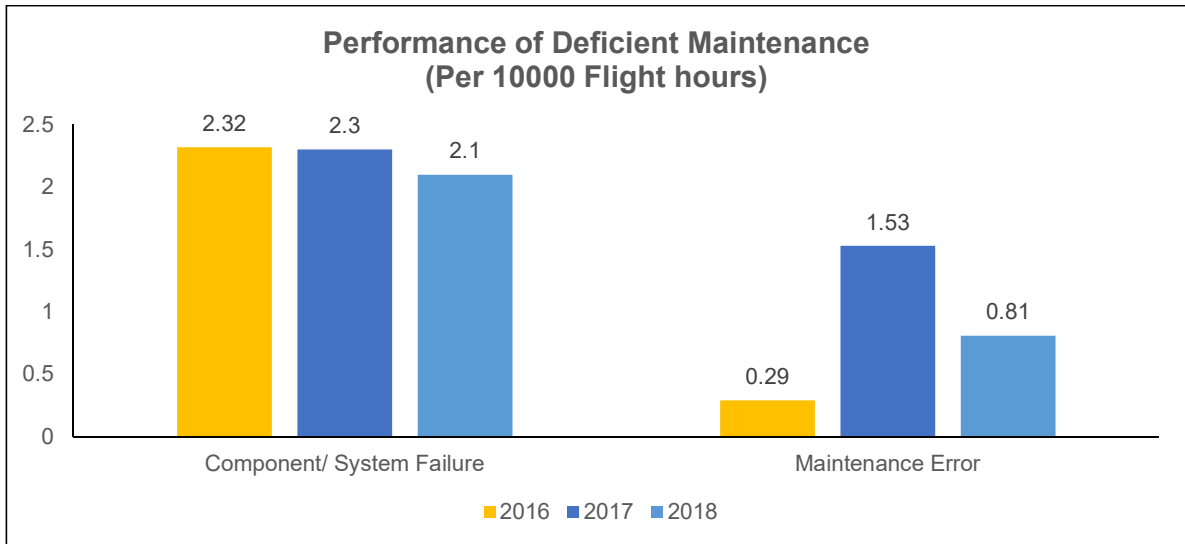


Fig 1.7

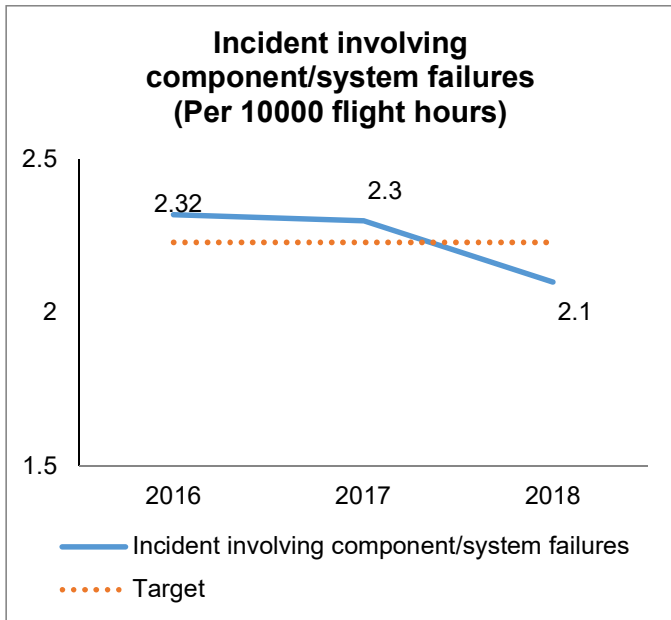


Fig 1.7(a)

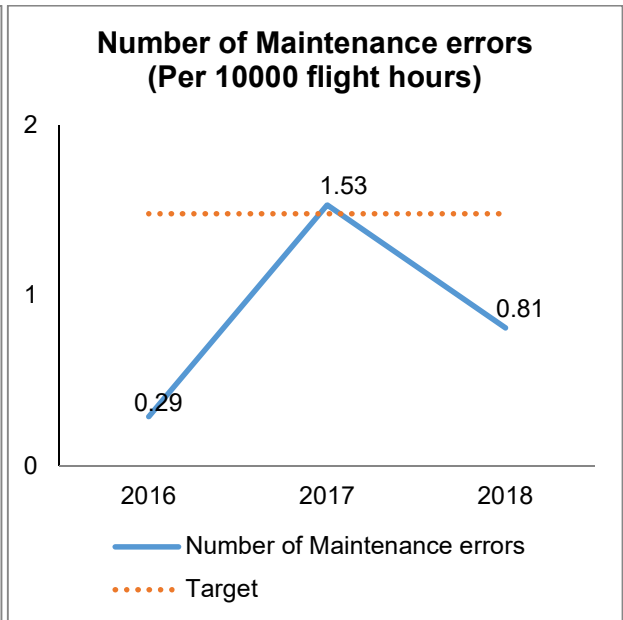


Fig 1.7(b)

1.3.2.8 Aviation Procedures and Documentation

The safety objective is to improve the regulatory compliances related to Procedures and Documentation amongst aviation service providers for ensuring safe operations. Performance achieved along-with targets set for the year 2018 is given in Table 1.8.

Table 1.8 Target Performance vs Achieved Performance			
No.	Performance Indicators	Target	Achieved Performance
1	Regulatory audit findings related to procedures (measured in terms of percentage of total findings)	38%	26%
2	Regulatory audit findings related to workplace Manual (measured in terms of percentage of total findings)	30%	29%
3	Regulatory audit findings related to documentation (measured in terms of percentage of total findings)	9.7%	9%

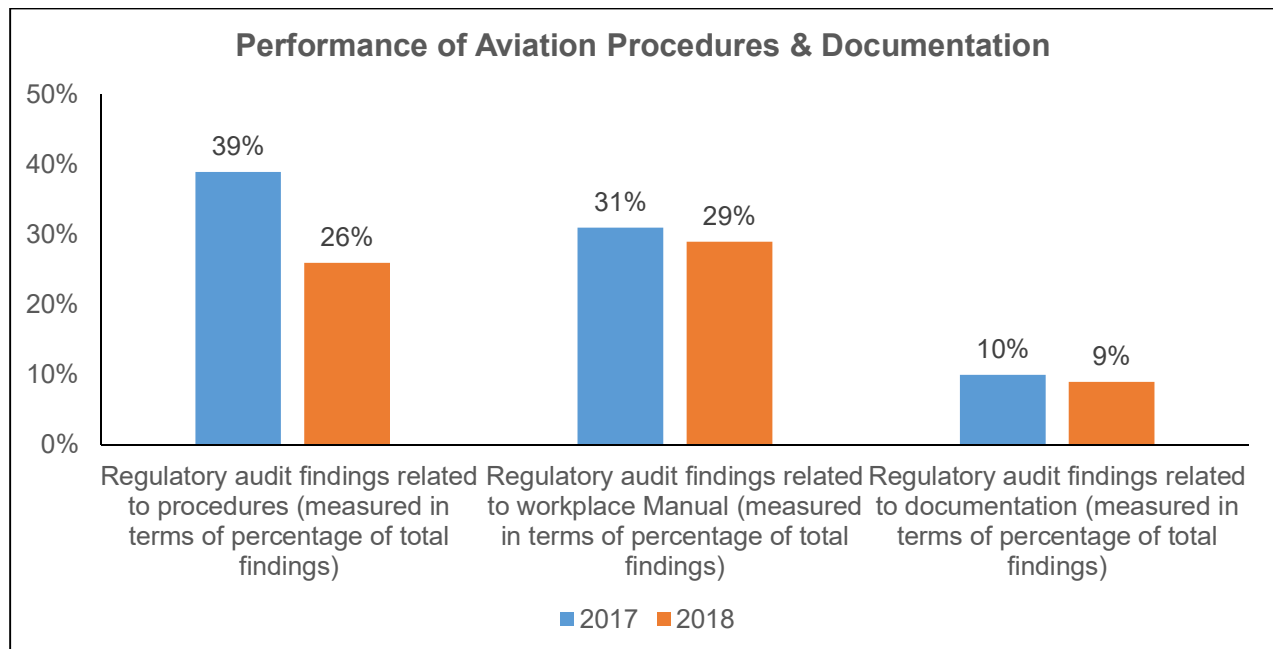


Fig 1.8

1.3.3. Number of Fatal Accidents

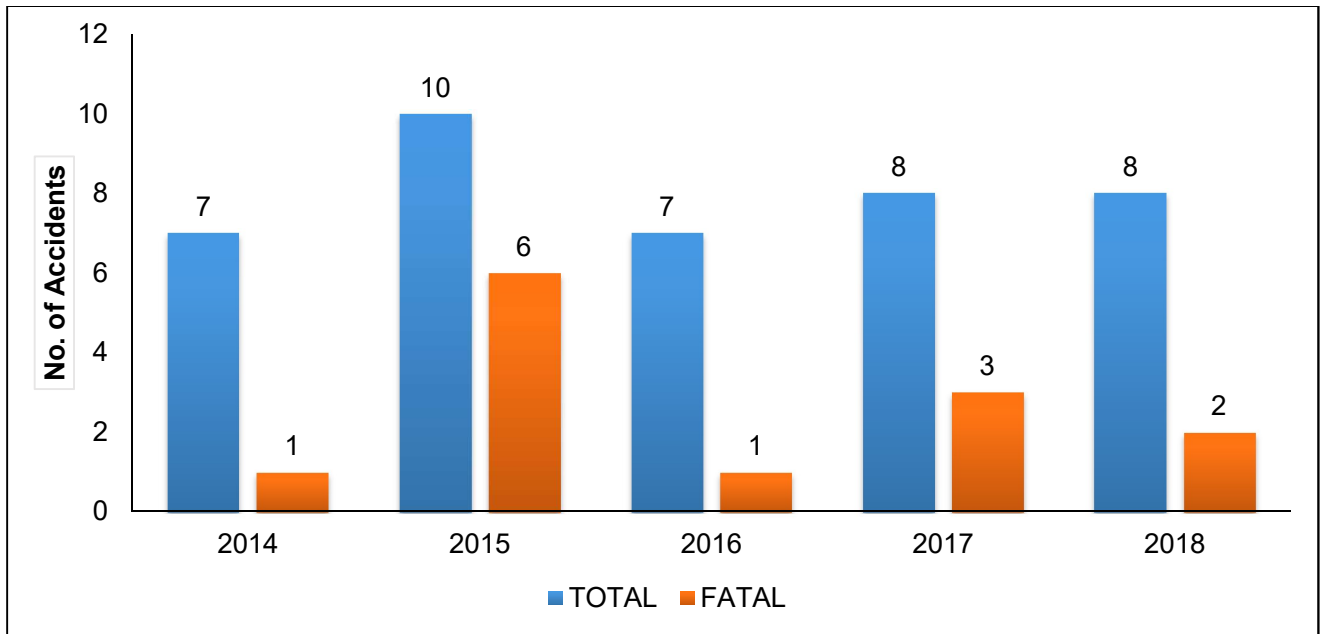


Fig 1.9

Table 1.9 Number of Fatal Accident

Type of Operation	Year				
	2014	2015	2016	2017	2018
Commercial Fixed wing Operation 5700 kgs and above	0	1	0	0	0
Commercial fixed wing Operation 5700 kgs. and below.	0	0	0	1	1
Helicopter Commercial Operation	0	3	1	1	1
State	0	1	0	0	0
FTO	1	0	0	1	0
Microlight	0	1	0	0	0
Glider	0	0	0	0	0

- Commercial Helicopter Operation involves more number of fatal accidents and it is followed by the Flying training Organisations.
- Commercial fixed wing Operation 5700 Kgs and below also is focus area.

CHAPTER 2

Global Safety Scenario



2.1 Introduction

This Chapter covers the accidents which took place elsewhere in the world involving commercial transport aircraft with all up weight more than 5700 kg. In the year 2018, a total of 98 accidents happened. This includes 11 fatal accidents which resulted in 514 fatalities.

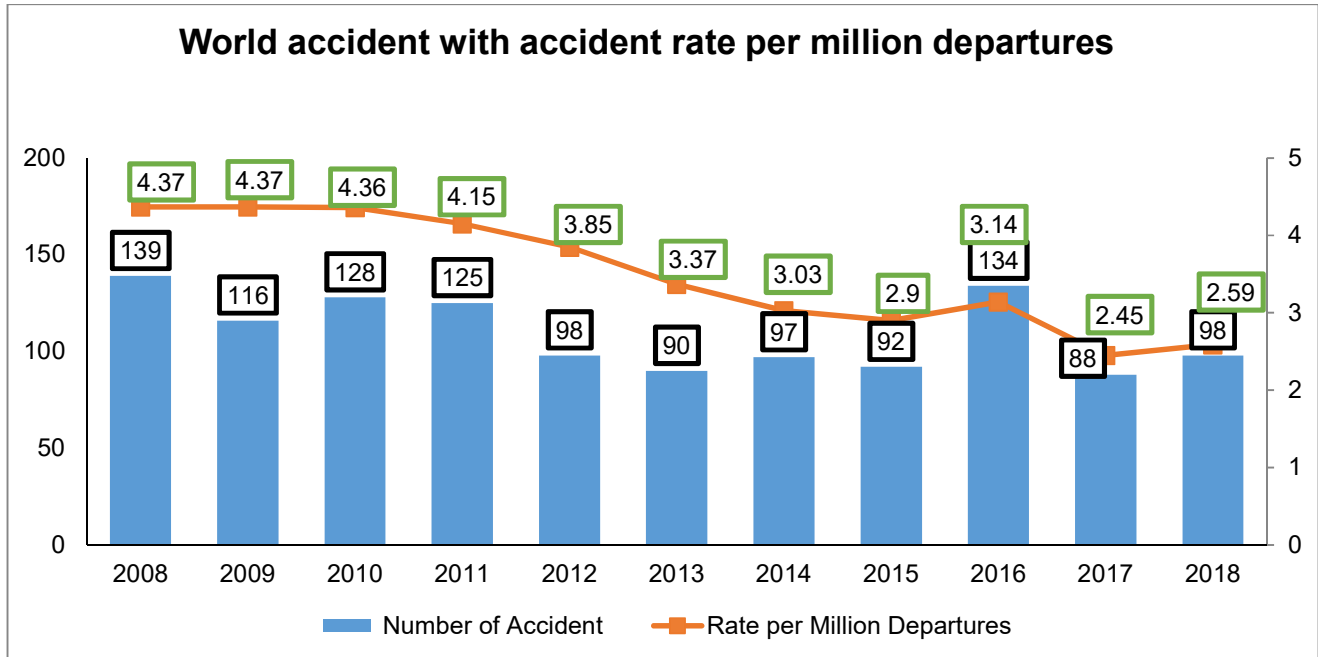


Fig 2.1

There is a gradual decreasing trend in the worldwide accidents.

2.2 Review of Worldwide Fatal Accident 2018

Table 2.1 Worldwide Fatal Accidents 2008-2017			
Year	Accident	Fatal Accidents	Fatalities
2018	98	11	514
2008 to 2017 Average	105	12	381

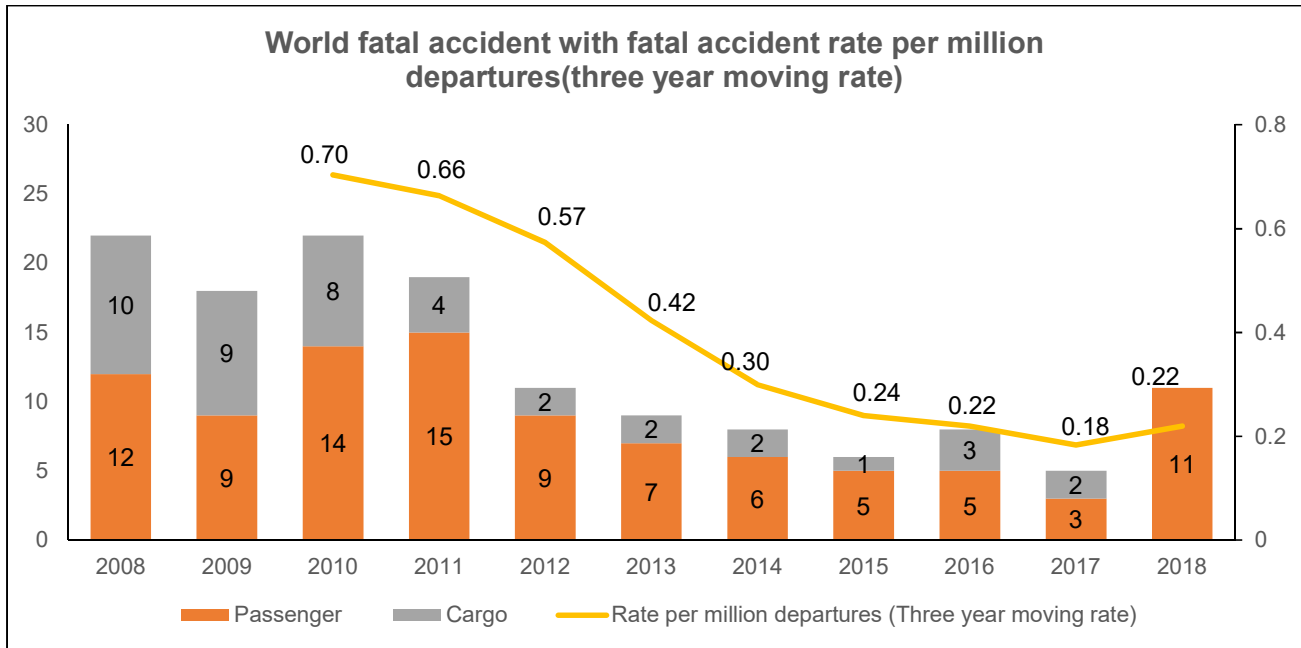


Fig 2.2

2.3 World-wide commercial air transport fatal accident above 5700kgs for the Year 2018

Table 2.2 Worldwide Fatal Accidents- Commercial Air Transport Above 5700Kgs				
Date	Aircraft Type	Location	Fatalities	Description
11.02.2018	Antonov An-148	Russia	71	Aircraft was operating flight from Moscow Domodedovo to Orsk (Russia). There were 65 passengers and 6 crew on board. Aircraft took off from runway 14R at Moscow's. After climbing to 6000 feet altitude, it started descending and disappeared from radar. The aircraft was subsequently found crashed in an open field about 18nm southeast of the aerodrome coordinates approximately N55.3 E38.41. There was no survivors. The wreckage was distributed over a distance of about 1000m, no fire occurred.
18.02.2018	ATR72	Iran	66	Aircraft was operating flight from Tehran Mehrabad to Yasuj (Iran) with 60 passengers and 6 crew on board, It crashed near the Dena Mountain. There were no survivors.

12.03.2018	DHC-8-402Q	Nepal	51	Aircraft operating flight from Dhaka (Bangladesh) to Kathmandu (Nepal) with 67 passengers and 4 crew on board. While it was on final approach for Kathmandu's runway, it collided with the ground and burst into flames.
14-03-2018	B777	UAE	01	Aircraft was parked at the gate at Dubai (United Arab Emirates), and was being prepared for boarding. A flight attendant opened one of the aft doors for unknown reasons and fell out of the aircraft and landing on the concrete surface of the apron. The flight attendant received serious injuries.
17-04-2018	B737	USA	01	Aircraft was operating flight from New York-La Guardia Airport to Dallas-Love Field, Texas. When the aircraft was climbing through FL325, the no.1 engine suffered an uncontained failure. As a result of the uncontained failure, a fan blade, parts of the engine cowling and engine air inlet cowl separated. Debris impacted a window frame of row 14, causing the window and frame to break away. This resulted in a decompression of the aircraft. The flight was vectored towards Philadelphia Airport and landed there. A passenger died.
18-05-2018	B737-200	Mexico	112	Aircraft crashed after takeoff from Havana-José Martí International Airport, Cuba. The aircraft lost speed and began an uncontrolled descent until it impacted the ground about 40 seconds after lifting off from the runway. There were 107 passengers on board along with six Mexican crew members.
09-09-2018	L-410	South Sudan	20	L-410 aircraft operating flight from Juba to Yirol crashed into Lake Yirol, South Sudan due to the bad weather, at the destination airport. There were 23 person on board. The aircraft was destroyed.
28-09-2018	B737	Papua New Guinea	01	Boeing 737-800, operating flight from Pohnpei to Chuuk (Micronesia) with 35 passengers and 12 crew, was on final approach to Chuuk's

				runway 04 in poor weather when the aircraft came too low and touched down into the sea and came to a stop about 150 meters left abeam of runway threshold. The aircraft was evacuated, all passengers and crew were able to leave the aircraft. One passenger was dead, 6 people suffered serious injuries, and 4 people received minor injuries, the other occupants remained uninjured.
29-10-2018	B737 (Max)	Indonesia	189	Aircraft was operating flight from Jakarta to Pangkal Pinang (Indonesia) with 181 passengers and 8 crew. During climb when the aircraft reached an altitude of about 5400 feet, it lost height and crashed over the Java Sea. All the passengers included the crew died in the crash.
09-11-2018	B757-200	Jamaica	01	Aircraft was operating flight from Georgetown to Guyana. Due to hydraulic system snag it returned back to Georgetown. During landing at Georgetown, it was involved in runway excursion. It went off the runway and came to rest across the airport perimeter fence. The aircraft sustained substantial damage. Six persons were injured and one passenger succumbed to injuries.
20-11-2018	B737-800	Russia	01	Aircraft operating flight from Moscow Sheremetyevo (Russia) to Athens (Greece), while in the initial climb out of Sheremetyevo's runway reported a collision with an animal on the runway. The crew continued the flight to Athens. During runway inspection human remains as well as a wallet, documents and other personal belongings were found on the runway.

CHAPTER 3

Indian Safety Scenario -Scheduled Operations



3.1 Introduction

This Chapter covers the accidents which took place in India involving scheduled aircraft and Non-scheduled aircraft with all-up-weight more than 5700 Kgs. In the year 2018, 01 accident occurred in this category.

3.2 Review of Scheduled Aircraft Accident 2018

Table 3.1			
Year	Accident	Fatal Accidents	Fatalities
2018	1	0	0
2008 to 2017	13*	2	159

* Includes accident to foreign aircrafts in India

3.3 Indian Scheduled Aircraft Accident Above 5700 kgs for the Year 2018

Table 3.2				
Date	Aircraft Type	Location	Fatalities	Description
12.10.2018	B737	India	Nil	Aircraft was involved in an accident while operating flight (Trichy-Dubai) on 12.10.2018. The aircraft hit the ILS Antenna and top of boundary wall while taking off from Trichy Airport.

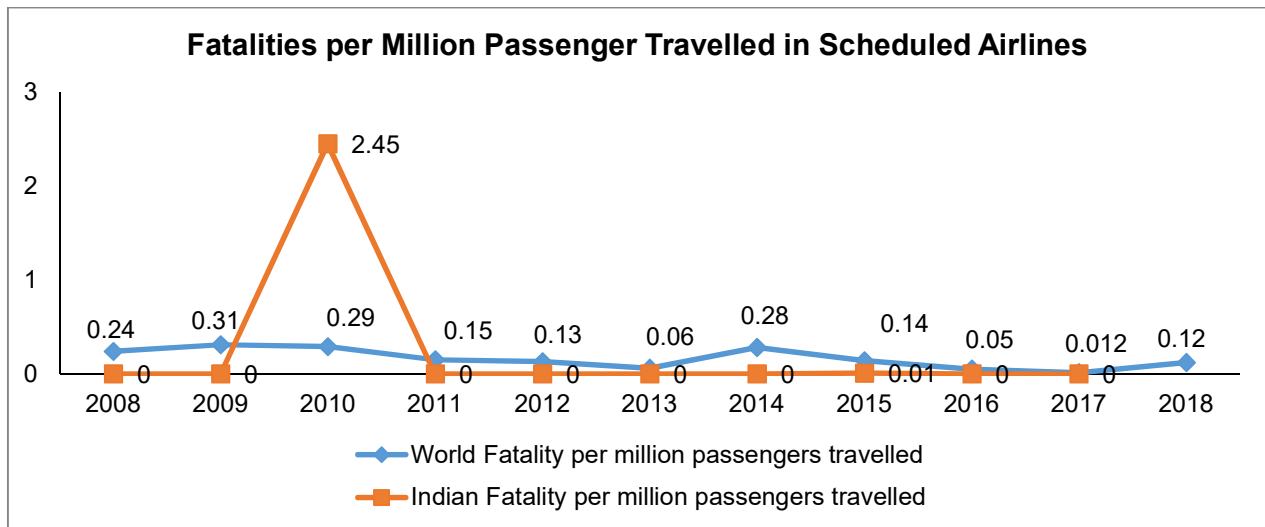


Fig 3.1

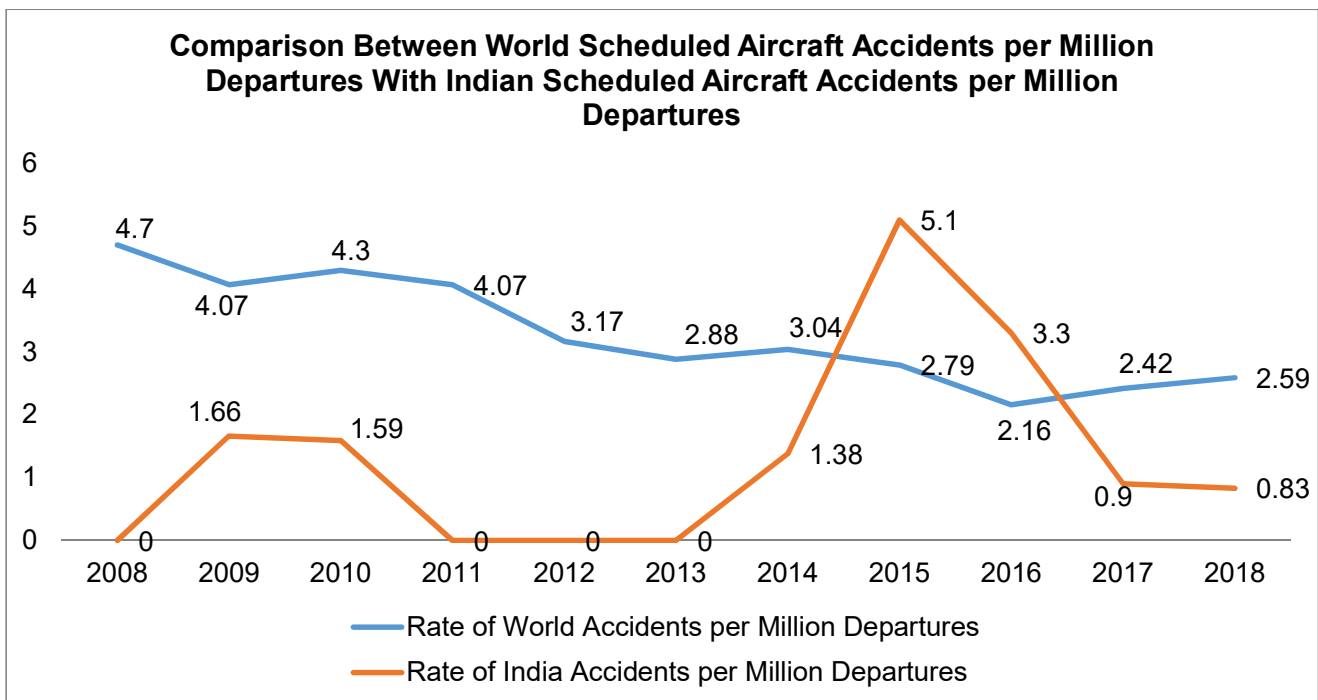
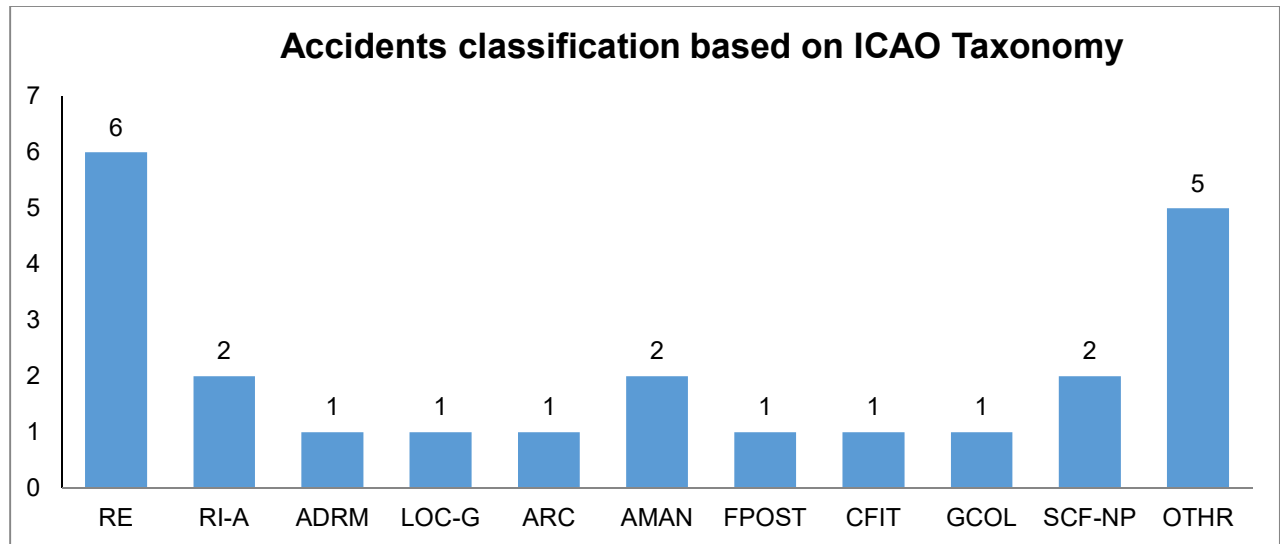


Fig3.2

3.4. Classification of Accidents as per ICAO Taxonomy

Scheduled aircraft accidents in India for the period from the year 2008 to 2018 have been classified as per the CICTT values and is presented in Fig. 3.3.

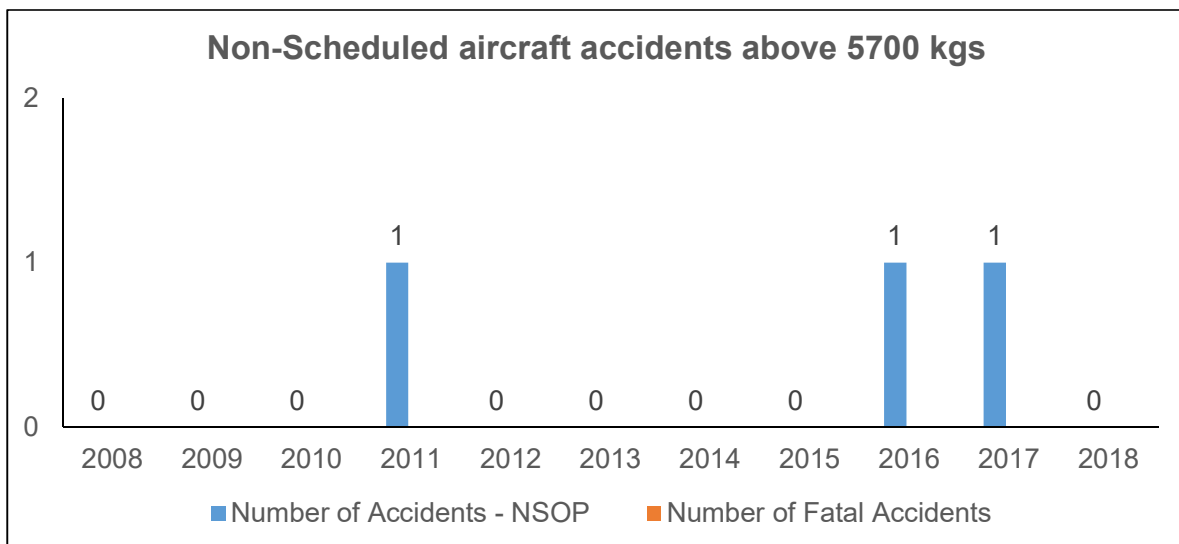
It is seen that Runway Excursion (RE) is the most common category, which is mainly due to “unstabilised approaches that continued to land coupled with adverse weather and runway conditions”.



*OTHR includes Unstabilised Approaches during landing, non-adherence to SOPs

Fig 3.3

3.5 Indian Non-Scheduled Aircraft Accident Above 5700 kgs



* Includes 01 accident to foreign aircrafts (under NSOP) in India

Fig 3.4

CHAPTER 4

Helicopter Analysis



4.1 Introduction

This Chapter provides overview on accidents involving helicopter which have occurred in India during the period from 2008 to 2018 (Fig. 4.1). Details of few significant helicopter accidents occurring world over are also covered in this chapter. In the year 2018, two helicopter accidents occurred, out of which one helicopter accident was fatal resulting in 07 fatality.

For improving the safety in helicopter operations, DGCA has adopted three pronged strategy as given below:

1. Regulatory Intervention
2. Audits/Surveillances
3. Interaction with stakeholders and operating crew

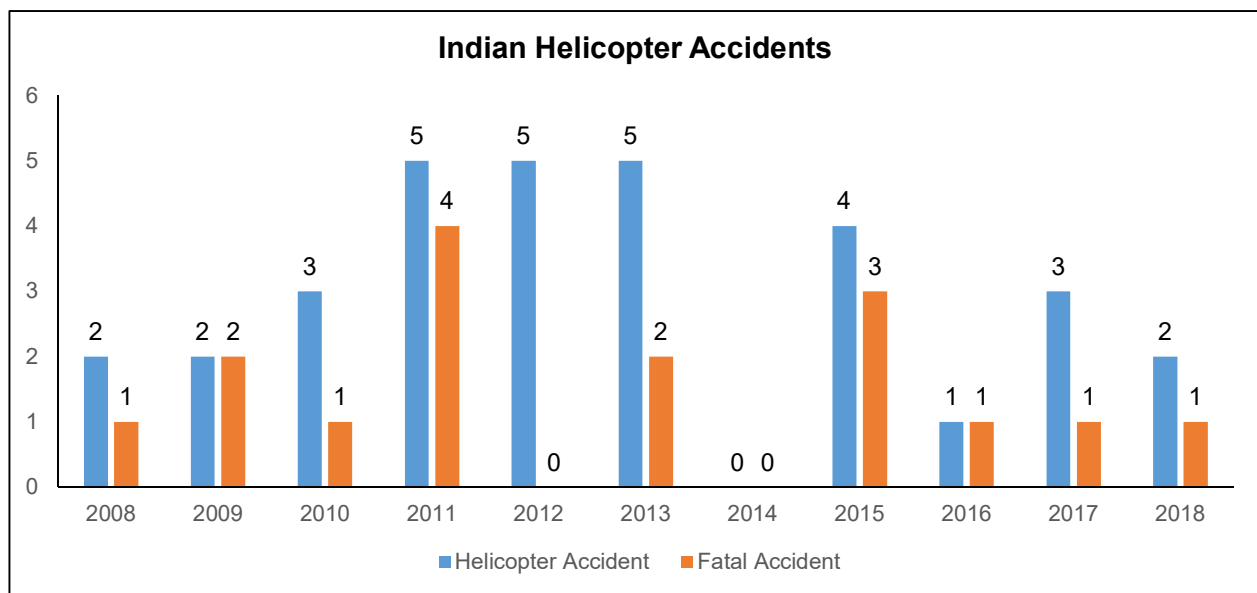


Fig 4.1

4.2 Indian Helicopter Accidents for the Year 2018

Date	Aircraft Type	Location	Fatalities	Description
13.01.2018	Dauphin AS365 N3	Mumbai Offshore	07	Helicopter VT-PWA was involved in an accident while operating flight from Juhu to ONGC offshore (Platform NF) on 13.01.2018. There were a total of 07 people on board the helicopter including 02 crew members. The helicopter took-

				<p>off from Juhu and crashed approx. 30 NM from Mumbai in Arabian Sea.</p> <p>Probable cause:</p> <p>The helicopter plunged into the sea at high velocity as the PF was induced into spatial disorientation while operating in poor visibility conditions as a result of malfunction(known and existing)of AFCS coupled with not handing over of controls to PM despite repeated caution of excessive bank by PM.</p>
03.10.2018	Bell 206	Jammu & Kashmir	Nil	<p>Helicopter VT-PHD was on recce mission to locate stranded labourers in Shinkula pass (High reaches in Ladakh). Helicopter attempted landing in Kurgiakh. In the process it impacted the ground and crashed.</p>

4.3 Helicopter Accidents According to Type of Operation

Fig 4.2 shows distribution of accidents according to the type of operations. More than 50 % of accidents have occurred to the helicopters involved in commercial operations.

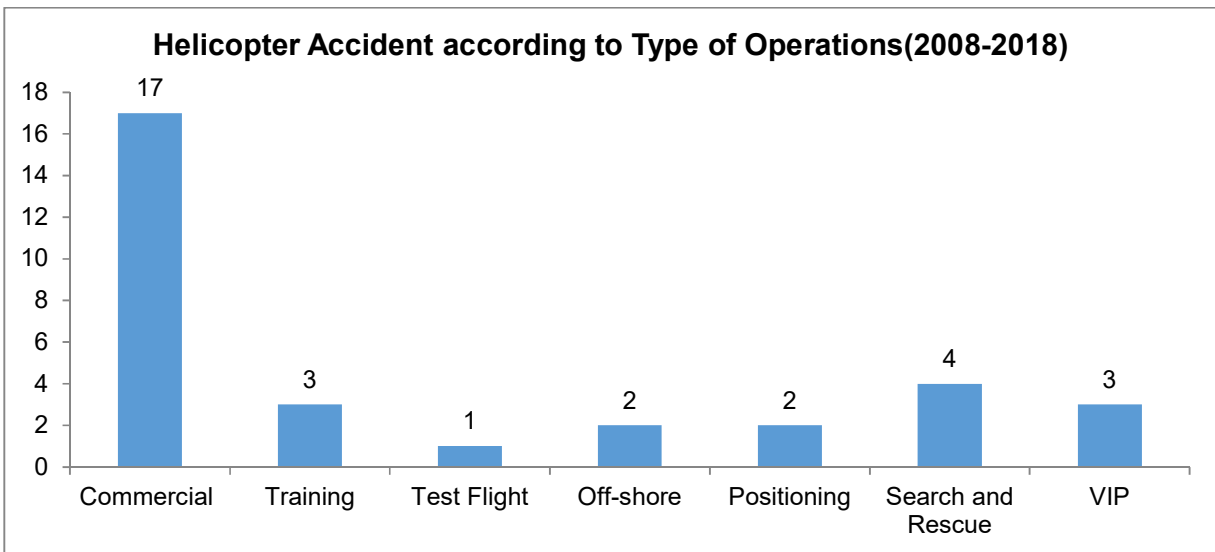
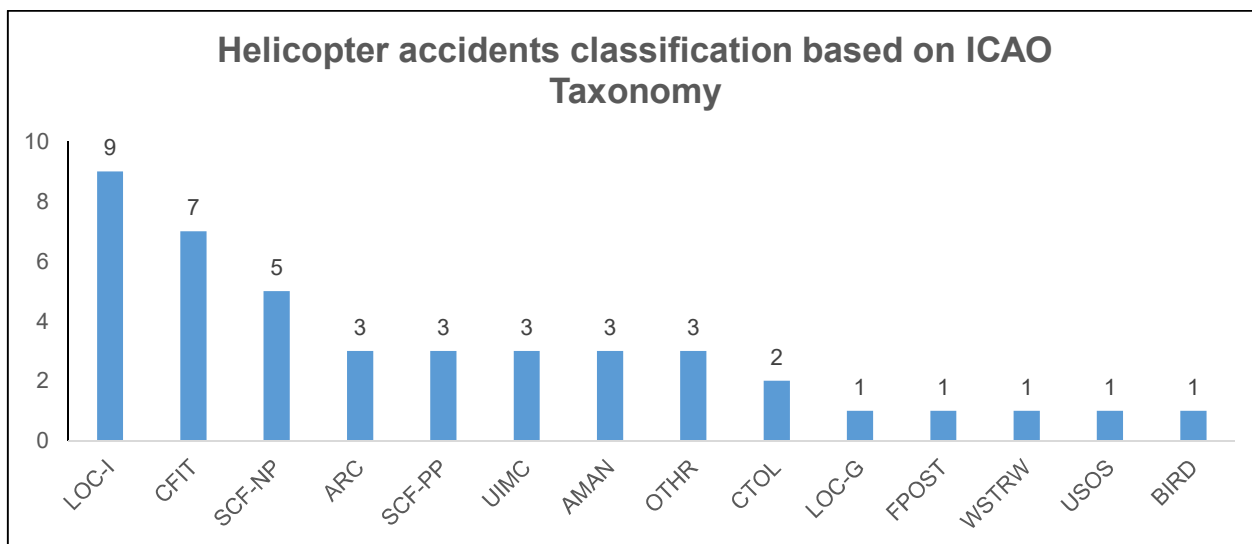


Fig 4.2

4.4 Classification of Accidents as per ICAO Taxonomy

Multiple occurrence categories have been assigned to helicopter accidents from the year 2008-2018 for identification of particular safety issues. This was done using the ICAO CICTT occurrence categories.



*OTHR includes cabin crew fall from helicopter during flight, Non-adherence of SOPs

Fig 4.3

The most common risk areas for accidents were Loss of Control Inflight (LOC-I), followed by Controlled Flight into Terrain, System/component failure (Non power plant and Power Plant), Unintended Flight in IMC, Abnormal Runway Contact and Abrupt Maneuver.

4.5 World Wide Helicopter Accidents for the Year 2018

Table 4.2

Date	Aircraft Type	Location	Fatalities	Description
17.01.2018	Bell UH-1H	New Mexico	5	<p>The helicopter was operating flight from the Raton Municipal Airport, near Raton, (New Mexico) to Folsom (New Mexico) in night visual meteorological conditions (VMC) with five passengers and one crew member on board. The flight proceeded normally until helicopter impacted the ground in level flight and came to rest inverted. The wreckage was located on a nearly-level mesa that rose about 100 ft above the surrounding mountainous terrain. One passenger survived the accident.</p> <p>The probable cause of accident was “pilot's failure to maintain adequate altitude above mountainous terrain during cruise flight in dark night conditions, which resulted in controlled flight into terrain”.</p>
01.04.2018	Robinson R44 II	Brazil	4	<p>The Helicopter was operating flight from Lima Campos(Brazil) to Heliponto Veja (Brazil) with three passengers and a crew member on board. Helicopter lost contact with the ATC and crashed killing all person on board.</p>
06.07.2018	Bell 206B3 Jet Ranger III	United Kingdom	1	<p>The helicopter was operating flight from Hustwaite to Walton Wood Airfield for its annual maintenance check with only pilot on board. The weather conditions en route were challenging with low cloud and reduced visibility. The helicopter was seen by several witnesses to be flying normally before climbing steeply into cloud. It was then seen to emerge from the cloud, rotate through 540°, then descend rapidly, striking the ground in an approximately level attitude. The helicopter became inverted and caught fire. The investigation did not find any evidence of pre-</p>

				existing defects with the helicopter or its engine. It could not be determined why the helicopter entered cloud but it is probable that the pilot was distracted or became disorientated in the poor weather conditions. Having entered cloud it is likely that the pilot became spatially disorientated and was unable to maintain control of the helicopter.
10.08.2018	Bell 412EP	Japan	9	<p>The helicopter was on an inspection flight for a new mountain trail which was to be opened the next day with nine person on board. The contact was lost and the helicopter was subsequently found crashed near Mt. Yokote, Gunma prefecture.</p> <p>"it is probable that, while flying over mountainous areas for exploration of mountain climbing trail, the Helicopter entered the cloudy airspace and was unable to continuously recognize the ground surface due to lowered visibility, and the captain who was exposed to spatial disorientation could not perform an appropriate maneuvering to maintain the attitude of the Helicopter that subsequently crashed into the slope of the mountain. It is probable that losing continuous visual recognition of the ground surface in the lowered visibility were caused by delayed decision to return and continuing flight in the situation that it was getting difficult to maintain VMC"</p>
27.10.2018	Agusta Westland AW169	United Kingdom	5	The helicopter was operating flight from King Power Stadium, Leicester to London Stansted Airport with four passenger and crew on board in night VMC. The helicopter lifted from the center circle, yawed 15° left and moved forward a few meters. The helicopter then began a climb on a rearward flight path while maintaining a northerly heading. Gear retraction started as it passed through a height

				<p>of approximately 320 ft. The climb then paused. Heading changes consistent with the direction of pedal movements were recorded initially, then the helicopter entered an increasing right yaw contrary to the pilot's left pedal command. The helicopter reached a radio height of approximately 430 ft before descending with a high rotation rate. The helicopter struck the ground in an approximately upright position on a stepped concrete surface, with the landing gear retracted, and rolled onto its left side. The helicopter was destroyed due to impact and fire.</p> <p>As safety action the manufacturer of the helicopter has issued Alert Service Bulletin (ASB) 169-120 for AW169 helicopters, giving instructions for a precautionary inspection of the tail rotor control assembly on all helicopters in the global fleet. The manufacturer also issued ASB 189-213 for AW189 helicopters, which have a similar tail rotor control system.</p>
24.12.2018	Agusta Westland AW109S	Mexico	5	<p>The helicopter was operating under day Visual conditions with five person on board including the crew. During flight there was loss of control due to a sudden left roll that was not recovered by the PIC, causing the helicopter to invert in flight and impact the ground. There were five person on board. The helicopter impacted a cornfield in the Santa Maria Coronango municipality of Puebla. The helicopter was partially consumed by the post-impact fire</p>

CHAPTER 5

Commercial and General Aviation
Operation, AUW \leq 5700 Kg



5.1 Introduction

This Chapter covers the accidents, which took place in India involving Commercial Transport operation by fixed wing aircraft with all up weight of 5700 Kg and below (Both schedule and non-schedule operation) and General Aviation (GA) aircraft. In the year 2018, two accident occurred in former category and three in the latter category.

5.2 Analysis of Accidents to fixed wing aircraft, AUW ≤ 5700 Kg involved in commercial operation

Fig 5.1 shows total number and fatal accidents which occurred to fixed wing aircrafts with AUW less than 5700 Kgs in the Non-Scheduled category.

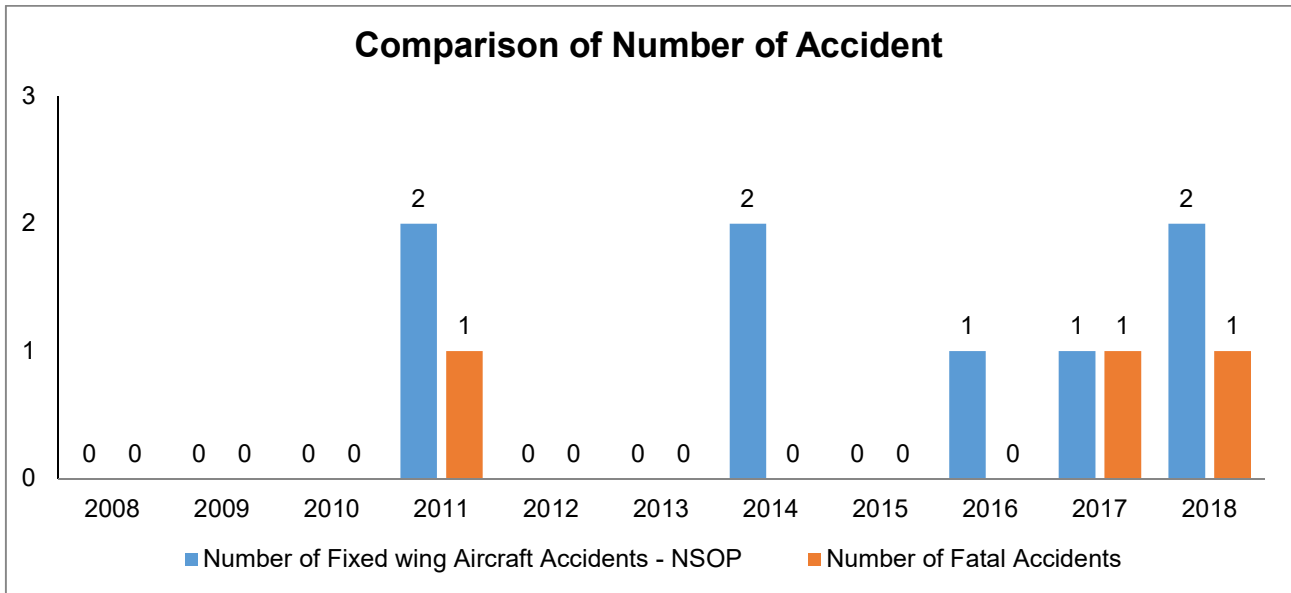
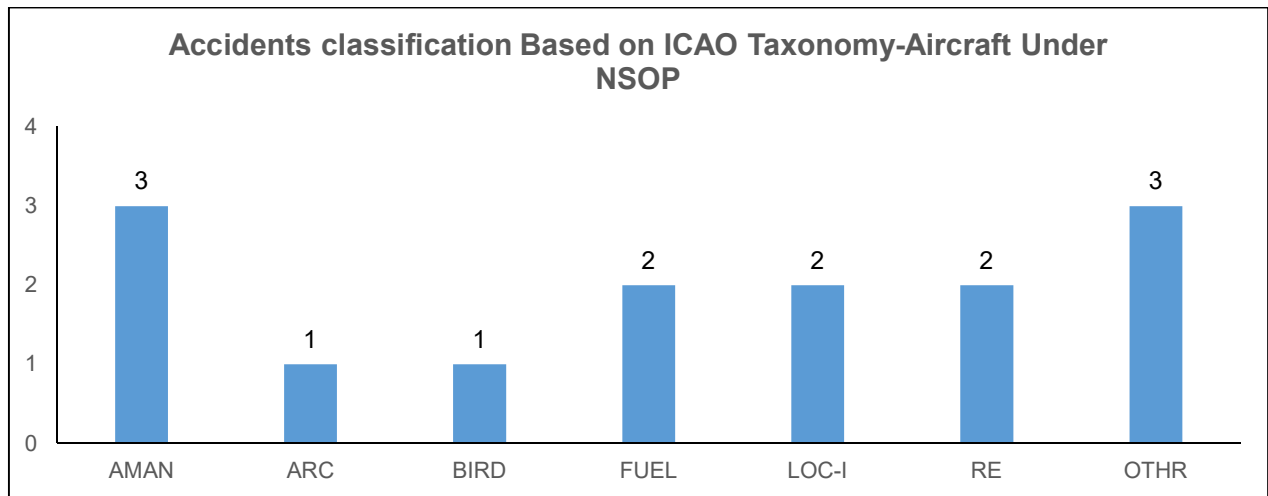


Fig 5.1

5.3 Classification of Accidents as per ICAO Taxonomy

Accident data for the period from 2008 to 2018 has been used for the analysis. Multiple occurrence categories have been assigned to each of the accident for identification of particular safety issue using the ICAO CICTT occurrence categories.

Figure 5.2, shows accident classification as per ICAO defined Occurrence Category. The most common risk areas are abrupt maneuver followed by fuel starvation, loss of control and runway excursion.



*OTHR includes Non-adherence to SOP, Unstabilised approach

Fig 5.2

5.4 General Aviation Accidents

General Aviation is small but forms an important part of the aviation community. General Aviation in India is broadly classified into following categories:

- a. State Governments/BSF
- b. Flying Training Institutes
- c. Private Aircraft
- d. Experimental aircraft
- e. Gliders
- f. Microlight

Fig 5.3 shows comparison of total accidents and fatal accidents of fixed wing aircraft in the General Aviation category during the period 2008-2018.

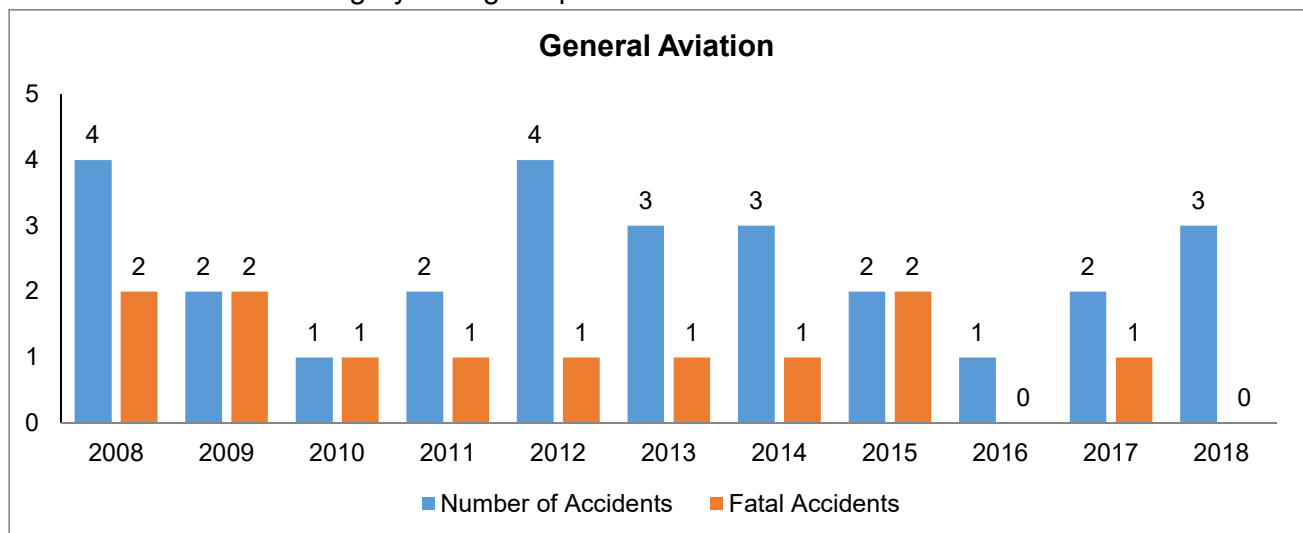


Fig 5.3

Fig. 5.4 shows accidents as per the category of the operator during the period from 2008 to 2018.

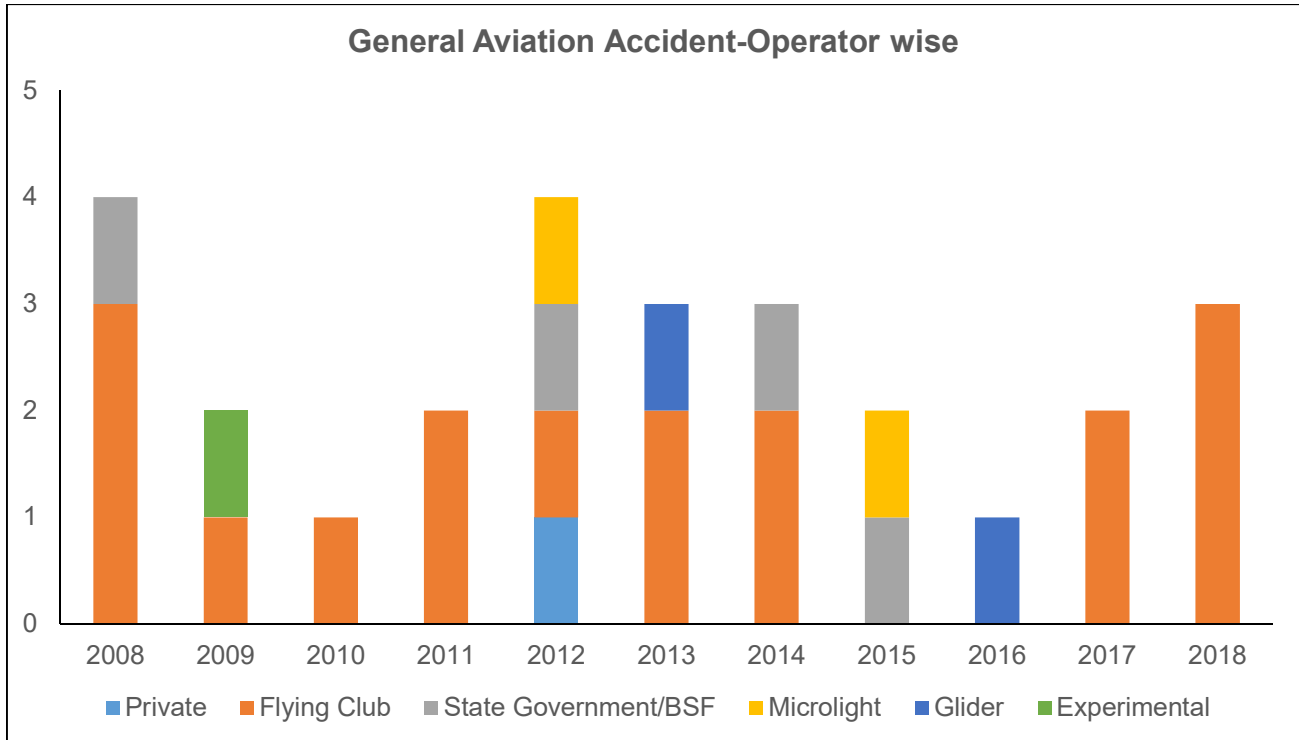
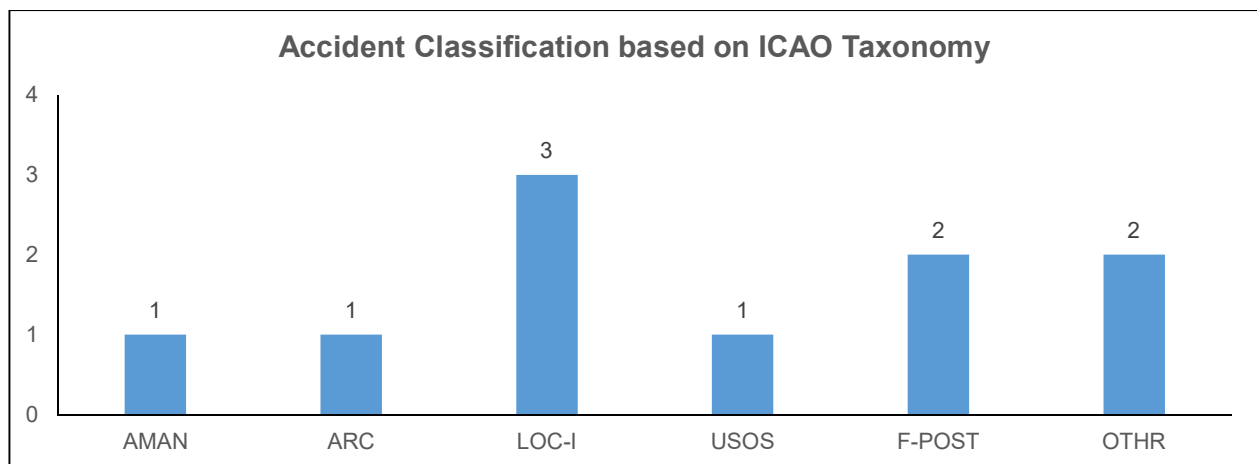


Fig 5.4

5.5 Classification of Accidents as per ICAO Taxonomy for “State Governments/BSF and Private aircraft”.

Multiple Occurrence categories have been assigned to each of the State Governments/BSF and Private aircrafts from the year 2008-2018, for identification of particular safety issue using the ICAO CICTT occurrence categories. Figure 5.5, shows the most common risk areas for accidents were Loss of Control Inflight (LOC-I).



*OTHR includes Non-adherence to SOP

Fig 5.5

5.6 Analysis of Flying Training Organisation Aircraft Accidents from 2008 to 2018

Refer Fig 5.6 and 5.7, flying school aircraft accident data has been analysed from the year 2008 to 2018 and found that the majority of accidents have occurred due to operational reason i.e. crew action/inactions. 18% of accidents have occurred due to System Component Failure.

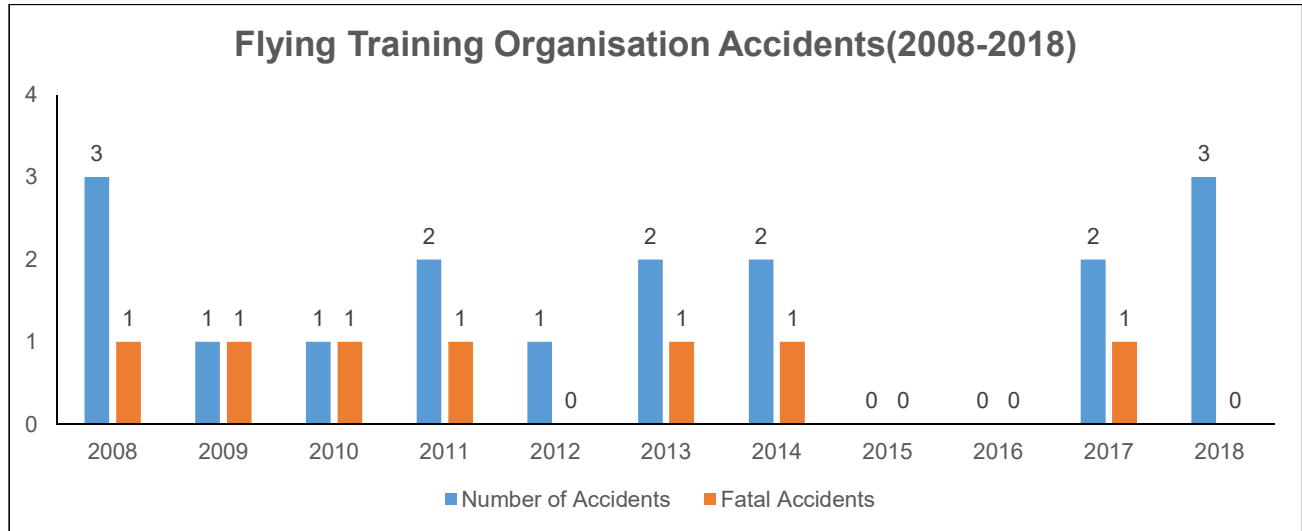


Fig 5.6

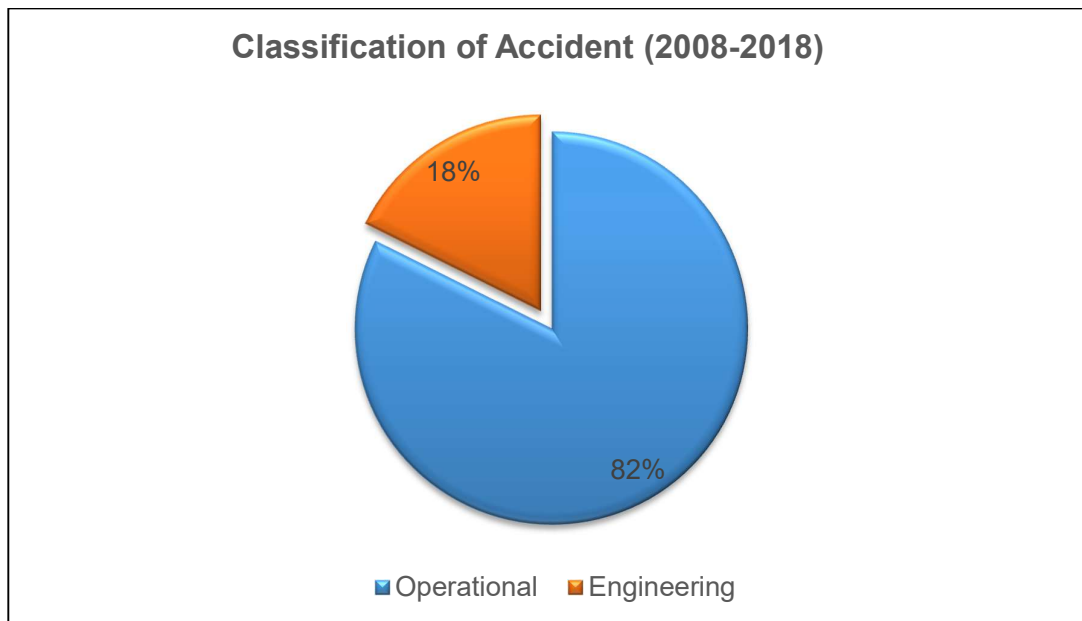


Fig 5.7

Analysis based upon type of flying training indicates (ref Fig 5.8) almost equal percentage of accidents have occurred during the Local Area Flying, and Circuit and landing flying exercises.

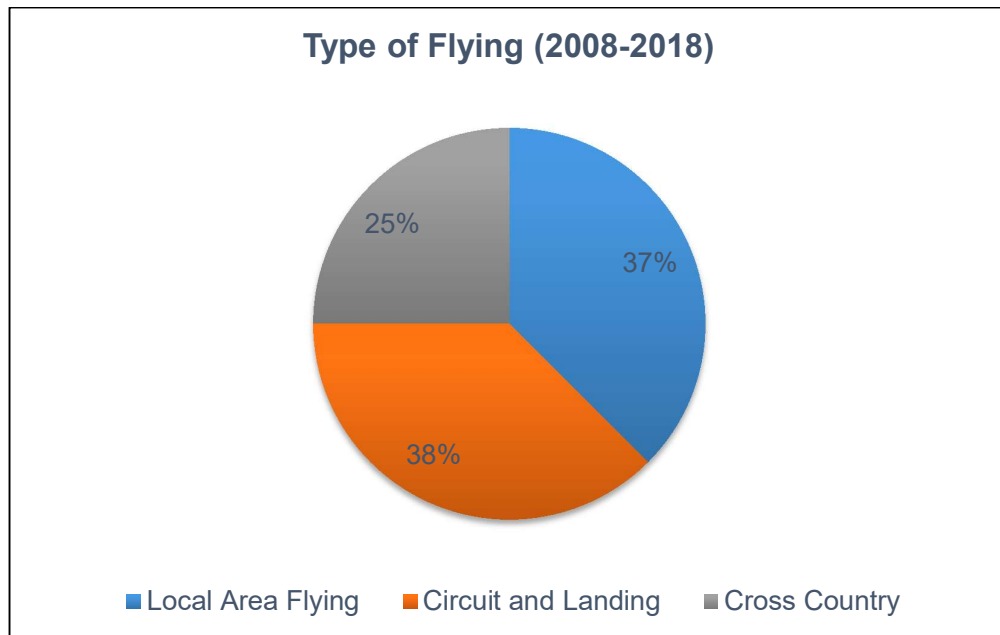


Fig 5.8

The analysis of data has brought out 03 causative factors under operational reasons (ref Fig 5.9) viz. Action performed incorrectly, Deviation from intended flight path, Flight planning and preparation.

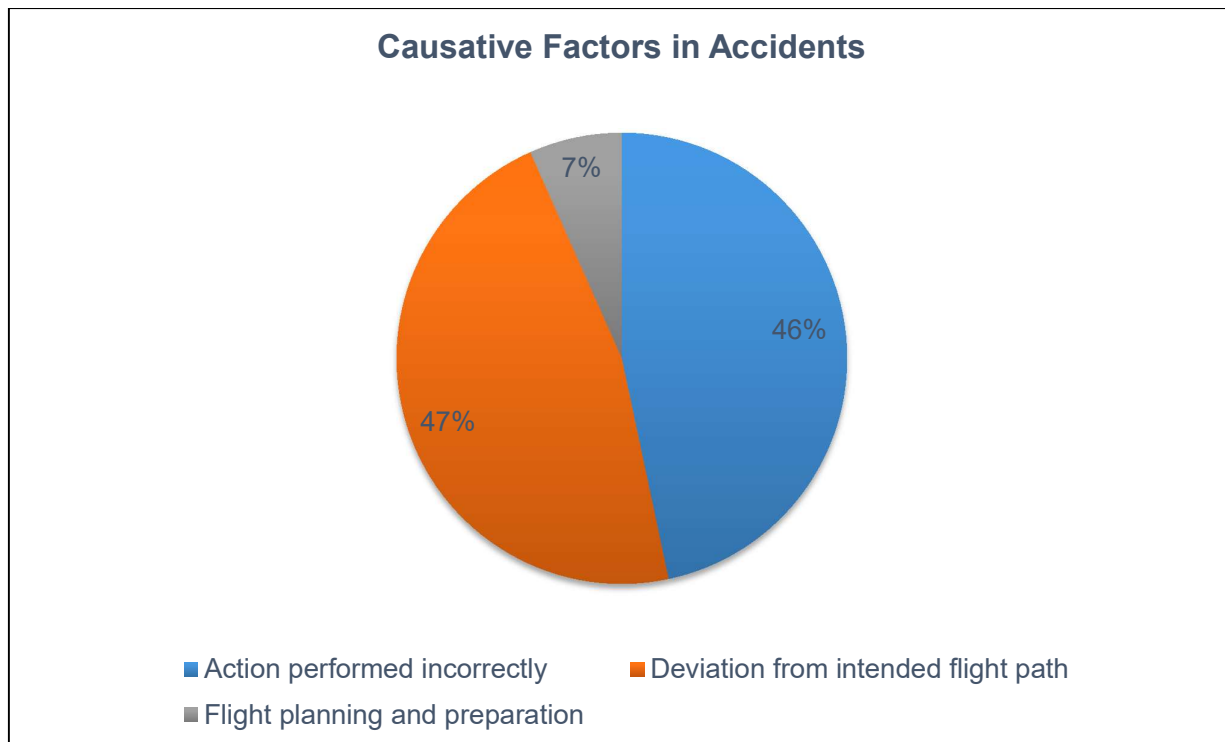


Fig 5.9

Action performed incorrectly being the major factor was further analysed for underlying reasons, same are given in Fig.5.10. For other factors, underlying reasons are given in Table 5.1

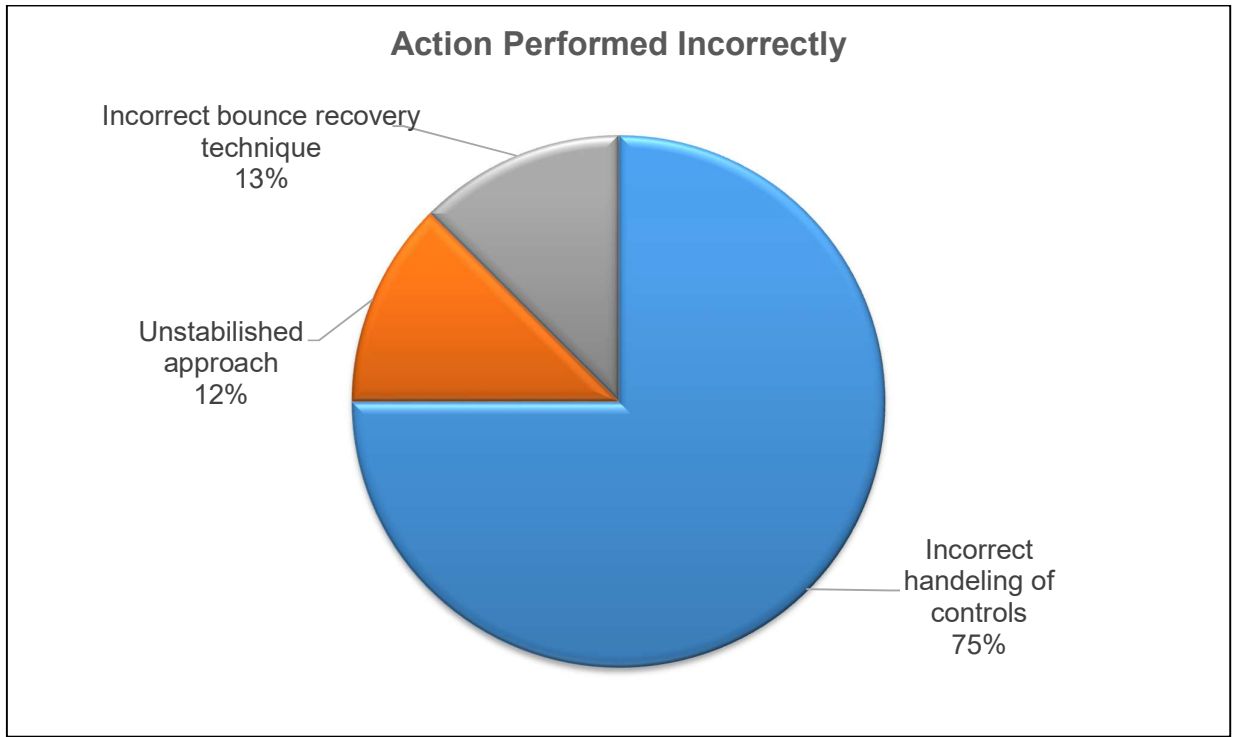


Fig 5.10

Table 5.1

S. No.	Factors	Sub-Factors
1	Deviation form Intended Flight Path	Flying too close to ground
2	Flight Planning and preparation	Incorrect Fuel calculation

5.7 Classification of Accidents as per ICAO Taxonomy for “Flying Training Organisation Aircraft”.

Multiple Occurrence categories have been assigned to each of the Flying Training Organisation aircraft accidents from the year 2008-2018, for identification of particular safety issue using the ICAO CICTT occurrence categories. Figure 5.11, shows the most common risk areas for accidents were Low Altitude Flying followed by Loss of Control Inflight (LOC-I), Controlled flight into terrain, Abrupt Maneuver.

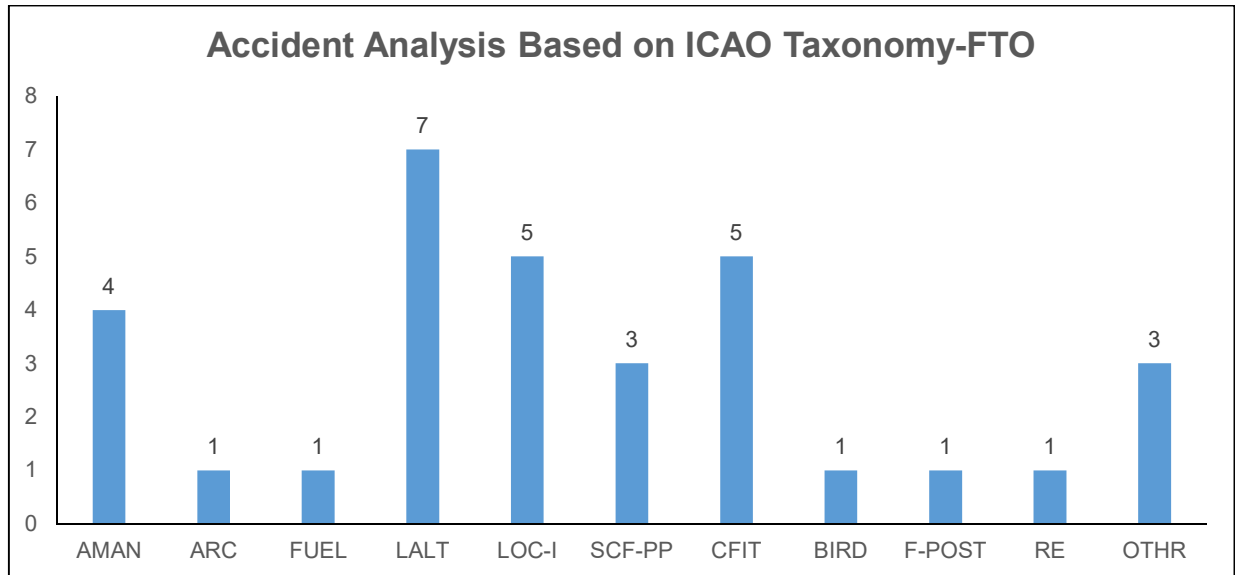


Fig 5.11

5.8 Indian NSOPs Accidents for the Year 2018

Table 5.2				
Date	Aircraft Type	Location	Fatalities	Description
10.5.2018	King Air C-90	Mumbai	05	During a test flight for the issue of C of A, aircraft crashed near Ghatkopar, Mumbai. There were four person on board including 02 cockpit crew and 02 engineers. All 04 on-board and 01 on ground died in the accident.
07.08.2018	Cessna 208B	Ganganagar	Nil	Aircraft while operating flight from Jaipur to Lalgah was involved in an accident during landing at Lalgah airstrip, Rajasthan. There were a total of 07 passengers on board the aircraft. During landing, the aircraft overshot the runway and hit the airstrip boundary wall. There were no injuries to any person on-board

5.9 Accident to Flying Training Organisation Accident for the Year 2018

Table 5.3

Date	Aircraft Type	Location	Fatalities	Description
26.04.2018	Cessna 152	Faizabad	Nil	The aircraft, while engaged in a training flight sortie encountered mid-air engine failure. Thereafter pilots carried out forced landing in a river-bed about 6.7 nm from Faizabad airport. There were no injuries to flight crew.
21.11.2018	Cessna 172	Hyderabad	Nil	The aircraft was engaged in a solo cross country training flight from Begumpet, Hyderabad. The flight crew declared "MAY DAY" due to engine failure while flying at 17 NM west of Hyderabad. Aircraft landed at Mokila in a paddy field near Shankarpalli, Hyderabad. The aircraft sustained substantial damages.
24.11.2018	Cessna 172	Mehsana	Nil	The Aircraft was engaged in solo circuit and landing exercise at Mehsana, Gujarat. The first circuit was uneventful. During second circuit, after getting airborne the student pilot reported about power loss. During the process of landing, the aircraft overshot the runway end 05, broke a runway edge light with its left main wheel, went in to Kutcha and stopped 4-5 feet from the boundary wall in a small drain. There was no injury to student pilot.

CHAPTER 6

Incidents Analysis



6.1 Introduction

This Chapter covers the incidents/occurrences involving Indian aircraft. In the year 2017, a total of 1917 occurrences were reported to DGCA India. These occurrences included all incidents, accidents and serious incidents.

6.2 Review and Analysis of Safety Database for the Year 2018

6.2.1 Mandatory Incidents Reporting

CAR Section 5, Series C, Part I on “Notification of Incidents and Investigations thereof” requires reporting of occurrences to DGCA/AAIB.

DGCA has established ECCAIRS (European Coordination Centre for Accident and Incident Reporting Systems) for the recording/reporting of occurrences. The system has become effective from January 2015, and the database format is compatible with the ICAO requirements. Operators are encouraged to report the occurrences in the ECCAIRS format.

- Classification of 2156 occurrences reported to DGCA in the year 2018 is as follows:
 - Accidents : 08
 - Serious Incidents : 19
 - Incidents investigated by DGCA under Rule 13 (1) of Aircraft Rules 2017 : 13
 - incidents and were investigated : 704
 - Airprox : 47
 - Runway Incursions : 40
 - Wildlife strike : 1325

6.3 Analysis of Incidents Pertaining to Scheduled Airlines

For analysis, incidents are classified in the following categories:

- Engineering Incidents
- Operational Incidents
- Ground Incidents
- Human Error Incidents
- Miscellaneous Incidents

Note: Miscellaneous incidents includes FOD damage, weather related incidents (i.e. windshear, lightning strike and turbulence), cabin safety related incidents (injury while servicing, etc).

Fig. 6.1 shows incidents to scheduled airlines classification on the basis of their area of occurrence. The majority of incidents is were of engineering and operational nature.

6.4 Incidents per 10000 Departures

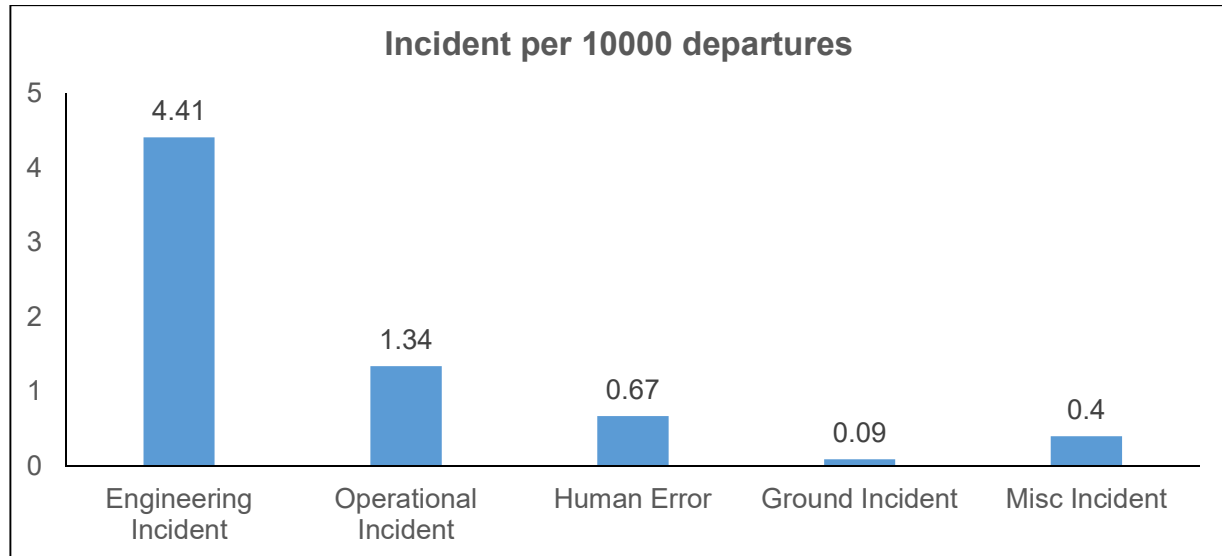


Fig 6.1

6.5 Analysis of Operational Incidents

Operational incidents as shown in Fig 6.2 are analysed as per phase of flight

- Take off
- Landing
- Approach
- En route
- Climb
- Taxi
- Standing/Push back

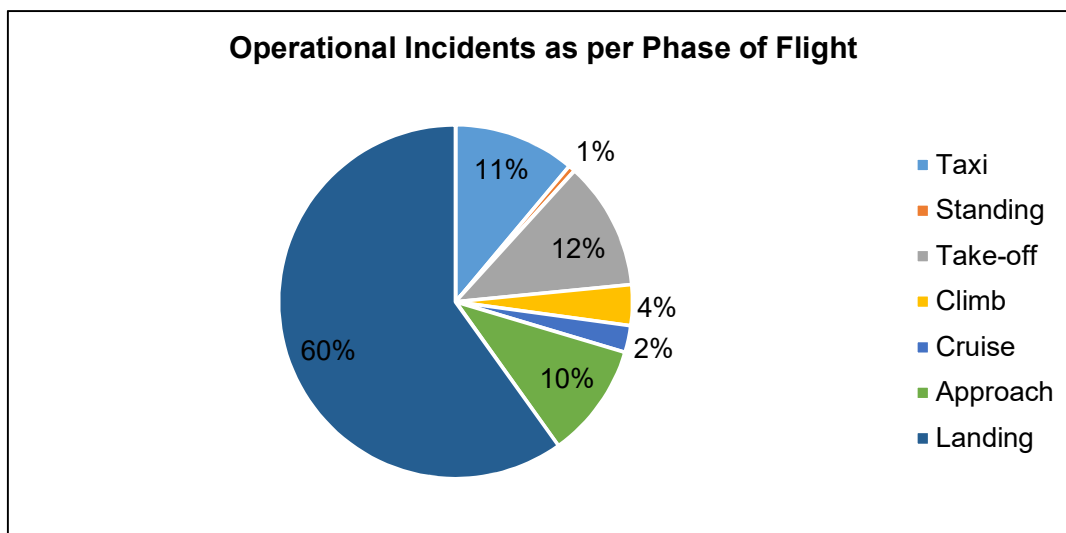


Fig 6.2

6.6 Fleet wise Engineering Incident Analysis

Engineering incidents as shown in Fig 6.3 have been analyzed based on type of aircraft available in the fleet of scheduled airlines. Majority of engineering incident have occurred with A320 and B737 types of aircraft, which form bulk of the fleet scheduled airlines.

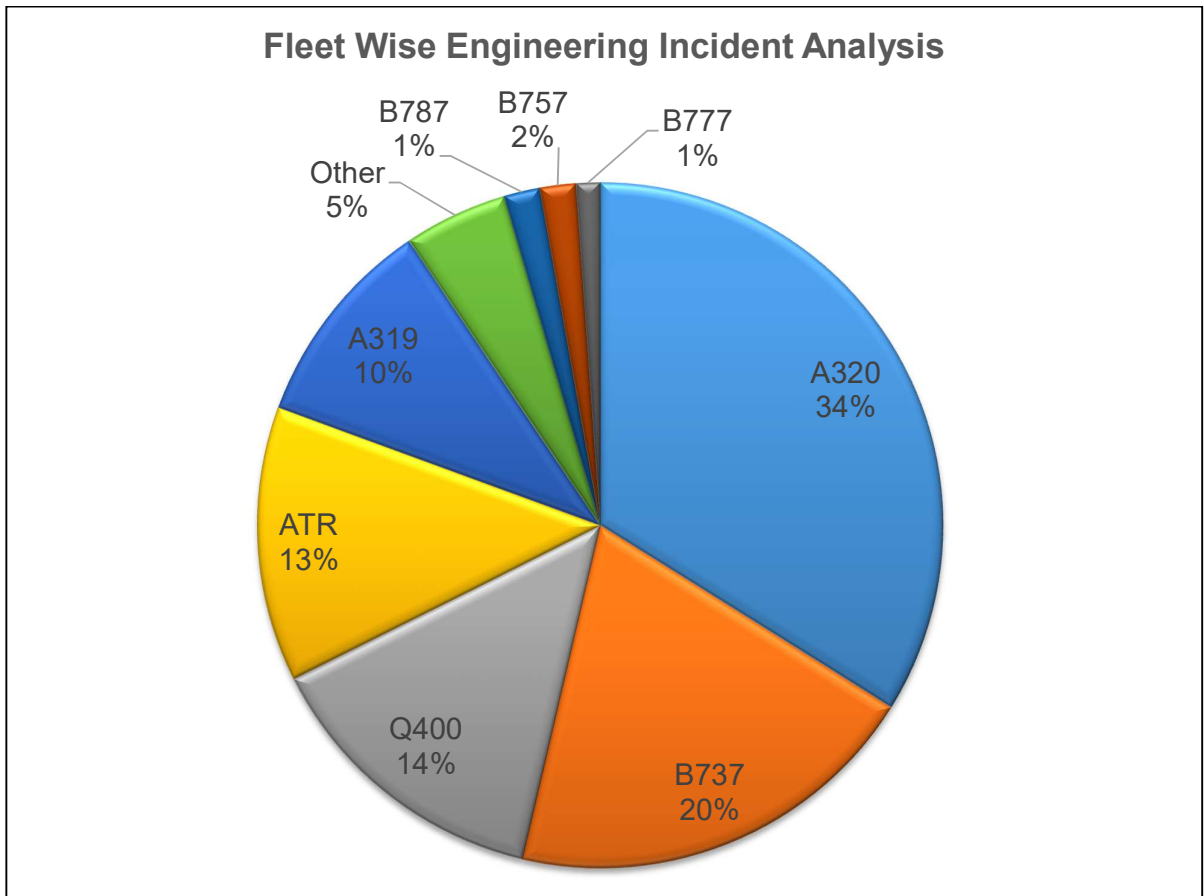


Fig 6.3

6.7 Classification of Incidents as per ICAO Taxonomy

Figure 6.4, shows the number of incidents as per ICAO defined Occurrence Category. The most common risk areas are System/component failure or malfunction (non-power plant), System/component failure or malfunction (power plant) followed by Abnormal Runway Contact. This can also be related to Fig 6.1, as the majority of incidents are in the area of engineering.

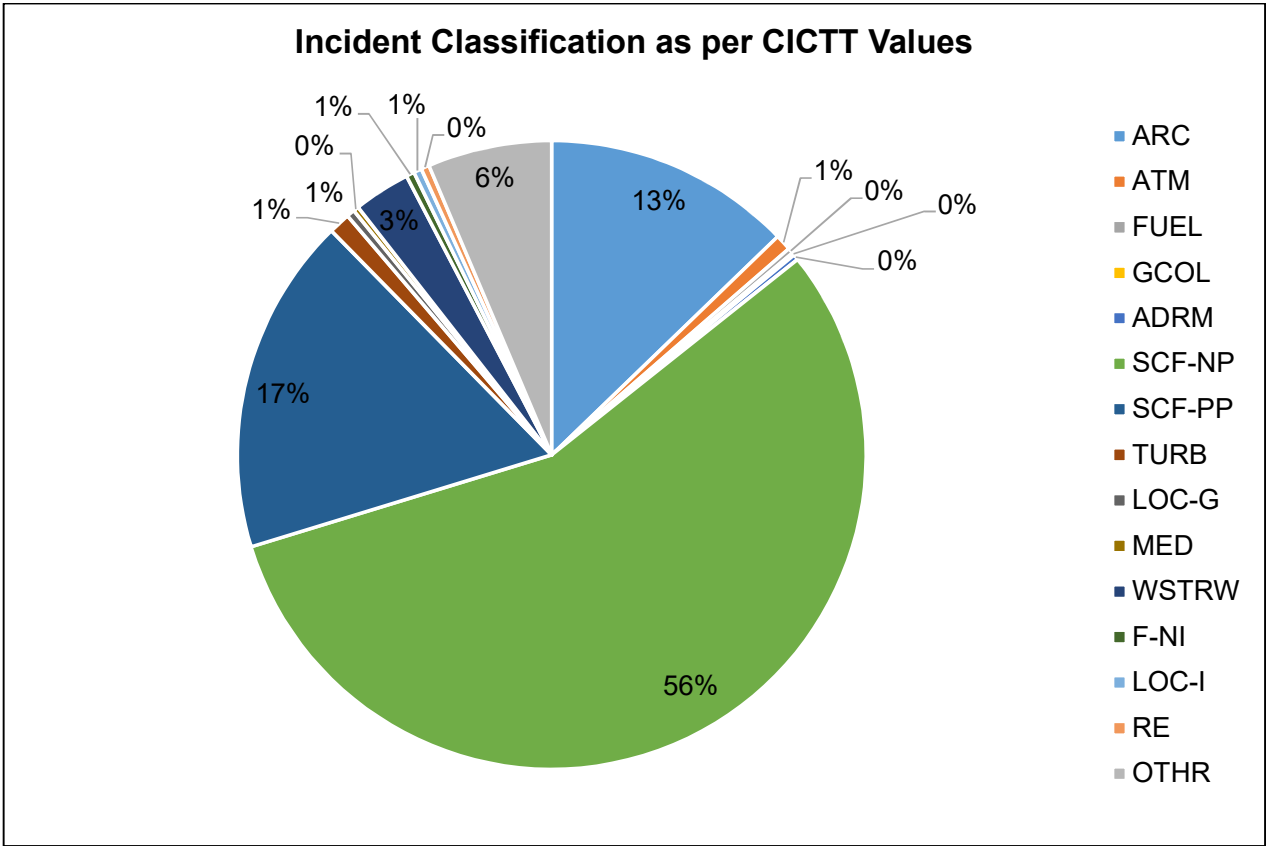


Fig 6.4

CHAPTER 7

Aerodromes



7.1 Introduction

This Chapter covers the aerodrome related occurrences which took place at Indian aerodromes. Aerodrome related occurrences are broadly classified into three categories:

1. Wildlife Strikes
2. Ground Incidents
3. Runway Incursion

7.2 Study on Wildlife Strike for Year 2018

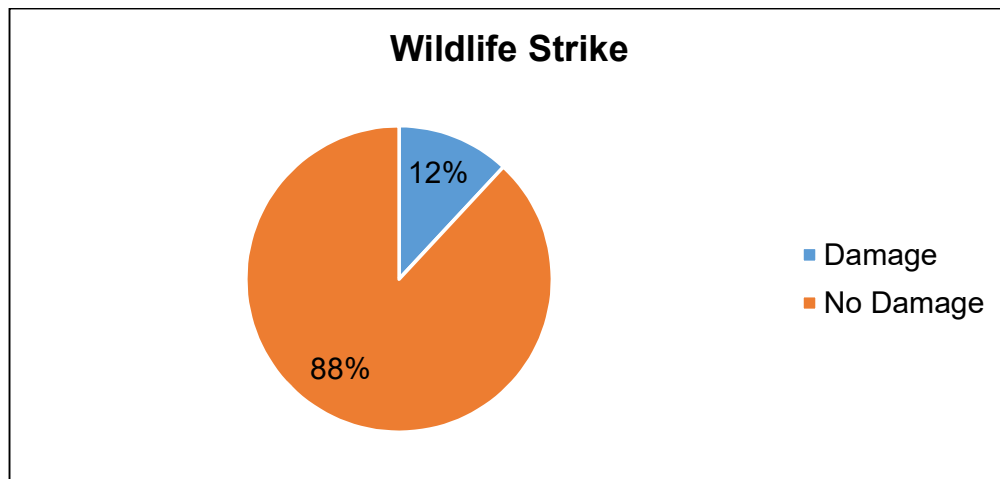


Fig 7.1

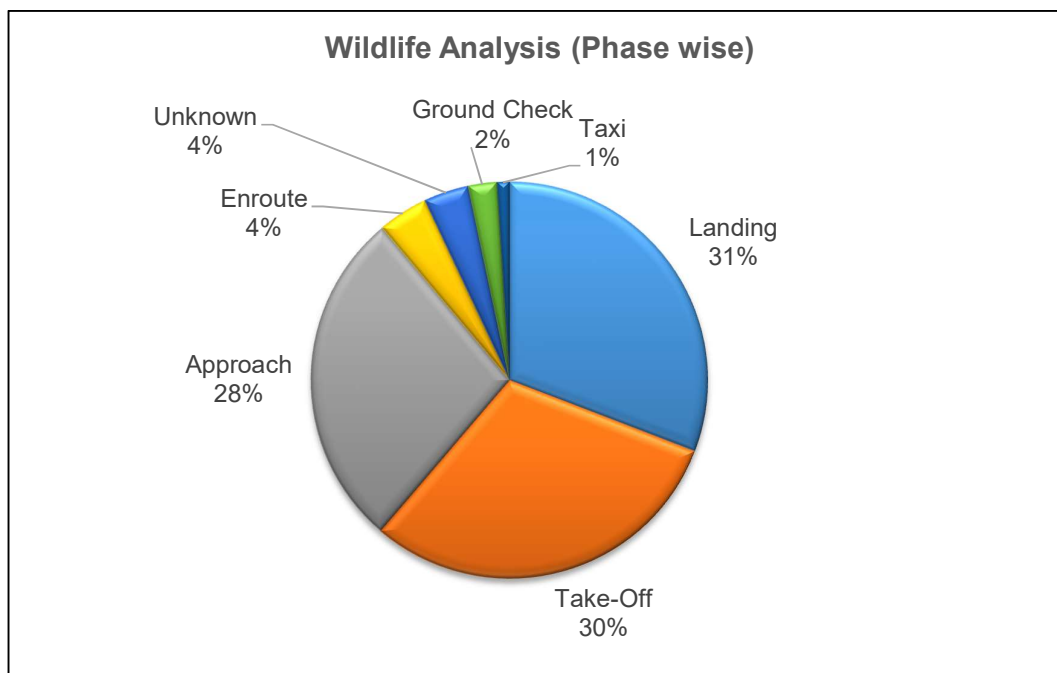


Fig 7.2

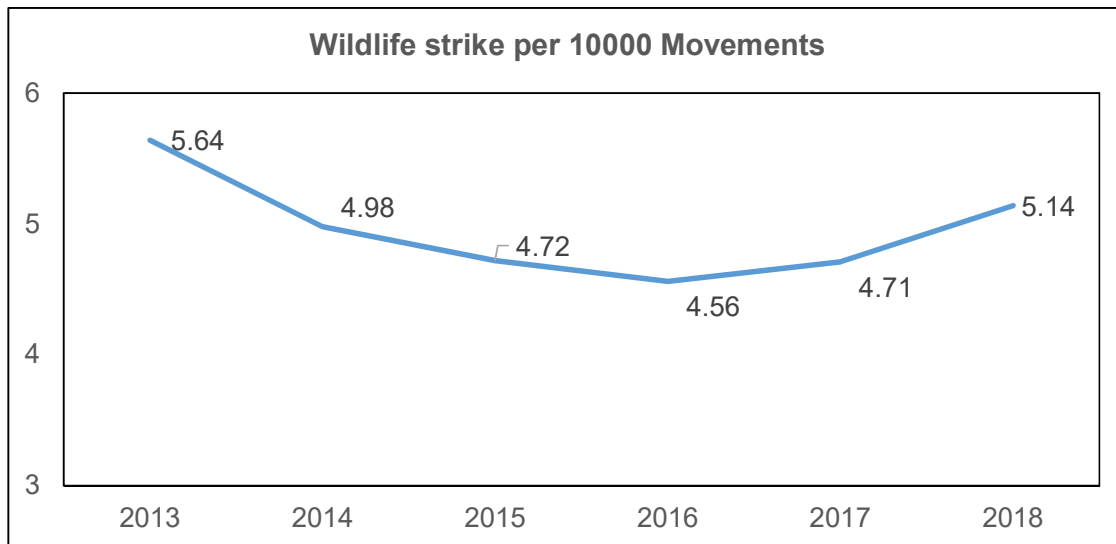


Fig 7.3

7.3 Ground Incidents

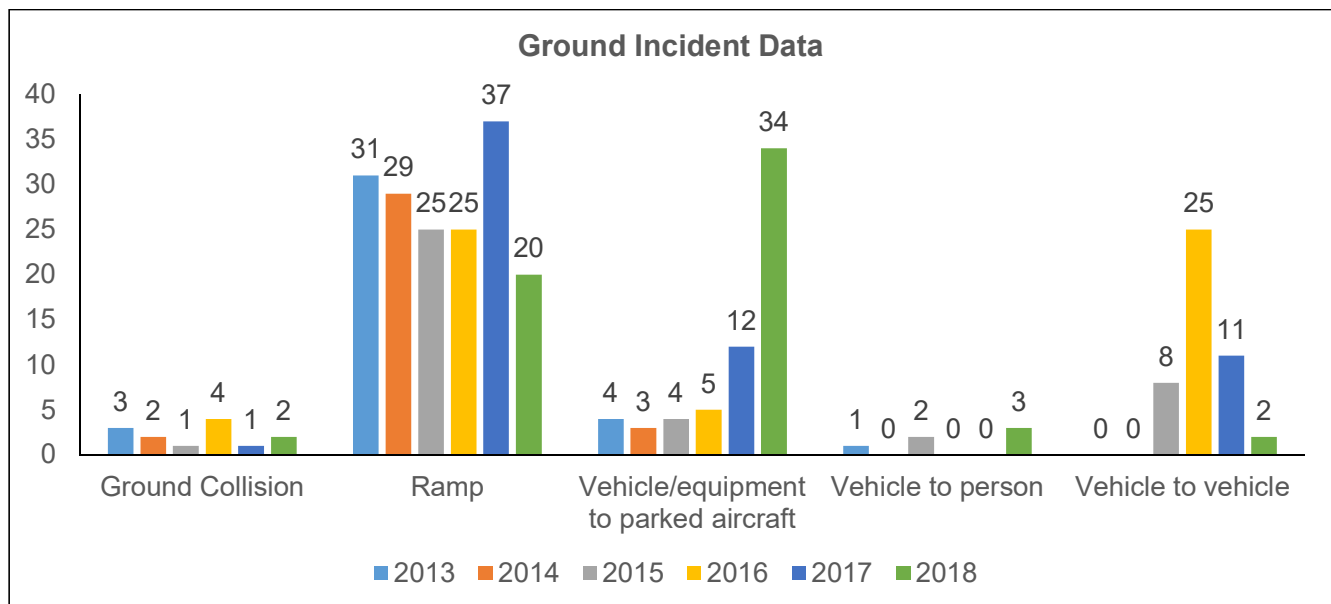


Fig 7.4

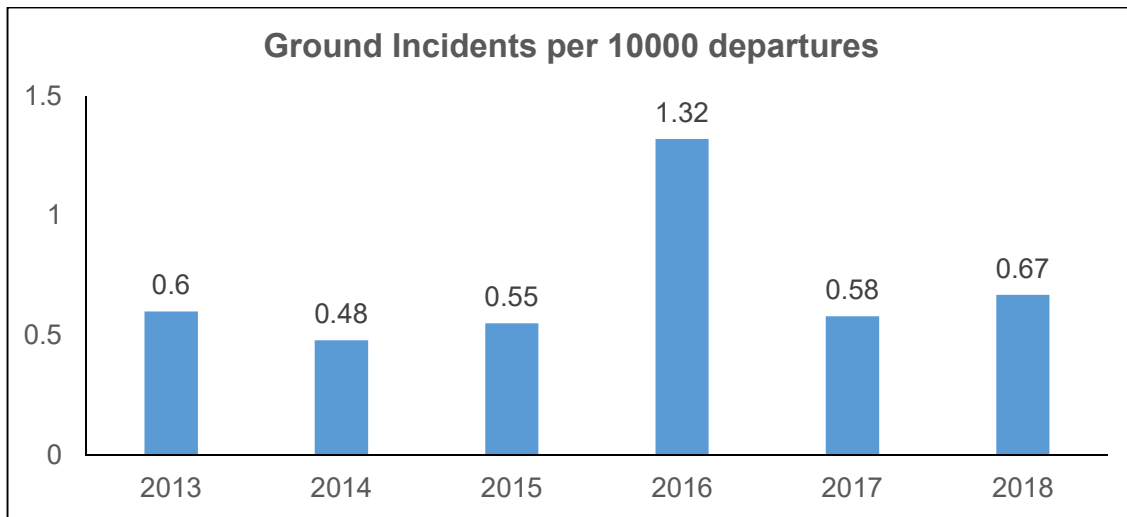


Fig 7.5

7.4 Runway Incursions

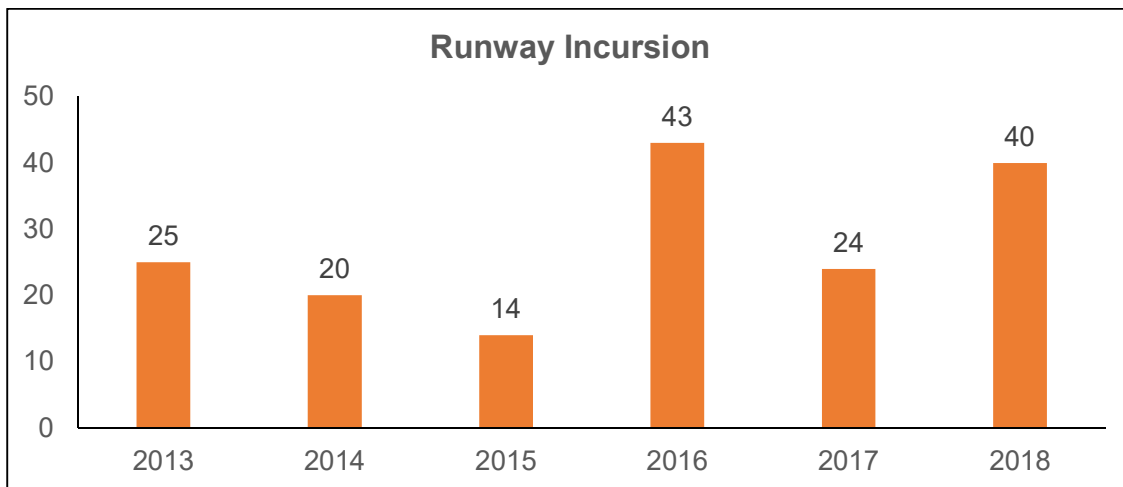


Fig 7.6

7.5 Causative factors of Runway Incursion

The major factors involved in the runway incursions are as follows:

- a) Use of non-standard phraseology.
- b) The pilot and/or vehicle driver misunderstanding the controller's instructions.
- c) The pilot and/or vehicle driver accepting a clearance intended for another aircraft or vehicle.
- d) Loss of situational awareness by pilots, non-familiarization with aerodrome layout.
- e) Inadequate signage and markings (particularly the inability to see the runway-holding position lines) or multiple holding position.
- f) A complicated airport design/ taxiway.

- g) Failure to obtain clearance to enter the runway by vehicle driver.
- h) Vehicle driver non familiar with aerodrome layout.
- i) Failure to obtain clearance to enter the runway by pilot
- j) Unauthorized entry on runway by person
- k) Incorrect instructions issued by ATC to pilot or the vehicle driver.

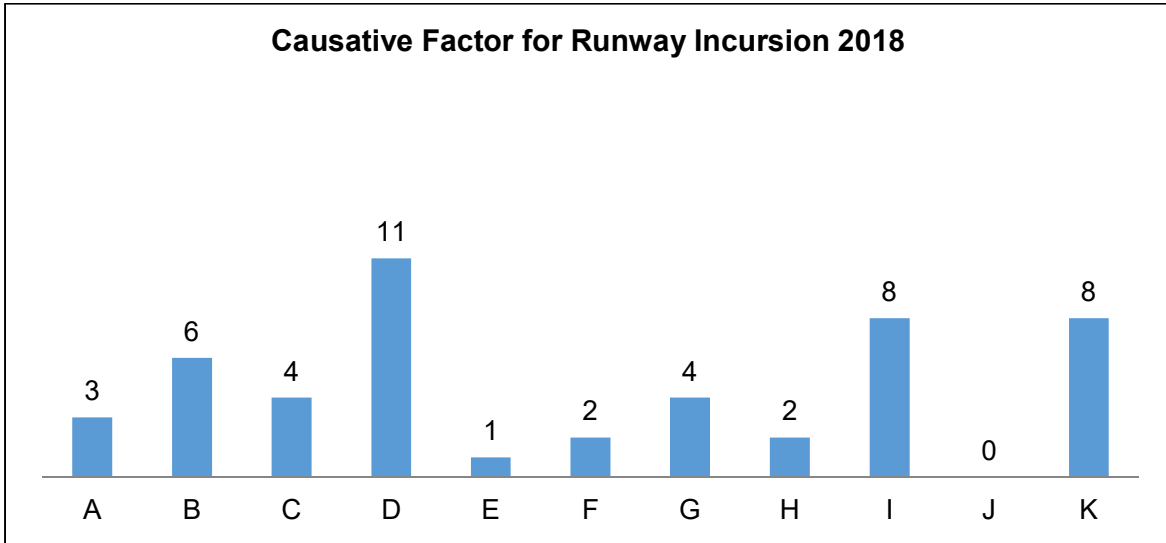


Fig 7.7

CHAPTER 8

Air Traffic Management



8.1 Introduction

Airprox incidents are investigated by the board constituted for Airprox Incident Investigation. Based on the investigation, various causative factors are ascertained. Fig. 8.1 shows slight decrease of Airprox incidents in the year 2018 compared to the previous years.

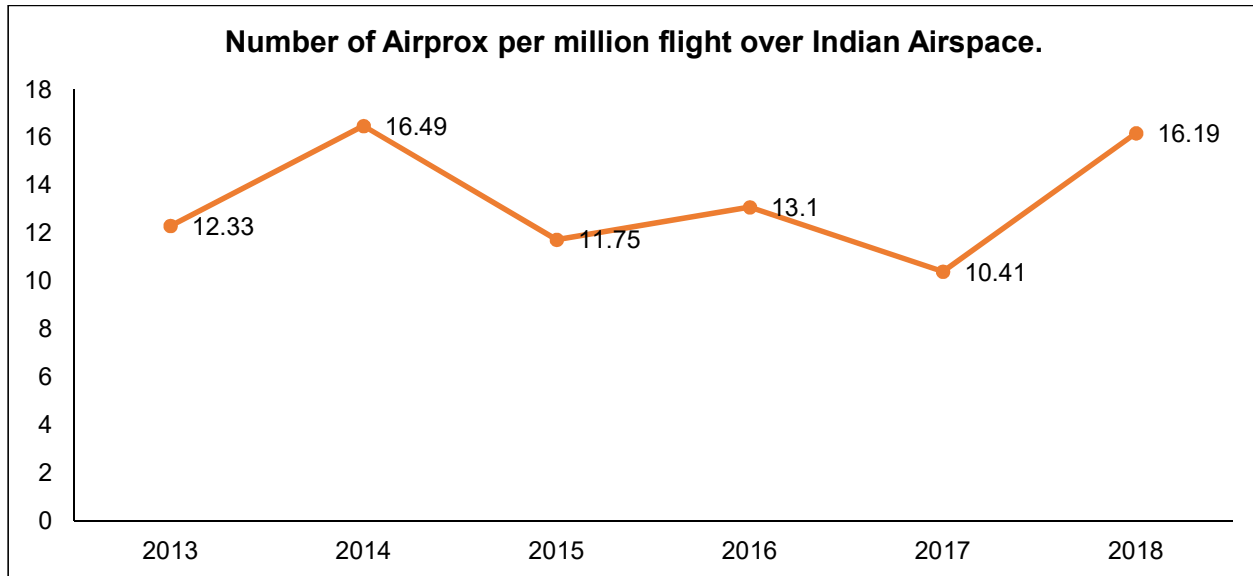
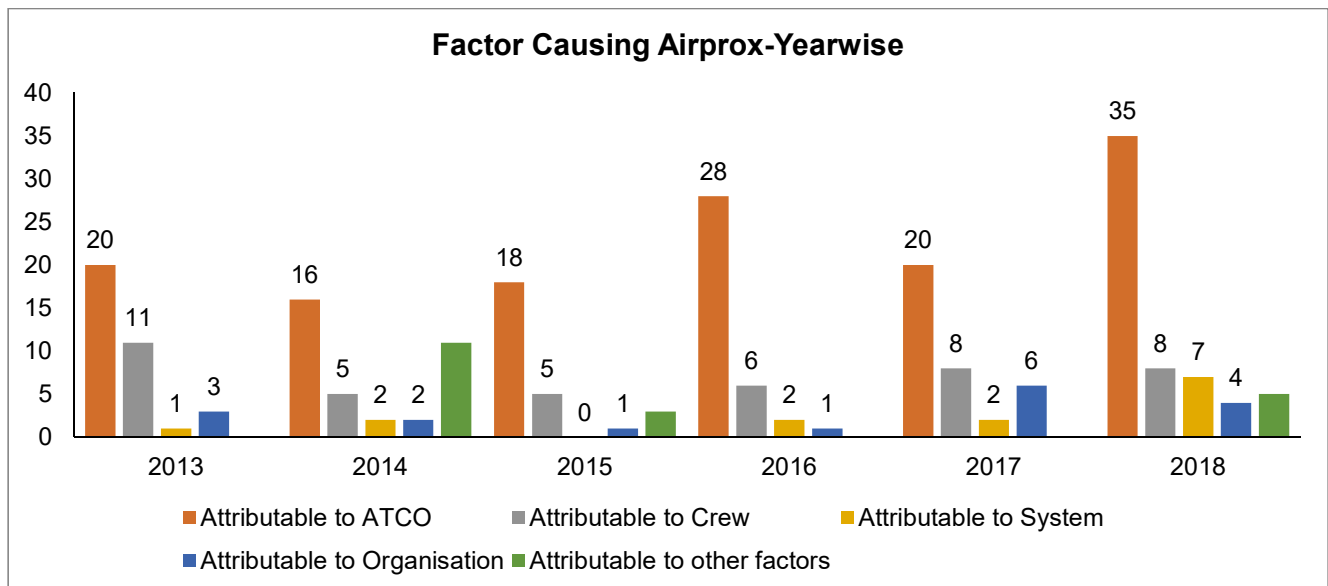


Fig 8.1

8.2 Year-wise AIRPROX on the basis of Errors



*Others includes AIRPROX attributable to Air Force/ Adjacent States

Fig 8.2

8.3 Classification in accordance with ECCAIRS Taxonomy

Fig 8.3 shows various contributory factors identified in accordance with ICAO ECCAIRS taxonomy during the analysis of the AIRPROX incidents. This includes incident data from 2013 to 2018.

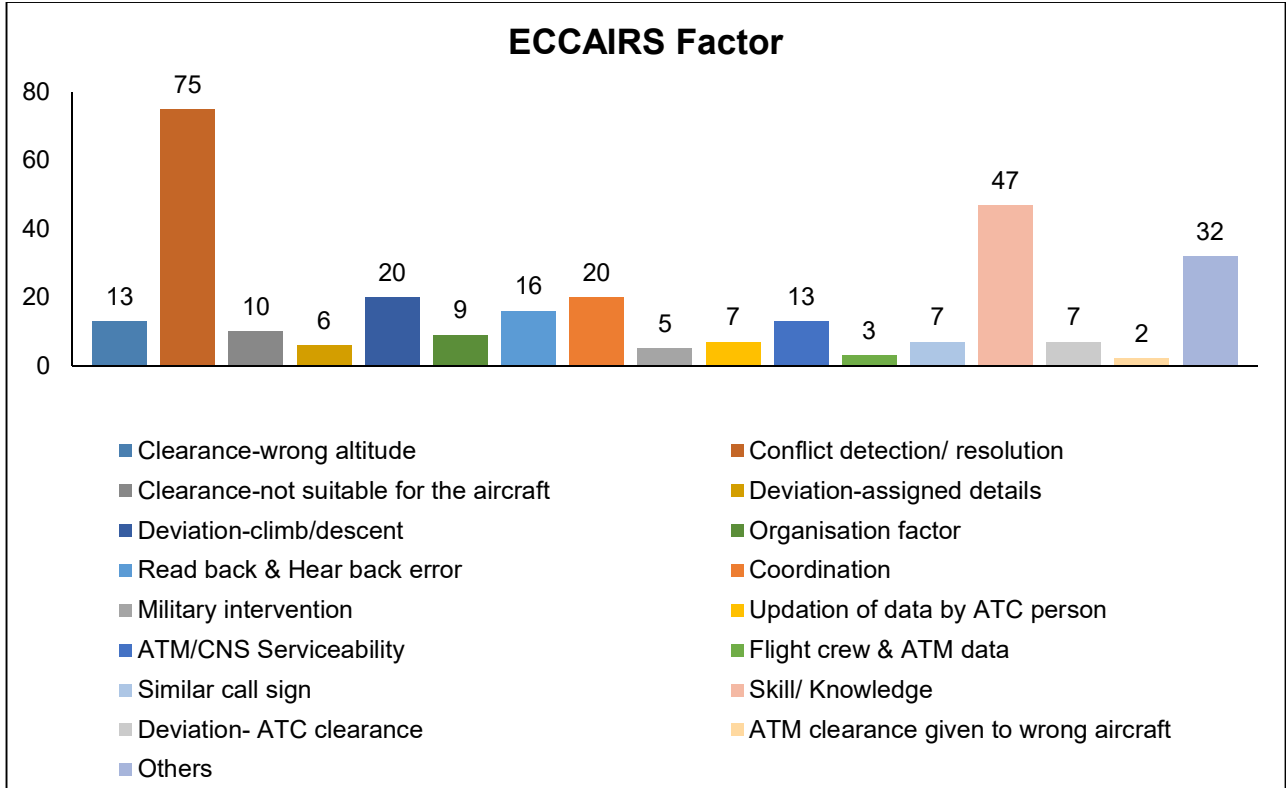


Fig 8.3

***Others includes:** Deviation-approach, Approach on wrong rwy, Handing over procedure, Deviation-ATM regulations, Deviation- ATC clearance, System/crew mismatch, Aircraft component failure, Failure of ATM, Deviation- landing, ATM procedure not defined, Non-use of aids, Provision of ANS traffic information, Deviation-flight level/altitude, Clearance- wrong heading, weather, Procedure not well developed.

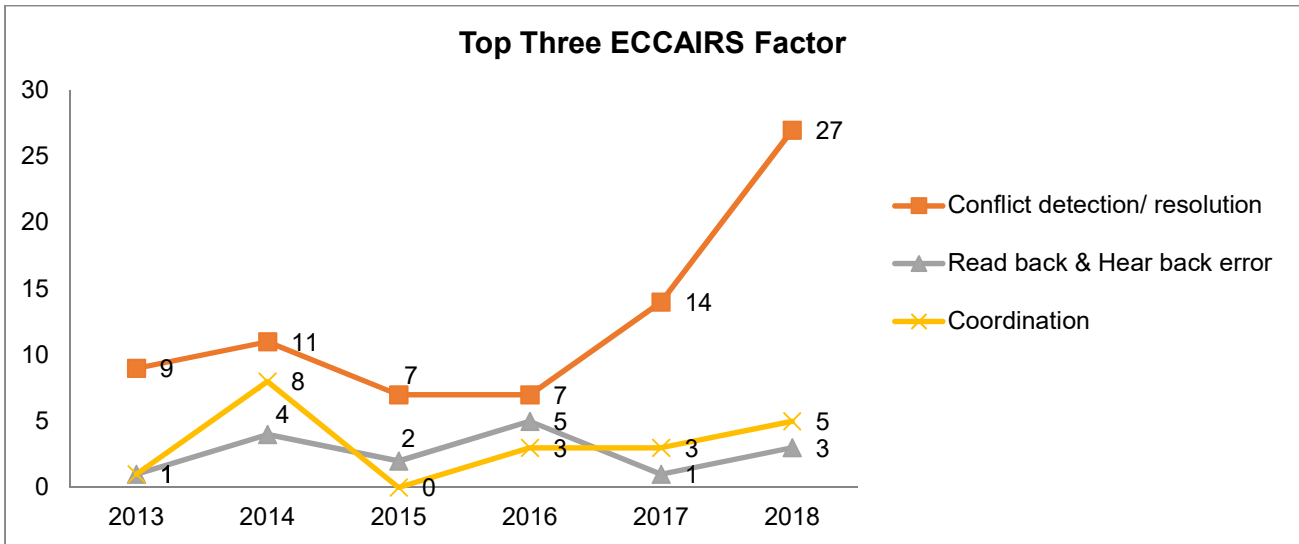


Fig 8.4

The major factor for airprox incidents of the year 2018 is conflict detection /resolution which is on the increasing trend.

CHAPTER 9

State Safety Oversight

-Surveillance



9. 1 Introduction

DGCA publishes Annual Surveillance Programme (ASP) based on the in-built safety oversight programme of each Directorate. The respective directorate carried out the surveillance activities as per the plan and provided data to Surveillance and Enforcement Directorate for root cause analysis and enforcement action, if any.

9.2 Areas of Safety Oversight

The DGCA Safety Oversight Programme had been divided into 8 areas:

1. Surveillance Activities (Planned Inspection)
2. Regulatory Audit (Planned Audit)
3. Surveillance of Foreign Aircraft (SOFA)
4. Spot Check (Unplanned Checks)
5. Night Surveillance
6. Ramp Checks
7. Certification/audit of Foreign MRO
8. Inspections/spot checks carried out under the directions of the DG.

9.3 Directorates Participating in the Safety Oversight Program

1. Directorate of Airworthiness
2. Directorate of Air Safety
3. Flight Standards Directorate
4. Directorate of Aerodrome
5. Air Space & ANS Directorate
6. Directorate of Flying & Training
7. Cabin Safety Division
8. Dangerous Goods Division
9. Directorate of Aircraft Engineering

9.4 Overview of Safety Oversight

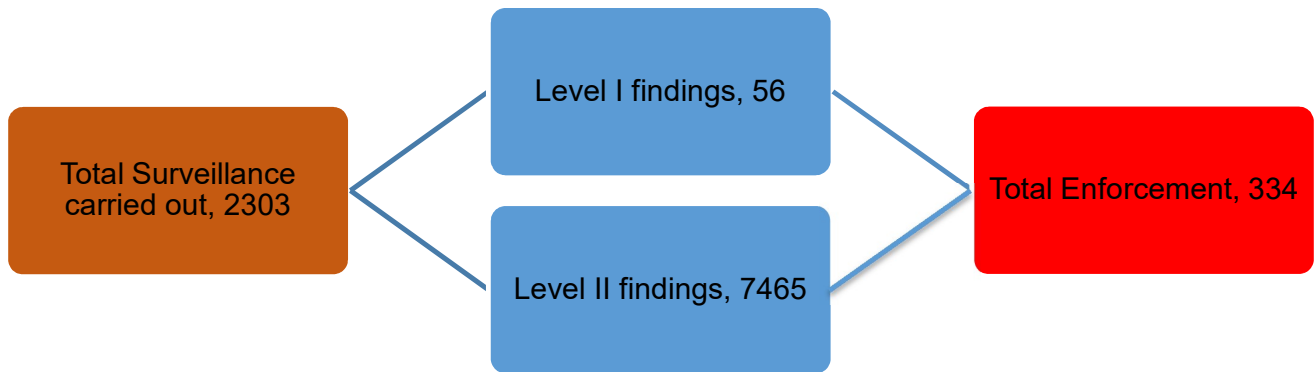


Fig 9.1

A total of 2303 surveillances were carried out in the year 2018 on the service providers in India. Deficiencies observed during the surveillance are classified as Level I and Level II findings.

Level I findings correspond to a significant non-compliance with the applicable requirement which lowers the safety standard and serious hazards to flight safety. In the year 2018, 56 Level I findings were observed.

Level II findings correspond to any non-compliance with the applicable requirement which could lower the safety standard and possibly create hazard to flight safety. In the year 2018, 7465 Level II findings were observed.

Based on the discrepancies observed, while carrying out oversight of the various stakeholders, a total of 334 enforcement actions were taken which consisted of warnings, suspensions, corrective actions, show cause notices, withdrawals, de-rostering, non-renewal of flight crew license, etc.

9.5 Areas of Safety Concern

Regulatory audit findings for the year 2018 have been analysed using following factors:

S. No.	Factor	Description of events involved
1.	Internal Quality Audit	Procedure not defined, audit not carried out, records not maintained, trained auditor not available.
2.	Safety policy	Authority, accountability, responsibility not defined, deficiency in appointment of key safety personnel.

3.	Documentation	Lack of training records, safety surveys, improper maintenance of records.
4.	Equipment calibration	Equipment not calibrated.
5.	Safety Risk Management (SRM)	Reporting culture, investigation not carried out, Safety Risk Assessment not carried out, Hazard Log not maintained.
6.	Workplace Manual	<ul style="list-style-type: none"> • Includes all company manuals, procedure/SOPs. • Manuals/documents out of date/obsolete, procedure poorly defined, Manual/documents not easily available.
7.	Flight Safety Documentation System (FSDS)	Nodal officer not nominated, lack of information dissemination.
8.	Safety promotion	Training not carried out, poor communication of safety information.
9.	Procedure	Non-compliance of agreed/ approved procedure by responsible person/ organisation, system not established as per requirement.
10.	Facility	Non-availability/ poor maintenance of Hanger, workshop, workspace.
11.	Emergency Response Plan (ERP)	Procedure not defined, periodic drills not carried out.
12.	Flight Data Monitoring(FDM)	Not carried out, Not analysed
13.	Safety Assurance	Voluntary reporting system, mandatory reporting system

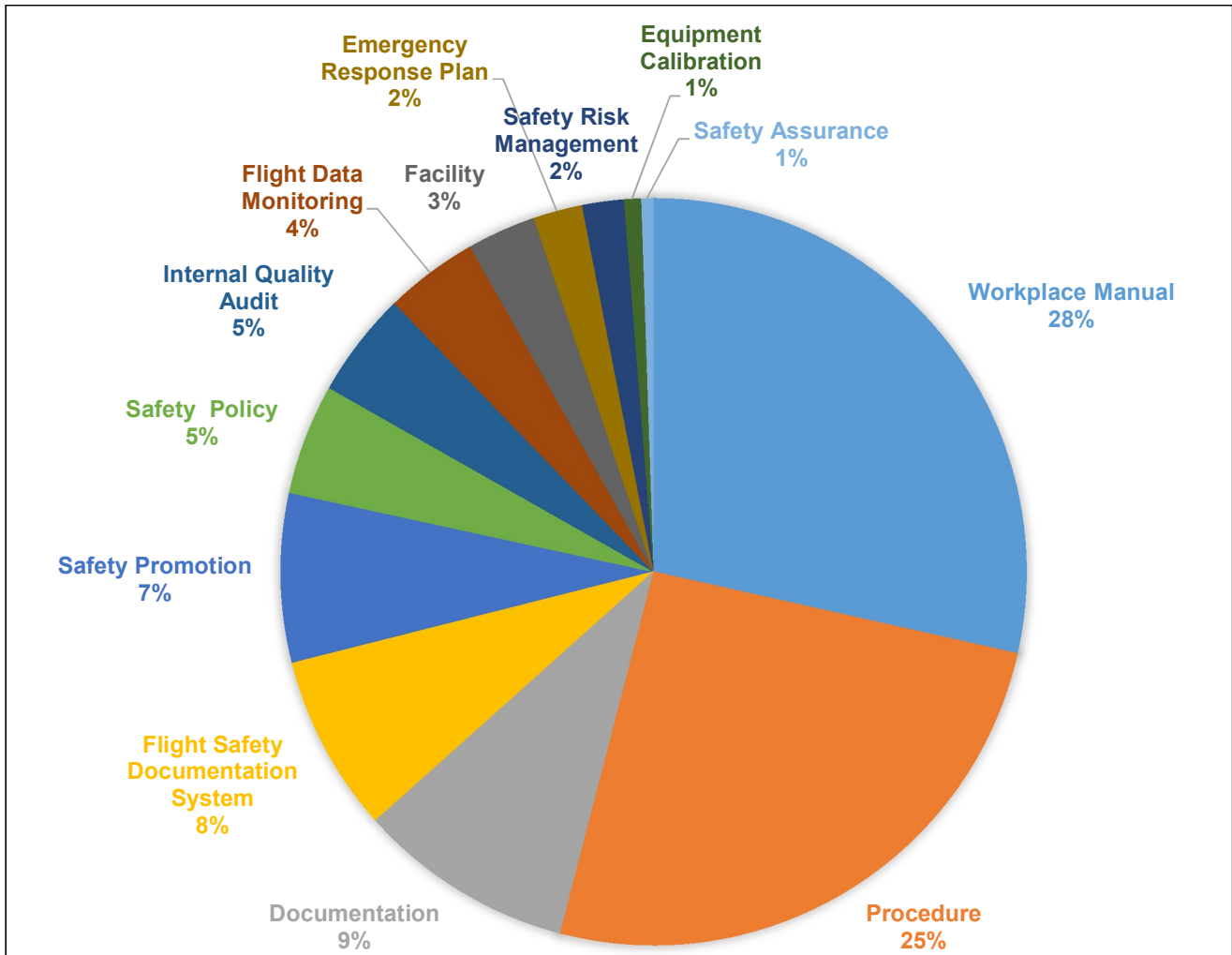


Fig 9.2

9.6 Areas of Safety Concern in Aerodrome

Aerodrome surveillance findings for the year 2018 have been analysed using following factors:

S. No.	Factor	Description of events involved
1.	Marking	Runway/taxiway markings, apron marking
2.	Procedure	Non-compliance of agreed/ approved procedure by responsible person/ organization, system not established as per requirement
3.	Obstacle	Obstacles not marked

4.	Workplace manual	<ul style="list-style-type: none"> • Includes all manuals, procedure/SOPs • Manuals/documents out of date/obsolete, procedure poorly defined., Manual/documents not easily available
5.	Foreign Object Debris(FOD)	FODs found on runway/taxiways
6.	Instrument calibration	Equipment not calibrated , Calibration not carried out, Equipment's unserviceable
7.	Aerodrome environment	Garbage near/inside the aerodrome, pond, wildlife activity, wall broken
8.	Documentation	Lack of training records, safety surveys
9.	Safety promotion	Training not carried out, poor communication of safety information
10.	Signage	Signage not available
11.	Surface condition	Runway/taxiway surface not proper like pot holes, pebbles, rubber deposit on runway
12.	Emergency Response Plan (ERP)	Procedure not defined, periodic drills not carried out
13.	Safety Policy	Authority, accountability, responsibility not defined, deficiency in appointment of key safety personnel
14.	Safety Risk Management (SRM)	Reporting culture, investigation not carried out, Safety Risk Assessment not carried out, Hazard Log not maintained
15.	Internal Safety Audit	Procedure not defined, audit not carried out, records not maintained, trained auditor not available
16.	Flight Safety Documentation System (FSDS)	Lack of information dissemination
17.	Security	Breach of security
18.	Lights	Airfield Ground Lighting (AGL) serviceability issue
19.	Maintenance	Pavement maintenance not carried out

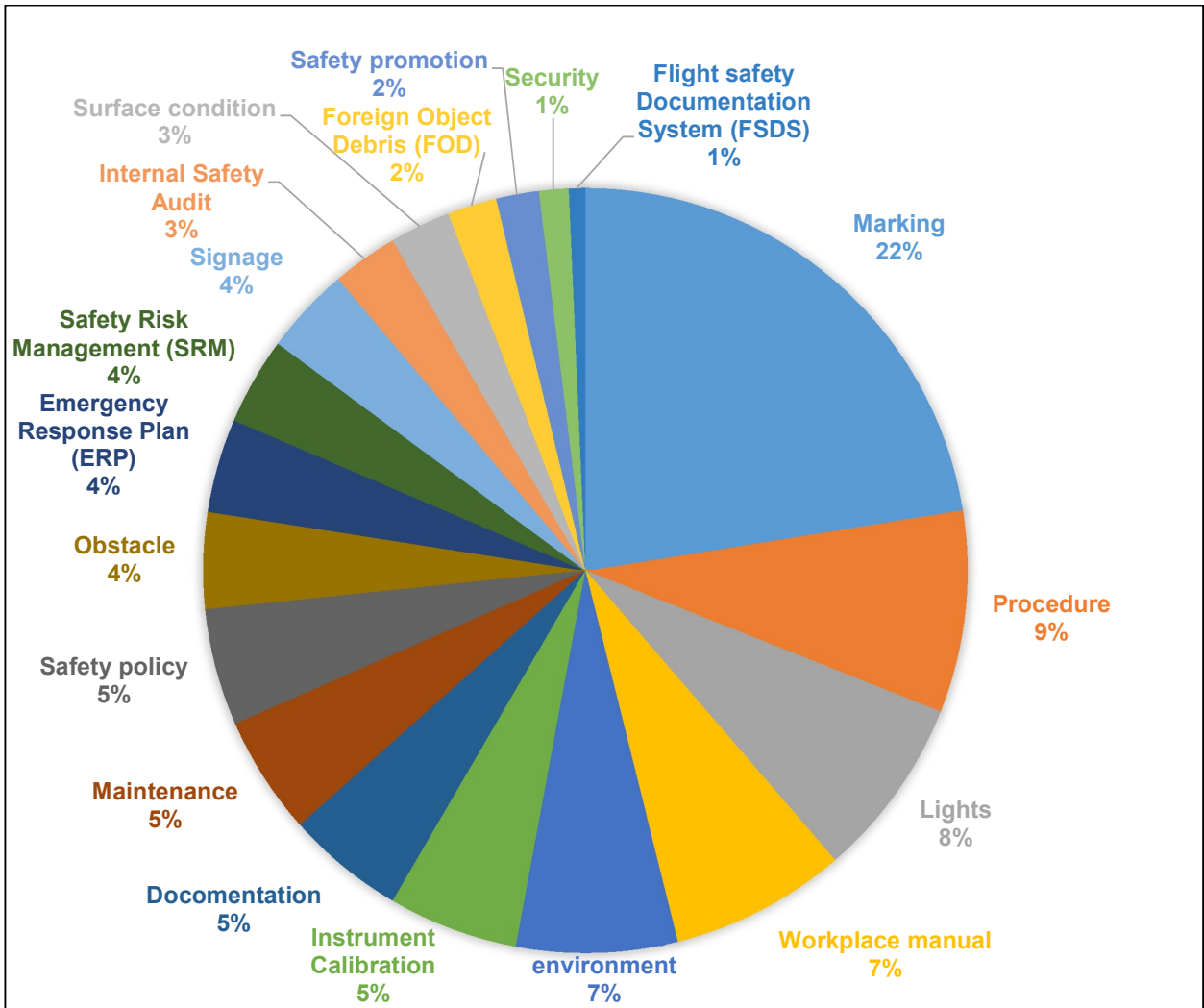


Fig 9.3

CHAPTER 10

State Safety Promotion



10.1 Collection of Safety Information

10.1.1 Mandatory Occurrence Reporting

CAR Section 5 Series C Part I on “Notification of Incidents and Investigations thereof” requires reporting of occurrences to DGCA and AAIB.

DGCA has established ECCAIRS (European Coordination Centre for Accident and Incident Reporting Systems) for the recording/reporting of occurrences. The system has become effective from January 2015 onwards, and the database format is compatible with the ICAO requirements. All the operators have been encouraged to report the occurrences in the ECCAIRS format.

The occurrence analysis has been carried out based on the data captured in ECCAIRS format and also the trends of various occurrences were discussed during the National Aviation Safety Team meetings with the stakeholders.

10.1.2 Voluntary/Confidential Reporting System

- “Voluntary Reporting System” has been established for the collection and analysis of the Voluntary Reports.
- This system enhances aviation safety through the collection of reports on actual or potential safety deficiencies that would otherwise not be reported through other channels.
- The voluntary reports were analysed and appropriate actions were taken to address the concern with the stakeholders.

10.2 Internal Training, Communication and Dissemination of Safety Information

- The DGCA has established appropriate Training Programme for its officers. Each individual's development and training needs including SSP/SMS is being assessed upon induction at DGCA by the Training Directorate. Both initial and recurrent training is provided to officials/inspectors. The trainings are being conducted at regular intervals as per the annual training programme developed by the Training Directorate in consultation with the concerned directorates.
- DGCA communicates and disseminates safety-relevant information within the DGCA through circulars, emails, DGCA website, DGCA intranet, Safety alerts, workshops, etc.

10.3 External Training, Communication and Dissemination of Safety Information

- DGCA communicates with stakeholders in many different ways. At a high level, safety is addressed in the MOCA's Annual Report. DGCA has developed a State Safety Plan which describes in more detail the high-level safety objectives and outline the DGCA's programme of work to achieve continuous safety improvement and is published on DGCA website.

- DGCA also provides/publishes guidance to support regulatory action in the form of case studies, circulars, public notices, seminars, meetings, etc.

10.4 Areas of Concern

10.4.1 Unstabilised Approaches which continue to land

- DGCA has adopted non punitive policy towards Go-Around. Still the unstabilised approaches which continue to land have increased in the year 2018 over the previous year. All such occurrences are being investigated and corrective actions are being applied.

10.4.2 Wildlife Hazard Management

- As part of the State Safety Programme, one of the most important State Safety Priority and another area of concern was identified as Wildlife (Bird/Animal) Strike to the aircraft. The wildlife strike data of all the airports has been analysed and categorized for mitigation actions by domain Directorate, and concerned airport. Due to efforts the SPI are within limits. However, it calls for the continuity of the efforts.

10.4.3 Airprox Incidents

- The overall Airprox incident rate for the year 2018 shows a downward trends as compared to previous year. However, the number of risk bearing Airprox have increasing trend. The major factor for Airprox incidents of the year 2018 is conflict detection /resolution and updation of the data. ANSP has been advised to take corrective actions

10.4.4 Runway Incursions

The number of incidents of runway incursions in India for the year 2018 have increased as compared to the previous year and also it has breached the target. The main cause of the runway incursion was loss of situational awareness by pilots, non-familiarization with aerodrome layout, followed by complicated airport design/ taxiway.

10.5 Way Forward

10.5.1 State Safety Oversight- Performance Based Oversight

- Indian aviation is in a state of continuous change. The aviation sector is one of the fastest growing in the world and service providers experiencing a number of operational, technical and financial challenges all of which can have an effect on safety. A key focus for the DGCA during the period of this Safety Plan will be on ensuring that it remains fit-for-purpose and continues to provide an appropriate and effective level of regulatory and safety oversight that balances needs of the industry, travelling public and the international community.

- DGCA will focus and provide training to the officers on the performance based oversight which focuses on achieving the desired performance. This will lead to a more active involvement and interaction of all players in managing the aviation safety system.

10.5.2 Progressive Adoption of Safety Culture

Adoption of an appropriate safety culture, which encourages reporting and helps to reduce risk across the aviation sector, is a challenge. Whilst the DGCA and many service providers (through their SMS) have initiated their own activities to develop a safety culture, it is likely to take a number of years before tangible benefits are realised. Therefore, DGCA aims at progressing the development of a safety culture amongst all service providers' staff, initially evidenced by increased reporting and a willingness to share more safety related information, and to develop a means of measuring the safety culture of an organisation.

10.5.3 Safety Management System Implementation by Operators

- As part of State Safety Programme and National Aviation Safety Plan, major operators have developed their Safety Performance Indicators and associated targets and alert levels, which are congruent with the State SSP aggregate safety Indicators and are also pertinent with the service provider's aviation activities. DGCA is in the process of accepting the SPIs with the associated targets and alert levels.
- Operators are encouraged to carry out safety risk assessments for any major change viz. operations to new airport, induction of new type of aircraft, etc.
- To standardise the preparation of the Safety management System Manual SSP Circular 02 of 2018 was issued. It provides detailed guidance material for the preparation of SMS manual.

10.5.4 Management of Operational Safety Risk

- A data driven comprehensive study will be carried out of unstabilised approaches which continued to land taking into consideration all the relevant factors.
- A data driven comprehensive study will be carried out for mitigating runway incursions at various airports
- Review of ATC routes and Airspace realignment for reduction of Airprox incidents.

GLOSSARY

Acronym	Definition
ADRM	Aerodrome
AGL	Airfield Ground Lighting
AIRPROX	Air Proximity incident
ALoS	Acceptable Level of Safety
AMAN	Abrupt Maneuver
ANSP	Air Navigation Service Provider
ARC	Abnormal Runway Contact
ATC	Air Traffic Control
ATM	ATM/CNS
AUW	All-Up-Weight
CAR	Civil Aviation Requirement
CICTT	CAST/ICAO Common Taxonomy Team
CFIT	Controlled Flight Into Terrain
CTOL	Collision With Obstacle(s) During Takeoff and Landing
DGCA	Directorate General of Civil Aviation
EGPWS	Enhanced Ground Proximity Warning System
FL	Flight Level
F-NI	Fire/Smoke (non-impact)
F-POST	Fire/Smoke (Post- Impact)
FTO	Flying Training Organisation
FUEL	Fuel Related
GCOL	Ground Collision
GPWS	Ground Proximity Warning System
ICAO	International Civil Aviation Organization
ICE	Icing
ICVM	ICAO Coordinated Validation Missions

LALT	Low Altitude Operations
LOC-I	Loss of Control-Inflight
LOC-G	Loss of Control-Ground
LVP	Low Visibility Procedure
MoCA	Ministry of Civil Aviation
MRO	Maintenance Repair and Overhaul
NSOPs	Non Scheduled Operator Permit
OTHR	Other
RA	Resolution Advisory
RAMP	Ground Handling
RE	Runway Excursion
RI-A	Runway Incursion- Animal
RI-VAP	Runway Incursion-Vehicle, Aircraft or Person
SARPs	Standard and Recommended Practices
SCF-NP	System/Component Failure or Malfunction(Non-Power Plant)
SCF-PP	System/Component Failure or Malfunction(Power Plant)
SMS	Safety Management System
SOPs	Standard Operating Procedures
SPI	Safety Performance Indicator
SSP	State Safety Programme
TCAS	Traffic Collision Avoidance System
TURB	Turbulence Encounter
UIMC	Unintended flight in IMC
USOAP	Universal Safety Oversight Audit Programme
USOS	Undershoot/overshoot
VFR	Visual Flight Rules
WSTRW	Windshear or Thunderstorm

LIST OF TABLES

Chapter 1

Table 1.1 Target Performance vs Achieved Performance - Airborne Conflict

Table 1.2 Target Performance vs Achieved Performance - CFIT

Table 1.3 Target Performance vs Achieved Performance - Runway excursions and overrun

Table 1.4 Target Performance vs Achieved Performance - Wildlife and Bird strikes

Table 1.5 Target Performance vs Achieved Performance - Loss of Control in Flight

Table 1.6 Target Performance vs Achieved Performance - Ground collision and Ramp Safety

Table 1.7 Target Performance vs Achieved Performance - Deficient Maintenance

Table 1.8 Target Performance vs Achieved Performance – Aviation Procedures & Documentation

Table 1.9 Number of Fatal Accident

Chapter 2

Table 2.1 World Wide Fatal Accidents 2008-2018

Table 2.2 Worldwide Fatal Accidents - Commercial Air Transport above 5700kgs

Chapter 3

Table 3.1 Indian Accidents 2008-2018

Table 3.2 Indian Commercial Air Transport Accidents above 5700kgs

Chapter 4

Table 4.1 Indian Helicopter Accidents for the year 2018

Table 4.2 Worldwide helicopter accident for the year 2018

Chapter 5

Table 5.1 Causative factors in FTO accident

Table 5.2 Indian NSOPs fixed wing aircraft accidents for the year 2018

Table 5.3 Accident to flying training organization accident for the year 2018

LIST OF FIGURES

Chapter 1

Fig 1.1 Performance of Airborne Conflict (Per million flights)

Fig 1.1(a) Risk bearing AIRPROX per 10,00,000 flights

Fig 1.1(b) TCAS/RA per 10,00,000 flights

Fig 1.1(c) Noncompliance with ATC instructions per 10,00,000 flights

Fig 1.1(d) ATC/System failure per 10,00,000 flights

Fig 1.2 Performance of CFIT

Fig 1.2(a) Helicopter emergency landing due to bad weather per 10,000 departures

Fig 1.2(b) GPWS/EGPWS Warning per 10,000 flights

Fig.1.3 Performance of Runway Excursion and Overrun (Per 10,000 approaches)

Fig 1.3(a) Unstabilised approach per 10,000 approaches

Fig 1.3(b) Unstabilised approaches that continued to land per 10,000 approaches

Fig 1.3(c) Unstabilised approaches when performing a precision approach per 10,000 approaches

Fig 1.3(d) Unstabilised approaches when performing a non-precision approach per 10,000 approaches

Fig 1.3(e) Unstabilised approaches when performing a visual approach per 10,000 flights

Fig 1.3(f) 'Near' Runway excursions per 10,000 approaches

Fig 1.3(g) Runway excursions per 10,000 approaches

Fig 1.4 Performance of wildlife & Birds Strike

Fig 1.4(a) Reported bird strikes per 10,000 movements

Fig 1.4(b) Reported wildlife strikes per day

Fig 1.4(c) Runway incursions by wildlife per day

Fig 1.5 Loss of control events per 10,000 departures

Fig 1.6 Performance of Ground Collision and Ramp Safety

Fig 1.6(a) Number of runway incursions (aircraft) per 10,00,000 movements

Fig 1.6(b) Number of runway incursions (vehicle) per 10,00,000 movements

Fig 1.6(c) Number of runway incursions (person) per 10,00,000 movements

Fig 1.6(d) Loss of situational awareness by pilots per 10,00,000 movements

Fig 1.6(e) Number of ramp incidents that result in damage to aircraft, vehicles, or loss of life/serious injury to personnel per 10,00,000 movements

Fig 1.7 Performance of Deficient Maintenance

Fig 1.7(a) Incidents involving component/system failures per 10,000 flight hours

Fig 1.7(b) Number of maintenance errors per 10,000 flight hours

Fig 1.8 Performance of Aviation Procedures & Documentation

Fig 1.9 Fatal Accidents

Chapter 2

Fig 2.1 World accidents with accidents rate per million departures (three year moving rate)

Fig 2.2 World fatal accident with fatal accidents rate per million departures (three year moving rate)

Chapter 3

Fig 3.1 Fatalities per Million Passenger Traveled

Fig 3.2 Comparison between World Accidents and Indian Accidents (Per million departures)

Fig 3.3 Accidents classification based on ICAO Taxonomy

Fig 3.4 Non-scheduled aircraft accident above 5700 Kgs

Chapter 4

Fig 4.1 Indian Helicopter accidents

Fig 4.2 Helicopter Accidents according to type of operations (2008-2018)

Fig 4.3 Helicopter Accidents Classification Based on ICAO Taxonomy

Chapter 5

Fig 5.1 Comparison of number of accidents

Fig 5.2 Accidents classification Based on ICAO Taxonomy-Aircraft under NSOP

Fig 5.3 General aviation

Fig 5.4 General aviation accidents operator wise

Fig 5.5 State government/BSF and Private aircraft accidents classification based on ICAO Taxonomy

Fig 5.6 Flying Training Organisation accidents (2008-2018)

Fig 5.7 FTO- Classification of accidents (2008-2018)

Fig 5.8 Type of flying (2008-2018)

Fig 5.9 Causative factor in accidents

Fig 5.10 Factors under action performed incorrectly

Fig 5.11 Flying Training Organisation aircraft accidents classification based on ICAO Taxonomy

Chapter 6

Fig 6.1 Total incidents per 10000 departures

Fig 6.2 Operational Incidents as per Phase of Flight

Fig 6.3 Fleet Wise Engineering Incident Analysis

Fig 6.4 Incident Classification as per CICTT Values

Chapter 7

Fig 7.1 Wildlife Strike

Fig 7.2 Wildlife analysis- Phase wise

Fig 7.3 Wildlife analysis (phase wise)

Fig 7.4 Wildlife Strike per 10000 Movements

Fig 7.5 Ground Incidents Data

Fig 7.6 Ground incidents per 10,000 departures

Fig 7.7 Runway Incursion

Fig 7.8 Causative factors for runway incursion

Chapter 8

Fig 8.1 Number of AIRPROX per Million Flights over Indian airspace

Fig 8.2 Factors causing AIRPROX - Year wise

Fig 8.3 AIRPROX incidents as per ECCAIRS Taxonomy

Fig 8.4 Top three ECCAIRS factors

Chapter 9

Fig 9.1 Overview of safety oversight

Fig 9.2 Analysis of regulatory audit findings

Fig 9.3 Analysis of aerodrome surveillance findings

