

HANDBOOK
ON
STATE SAFETY PLAN
2015-2016

Edition I

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FOREWARD

It gives me immense pleasure to communicate that India is steadily progressing towards the implementation of State Safety Programme established in the year 2010. To effectively monitor and control the aviation safety risks that India is facing, DGCA India has developed a process for measuring the risks and is working with the major stakeholders to develop a safety plan to mitigate these identified risks.

This handbook illustrates the aviation safety risks identified by the DGCA India, in terms of the Safety Performance Indicators. Targets have been specified for the subsequent years in comparison to the performance of these indicators in the year 2013. The safety plan developed to achieve these targets have also been included. Through the continuous monitoring of Safety Performance Indicators, the effectiveness of the safety plan will be evaluated. It will provide a room for further improvement and optimising the safety plan.

This also exhibits a strong resolve of India in implementing the ICAO SARPS and giving the safety of aircraft operation prime importance.

I appreciate the sincere and tireless efforts of the DGCA Safety Team in managing the State Safety Programme and achieving this goal.



(Dr. Prabhat Kumar)
Director General Civil Aviation

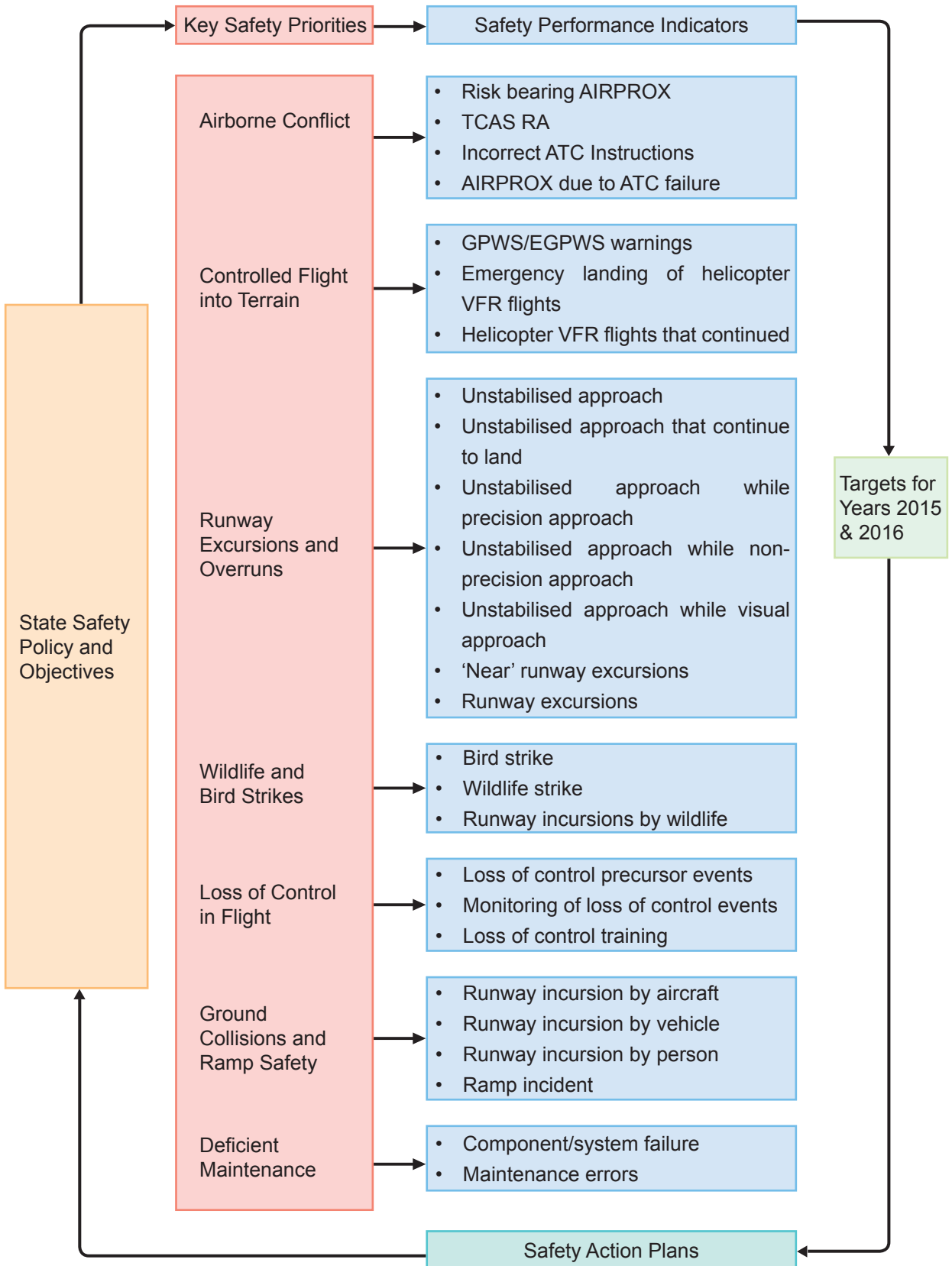
OVERVIEW

The State Safety Plan 2015-2016 is an outcome of some of the activities described in the State Safety programme (SSP) and the work undertaken by stakeholders in the development and implementation of their Safety Management System (SMS). It has been developed in partnership with the service providers and sets out the States' **safety priorities, objectives, safety performance indicators** and associated **action plans** with the sole aim of further improving safety across the civil aviation industry.

Our Key Safety Priorities

- Airborne conflict
- Controlled flight into terrain
- Runway excursions and overruns
- Wildlife and bird strikes
- Loss of control in flight
- Ground collisions and ramp safety
- Deficient maintenance

DIAGRAMMATIC PRESENTATION OF STATE SAFETY PLAN



SAFETY OBJECTIVES & SAFETY RISK CONTROLS

Safety Objective (s) of Key Safety Priorities	
SO1.1	Reduce the risk of airborne conflict
SO2.1	Reduce the risk of CFIT events
SO3.1	Reduce the number of runway excursions
SO4.1	Reduce the number of wildlife strikes (ground)
SO4.2	Reduce the number of bird strikes
SO5.1	Reduce the number of loss of control precursor events
SO6.1	Reduce the number of ground collisions between aircraft
SO6.2	Reduce the number of ground collisions between aircraft and vehicles
SO6.3	Reduce the number of ramp fatalities and serious injuries
SO6.4	Reduce the number of runway incursions
SO7.1	Improve the airworthiness of Indian registered passenger carrying aircraft
State Safety Risk Controls	
SO8.1	Establish and maintain an appropriate regulatory framework and approach to ensure effective oversight
SO8.2	Comply with international safety standards
SO8.3	Prepare for the transition to a risk-based approach for regulatory oversight
SO8.4	All 'priority' service providers to have fully implemented SMS
SO8.5	All other applicable service providers to have fully implemented SMS (where required to do so)
SO8.6	Service providers to develop an appropriate organisation safety culture
SO8.7	To be able to effectively measure safety culture maturity

SUMMARY OF SPIs AND TARGETS

SPI	Indicator	Actual 2013	Target 2015	Target 2016
<i>1. Airborne Conflict</i>				
1.1	Number of risk bearing AIRPROX per 10,00,000 flights over Indian airspace	1.61	1.53	1.45
1.2	Number of TCAS RA in controlled airspace leading to breach of separation per 10,00,000 flight over Indian airspace	12.33	11.71	11.12
1.3	Number of aircraft not or incorrectly complying with ATC instructions (including level bust) per 10,00,000 flights over Indian airspace	5.89	5.60	5.32
1.4	Number of AIRPROX attributable to ATC/system failure per 10,00,000 flights over Indian airspace	9.65	9.16	8.71
<i>2. Controlled Flight into Terrain</i>				
2.1	Number of GPWS/EGPWS warnings (scheduled airlines) per 10,000 departures	0.076	0.072	0.068
2.2	Number of helicopter VFR flights that make emergency landing due to degraded visual environment per 10,000 departures	0.97	0.92	0.87
<i>3. Runway Excursions and Overruns</i>				
3.1	Number of unstabilised approaches per 10,000 approaches	10.01	9.51	9.03
3.2	Number of unstabilised approaches that continue to land per 10,000 approaches	1.35	1.28	1.22
3.3	Number of unstabilised approaches when performing a precision approach per 10,000 approaches	5.24	4.98	4.73
3.4	Number of unstabilised approaches when performing a non-precision approach (no vertical guidance) per 10,000 approaches	1.64	1.56	1.48
3.5	Number of unstabilised approaches when performing a visual approach per 10,000 approaches	3.13	2.97	2.82
3.6	Number of 'near' runway excursions per 10,000 approaches	0.045	0.042	0.039
3.7	Number of runway excursions per 10,000 approaches	0.076	0.072	0.068

SPI	Indicator	Actual 2013	Target 2015	Target 2016
4. Wildlife and Bird Strikes				
4.1	Number of reported bird strikes at Indian airports per 10,000 movements (movements only for 18 major airports in India)	4.92	4.68	4.44
4.2	Number of reported wildlife strikes at all Indian airports per day	2.01	1.99	1.89
4.3	Number of runway incursions by wildlife at all Indian airports per day	0.079	0.075	0.071
5. Loss of Control in Flight				
5.1	Loss of control precursor events per 10000 departures: <ul style="list-style-type: none"> • Actual stick-shake and alpha floor • Low speed during approach events • Low speed during cruise events • Bank angle exceeding (maximum permitted) as per AFM for aircraft type • Windshear below 500 feet 	2.71	2.58	2.45
5.2	Proportion of aircraft operators that actively monitor loss of control precursor measures (Only Scheduled operators)	66%	100%	100%
5.3	Number of operators that have implemented loss of control training	100%	100%	100%
6. Ground Collisions and Ramp Safety				
6.1	Number of runway incursions (aircraft)	(18)	(15)	(12)
6.2	Number of runway incursions (vehicle)	(2)	(1)	(0)
6.3	Number of runway incursions (person)	(5)	(4)	(3)
6.4	Number of ramp incidents that result in damage to aircraft, vehicles or loss of life/serious injury to personnel	(44)	(42)	(40)
7. Deficient Maintenance				
7.1	Incidents involving component/system failure	(419)	(398)	(378)

SPI	Indicator	Actual 2013	Target 2015	Target 2016
7.2	Number of maintenance errors <ul style="list-style-type: none"> <li data-bbox="243 297 815 369">i. Failure to follow published technical data or local instructions <li data-bbox="243 378 815 450">ii. Using unauthorized procedure not referenced in technical data <li data-bbox="243 459 815 571">iii. Supervisor/staff failure to follow maintenance instructions and approved data <li data-bbox="243 581 815 653">iv. Failure to document maintenance task properly in maintenance records <li data-bbox="243 662 815 695">v. Inadequate/unrecognised maintenance <li data-bbox="243 705 815 776">vi. Incorrectly installed hardware on aircraft/engine <li data-bbox="243 786 815 857">vii. Performing unauthorized modification on the aircraft <li data-bbox="243 867 815 938">viii. Failure to conduct a tool inventory after completion of the task <li data-bbox="243 948 815 1020">ix. Personnel not trained or certified to perform the task <li data-bbox="243 1029 815 1101">x. Ground support equipment improperly positioned for the task 	(23)	(22)	(21)

Note: (Absolute values are in bracket)

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SAFETY CONTEXT

1.1 State Safety Programme

The Indian State Safety Programme (SSP) was initially published in November 2010 to meet the requirements of ICAO Annex 19.

The SSP is an integrated set of regulations and activities describing as to how India manages and seeks the continuous improvement in aviation safety. The SSP recognises that States as well as service providers have safety responsibilities and provides a framework for all stakeholders to work together.

1.2 Safety Management System

Safety management principles provide a platform for parallel development of the SSP by the State and the Safety Management System (SMS) by its service providers. In developing the State Safety Legislative Framework, India has promulgated SMS requirements requiring that service providers implement their safety management capabilities allowing for the effective identification of systemic safety deficiencies and the resolution of safety concerns.

SMS is a largely performance-based system requiring the appropriate exchange of safety information with internal and external stakeholders. The State, through its SSP functions, provides both the oversight functions and facilitates implementation of appropriate data aggregation and information sharing initiatives.

1.3 Safety Indicators and Targets

Safety indicators are tactical monitoring and measurement tools of the State's safety performance. During the initial development and implementation of the SSP, the level of safety performance is normally represented by safety indicators related to high consequence outcomes (such as accident and serious incident rates) and high-level system assessment outcomes (such as effective implementation of ICAO SARPs). As the SSP matures, the level of safety performance can be complemented by indicators representing lower consequence system outcomes or deviation events. Safety Performance Indicators (SPI) are generally monitored using basic quantitative data trending tools that generate graphs or charts and incorporate alert/target levels commonly used in technical, quality or reliability control systems.

Targets define long-term SSP safety performance objectives. They are expressed in numerical terms and must be concrete, measurable, acceptable, reliable

and relevant. Targets also need to contain completion dates with milestones if it is to be achieved in phases or over an extended period of time. Targets provide a measurable way of ensuring and demonstrating the effectiveness of SSP.

Our desired safety outcome is to reduce number of reported events for each SPI by 5% every year.

1.4 The State Safety Plan 2015-2016

The State Safety Plan 2015-2016 is an outcome of some of the activities described in the SSP and the work undertaken by the stakeholders in the development and implementation of their SMS. It has been developed in partnership with service providers and sets out the States' **safety priorities, objectives, safety performance indicators** and associated **action plans** with the sole aim of further improving safety across the aviation industry.

OUR SAFETY FOCUS

2.1 State Safety Priorities

DGCA is targeting following **State Safety Priorities**, which have been identified based on our experience, supported by data from the State safety database and global trend:

- *Airborne conflict*
- *Controlled flight into terrain*
- *Runway excursions and overruns*
- *Wildlife and bird strikes*
- *Loss of control in flight*
- *Ground collisions and ramp safety*
- *Deficient maintenance*

This will be the focus area for the DGCA and the civil aviation community during the year 2015 and 2016.

For each **State Safety Priority**, we have developed **safety objectives** with **desired safety outcome**, **Safety Action Plan** and a number of **Safety Performance Indicators (SPIs)**, which have been explained in more detail in Sections 3 and 4.

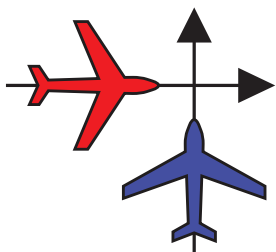
The Target date for the implementation of Safety Action Plan developed for each of the above safety priorities is 31 Oct 2015 unless stated otherwise.

2.2 Monitoring Effectiveness of Safety Risk Controls

In addition to focusing on State Safety Priorities, it is important that we measure and continuously improve the effectiveness of the key State risk controls. Our focus for 2015 and 2016 will be on ensuring the following:

- *Appropriate State safety oversight;*
- *Implementation of service providers' Safety Management System;*
- *Implementation of recommendations emanating from accidents, serious incidents and AIRPROX events; and*
- *Progressive adoption of aviation safety culture.*

STATE SAFETY PRIORITIES



3.1 SP1: Airborne Conflict

Whilst technology has helped reduce the number of actual airborne collisions, even a single event can cause huge loss of life. This undermines confidence in Indian aviation and, in turn, will impact the Indian economy as a whole.

Table 3.1-SP1 Safety Measures Already in Place

DGCA References	Safety Measures Already in Place
CAR Section 2, Series I, Part VIII	ACAS is mandatory for all operators operating air transport services to, through within and over flying Indian airspace
Operations Circular 07 of 2010	Guidance material published on ACAS performance based training
Operations Circular 07 of 2010	Promotion of the use of simulators and interactive CBT for ACAS training

The **safety objective** (SO1.1) is to reduce the risk of airborne conflict occurring through tracking and actively managing events that can lead to a collision.

Safety Action Plan:

Table 3.2-SP1 Safety Objectives

Safety objective(s)	Action	Stakeholder(s)
SO1.1: Reduce the risk of airborne conflict	a. All air operators shall provide training to relevant staff that includes: <ul style="list-style-type: none"> i. Detailed classroom sessions on TCAS including limitations of RA for the pilots and ATCOs (especially close to the ground) ii. CRM training for pilots with specific emphasis on situational awareness with respect to traffic iii. Follow standard departure, arrival and route procedures 	1. Air Operators 2. ANS Provider

Safety objective(s)	Action	Stake holder(s)
	b. Availability of booklet containing TCAS procedure for reference c. Regular proficiency check and structured refreshers for ATCOs	

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 3.3-SPI SPIs

SPI	Metrics	Reported in 2013
1.1	Number of risk bearing AIRPROX per 10,00,000 flights over Indian airspace	1.61
1.2	Number of TCAS RA in controlled airspace leading to breach of separation per 10,00,000 flight over Indian airspace	12.33
1.3	Number of aircraft not or incorrectly complying with ATC instructions (including level bust) per 10,00,000 flights over Indian airspace	5.89
1.4	Number of AIRPROX attributable to ATC/system failure per 10,00,000 flights over Indian airspace	9.65

3.2 SP2: Controlled Flight into Terrain



Controlled Flight into Terrain (CFIT) events are one of the most common causes of accidents. Whilst technology has made certain amount of intervention, however, this is still a key area of concern for scheduled, non-scheduled fixed-wing and helicopter operations.

CFIT accidents are caused due to lack of flight crew vertical/horizontal position awareness in relation to ground, water or obstacle. More than two-thirds of all CFIT accidents have occurred due to the result of altitude error or lack of vertical situational awareness. The CFIT accidents also occur during reduced visibility associated with instrument meteorological conditions, darkness or a combination of both the conditions.

MSAWS alerts the air traffic controller with both visual and aural alarms when an airplane penetrates, or is predicted to penetrate, a predetermined MSA in the protected terminal area. The GPWS warning is normally the flight crew’s last opportunity to avoid CFIT. Incidents and accidents have occurred because flight crew have failed to make timely and corrective action in response to the GPWS warnings.

Table 3.4-SP2 Safety Measures Already in Place

DGCA References	Safety Measures Already in Place
CAR Section 2, Series I, Part VII	Implementation of ICAO Standards for installation of GPWS equipment
Operations Circular 04 of 2010 & Operations Circular 01 of 2003	Developing standards to require air operators to ensure flight crew receive initial and recurrent Approach and Landing Accidents (ALA) and CFIT prevention training
Air Safety Circular 09 of 2013	Non-punitive policy towards helicopter pilots who decided to abort the mission and carryout safe forced landing due to deteriorating weather conditions

The safety objective (SO2.1) is to further reduce the risk of CFIT events occurring through tracking and actively managing events that can lead to a collision.

Safety Action Plan:

Table 3.5-SP2 Safety Objective

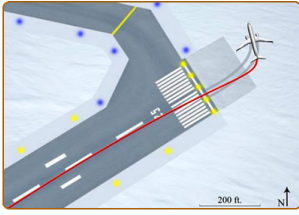
Safety objective(s)	Action	Stake holder(s)
SO2.1: Reduce the risk of CFIT events	<ul style="list-style-type: none"> a. Emphasize, monitor and enforce pilots to carry out instrument approaches, follow all stabilized approach criteria and SOPs for approach and landing b. Specialized CFIT awareness programmes, through ALAR Tool kit and training films with correlation of similar incidents c. Training modules covering situational awareness, standard phraseology, adherence to checklists, altimeter settings and availability of serviceable landing aids, terrain specific warnings e.g. EGPWS/GPWS d. Analysis and follow-up of EGPWS events e. Assessments during Line checks f. Helicopter operations, provision for improved MET forecast even at uncontrolled airfields g. Strict monitoring and enforcement of MET minima 	<ul style="list-style-type: none"> 1. Air Operators 2. Indian MET Dept

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 3.6-SP2 SPIs

SPI	Metrics	Reported in 2013
2.1	Number of GPWS/EGPWS warnings (scheduled airlines) per 10,000 departures	0.076
2.2	Number of helicopter VFR flights that make emergency landing due to degraded visual environment per 10,000 departures	0.97

3.3 SP3: Runway Excursions and Overruns



Globally, runway excursions and overruns are the cause of more accidents and serious incidents than any other single cause. Both remain a significant problem in India, particularly during the monsoon season.

Table 3.7-SP3 Safety Measures Already in Place

DGCA References	Safety Measures Already in Place
CAR Section 2, Series I, Part VII	Implementation of ICAO Standards for installation of GPWS equipment
Operations Circular 04 of 2010 & Operations Circular 01 of 2003	Developing standards to require air operators to ensure flight crew receive initial and recurrent Approach and Landing Accidents (ALA) and CFIT prevention training
Operations Circular 01 of 2013	Non-punitive policy towards pilots who decide to go around

The **safety objective** (SO3.1) is to reduce number of runway excursions at all India airports and at all times of the year.

Safety Action Plan:

Table 3.8-SP3 Safety Objective

Safety objective(s)	Action	Stakeholder(s)
SO3.1: Reduce the number of runway excursions	a. All air operators shall provide a training module to includes: i. CRM class: <ul style="list-style-type: none"> Increased emphasis on coordination between two pilots with respect to traffic clearances given by ATC 	Air Operators

Safety objective(s)	Action	Stakeholder (s)
	ii. Flight Safety Class: <ul style="list-style-type: none"> • Causes of runway excursions • Increased emphasis on situational awareness with respect to traffic on approach/departures/taxiing on runways iii. Simulator training: <ul style="list-style-type: none"> • On performance limited airfields • Stabilized approaches • Training on cross-wind landings to a level required for operations b. Continuous periodic monitoring through route/ in-flight checks	

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 3.9-SP3 SPIs

SPI	Metrics	Reported in 2013
3.1	Number of unstabilised approaches per 10,000 approaches	10.01
3.2	Number of unstabilised approaches that continue to land per 10,000 approaches	1.35
3.3	Number of unstabilised approaches when performing a precision approach per 10,000 approaches	5.24
3.4	Number of unstabilised approaches when performing a non-precision approach (no vertical guidance) per 10,000 approaches	1.64
3.5	Number of unstabilised approaches when performing a visual approach per 10,000 approaches	3.13
3.6	Number of 'near' runway excursions per 10,000 approaches	0.045
3.7	Number of runway excursions per 10,000 approaches	0.076

3.4 SP4: Wildlife and Bird Strikes



Wildlife and bird strikes pose a significant threat to flight safety and have caused a number of accidents, including incidents in India. Most incidents occur at the critical phase of flight resulting into structural damage, as well as damage to aircraft systems. As such, both wildlife and bird strikes remain a major focus for the DGCA.

Table 3.10-SP4 Safety Measures Already in Place

DGCA References	Safety Measures Already in Place
Order No. AV-15023/1/2009-AS (NBCC) dated 02.12.2013	National Bird Control Committee
Ministry of Home Affairs Letter No. 53/1/80-Public dated 07.05.1980	Airfield Environment Management Committees
Rule 91, Aircraft Rules 1937	Primary legislation (Aircraft Rules) preventing dumping of garbage and de-skinning of animals within a 10 km radius around airport
Recommendation of NBCC	Education and outreach programmes
Recommendation of NBCC	Extensive audits and inspections
Air Safety Circular 02 of 2011	Comprehensive data collection activities

The **safety objectives** (SO4.1 and 4.2) are to reduce the number of wildlife and bird strike events at Indian airports.

Safety Action Plan:

Table 3.11-SP4 Safety Objectives

Safety objective(s)	Action	Stakeholder(s)
SO4.1: Reduce the number of wildlife strikes (ground)	a. Reiterate generation of pilot reports on wildlife sighting b. Awareness campaign in localities and schools regarding wildlife hazards	1. Air Operators 2. Aerodromes Operators
SO4.2: Reduce the number of bird strikes		

Safety objective(s)	Action	Stakeholder(s)
	<ul style="list-style-type: none"> c. Dedicated team managed by trained staff to ensure implementation of wildlife strike control measures d. Review of existing mitigation action and identify the areas of improvement with airport management e. Appraise administration of all the State Government, through communication to the Chief Secretaries of the States on the importance of compliance of Rule 91 of the Aircraft Rules 1937 f. Instruct management of all airports to take effective steps for mitigation of wildlife hazard 	

Implementation this Safety Action Plan is a countinuous process.

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 3.12-SP4 SPIs

SPI	Metrics	Reported in 2013
4.1	Number of reported bird strikes at 18 major Indian airports per 10,000 movements	4.92
4.2	Number of reported wildlife strikes at all Indian airports per day	2.01
4.3	Number of runway incursions by wildlife at all Indian airport per day	0.079

3.5 SP5: Loss of Control in Flight



Loss of control can be caused by many events, such as system or component failure, aircraft damage or even severe weather. However, the most significant secondary cause of accidents resulting from a loss of control relates to ‘control upset’ either induced by the pilot and/or when operating at low altitude, such as final approach and landing.

Table 3.13-SP5 Safety Measures Already in Place

DGCA References	Safety Measures Already in Place
Operations Circular 03 of 2011	Guidance material for training of pilots in high altitude and high speed flights
CAR Section 5, Series F, Part-II	100% Flight Data Monitoring by the operators

The **safety objective** (SO5.1) is to reduce the number of loss of control pre-cursor events.

Safety Action Plan:

Table 3.14-SP5 Safety Objective

Safety objective(s)	Action	Stakeholder(s)
SO5.1: Reduce the number of loss of control pre-cursor events	<ul style="list-style-type: none"> a. All air operators shall provide a training module (i.e. initial and recurrent) to include: <ul style="list-style-type: none"> i. Upset recovery and preventive training ii. Assessment/ detection of windshear iii. Practise of stall recovery in landing configuration during approach with emphasis on speed control and thrust management (simulator training) iv. Training for high altitude operation including speed management, knowledge of buffet margins, high altitude stall recovery 	Air Operators

Safety objective(s)	Action	Stakeholder (s)
	b. Emphasis on stabilised approaches c. Laying down max. bank angle limits, monitoring of EGPWS call-outs in SSFDR and subsequent analysis of bank angle exceedences d. SOP to handle windshear during take-off and landing	

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 3.15-SP5 SPIs

SPI	Metrics	Reported in 2013
5.1	Loss of control precursor events per 10,000 departures: <ul style="list-style-type: none"> • Actual stick-shake and alpha floor • Low speed during approach events • Low speed during cruise events • Bank angle exceeding (maximum permitted) as per AFM for aircraft type • Windshear below 500 feet 	2.71 0.15 0.15 0 1.99 0.41
5.2	Proportion of aircraft operators that actively monitor loss of control precursor measures (only scheduled operator)	66%
5.3	Number of operators that have implemented loss of control training	100%

3.6 SP6: Ground Collisions and Ramp Safety



Ground collisions also result into numerous serious incidents. There was one reported fatality and numerous injuries in 2013, as such this remains one of the DGCA's safety priorities.

Table 3.16-SP6 Safety Measures Already in Place

DGCA References	Safety Measures Already in Place
CAR Section 4, Series X, Part IV	Establishing of Runway Safety Teams at licensed airport
Air Safety Circular 04 of 2007	Guidance material issued for safety on the apron

The **safety objectives** (SO6.1, 6.2, 6.3 and 6.4) are 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.

Safety Action Plan:

Table 3.17-SP6 Safety Objectives

Safety objective(s)	Action	Stakeholder(s)
SO6.1: Reduce the number of ground collisions between aircraft	a. Airlines and airport operators shall ensure training of vehicle drivers to follow speed control and know the sensitive areas	1. Air Operators 2. Airport Operators
SO6.2: Reduce the number of ground collisions between aircraft and vehicles	b. Airport operators shall introduce and ensure the effective utilisation of ATC ground surveillance at all high density airports	3. ANS Providers
SO6.3: Reduce the number of ramp fatalities and serious injuries	c. Airport operators shall introduce training to ATCOs on prevention of runway incursions d. Improved signage in accordance with ICAO SARPs	

Safety objective(s)	Action	Stakeholder(s)
SO6.4 Reduce the number of runway incursions	<ul style="list-style-type: none"> e. Airport operators shall introduce Breathe Analyzer tests for all drivers & equipment operators on airport premises f. Operators shall review existing taxing and towing procedures and update them to include: <ul style="list-style-type: none"> i. Adherence to SOPs on ramp ii. Adherence to SOPs for towing/taxiing iii. Utilization of wing walkers during pushback/taxi in/out g. All air operators shall develop training program to include: <ul style="list-style-type: none"> i. Increased alertness levels amongst crew while taxiing ii. Following correct taxiways and speed limits iii. Clear and unambiguous RT between aircraft and ATC iv. Meticulous adherence to ground markings and awareness of works in progress at an airfield h. Intermediate holding position marking and lights at all high density airports i. All airport operators shall develop and introduce procedures to significantly reduce vehicular movements on the manoeuvring area during LVP/bad weather 	

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 3.18-SP6 SPIs

SPI	Metrics	Reported in 2013
6.1	Number of runway incursions (aircraft)	18
6.2	Number of runway incursions (vehicle)	2
6.3	Number of runway incursions (person)	5
6.4	Number of ramp incidents that result in damage to aircraft, vehicles or loss of life/serious injury to personnel	44

3.7 SP7: Deficient Maintenance



There are currently a large proportion of incidents that occur as a result of component failure. Understanding and addressing these is a key safety priority during this period.

Table 3.19-SP7 Safety Measures Already in Place

DGCA References	Safety Measures Already in Place
CAR M & CAR 145	Component failure
	Maintenance errors

The **safety objective** (SO7.1) is to improve the maintenance of Indian registered passenger carrying aircraft, thereby reducing the number of incidents relating to maintenance issues.

Safety Action Plan:

Table 3.20-SP7 Safety Objective

Safety objective(s)	Action	Stakeholder(s)
SO7.1: Improve the airworthiness of Indian registered passenger carrying aircraft	<ul style="list-style-type: none"> a. Review of qualifying requirements for licensing of technical personnel due to advancement of technology b. DGCA, with the support of relevant service providers, shall develop programmes to encourage voluntary reporting in technical work through a non-punitive approach c. Integration of avionic system training along with other airframe/ engine system d. Improve the qualifying requirement of senior technicians 	<ul style="list-style-type: none"> 1. DGCA 2. Air Operators

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 3.21-SP7 SPIs

SPI	Metrics	Reported in 2013
7.1	Incident involving component/system failure	419
7.2	Number of Maintenance errors	23
	i. Failure to follow published technical data or local instructions	10
	ii. Using unauthorized procedure not referenced in technical data	0
	iii. Supervisor/staff failure to follow maintenance instructions and approved data	0
	iv. Failure to document maintenance task properly in maintenance records	01
	v. Inadequate/unrecognised maintenance	06
	vi. Incorrectly installed hardware on an aircraft/engine	03
	vii. Performing unauthorized modification on the aircraft	0
	viii. Failure to conduct a tool inventory after completion of the task	0
	ix. Personnel not trained or certified to perform the task	0
	x. Ground support equipment improperly positioned for the task	03

SAFETY RISK CONTROLS

In addition to focusing on the State safety priorities, effectiveness of the key State risk controls will also be actively monitored.

4.1 Appropriate State Safety 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 are 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.

The key **safety objectives** (SO8.1-8.3) and our proposed **action plan** are summarised below:

Table 4.1-Key Safety Objectives

Safety objective(s)	Action	Stakeholder (s)	Target date
SO8.1: Establish and maintain appropriate regulatory framework and approach to ensure effective oversight	DGCA shall conduct periodic reviews of all regulations to ensure applicability and compliance with best practice	DGCA	On-going
	DGCA shall develop new regulations in consultation with relevant service providers	1. DGCA 2. Service providers	On-going
SO8.2: Comply with international safety standards	DGCA shall routinely assess itself against ICAO and other requirements to ensure ongoing compliance	DGCA	On-going
SO8.3: Prepare for transition for a risk based approach for regulatory oversight	DGCA shall establish necessary processes to ensure availability and quality of data to enable it to progressively transition to risk-based approach for regulatory oversight	1. DGCA 2. Service providers	31 Oct 2015

4.2 Effective Safety Management System

Service providers also have an important role to play in ensuring an acceptable level of safety. Effective SMS helps improve the overall safety performance of a service provider, which will eventually lead to improvement of overall safety performance of the State as a whole.

CAR on SMS requires service providers to have an effective SMS, however, the progress in implementing and the effectiveness of the SMS itself inevitably differs between organisations. In the last two years, DGCA has been focusing on the larger ‘priority’ stakeholders, including scheduled commercial airlines, cargo operators, airports, etc. In 2014-2015, NSOPs, MROs, design and production organisations are also in the focus of DGCA for SMS implementation.

The safety objectives (SO8.4 and 8.5) are for 100% of ‘priority’ service providers and at least 80% of all other applicable service providers to have fully implemented their SMS by December 2015 and 2016 respectively.

Safety Action Plan:

Table 4.2-Effective Safety Management Systems - Action Plan

Safety objective(s)	Action	Stakeholder(s)	Target date
SO8.4: Number of ‘priority’ service providers that have completed the implementation of SMS (as a percent of the total number) i.e.scheduled operators, aerodrome operators and ANS service providers	DGCA shall formally assess the progress of each ‘priority’ service provider and provide guidance in order to achieve full compliance	1. DGCA 2. ‘Priority’ service providers	31 Dec 15

Safety objective(s)	Action	Stakeholder(s)	Target date
SO8.5: Number of other applicable service providers that have completed the implementation of SMS (as a percent of the total number) i.e. NSOPs, MROs and aircraft design & production organizations	DGCA shall provide all applicable service providers with initial guidance and follow-up with an assessment of their progress and provide additional direction as necessary	1. DGCA 2. Service providers	31 Dec 16

4.3 Progressive Adoption of Aviation 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, the final safety objectives in this area (SO8.6 and 8.7), are aimed 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.

Safety Action Plan:

Table 4.3-Aviation Safety Culture - Action Plan

Safety objective(s)	Action	Stakeholder(s)	Target date
SO8.6: Service providers will develop an appropriate organisation safety culture	DGCA shall provide guidance to all service providers	DGCA	On going
	Service providers shall develop and implement safety promotion and plan for all staff	'Priority' service providers	31 Dec 2015
		Others service providers	31 Dec 2016

Safety objective(s)	Action	Stakeholder(s)	Target date
SO8.7: To be able to effectively measure safety culture maturity	a. DGCA, while working with other stakeholders shall develop a means to measure and assess safety culture maturity b. ICAO checklist for assessment of safety culture will be used	DGCA	31 Dec 15

The effectiveness of actions will be assessed by tracking the following SPIs:

Table 4.4-Aviation Safety Culture - SPIs to be Tracked

SPI	Indicator	Actual 2013	Target 2015	Target 2016
8.1	Number of MORs received	3347	4020	4824
8.2	Number of voluntary or confidential reports received through State Voluntary Reporting System	12	14	17

4.4 Safety Management System Implementation by Operators

Following performance indicators (Table 4.5) will be monitored in future for which relevant data is being collected.

Table 4.5

SPI	Indicator
9.1	Number of 'priority' service providers that have completed the implementation of their SMS i. Scheduled operators ii. Aerodrome operators iii. ANS service providers
9.2	Number of other applicable service providers that have completed the implementation of their SMS a. NSOPs b. MROs c. Aircraft design & production organizations d. Flying training organizations

GLOSSARY

Acronym	Definition
ACAS	Airborne Collision Avoidance System
AFM	Airplane Flight Manual
AIRPROX	Air Proximity incident
ALA	Approach and Landing Accidents
ALAR	Approach and Landing Accidents Reduction
ANS	Air Navigation Service
ATC	Air Traffic Control
ATCO	Air Traffic Control Officers
CAR	Civil Aviation Requirement
CBT	Computer Based Training
CFIT	Controlled Flight Into Terrain
CRM	Crew Resource Management
DGCA	Directorate General of Civil Aviation
EGPWS	Enhanced Ground Proximity Warning System
GPWS	Ground Proximity Warning System
ICAO	International Civil Aviation Organization
LVP	Low Visibility Procedure
MET	Meteorology
MORS	Mandatory Occurrence Reporting System
MRO	Maintenance Repair and Overhaul
MSA	Minimum Safe Altitude
MSAWS	Minimum Safe Altitude Warning System
NSOPs	Non Scheduled Operator Permit
RA	Resolution Advisory
RT	Radio Telephony
SARPs	ICAO Standards and Recommended Practices
SMS	Safety Management System
SO	Safety Objective
SOPs	Standard Operating Procedures
SPI	Safety Performance Indicator
SSFDR	Solid State Flight Data Recorder
SSP	State Safety Programme
TCAS	Traffic Collision Avoidance System
VFR	Visual Flight Rules

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