



STATE SAFETY PLAN 2016–2019





FRONT COVER: Boeing 737-800, EI-FJM – Photo by Norwegian Air International

THIS PAGE: Ireland Sikorski S92. Photo by Paul Daly

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SECTION ONE: INTRODUCTION

Purpose of the Plan

The State Safety Programme (SSP) of Ireland aims to ensure the continuous improvement of safety performance in Ireland. This is achieved by focussing our resources in the areas that present the greatest risk to aviation safety and implementing actions that will best mitigate these risks. The IAA has been nominated as the SSP placeholder organisation, the Chief Executive of the IAA is the accountable executive for the SSP, and the IAA Safety Regulation Division is responsible for implementing the State level aspects of the program.

Accordingly, as part of the State Safety Programme the IAA Safety Regulation Division (SRD) produces the State Safety Plan (SSp) on behalf of the State, and co-ordinates fully with the Department for Transport, Tourism and Sport, as part of the process. The purpose of the SSp is to outline to all stakeholders where the IAA will target resources in the next four years in order to fulfil the State Safety Programme main objective of reducing accidents and incidents.

SSp 2016-2019 contains safety initiatives to address key safety risks in aviation. The key safety operational risks are identified based on analysis of safety outcomes (ie accidents and incidents) at both national and global level. In addition systemic risks (eg regulatory/policy issues) that underlie the operational performance of the civil aviation system are addressed.

The Annual Safety Review of Aviation in Ireland (see www.iaa.ie) provides a summary of the safety performance of the civil aviation system in Ireland. This review provides an analysis of fatal accidents, accidents and serious incidents involving Irish registered aircraft, as well as analysis of civil aviation occurrences reported under occurrence reporting systems (mandatory and voluntary) in the State. The key safety priorities are established using a risk based approach in order to minimise the potential for fatalities, injuries and aircraft damage.

Aviation is a global business and lessons learned from across the globe may be equally applicable in Ireland, so the risk analysis is also informed by key safety issues identified by ICAO, the European Aviation Safety Agency (EASA), and other States national safety plans. For example, the Plan includes the key safety risks of Runway Excursions, Runway Incursions, Controlled Flight Into Terrain, Loss of Control - Inflight, even though, thankfully, the IAA has not received many reports of incidents that fall under these categories.

The European Aviation Safety Agency also publishes a Safety Plan for Europe, the latest version of the European Plan for Aviation Safety (EPAS) is available on the EASA website www.easa.eu.int. The IAA voluntarily adopts the provisions for Member States included in the EPAS, as far as practicable. For ease of cross reference we have synergised the structure of our Plan as closely as possible to the EPAS structure, whilst maintaining separate sections addressing systemic risks, risks pertinent to commercial air transport and risks pertinent to general aviation to better facilitate access to the Plan for Irish stakeholders.



Structure of the Plan

The safety issues addressed in the Plan are grouped into three sections – systemic, commercial air transport and general aviation.

- Systemic risks impact across multiple sectors affecting the structural aspects of the aviation system, including items such as development of the State Safety Programme, the implementation of Safety Management Systems, and the development of risk and performance based oversight.
- The Commercial Air Transport section addresses safety risks at operational level which may be more directly related to accident and serious incident outcomes (lagging Indicators) and concern all domains involved in commercial aviation including airlines, aerodromes, air navigation services, maintenance organisations and ground operations service providers.
- Likewise the General Aviation section also addresses operational risks but from the perspective of general aviation.

Chapter 2 provides an overall executive summary of the Plan with statistical information on the performance of the Plan and summary highlights of the actions contained therein.

Chapters 3, 4 and 5 provide details on the individual risks addressed under the systemic, commercial aviation and general aviation headers. In a change from previous versions of the Plan these chapters now contain only a short summary of the risks and a full list of the open actions contained in the Plan. A narrative is still provided for each risk in the Plan, including a summary statement of the objectives and description of the actions taken to date and planned for the future, however this narrative is now added as an Appendix to the document. It is hoped that this new structure will provide easier access to the full extent of the actions in the Plan whilst maintaining detailed narrative in the Appendix for those interested in more details on specific key risk areas. New actions in this version of the Plan are highlighted as before.

In keeping with the editorial practice employed thus far, the action items closed in the preceding year (in this case 2015) are included in the Plan to record their closure. Action items closed prior to 2014 are deleted, however, this deletion does not affect the overall statistical information provided in the Plan.

SECTION TWO: EXECUTIVE SUMMARY OF THE PLAN

ACTIONS AND STATUS

Since its inception in 2010 there have been a total of 45 risk topics addressed in the SSp with 166 associated actions to address the safety issues. The individual action items in the Plan are aligned with the four pillars of the

State Safety Programme for Ireland, namely Safety Policy, Safety Risk Management, Safety Assurance and Safety Promotion. Figure 1 below shows how the actions break down between the different SSP Pillar by section.

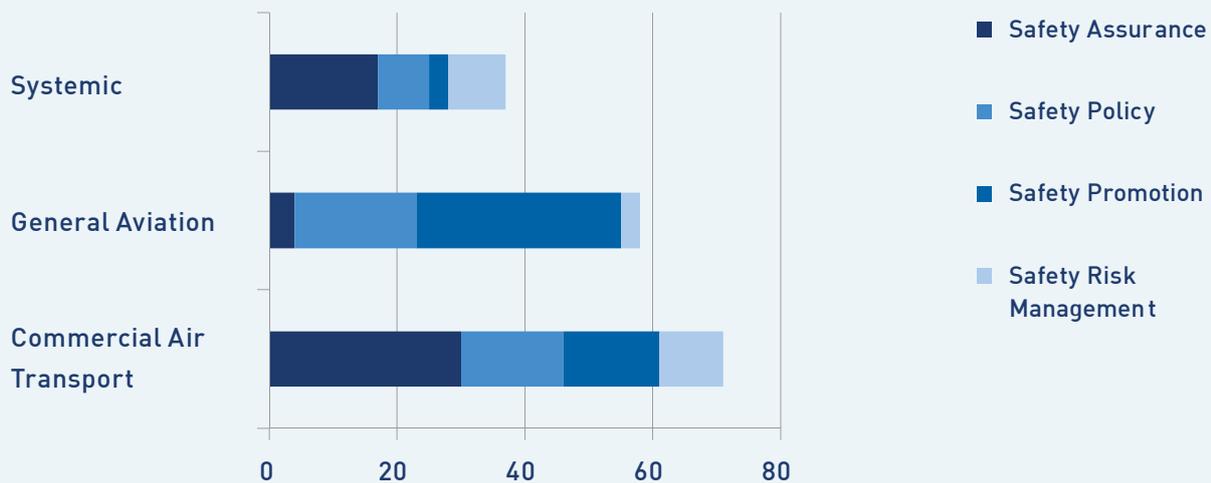


Figure 1: Breakdown of SSp actions by Section and SSP framework pillar

Almost two thirds of all actions included in the Plan since it's inception have been completed. The current version of the Plan has a total of 59 open or on-going actions, 21 of which were added this year.

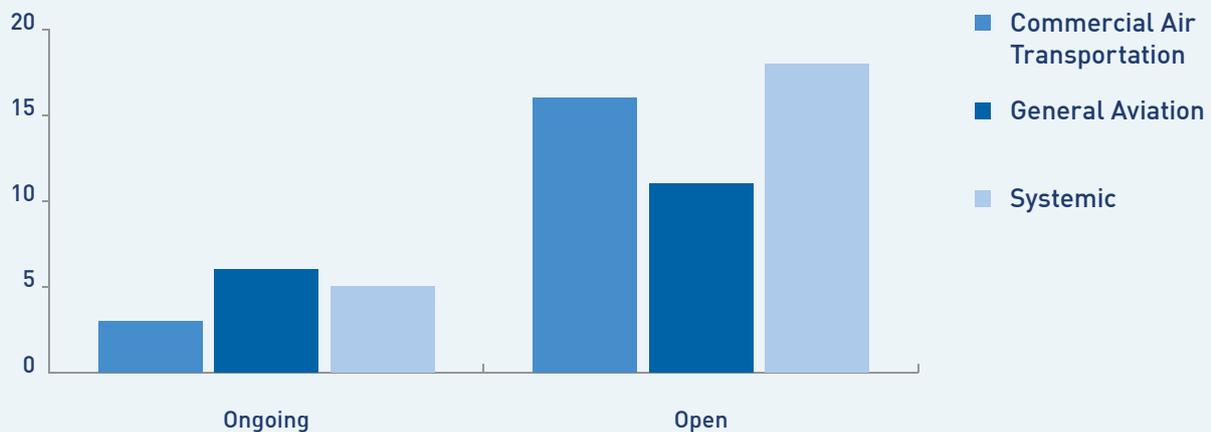


Figure 2: Breakdown of current SSp actions

Summary of current actions

Systemic actions

The primary objective of the Systemic actions is to improve safety management across the total civil aviation system.

The current actions in the plan are focused on the enhancement of the key enablers of safety management, namely: the State Safety Programme (SSP) at State level and the Safety Management System (SMS) at industry level. The main actions in this version of the Plan address:

- Greater collaboration and data sharing between the SSP of the State and the SMS of the service provider
- Specific actions to address the emergence of complex operational models or novel business practices.
- Enhanced data analysis for Commercial Air Transport operators, to include the use of Flight Data Monitoring systems as part of the operators Safety Management Systems
- Development of methods and tools to support risk and performance based safety oversight in all domains
- Specific improvements in safety management, including safety culture, integration of human factors, development of safety targets etc



Figure 3: Breakdown of SSP actions by Section and SSP framework pillar

Commercial Air Transport (CAT)

The primary objective of the actions included in the CAT section of the Plan is to reduce the risk of accidents and serious incidents for Irish commercial air operators. To achieve this aim, the safety performance of CAT operators is continuously monitored and analysis of this performance, including lessons learned from investigation of accidents, serious incidents and incidents, both in Ireland and abroad, is used to determine the highest risk categories and associated actions to mitigate against these risks.

As this is a rolling 4-year Safety Plan which began in 2010, many actions to address the key risks have already been taken and closed in previous years, so the main actions in the current Plan address:

- Flight crew training initiatives to address upset prevention and recovery, crosswind landings and competency based training
- Provision of non-precision approaches with vertical guidance in airports licensed for CAT operations
- IAA/industry Aerodrome Safety Group to address ground collisions, near collisions or related safety issues in any part of the airport maneuvering areas (ramp, taxiways etc).
- Implementation of European best practices recommendations to address specific key risks, including, EPAIRR (airspace infringements), EAPPRE (runway excursions) and EAPPRI (runway incursions).
- Specific actions to address mid-air collision (including military infringements over high seas, operations in non-controlled airspace), carriage of lithium batteries, birdstrikes etc

Key Risks Affecting Commercial Aviation



**Loss of Control - Inflight
(LOC-I)**



**Controlled Flight Into Terrain
(CFIT)**



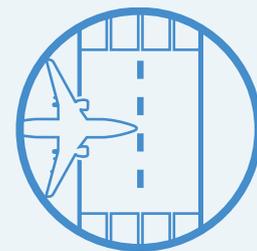
**Mid Air Collision
(MAC)**



**Runway Excursions
(RE)**



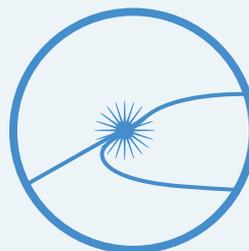
**Safety of Ground Operations
(RAMP, GCOL, ICE)**



**Runway Incursion
(RI)**



**Fire Smoke and Fumes
(FIRE-NI)**



**Laser Attacks
(LASER)**



**Birdstrikes
(BIRD)**

General Aviation (GA)

The primary objective of the actions included in the GA section of the Plan is to reduce the risk of accidents and serious incidents for the Irish general aviation community. This community includes wide ranging and diverse recreation and sporting activities across a wide spectrum of aircraft types and operations (including light fixed wing aeroplanes, light helicopters, microlights, gyroplanes, gliders, balloons etc).

The key risks for general aviation are identified from the safety analysis of accidents and incidents in the State as well as from issues that emerge during regulatory oversight activities.

The General Aviation Safety Council of Ireland was established in 2012 consisting of representatives from a broad spectrum of the various clubs and associations involved

in GA activities in Ireland as well as State representatives from IAA and Air Accident Investigation Unit. This Council has been very effective in promoting safety and many of the actions in the Plan are implemented through GASCI.

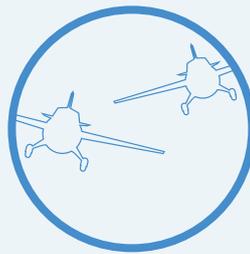
Similar to CAT operations many safety issues have been addressed and closed in previous versions of the Plan (eg Wire Strikes, Obstacles, Airstrip Operations), therefore the main actions in the current plan address:

- Reducing the risk of airspace infringement by GA traffic through airspace design and safety promotion activities
- Reducing the risk of mid-air collision among GA aircraft in uncontrolled airspace through charting improvements and improved AIP guidance

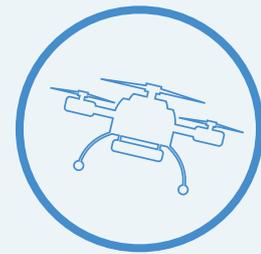
Key Risks Affecting General Aviation



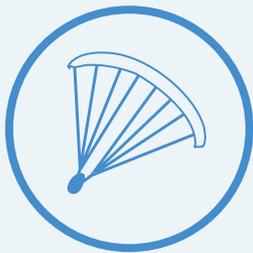
**Airspace Infringements
by GA aircraft**



**Mid Air Collision
by GA Aircraft**



RPAS/Drone



Paragliding Activities



**Risks in aircraft
maintenance**



GA Flight Planning



Air Displays

- Promotion of recently published regulations, policies and guidance to address the risks associated with RPAS/drones operations
- Specific policy and safety promotion initiatives to address the risks in paragliding activities, GA maintenance, accident survival and conduct of air displays.
- Promotion of best European guidance information (eg EGAST/EHEST safety leaflets) through electronic media and safety information evenings for the public.

Measuring the success of the State Safety Plan

Whereas the summary data above gives an indication of the progress of the actions included in the State Safety

Plan, the true evidence of the success of the Plan will be measured based on the safety outcomes, namely in the rate of accidents, serious incidents and incidents in the Irish civil aviation system. The trends analyses of precursors to the key safety indicators identified in the service providers SMS/FDM systems will also provide evidence of success and some of this preliminary data is provided in the appendices.

The IAA publishes measures of these key safety indicators in the Annual Safety Review, as well as on the IAA website. In addition the IAA is an active participant in the EASA Network of Analysts which continues to identify key risks and measures for use as part of EU Member States safety management programmes.

The summary of accidents and serious incidents for Irish registered aircraft involved in commercial air transport and aircraft involved in general aviation is shown below:

Irish registered aircraft involved in commercial operations			
Year	Fatal Accident	Non-fatal Accident	Serious Incident
2011-2014 (avg)	0	5	19
2015	1*	4	20
Aircraft involved in General Aviation			
Year	Fatal Accident	Non-fatal Accident	Serious Incident
2011-2014 (avg)	0.25	9.25	3.25
2015	2	6	2

* Irish registered, Russian operated aircraft disintegrated over Egypt — criminal activity suspected.

For further breakdown of these statistics including event categorisation details please refer to the IAA Annual Safety Review (<https://www.iaa.ie/safety>)



Dublin Airport. Photo by Tony Lane

SECTION THREE: SYSTEMIC RISKS

SUMMARY OF OBJECTIVES AND ACTIONS



State Safety Programme - M.002

The State Safety Programme (SSP) is an integrated set of regulations and activities aimed at improving safety in the State. The objective is to achieve an acceptable level of safety of aviation services and products delivered by aviation service providers. The actions in this plan are focused on ensuring that Ireland meets the targets established in the ICAO Global Aviation Safety Plan, however EASA rulemaking delays associated with SMS regulations in the airworthiness domain, means that full implementation of the SSP is delayed until end 2018.

ACTIONS

M.002 d): The IAA will update the State Safety Programme document as necessary to align with latest issue of European Aviation Safety Program and Amendment 1 to Annex 19.

Target Date:
Q4 2018

EPAS Reference: MST.001

M.002 a): The IAA will continue to implement the elements of the EASA European Plan for Aviation Safety that apply to national authorities.

Target Date:
On-going

EPAS Reference: App 1

M.002 c): The IAA will work, in conjunction with EASA as appropriate, to ensure that the full implementation of the SSP for Ireland is accomplished in accordance with the ICAO GASP near term objectives

Target Date:
Q4 2018

Safety Management Systems - M.004

A Safety Management System (SMS) provides aviation service providers with a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective. This Plan targets the implementation of SMS across all domains in the Irish civil aviation system by the end of 2018, subject to the availability of SMS requirements in airworthiness domain in accordance with the EASA rulemaking programme.

ACTIONS

<p>M.004 b): The IAA will include SMS promotional material developed by SMICG and EASA in Annual SMS training delivered by the IAA.</p> <p>EPAS Reference: MST.002</p>	<p>Target Date: Q4 2016</p>
<p>M.004 f): The IAA will promote the harmonisation of SMS approaches in the context of the FAB in consultation with the UK CAA and will work with UKCAA on the implementation of Regulation (EC) No 390/2014</p> <p>EPAS Reference: SPT.059</p>	<p>Target Date: On-going</p>
<p>M.004 g): The IAA will work with EASA for the development of SMS requirements in airworthiness.</p> <p>EPAS Reference: RMT.0251</p>	<p>Target Date: Q4 2018</p>
<p>M.004 h): The IAA will develop suitable tools to measure the effectiveness of safety management by approved organisations in all domains</p>	<p>Target Date: Q4 2016</p>

Safety Performance Indicators - M.003

Safety Performance Indicators are metrics used to express the level of safety performance achieved in the aviation system and are usually linked to safety performance targets. The expected benefits of the actions in this Plan are that a standardised list of SPI's will be developed for use in civil aviation in all EU Member States and implemented in Ireland by the end of 2017.

ACTIONS

<p>M.003 a): The IAA will participate in the development of standard safety performance indicators across Europe in conjunction with the EASA Network of Analysts working group.</p> <p>EASA Reference: SPT.060</p>	<p>Target Date: Q3 2017</p>
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Occurrence Reporting - M.005

The IAA has implemented occurrence reporting systems in the State for collection of both mandatory and voluntary occurrence reports. New Regulation (EU) 376/2014 became applicable in November 2015 and includes, inter alia, mandatory reporting requirements for the general aviation community for the first time. The actions in this Plan aim to ensure this community is fully aware of the new mandatory reporting obligations, as well as continuing to encourage the voluntary sharing of safety occurrences by those not subject to the mandatory provisions in the regulation and to develop improvements in safety culture through occurrence reporting.

ACTIONS

M.005 f): The IAA will take a leading role in the EASA occurrence reporting survey of States and support the EASA NoA with the subsequent analysis. **Target Date:** Q4 2017

EPAS Reference: MST.023

M.005 g): The IAA will use the results of oversight of occurrence reporting as a performance indicator of the safety culture of an organisation. **Target Date:** On-going

EPAS Reference: MST.023

M.005 e): The IAA will work with GASCI to provide guidance to GA community on the requirements of the new EU Occurrence Reporting Regulation No. 376/2014 and to encourage voluntary reporting by those not subject to the mandatory requirements (eg BR Annex II operators). **Target Date:** Q4 2016

Implementation of Performance Based Oversight - M.010

A key feature of safety management at the State level is the use of performance based regulations and risk and performance based oversight methodologies to compliment traditional prescriptive rulemaking and compliance based oversight activities. The IAA target is to implement the tools to enable performance based oversight in Ireland across all domains in civil aviation by the end of 2019.

ACTIONS

M.010 d): The IAA will develop the tools to support risk and performance based oversight in airworthiness based on assessment of organisation risk profile, organisation compliance profile and organisation performance profile. **Target Date:** Q4 2019

M.010 c): The IAA will develop the tools to support risk and performance based oversight in air navigation services and aerodromes domains based on assessment of organisation risk profile, organisation compliance profile and organisation performance profile. **Target Date:** Q4 2017

Implementation of ERP in IAA SRD - M.006

The implementation of the EMPIC system in the IAA is a key enabler of the performance based oversight approach the IAA wants to pursue. This system facilitates quick access to oversight audit results and trends which will be used, along with other measures, to develop the risk and performance profiles of the relevant service provider. The target is to implement EMPIC organisation oversight modules across all domains by the end of 2018, and the Plan is focused on the short term objectives in the phased implementation programme.

ACTIONS

M.006 b): The IAA will implement the EMPIC modules applicable to Aerodromes.

Target Date:
Q4 2017

Enhanced collaboration between SSP and SMS - M.011

The State Safety Program is complimentary to the Safety Management Systems implemented by the civil aviation organisations and service providers. The IAA wishes to ensure closer collaboration between the State SSP and organisations SMS for the purposes of enhancing the overall safety performance in the State. Whereas the occurrence reporting system is a key enabler of safety management, the IAA will encourage the use of other sources of safety data (eg air operators FDM) to enhance the risk management and safety assurance processes.

The objective of closer collaboration between SSP and SMS is to ensure that safety intelligence is mutually shared between organisations and the State in more effective manner. As part of the process the IAA is actively participating in the EASA Data4Safety programme and the IAA will enhance its current safety analysis capability to include Big Data analytics. The target is to implement the relevant methodologies and processes by end 2019.

ACTIONS

M.011 a): The IAA will target the key risks identified in this Plan, including RE, LOC-I, MAC, CFIT and precursor events as part of AOC Holder SMS oversight.

Target Date:
Ongoing

M.011 b): The IAA will establish regular dialogue with aircraft operators to promote the benefits of FDM and ensure that the standardised indicators (including RE, MAC, CFIT, LOC-I) and associated event triggers published by the European Authorities Co-ordination Group on Flight Data Monitoring (EAFDM) are implemented and monitored as part of the SMS.

Target Date:
Q4 2017

EPAS Reference: MST.003

M.011 c): The IAA, in conjunction with industry, will establish the methodology, tools and processes to facilitate the collection of relevant safety data from the regulated entities SMS, over and above the current data provided under the mandatory and voluntary occurrence reporting scheme.

Target Date:
Q4 2019

M.011 d): The IAA will work with organisations to ensure that Human Factors principles are fully integrated into Safety Management processes.

Target Date:
Q4 2019

M.011 e): The IAA will develop the processes and systems necessary to enhance the current safety analysis capabilities including the development of Big Data analytics

Target Date:
Q4 2019

Complex or Novel business models.

Due to the increased complexity of the aviation industry, the number of interfaces between organisations, their contracted services and regulators has increased, as has the geographic spread of the associated operational and management processes. The objective is to ensure that organisations under the oversight of the IAA that have complex or novel business models address all the associated risks as part of their Safety Management Systems and to ensure that the IAA collaborates fully with other States where high levels activities are performed (eg outstations, extended workbench etc). The target is to implement, or oversee the implementation of, the relevant processes by end 2018.

ACTIONS

M.012 a): The IAA will implement cooperative oversight and disseminate best practices on how NAAs can better work together and collaborate in the oversight of organisations/persons certified by another Member State.

Target Date:
Q4 2018

EPAS Reference: MST.021

M.012 b): The IAA will ensure it has a thorough understanding of operators' governance structure, in particular, influence of financial stakeholders and of the controlling management personnel, where such personnel are located outside the scope of approval. The IAA will also assist in the development of, and implement, best EU practices in this regard

Target Date:
Q4 2017

EPAS Reference: MST.019

M.012 c): Management systems of the operator should capture new hazards that are introduced by different employment models within an individual operator, increased mobility of pilots, safety-critical services provided by non-certified service providers and (long-term) leasing. The IAA will ensure this happens through SMS oversight activities and provide relevant updates to the Agency when requested

Target Date:
Q4 2017

EPAS Reference: MST.022

Detailed summaries of the progress and actions for each of these risk areas are provided in Appendix 1.



SECTION FOUR: COMMERCIAL AIR TRANSPORT

SUMMARY OF OBJECTIVES AND ACTIONS

The key safety risks included in the Plan reflect the highest risk category for fatal accidents in Ireland, Europe and worldwide.

The overall objective in each case is to reduce the number of accidents and serious incidents attributed to the key risks addressed in this section for commercial air transport operations in Ireland. The IAA will monitor the accident, serious incident and occurrence rate of these key risks (and associated pre-cursor events) for approved Irish organisations, in order to measure the effectiveness of the actions in the Plan. Risk Registers are used to help identify the main safety issues addressed in the plan.

The following is a brief description of each of the safety risks included in the Plan, along with the current actions being taken to address the risks involved. Reference is included in the list to the associated actions in the European Plan for Aviation Safety (EPAS), where relevant.

Loss of Control – Inflight (LOC-I) – FOD.001

Loss of control usually occurs because the aircraft enters a flight regime which is outside its normal envelope, frequently associated with an element of surprise (startle effect) for the flight crew involved. EASA has reported that LOC-I is the risk area with the most frequent fatal accidents, both in Europe and worldwide with on average, three fatal accidents every year related to LOC-I worldwide and one every second year involving an EASA MS operator. The actions in the Plan currently focus on Loss of Control Prevention and Recovery Training for operators and flight training organisations.

ACTIONS

FOD.001 d): The IAA will promote the new EU regulations concerning Loss of Control Prevention and Recovery Training and will provide guidance to individual Irish operators and approved training organisations on the implementation of these requirements.

Target Date:
Q4 2018

EPAS Reference: SPT.012

FOD.001 e): The IAA will review and promulgate latest EASA publications (policies/ SIB's) concerning LOC-I and monitor the implementation of recommendations applicable to the Irish civil aviation system.

Target Date:
On-going

FOD.001 f): The IAA will use the EHFAG regulatory inspectors HF competency framework in assessing training organisations implementing competency based training programmes.

Target Date:
Q4 2016

Controlled Flight Into Terrain (CFIT) – FOD.003

CFIT is an event where an airworthy aircraft under the complete control of the flight crew is inadvertently flown into terrain, water or an obstacle. The flight crew is generally unaware of the danger through loss of situational awareness (eg navigational error, technical problem, other distraction) until it is too late. The highest risks are present during Non-Precision Approach (NPA) and thus the actions in the Plan currently focus on the implementation of approach with vertical guidance procedures at Irish airports licensed for CAT operations.

ACTIONS

FOD.003 c): The IAA will work with service providers to ensure that Irish airports licensed for commercial air transport provide non-precision instrumented approaches that contain vertical guidance. **Target Date:** Q4 2016

EPAS Reference: MST.006

Mid-Air Collision (MAC) – ASD.001

Mid-Air Collisions (MAC) are accidents where two or more aircraft come into contact with each other in the air. While the likelihood of an event is low the consequences of any event are extremely high (major loss of life). Near Mid-Air collision (eg Airprox) is one of the main causes attributed to serious incidents both in Europe and worldwide. The Actions in the Plan currently focus on implementing European recommendations to address this risk (eg EAPAIRR), assessment of recent detailed safety analyses of MAC events and new actions to address infringements by military aircraft over the high seas and commercial operations in uncontrolled airspace.

ACTIONS

ASD.001 e): The IAA will review the recommendations for EU Member States contained in EASA technical analysis "Report on occurrences over the high seas involving military aircraft in 2014" and implement these recommendations as appropriate, in conjunction with relevant State authorities. **Target Date:** Q4 2016

EPAS Reference: MST.024

ASD.001 f): The IAA will ensure that Irish operators fully address the risks associated with operations into uncontrolled airspace in their safety management system **Target Date:** Q4 2016

ASD.001 b): The IAA will review the level of implementation of recommendations for service providers contained in the EAPAIRR as part of the oversight cycle. **Target Date:** Q4 2016

EPAS Reference: MST.010

ASD.001 d): The IAA will review the EASA NoA detailed analysis of MAC related events in order to identify the main causes and consequences and to help develop further means to mitigate against this hazard. **Target Date:** Q4 2016

Runway Safety – FOD.002, M.007

There are two specific safety risks in the area of runway safety, runway incursion and runway excursion. A runway incursion (RI) is any occurrence at an aerodrome involving the incorrect presence of an aircraft vehicle or person on the protected area of a surface designated for the landing and take-off of an aircraft. A runway excursion (RE) is an event in which an aircraft veers off or overruns the runway surface during either take-off or landing. One of the key mitigating actions was the establishment of the Runway Safety Teams and the IAA will monitor the effectiveness of these teams in reducing the risks. Other actions in the Plan are to monitor the implementation of European recommendations to improve runway safety (eg EAPPRI, EAPPRE, SIB's) and to share information on effective measures with EASA.

ACTIONS

FOD.002 k): The IAA will review the implementation of recommendations in EASA SIB 2014-20 "Aeroplane Operations in Crosswind Conditions" with Irish AOC holders during the current oversight cycle.	Target Date: Q4 2017
FOD.002 c): The IAA will share actions and measures in use at national level to address the safety risk of runway excursions and participate in EASA initiatives to share best practice and coordinate actions.	Target Date: On-going
FOD.002 f): Where practicable, the IAA will ensure that specific joint training and familiarisation in the prevention of runway excursions, is provided to Pilots, Air Traffic Controllers and Aerodrome Operator staff (EAPPRE 3.1.4).	Target Date: Q4 2016
FOD.002 j): The IAA will monitor the implementation of EAPPRE recommendations for service providers during oversight audits. EPAS References: MST.007, SPT.075	Target Date: Q4 2016
M.007 b): The IAA will audit the effectiveness of the local runway safety teams (including effectiveness of SMS in reducing RI precursor events). EPAS Reference: MST.011	Target Date: On-going
M.007 c): The IAA will review the level of implementation of recommendations for service providers contained in the EAPRRI as part of the oversight cycle EPAS Reference: MST.014	Target Date: Q4 2016

Safety of Ground Operations - FOD.004

Analysis of global accidents has shown that there has been a steady rise in accidents caused either during or as a result of ground operations. Ground operations involve all aspects of aircraft handling at the airport as well as aircraft movement around the aerodrome, except when on active runways. The risk of fatality or injury to persons is low however the impact in terms of delays and disruption to air traffic at an aerodrome and damage to aircraft are high. Previous actions in the Plan addressed loading and aircraft de-icing issues and currently the Plan includes actions for the newly established aerodromes safety review group (including industry stakeholders) to help identify and mitigate the main risks.

ACTIONS

FOD.004 e): The IAA will review ramp and taxiway events (collisions and near collisions) and develop/promote mitigating measures, including structural, technological, operational and training.

Target Date:
Q4 2017

EPAS Reference: MST.018

Fire, Smoke and Fumes - M.009

Uncontrolled fire on board an aircraft, especially when it is in flight, represents one of the most severe hazards in aviation. Aircraft fire can lead to loss of control, either as a result of structural or control system failure, or as a result of crew incapacitation and can also lead to significant casualties on the ground if evacuation and emergency response actions are ineffective. The actions in the Plan are currently focused on addressing the risks posed by the carriage of lithium batteries as well as addressing latest updated guidance provided under the auspices of the Royal Aeronautical Society (RAeS).

ACTIONS

M.009 c): The IAA will promulgate EASA guidance for operators and passengers on Lithium Battery Safety and will follow up with Irish operators during oversight activities to ensure that this guidance is incorporated as appropriate.

Target Date:
Q4 2017

EPAS Reference: MST.005, SPT.069

M.009 b): The IAA will review the updated guidance in RAeS document "Smoke, Fire and Fumes in Transport Aircraft" and address any areas of concern for the civil aviation system in Ireland.

Target Date:
Q4 2016

Birdstrikes - AED.002

Bird strikes may cause significant damage to an aircraft structure or flight controls, and aircraft engines (especially jet-engines) are vulnerable to the loss of thrust which can follow the ingestion of birds into engine air intakes which may lead to an accident. Whereas the IAA has taken specific actions to mitigate this safety risk at national level over the past few years the current Plan is focused on encouraging more globally lead initiatives through the auspices of ICAO.

ACTIONS

AED.002 c): The IAA will encourage ICAO to provide global statistics from the ICAO IBIS system and will fully engage with the plans for the forthcoming ICAO Wildlife Strike Reduction Symposium.

Target Date:
Q2 2017

Laser Attacks - FOD.019

There has been a noticeable increase of malicious laser attacks on aircraft pilots both in Ireland and across Europe and the rest of the world. More serious laser attacks can cause eye injury to pilots or flash blindness in the cockpit thereby endangering the pilot's ability to properly operate an aircraft during critical flight phases. The relevant legislation to criminalise laser attacks on aircraft has been enacted in Ireland and the current actions in the Plan are focused on providing the latest international best practices guidance to assist flight crews in dealing with the risk.

ACTIONS

FOD.019 c): The IAA will review SAE ARP5598 "Laser Visual Interference - Pilot Operational Procedures" and provide any necessary updates to currently published IAA guidance on this subject.

Target Date:
Q2 2017

Detailed summaries of the progress and actions for each of these risk areas are provided in Appendix 2.



Piper PA-22
Photo by Frank Grealish/IrishAirPics.com

SECTION FIVE: GENERAL AVIATION

SUMMARY OF OBJECTIVES AND ACTIONS

The General Aviation community includes wide ranging and diverse recreation and sporting activities across a wide spectrum of aircraft types and operations (including light fixed wing aeroplanes, light helicopters, microlights, gyroplanes, gliders, balloons etc).

The key risks for general aviation are identified from the safety analysis of accidents and incidents in the State as well as from issues that emerge during regulatory oversight activities. The IAA Annual Safety Review includes performance reports on the GA community and this review contributes to the identification of the key safety risks included in this Plan.

The objectives of the actions in the Plan are aimed at providing better awareness and training to GA pilots in order to minimize the risks of having accidents or serious incidents due to the hazards identified in this Plan.

A Risk Register for General Aviation is used to help identify the main safety issues addressed in the Plan. Many of the actions in the Plan are devised and implemented via the General Aviation Safety Council of Ireland, which includes representatives of the various GA activities, as well as IAA (service provider and regulator) and the air accident investigation unit.

The following is a brief description of each of the safety risks included in the Plan, along with the current actions being taken to address the risks involved. Reference is included in the list to the associated actions in the European Plan for Aviation Safety (EPAS), where relevant.

Airspace Infringements by GA aircraft – FOD.017

An airspace infringement occurs when an aircraft enters controlled airspace without receiving the appropriate ATC clearance. The problem of airspace infringement is a serious risk to aviation safety and the risk is particularly serious when the infringing aircraft involved is a GA light aircraft, as the majority of these aircraft are not required to carry appropriate transponder equipment used to ensure appropriate separation of aircraft. The current actions in the Plan are focused on the elimination of GA infringement hotspots through revised airspace design and awareness initiatives.

ACTIONS

FOD.017 a): The IAA will work with the General Aviation Safety Council of Ireland to review airspace design issues at airspace infringement hotspots with a view to implementing measures to reduce airspace infringements by GA aircraft.

Target Date:
Q4 2016

EPAS Reference: MST.016

Mid Air Collision of GA aircraft in Class G airspace – FOD.020

Mid Air collisions involving CAT operations were discussed in the previous Chapter of this Plan. This chapter deals with the same subject but the focus is on the prevention of mid-air collisions between general aviation aircraft flying outside of controlled airspace without the benefit of air traffic control services. The actions in the Plan are focused on improved guidance for flying at unattended airfields and improved information for GA community on published aeronautical charts.

ACTIONS

FOD.020 a): The IAA will work with the General Aviation Safety Council of Ireland to assist in the development of improved AIP guidance for VFR traffic at unattended airfields. **Target Date:** Q4 2016

FOD.020 b): The IAA will work with the General Aviation Safety Council of Ireland (GASCI) to introduce improved symbology in Aeronautical Charts (eg ATZ) for GA airfields and high density GA activity areas. **Target Date:** Q4 2016

EPAS Reference: SPT.044

Paragliding activities – FOD.016

A paraglider is a wide canopy resembling a parachute that is attached to a person's body by a harness in order to allow them to glide through the air. Paragliding activities involve various types of self-regulated activities, including paragliding, powered paragliding, also known as paramotoring, and powered parachuting. The actions in the Plan are currently focused on improved methods to reach out to those involved to ensure they are aware of the latest safety information pertaining to this activity.

ACTIONS

FOD.016 c): The IAA will review recent safety initiatives implemented to address the operations of drones in Ireland and consider opportunities to apply similar initiatives to enhance the safety of paragliding activities in Ireland. **Target Date:** Q4 2017

FOD.016 a): The IAA will issue updated guidance material in respect of paraglider flying in Ireland. **Target Date:** Q4 2016

FOD.016 b): The IAA and GASCI will develop methods to improve safety awareness to those involved in paragliding activities in Ireland, including foreign visitors. **Target Date:** Q4 2016

Safety Information for GA Maintenance – AWS.D.006

One of the top causal factors for both fatal and non-fatal accidents involving GA aircraft is system component failures (SCF), whether it be the engine itself or other system component failures critical to safety of flight (eg fuel, oil, landing gear etc). The current actions in the Plan are aimed to ensure that those involved in maintaining GA light aircraft (often the owner/pilots themselves) are made aware of airworthiness related safety information available from both within and outside of Ireland.

ACTIONS

AWS.D.006 a): The IAA will review accident reports and safety information provided by air accident investigation authorities and develop safety information (based on effective communication of key messages) concerning aircraft equipment failure and maintenance for dissemination to the Irish general aviation community.

Target Date:
On-going

Small Remotely Piloted Aircraft Systems/Drones – FOD.009

The proliferation of the use of drones represents an emerging risk to both commercial and general aviation. The focus on this section of the Plan is on small drones (ie those weighing less than 150 Kgs). Significant progress was made in Ireland in this area in 2015, including updated regulations, the implementation of a drone licencing system and major media promotion events in the run up to Christmas 2015. The raising of public awareness to the regulations and hazards associated with drone operations will continue over the next few years as will the IAA continued participation with EC led safety initiative (JARUS) to help develop a standardised EU wide approach to this risk.

ACTIONS

FOD.009 g): The IAA will work with the main Irish airports in order to establish prohibited zones for drone flying in close proximity to an airport along with associated road-signage, promotional campaign etc

Target Date:
Q4 2016

FOD.009 c): The IAA will continue to participate in the development of appropriate guidance concerning the operation of drones through its collaboration in the Joint Authorities for Rulemaking of Unmanned Systems Group (JARUS).

Target Date:
On-going

FOD.009 f): The IAA will provide relevant public guidance to raise awareness of the regulatory requirements and safety hazards associated with operating drones.

Target Date:
Q4 2017

Safety Information for General Aviation – FOD.014, FOD.015

The European General Aviation Safety Team (EGAST) is a voluntary safety partnership between General Aviation associations and authorities from across Europe. EGAST creates a forum for sharing best practices, improving data sources, and promoting safety. Similarly the European Helicopter Safety Team was developed to provide a focus for helicopter safety initiatives to address helicopter safety concerns. Although EASA is currently restructuring these partnership arrangements, the proliferation of EGAST/EHEST branded safety material is set to continue for the next few years. The Plan includes ongoing tasks to review the safety information provided by EGAST and EHEST and ensure the promulgation of this material to the General Aviation community using, in the main, public safety information events and electronic media.

ACTIONS

FOD.014 a): The IAA will work with GASCI to develop and promote EGAST Safety Material to general aviation community in Ireland.	Target Date: On-going
FOD.014 b): The IAA will work with GASCI to organise/facilitate regular general aviation safety events, during which EGAST safety material will be promoted.	Target Date: On-going
FOD.015 a): The IAA will work with GASCI to develop and promote EHEST/IHST Safety Material to GA community in Ireland.	Target Date: On-going
FOD.015 b): The IAA will work with GASCI to organise/facilitate regular general aviation safety events, during which EHEST/IHST safety material will be promoted.	Target Date: On-going

EASA Reference: MST.015

Planning for GA flights in uncontrolled airspace – FOD.021

This new chapter introduced in this version of the Plan addresses the risk of inadequate planning for the conduct of a GA flight in uncontrolled airspace that exposes the GA pilot to additional risk of death or serious injury following a survivable accident or emergency landing. GASCI has already issued a Safety leaflet to address the "Flight Planning" issue and the current actions in the plan are focused on raising awareness of this risk and providing guidance to GA pilots on the need to consider the carriage of appropriate equipment and clothing as part of the pre-flight planning process.

ACTIONS

FOD.021 a): The IAA will work with GASCI to raise awareness of the need for appropriate pre-flight planning for GA flights in uncontrolled airspace to consider the risk of a survivable accident or emergency landing.	Target Date: Q4 2016
FOD.021 b): The IAA will work with GASCI to develop and promulgate guidance information to GA pilots to ensure they are properly prepared for flight in uncontrolled airspace by carrying appropriate equipment and clothing in case of a survivable accident.	Target Date: Q2 2017

Conduct of Airshows – FOD.022

The fatal accident in 2015 involving an air display aircraft in Shoreham, UK, has highlighted the risks posed to participants, spectators and the non-involved public, during the conduct of air displays. Whereas there have been no accidents or serious incidents in Ireland during air displays, the actions in this Plan are aimed to ensure that those managing and participating in air displays properly assess all the risks involved.

ACTIONS

FOD.022a): The IAA will review the policies and procedures in place for the conduct of air displays in Ireland to ensure that they incorporate latest recommendations arising from recent UK AAIB accident investigations.

Target Date:
Q4 2016

Detailed summaries of the progress and actions for each of these risk areas are provided in Appendix 3.



Aer Lingus A320
Photo by Paul Daly

APPENDIX 1 SYSTEMIC RISKS DETAILS



M.002 Implementation of State Safety Programme

Risk Area

ICAO Standards and Recommended Practices (SARPs) require the implementation of State Safety Programmes in Annex 19, effective since November 2013. The incomplete or ineffective implementation of the SSP represents a risk to effective safety management in the State.

The State Safety Programme (SSP) is an integrated set of regulations and activities aimed at improving safety in the State. The objective is to achieve an acceptable level of safety of aviation services and products delivered by aviation service providers. The actions in this plan are focused on ensuring that Ireland meets the targets established in the ICAO Global Aviation Safety Plan near term objectives for the implementation of SSP.

Current Status

The State Safety Programme for Ireland is at an advanced stage of development. The IAA maintains an active role in development of the European Aviation Safety Programme (EPAS) and the European Plan for Aviation Safety (EPAS) in collaboration with EASA.

The documentation of the SSP for Ireland was updated in 2014 and published in January 2015. The updated version provides a more comprehensive description of the programme using the latest guidance template provided in the ICAO Doc 9859 Safety Management Manual, Third Edition. A further update is being considered for 2016 to align the document with the latest issue of the European Aviation Safety Programme, and the document will be updated to reflect Amendment 1 to Annex 19 and associated updates to the ICAO Doc 9859 in the next two years. (New Action item d) below).

A gap analysis (included as Appendix to the SSP document) has been performed that identifies the elements of the SSP that are not yet fully implemented in Ireland. These elements are mainly found under the SSP pillars of Safety Risk Management and Safety Assurance and concern items such as the establishment of SMS requirements across all domains and the development of key safety indicators and Acceptable Level of Safety Performance (ALoSP) at State level. Much of this work is accomplished in conjunction with EASA.

In addition, Ireland has voluntarily adopted the European Plan for Aviation Safety (EPAS) and has co-ordinated the Irish State Safety Plan with the European plan. The IAA provides regular updates to EASA on the status of the national State Safety Programme, as well as the status of action items for NAA's identified in the EASA EPAS and adopted by the IAA.

NEW ACTIONS

- | | |
|---|--|
| <p>d) The IAA will update the State Safety Programme document as necessary to align with Amendment 1 of Annex 19 and latest issue of European Aviation Safety Program.</p> <p>EPAS Reference: MST.001</p> | <p>Target Date:
Q4 2018</p> |
|---|--|

EXISTING ACTIONS

- | | |
|--|---|
| <p>a) The IAA will continue to implement the elements of the EASA European Plan for Aviation Safety that apply to national authorities.</p> <p>EPAS Reference: App 1</p> | <p>Target Date:
On-going</p> |
| <p>c) The IAA will work, in conjunction with EASA as appropriate, to ensure that the full implementation of the SSP for Ireland is accomplished in accordance with the ICAO GASPs near term objectives.</p> | <p>Target Date:
Q4 2018</p> |

M.004 Implementation of SMS

Risk Area

ICAO standards and EU Implementing rules require the implementation of Safety Management Systems (SMS) in aviation organisations. The lack of effective implementation of SMS could reduce the ability of organisations to improve safety performance.

An SMS provides aviation service providers with a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective. This Plan targets the implementation of SMS across all domains in the Irish civil aviation system in line with the ICAO GASP near term objectives, and this has been achieved in all domains with the exception of airworthiness which is dependant of the availability of implementing rules for SMS in the EASA rulemaking programme (RMT.0251) targeted for 2018.

Current Status

ICAO has published standards and recommended practices concerning safety management systems in Annex 19, effective November 2013. This annex consolidates the SMS requirements for all aviation disciplines, including those previously contained in other Annexes (eg Annex 1, 6 etc).

EU regulations have been amended to include provisions for the implementation of SMS standards in all organisations with the exception of airworthiness, which is scheduled for completion in 2018 (EASA RMT.0251).

Best practice guidance in the area of safety management for commercial air transport operations has been published by ICAO in Doc 9859 Safety Management Manual. The Safety Management International Collaboration Group (SMICG) and European ECAST and EHEST have published guidance material on the implementation of SMS in the airborne domain. The IAA is an active participant in SMICG, ECAST and EHEST and uses the associated guidance to promote SMS best practice. The IAA provides SMS training (week long courses) for the benefit of both IAA staff and Irish industry.

EASA has also identified in the European Plan for Aviation Safety the need to support the implementation of SMS in ANSP's, including in the context of the development of the Functional Airspace Block (FAB). Regulation (EU) No 691/2010 (Performance Scheme for ANS) established, inter alia, requirements for the State to report on just culture, the effectiveness of Safety Management and the use of the RAT tool for the so called Reference Period 1 (2013-2015).

This task was implemented in the IAA and the first annual report was submitted in 2013. Regulation (EU) 390/2013 establishes similar requirements for the Reference Period 2 (2015 – 2019) with the addition that the reporting will be accomplished at the level of the FAB. The IAA has already been engaged with it's FAB partner (UKCAA) on the harmonisation of SMS within the FAB and will continue to work with the UKCAA to plan the implementation of Regulation (EU) No 390/2013.

The IAA continues to monitor the effectiveness of safety management in organisations in the State. The Effectiveness of Safety Management (EoSM) tool has been used in the ANS domain (ref also EASA Decision 2013/032/R and the associated AMC/GM). This tool has also been tailored to suit the Air Operators domain and used to assess the effectiveness of safety management of AOC holders. In addition the SMICG tool "SMS Compliance and Best Practices" has been distributed to Irish AOC's for their completion. The IAA is currently planning to develop and use appropriate EoSM tools for all other domains.

No new or amended action items are required for this version of the Plan.

EXISTING ACTIONS

- | | | |
|-----------|--|---------------------------------|
| b) | The IAA will include SMS promotional material developed by SMICG and EASA in Annual SMS training delivered by the IAA.

EPAS Reference: MST.002 | Target Date:
On-going |
| f) | The IAA will promote the harmonisation of SMS approaches in the context of the FAB in consultation with the UK CAA and will work with UKCAA on the implementation of Regulation (EC) No 390/2014

EPAS Reference: SPT.059 | Target Date:
Q4 2016 |
| g) | The IAA will work with EASA for the development of SMS requirements in airworthiness.

EPAS Reference: RMT.0251 | Target Date:
Q4 2018 |
| h) | The IAA will develop suitable tools to measure the effectiveness of safety management by approved organisations in all domains | Target Date:
Q4 2016 |

M.003 Publication of Safety Performance Indicators (SPIs)

Risk Area

Measurement of safety performance requires the identification of relevant indicators. As aviation is a global business, the lack of standardised approach to development of SPI's among States (both in EU and worldwide) could diminish the ability of States to harmonise safety data analysis and associated risk management strategies.

Safety Performance Indicators are metrics used to express the level of safety performance achieved in the aviation system and are usually linked to safety performance targets. The expected benefits of the actions in this Plan are that a standardised list of SPI's will be developed for use in civil aviation in all EU Member States and implemented in Ireland by end of 2017.

Current Status

In 2011 EASA established a Network of Analysts (NoA) to help perform safety analysis and to help identify existing or emerging risks to be included in the European Plan for Aviation Safety. The NoA has established a working group on SPIs with the primary aim of identifying common SPIs across Europe and to provide guidance material on the development of SPIs. The work of the SPI working group will continue through 2016 and will be informed also by the related guidance emerging from the Safety Management International Collaboration Group (SM ICG). The IAA plays an active part in the work of the NoA, and this group provided the first edition of the EASA Member States Common Safety Performance Indicators in 2013 which identifies both Tier 1 and Tier 2 indicators to be monitored. The IAA is also represented in the SMICG since early 2016.

In the ATM domain, specific SPIs have been agreed and published in European regulation. EASA is continuing to develop and populate safety (key) performance indicators to measure ATM safety performance and to provide continuous monitoring and verification of the ANSPs performance achieved safety levels and trends (Ref also EPAS SPT.063).

The IAA has established SPI's at national level and publishes high level safety outcome based (tier 1 & 2) safety performance indicators in the Annual Safety Performance Review and on the IAA website. More granular SPIs (tier 3) for various sectors of the industry and individual organisations are provided to the relevant stakeholders. The IAA recognises the benefits of developing a common standardised list of SPI's at EU level and will continue to develop SPIs in line with EASA standards as they emerge, including the assessment of the benefits of FDM-based indicators for addressing national safety

The ICAO GASP 2013 targets the full implementation of the State Safety Programme in developed States by 2017, which includes the development of SPI's as a key element.

No new or amended action items are required for this version of the Plan.

EXISTING ACTIONS

- a) Participate in the development of standard safety performance indicators across Europe through participation in the EASA Network of Analysts working group.

EPAS Reference: SPT.060

Target Date:
Q3 2017

M.005 Safety Culture and Occurrence Reporting

Risk Area

Effective safety management is contingent on the timely availability of safety data from organisations and persons involved in civil aviation, which in turn is heavily dependent on a positive safety culture. The lack of timely reporting or poor safety culture reduces the ability to analyse and mitigate safety risks and to share vital safety information.

- The objectives of the actions in this section of the Plan are to:
 - assist organisations and persons experiencing difficulties implementing the new Regulation (EU) 376/2014
 - promote voluntary reporting for those not subject to mandatory reporting requirements
 - develop improvements in safety culture through occurrence reporting.

Current Status

New Regulation (EU) 376/2014 became effective on 15th November 2015 and includes provisions for the implementation of mandatory and voluntary occurrence reporting in both organisations and States. This regulation places new responsibilities on organisations to provide ADREP/ECCAIRS compatible reports and includes the General Aviation community under the mandatory occurrence reporting system for the first time. The IAA recognises that the new responsibilities which may require systems/procedure development and training and will provide assistance to organisations and persons experiencing difficulties implementing the new requirements (new Action Item f) below).

The IAA has established an online voluntary reporting system in 2011 and whereas the general public and industry personnel have made good use of this system, the general aviation community have not. The mandatory reporting requirements of the new Regulation (EU) 376/2014 applies to general aviation, however, those involved in operating the Basic Regulation Annex II aircraft are currently excluded. The General Aviation Safety Council of Ireland (GASCI) was established in 2012, with the 'promote the safety of General Aviation in Ireland'. To achieve this, GASCI seeks to identify flight safety risks and minimise them through education, training and shared experience amongst the Aviation Community. The IAA will work with GASCI to provide guidance to the GA community

on the new mandatory requirements in the regulation and to encourage voluntary reporting by those not subject to the mandatory provisions.

The new Regulation (EU) 376/2014 will enable the collection of more consistent occurrence reporting data on an EU-wide basis and consequently provide better opportunity to compare and contrast the types of occurrences that are analysed across the civil aviation system. This will further allow the sharing of information amongst States and organisations with the aim to improve the safety culture across the total system. The European Plan for Aviation Safety (ref SPT.067) advises that the EASA Network of Analysts will provide a focal point for EU wide assessment of safety culture which will include States survey of occurrence reporting as part of the process. The IAA conducted it's own EU wide occurrence reporting survey in 2013 and has agreed to support the EASA NoA with the analysis of the results of the EASA survey. In addition the IAA has used, and will continue to use the results of the oversight of occurrence reporting as a performance indicator of the safety culture of an organisation (see new Actions f) and g) below).

NEW ACTIONS

- | | |
|--|---|
| <p>f) The IAA will take a leading role in the EASA occurrence reporting survey of States and support the EASA NoA with the subsequent analysis.</p> <p>EPAS Reference: MST.023</p> | <p>Target Date:
Q4 2017</p> |
| <p>g) The IAA will use the results of oversight of occurrence reporting as a performance indicator of the safety culture of an organisation.</p> <p>EPAS Reference: MST.023</p> | <p>Target Date:
On-going</p> |

EXISTING ACTIONS

- | | |
|--|---|
| <p>c) The IAA will work with GASCI to encourage the sharing of Safety information within the GA community, at GASCI safety evenings and Club Fly-in events and via GASCI website and facebook.</p> | <p>Target Date:
On-going</p> |
| <p>e) The IAA will work with GASCI to provide guidance to GA community on the requirements of the new EU Occurrence Reporting Regulation No. 376/2014 and to encourage voluntary reporting by those not subject to the mandatory requirements *(leg BR Annex II operators).</p> | <p>Target Date:
Q4 2016</p> |



Irish Registered A321 operated by Alitalia
Photo Paul Daly

M.010 Implementation of Risk and Performance Based Oversight

Risk Area

The IAA plans to implement risk and performance based oversight as a key element of safety management in Ireland in order to target resources in the more critical safety areas. The lack of, or ineffective implementation of, risk and performance based oversight could result in the targeting of resources in the wrong areas.

A key feature of safety management at the State level is the use of performance (objective) based regulations and risk and performance based oversight methodologies to compliment traditional prescriptive rulemaking and compliance based oversight activities. The IAA target is to implement risk and performance based oversight in Ireland in the domains of operations, air navigation services and aerodrome domains by end by end 2017 and in airworthiness domain by end 2019.

Current Status

The concept of risk and performance based oversight provides greater flexibility for both the State and the service provider to target areas of greater concern. It is planned to compliment the compliance based oversight methods by targeting resources of both the State and the service provider towards areas of greatest risk to safety.

The full implementation of performance based oversight in the IAA is a medium term project which requires:

- Risk and performance measurement systems and structures
- Data collection and analysis systems
- Data quality verification processes
- Personnel training
- Roll-out planning
- Change management

Some of the core data collection and analysis elements are already in place in Ireland (eg mandatory occurrence reporting collection and analysis schemes) and this data is currently used to inform compliance based oversight approach in some cases. However a considerable amount of work is required to make the transformational changes (across people, process, systems, data and culture) to fully implement risk and performance based oversight.

Risk and performance based oversight is heavily dependent on the availability and use of appropriate measures of risk and performance data. A poor foundation in this area could lead to the inefficient targeting of resources in the wrong areas, or at worst, failure to identify critical safety concerns that might have prevented an accident or serious incident.

The main focus at this time is on the development of the safety performance measurement systems and structure necessary to enable risk and performance based oversight. Whereas the IAA has a mature measurement system in place for safety outcomes (ie lagging indicators of accidents, serious incidents and incidents) work is required in developing appropriate leading indicator measures at the service provider and regulatory levels (eg organisational performance, compliance findings, risk profiles, effectiveness measures for SSP/SMS performance, just culture etc) and the means to collect and analyse this data. Chapter M.003 (Development of SPI's) above will help to identify what measures are appropriate in this area, however this task will focus on how, where and when to collect and analyse this data.

The successful implementation of risk and performance based oversight is also highly dependent on the maturity of the safety management system of the service providers involved. In recognition of this dependency, and in order to ensure greater chance of success, the IAA implementation strategy is to roll-out risk and performance based oversight on a phased basis beginning with the most mature service providers and gradually building on this experience working towards full implementation across all other service providers and domains. It is envisaged that early implementation of performance based oversight will be conducted as a parallel process with the current compliance based oversight process in order to build confidence in the system before full implementation.

In 2014 the IAA established the measurement structure based on three pillars; organisation intrinsic risk profile, organisation compliance profile and organisation performance profile. Bespoke tools were used to establish the overall organisation risk and performance profile for all AOC Holders and the results were used as part of the AOC

oversight planning function for 2015 and 2016. Whereas, more work is required to bring the system to full maturity the underlying concept based on the three pillars identified above has proven it's usefulness in the Air Operations domain and will be rolled out to air navigation services and aerodrome domains in the next two years.

An effective risk and performance based oversight approach is dependent on the implementation of Safety Management System in the organisation. The requirements for SMS in airworthiness domains is subject to EU rulemaking (ref also M.003 above) and due in 2018. Consequently the roll-out of the measurement structure in the airworthiness domain is planned for end 2019 (new Action Item d) below)

NEW ACTIONS

- | | | |
|-----------|---|--------------------------------|
| d) | The IAA will develop the tools to support risk and performance based oversight in airworthiness based on assessment of organisation risk profile, organisation compliance profile and organisation performance profile. | Target Date:
Q4 2019 |
|-----------|---|--------------------------------|

EXISTING ACTIONS

- | | | |
|-----------|--|--------------------------------|
| c) | The IAA will develop the tools to support risk and performance based oversight in air navigation services and aerodromes domains based on assessment of organisation risk profile, organisation compliance profile and organisation performance profile. | Target Date:
Q4 2017 |
|-----------|--|--------------------------------|

M.006 Implementation of an Enterprise Resource Planning (ERP) System

Risk Area

Failure to implement an integrated Information System to allow more effective and efficient management of compliance and safety related data could diminish the ability to perform effective safety analysis and to improve the service provided to external customers. The EMPIC system was selected by the IAA.

The implementation of the EMPIC system in the IAA is a key enablers of the performance based oversight approach the IAA is implementing. This system will facilitate quick access to oversight audit results and trends which will be used, along with other measures, to develop the compliance profiles of the relevant service provider. The target is to implement EMPIC organisation oversight modules across all domains by end 2018, and the Plan is focused on the short term objectives in the phased implementation programme.

Current Status

The IAA is continuing with the phased implementation of the EMPIC system. It has now been extended to include modules for personnel licensing, aircraft registration and type certification, aircraft maintenance including continued airworthiness, flight operations and security.

The IAA continue to strategically manage the roll-out process in-house and on a phased basis, ensuring the project does not impact on the external customers and the internal resource requirements for existing safety oversight programmes.

EXISTING ACTIONS

- b) The IAA will implement the EMPIC modules applicable to Aerodromes.

Target Date:
Q4 2017

CLOSED ACTIONS

- a) The IAA will implement the EMPIC modules applicable to Flight Operations.

Target Date:
Q4 2015

M.011 Enhanced Collaboration Between SSP and SMS

Risk Area

The State Safety Program is complimentary to the Safety Management Systems implemented by the civil aviation organisations and service providers (regulated entities). Closer collaboration between the safety assurance processes in the SSP and the safety assurance processes in the regulated entities SMS will greatly enhance the ability of the overall safety system to identify the key areas of safety concern. Failure to collaborate between SSP and SMS could lead to a divergence in approach between the State and individual organisations.

The objective of closer collaboration between SSP and SMS is to ensure that safety intelligence is mutually shared between organisations and the State in more effective manner. The target is to implement the relevant methodologies and processes by end 2019.

Current Status

The IAA wishes to ensure closer collaboration between the State SSP and organisations SMS for the purposes of enhancing the overall safety performance in the State. Whereas the occurrence reporting system is a key enabler of safety management, the IAA will encourage the use of other sources of safety data (eg air operators FDM) to enhance the risk management and safety assurance processes.

EASA has launched the Data4Safety programme which will involve both State regulator and regulated entities in a collaborative project to implement Big Data analytics into aviation safety analysis. The IAA is actively involved in this project at both Steering Board and Technical Board level and will support the work of task teams as and when required.

The actions are focused on developing the methodologies and processes for ensuring closer collaboration on a two way basis to ensure that:

Some of the specific actions in this risk area that were included under different operational chapters in previous versions of this Plan, are consolidated under this chapter.

- The high level risks identified at State level (eg in this Plan) are properly considered by the regulated entities as part of their safety management processes.
- The use of data available from existing recording equipment (eg FDM) is fully integrated into the safety management process.
- The risks identified in the safety management systems implemented by the organisations are fed back to the State to ensure that lessons learned can be considered within the safety management processes at State level and appropriately shared with other affected stakeholders.
- The integration of Human Factors principles into the safety management processes.
- The enhancement of current safety analysis processes to include Big Data analytics.

NEW ACTIONS

- | | | |
|-----------|---|------------------------------------|
| a) | The IAA will target the key risks identified in this Plan, including RE, LOC-I, MAC, CFIT and precursor events as part of AOC Holder SMS oversight. | Target
Date:
Ongoing |
| b) | The IAA will establish regular dialogue with aircraft operators to promote the benefits of FDM and ensure that the standardised indicators (including RE, MAC, CFIT, LOC-I) and associated event triggers published by the European Authorities Co-ordination Group on Flight Data Monitoring (EAFDM) are implemented and monitored as part of the SMS.

EPAS Reference: MST.003 | Target
Date:
Q4 2017 |
| c) | The IAA, in conjunction with industry, will establish the methodology, tools and processes to facilitate the collection of relevant safety data from the regulated entities SMS, over and above the current data provided under the mandatory and voluntary occurrence reporting scheme. | Target
Date:
Q4 2019 |
| d) | The IAA will work with organisations to ensure that Human Factors principles are fully integrated into Safety Management processes. | Target
Date:
Q4 2018 |
| e) | The IAA will develop the processes and systems necessary to enhance the current safety analysis capabilities including the development of Big Data analytics | Target
Date:
Q4 2019 |

M.012 Complex or Novel Operational Models

Risk Area

Due to the increased complexity of the aviation industry, the number of interfaces between organisations, their contracted services and regulators has increased, as has the geographic spread of the associated operational and management processes. Failure to adequately address the safety risks arising from the introduction and on-going management of safety by organisations with complex business models or novel work practices, could have a detrimental effect on the current high level of safety.

The objective is to ensure that organisations under the oversight of the IAA that have complex or novel business models address all the associated risks as part of their Safety Management Systems and to ensure that the IAA collaborates fully with other States where high levels activities are performed (eg outstations, extended workbench etc). The target is to implement, or oversee the implementation of, the relevant processes by end 2018.

Current Status

The aviation industry in general, and Irish industry in particular, has always been to the forefront in developing new and innovative ideas to advance civil aviation, whilst ensuring the high levels of safety are maintained. This is achieved through robust risk management processes that identify and assess the hazards associated with any new idea and ensuring the associated risks are well managed. In the recent past in parallel with trends in other non-aviation related industries, complex business models and novel work practices have emerged and the actions in this chapter of the Plan are designed to address the associated safety issues. The European Plan for Aviation Safety (EPAS) has also recognised the growth of these complex models in the European context and some of the actions in this chapter are designed to address actions for EU Member States arising from EPAS.

One of the first challenges to address is the geographic spread of activities and development of operational bases or extended workbenches or other services outside of the Ireland. The IAA has already developed the relevant risk based oversight audit plans to accommodate these complex arrangements, however, the IAA also appreciates the value of cooperating on oversight activities with other States in which activities take place. The best practices employed thus far by the IAA includes, advising other MS of audit activities in that State and inviting that State to participate in the audit as observers, provision of an IAA safety review of a particular organisation on request, provision of safety information concerning specific risks on request etc. The IAA would also encourage reciprocal arrangements from other States whose organisation have bases in Ireland. (Action a) below refers).

Another challenge to be addressed is the complex organisational structures employed by many modern organisations to ensure that the management personnel have the relevant control of the business and resources to enable

them to meet their obligations. Irish Air Accident Investigation Unit Report Number 2014-001 into a fatal accident in Cork, Ireland found that some of the foreign AOC holder operational control responsibilities were being inappropriately exercised by parties outside of the AOC (ie aircraft owner and ticket seller) albeit this was not specifically identified as a contributory factor in the accident. The EPAS encourages EU Member State NAA's to have a thorough understanding of operators' governance structure, in particular, influence of financial stakeholders and of the controlling management personnel, where such personnel are located outside the scope of approval. The best practice currently employed by the IAA is to only accept applications from an organisation that has established a company in Ireland with access to all the resources it needs to fulfil it's obligations and the ability to operate with full autonomy from any parent/sister company or other financial interests. Further EU guidance is expected on this topic in 2017 and the IAA will assist in the development of this guidance and adopt any relevant recommendations that arise (Action b) below).

The Safety Management Systems required for approved organisations (ref also to Chapter M.004 for further details) include, inter alia, a risk management process to ensure all the risks applicable to that particular organisation are fully addressed. The IAA oversees the implementation of Safety Management Systems and will ensure that for complex organisations or for organisations employing novel business practices, that any new hazards are identified and addressed. The EPAS has recommended the following hazards be included; different employment models within an individual operator, increased mobility of pilots, safety-critical services provided by non-certified service providers and (long-term) leasing. The IAA will review the risk processes of relevant organisations in Ireland to ensure that these hazards are being addressed and will provide relevant information to EASA when requested.

NEW ACTIONS

- | | |
|---|--|
| <p>a) The IAA will implement cooperative oversight and disseminate best practices on how NAAs can better work together and participate in the oversight of organisations/persons certified by another Member State</p> <p>EPAS Reference: MST.021.</p> | <p>Target Date:
Q4 2018</p> |
| <p>b) The IAA will ensure it has a thorough understanding of operators' governance structure, in particular, influence of financial stakeholders and of the controlling management personnel, where such personnel are located outside the scope of approval. The IAA will also assist in the development of, and implement, best EU practices in this regard.</p> <p>EPAS Reference: MST.019</p> | <p>Target Date:
Q4 2017</p> |
| <p>c) Management systems of the operator should capture new hazards that are introduced by different employment models within an individual operator, increased mobility of pilots, safety-critical services provided by non-certified service providers and (long-term) leasing. The IAA will ensure this happens through SMS oversight activities and provide relevant updates to the Agency when requested.</p> <p>EPAS Reference: MST.022</p> | <p>Target Date:
Q4 2017</p> |

APPENDIX 2 COMMERCIAL AIR TRANSPORT DETAILS



FOD.001 Loss of Control in flight

Risk Area

Both ICAO and EASA have identified that although the loss of control of an aircraft in flight (LOC-I) is a relatively rare event, based on studies of accident data over the past 10 years, it has been found that the highest proportion of fatal accidents were attributed to LOC-I events across many different sectors in aviation.

Although LOC-I related accidents or serious incidents are thankfully rare in the Irish civil aviation system, LOC-I remains one of the key risks to fatal accidents in aviation and it is therefore included in this Plan. The expected benefits of these actions are that there will be no LOC-I related accidents or serious incidents involving Irish commercial aircraft. The main focus of the current actions are to help prevent LOC-I events from occurring particularly following aircraft upset events.

Current Status

Numerous studies of LOC-I related accidents have shown that the problem of LOC-I is a complex one to address. The most recent (2015) study of accident and incident data conducted by EASA Network of Analysts concluded that the most common precursor events related to environmental issues (eg flight in icing conditions or turbulence) or system failure, and a critical factor is the ability of the crew to anticipate the undesired behaviour of the aircraft, or once the undesirable state has commenced, to prevent it's deterioration. Note that the specific subject of aircraft de-icing is addressed under Chapter FOD.004 in this Plan.

An ICAO symposium on this topic was conducted in 2014 with the aim to provide a cohesive package of tools to pilots, operators, regulators and training organisations to address LOC-I. During 2014 improved ICAO SARPS to address training requirements were introduced in ICAO Annexes 1, 6 and PANS-TRG (DOC 9868). ICAO developed Doc 10011 "Manual on aeroplane Upset Prevention and Recovery Training (UPRT)", to support these new provisions and is applicable to the training of aeroplane pilots.

EASA applied an accelerated rulemaking process to publish AMC/GM to Part ORO (Decisions 2015-012-R and 2015-027-R) and to develop NPA 2015/13, all of which addresses the UPRT issue in the EU regulatory framework, incorporating the relevant ICAO SARPS and guidance. Action item d) has been amended accordingly to address the implementation and promotion of EASA regulations and guidance in this regard.

The implementation of competency based training programmes can also assist in addressing this risk. The European Human Factors Advisory Group (EHFAG) published the Regulatory Inspector Human Factors Competency Framework in 2014, which may be used to determine a set of relevant competencies for a particular role that best enhances the performance of an individual in relation to the task. The IAA will use this document

when assessing training organisations implementing competency based training programmes (Action item f) below). In the interim, the IAA has been working with individual operators to improve training (including instructor training) in areas such as approach to stall and stall recovery, subject to the limitations of the flight simulator training devices.

The IAA has implemented an operational oversight process with associated procedures and checklist to target LOC-I events for Irish AOC Holders, including review of the AOC holders SMS/FDM activities (ie SPI analysis/trends, mitigation actions) to address the precursors to LOC-I occurrences (see action in Chapter M.011). The IAA continues to share information on LOC-I events with EASA. In addition the IAA monitors the implementation of guidance contained in related EASA SIB's on an ongoing basis, albeit that some of this guidance has migrated into published AMC/GM.

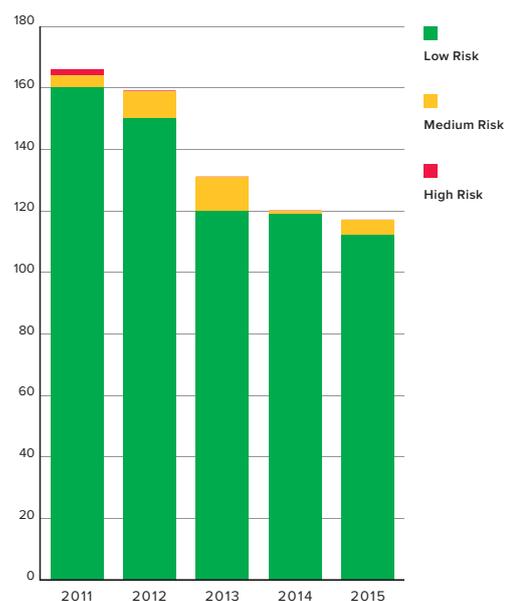


Figure 1: LOC-I Events

There is a decreasing trend evident for LOC-I precursor events reported to the IAA under the Mandatory Occurrence Reporting scheme in the past five years. Most of the events are low risk indicating only minor speed exceedances easily corrected by the flight crew.

EXISTING ACTIONS

- | | | |
|-----------|--|---------------------------------|
| d) | The IAA will promote the new EU regulations concerning Loss of Control Prevention and Recovery Training and will provide guidance to individual Irish operators and approved training organisations on the implementation of these requirements. | Target Date:
Q4 2018 |
| | EPAS Reference: SPT.012 | |
| e) | The IAA will review and promulgate latest EASA publications (policies/SIB's) concerning LOC-I and monitor the implementation of recommendations applicable to the Irish civil aviation system. | Target Date:
On-going |
| f) | The IAA will use the EHFAG regulatory inspectors HF competency framework in assessing training organisations implementing competency based training programmes. | Target Date:
Q4 2016 |

FOD.003 Controlled Flight into Terrain

Risk Area

Both ICAO and EASA have identified Controlled Flight Into Terrain (CFIT) as one of the main contributory causes to fatal and non-fatal accidents across all sectors of civil aviation. The EU States wish to reduce the level of controlled flight into terrain (CFIT) events in Europe.

CFIT is an event where an airworthy aircraft under the complete control of the flight crew is inadvertently flown into terrain, water or an obstacle. CFIT related accidents or serious incidents are thankfully rare in the Irish civil aviation system, nevertheless CFIT remains one of the common causes of fatal accidents in aviation and it is therefore included in this Plan. The expected benefits of these actions are that there are no CFIT related accidents or serious incidents involving Irish commercial aircraft. The current actions are focused on mitigating the risk by ensuring the precursor events are appropriately monitored under Safety Management Systems, and by supporting and encouraging the implementation of APV approaches in Irish airports licensed for commercial operations.

Current Status

The majority of fatal CFIT accidents occur during the approach phase of flight (nearly 70% for global fatal CFIT accidents), and most of these involve the aircraft being lined up with the runway but incorrectly positioned in the vertical plane. Of the fatal CFIT accidents that occur during the approach phase of flight, more than half involve non-precision, visual/circling or user-defined approaches.

The majority of fatal CFIT accidents involve aircraft not equipped with functioning Terrain Awareness Warning Systems. In addition, TAWS effectiveness is dependent on use of accurate position information. EASA is currently focussed on introducing new regulation to mandate installation of TAWS on commercial transport aircraft currently not mandated (ie on aircraft less than 5700 kgs MTOM that are able to carry 6 to 9 passengers (due 2016)).

In Ireland, the IAA provides Electronic Terrain And Obstacle Data (ETOD), for use by industry stakeholders, such as GPS and FMS database suppliers. The ETOD helps to eliminate database transfer errors in on-board TAWS equipment and thereby helps minimise CFIT occurrences.

The IAA has implemented an operational oversight process with associated procedures and checklist to target CFIT for Irish AOC Holders, including review of the AOC holders SMS/FDM activities (ie SPI analysis/trends, mitigation actions) to address the precursors to CFIT occurrences (see chapter M.011 above). The IAA also continues to participate in EASA Survey's of Member States to share information on actions and measures in use in the State to address CFIT.

ICAO has recommended the implementation of area navigation and approach procedures with vertical guidance for all Instrument runway ends, either as the primary

approach or as a back-up for a precision approach, by 2016. An Implementation Plan for Ireland has been developed that aims to provide APV/LPV approaches in the main Irish airports licenced for commercial air transport operations by the end of 2016. The IAA is actively involved in assisting and encouraging the delivery of the plan, in conjunction with the affected service providers.

Figure 2 shows the relatively low level of reports of CFIT events received under the Mandatory Occurrence Reporting scheme and the declining trend evident since 2012. Most of the events were low risk reflecting momentary TAWS alerts (eg during unstable or turbulent conditions) during which the flight crew remained fully aware of, and in control of the situation.

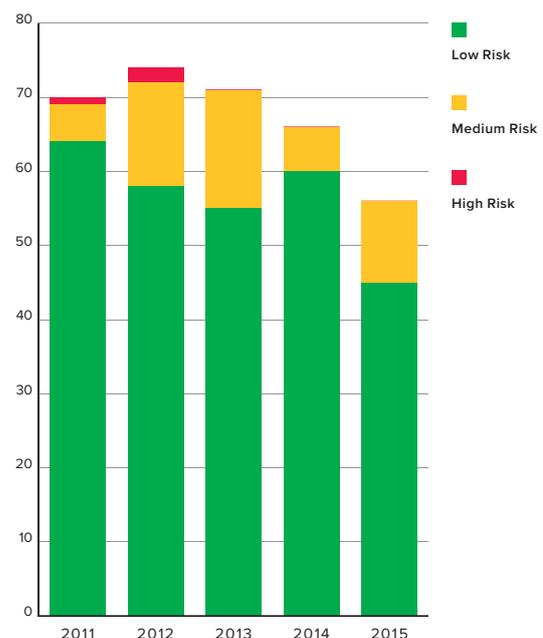


Figure 2: CFIT Events

EXISTING ACTIONS

- c)** The IAA will work with service providers to ensure that Irish airports licensed for commercial air transport provide non-precision instrumented approaches that contain vertical guidance.

EPAS Reference: MST.006

**Target
Date:**
Q4 2016

ASD.001 Mid-Air Collisions

Risk Area

Mid-Air Collisions (MAC) are accidents where two or more aircraft come into contact with each other in the air. While the likelihood of an event is low the consequences of any event are extremely high (major loss of life) and therefore the aim is to reduce the level of safety incidents that may be a contributory factor in a mid-air collision event.

A MAC occurrence is a loss of aircraft separation event that has escalated into an accident. The expected benefits of these actions are that there will be no MAC related accidents or serious incidents, due to failures in the Irish Civil Aviation system and involving Irish commercial operators or any operator flying in Irish airspace. In addition the actions are focused on reducing the level of MAC precursor events such as TCAS RA, airprox, loss of separation, level bust, airspace infringements and ATC issues.

Current Status

MAC events are a common reported occurrence category by Irish operators (including those related to TCAS RA activation). The vast majority of these reports do not have any potential accident outcome; however MAC is included in this plan based on the catastrophic consequences of an actual mid-air collision.

The European Action Plan for Airspace Infringement Risk Reduction (EAPAIRR) was developed in 2009 to reduce the number of airspace infringements which, in the worst case scenario, could end in a mid-air collision. The plan contains action items for the main stakeholders – the airspace users, regulators, military, training organisations, Eurocontrol, the air navigation service providers and related services such as metrological data. The IAA has completed all of the thirteen recommended and proposed actions for regulators included in the plan. The IAA promotes the implementation of EAPAIRR recommendations for service providers in the States and is currently reviewing the level of implementation.

The IAA has implemented an operational oversight process with associated procedures and checklist to target MAC events for Irish AOC Holders, including review of the AOC holders SMS/FDM activities (ie SPI analysis/trends, mitigation actions) to address the precursors to MAC occurrences and will continue to do so (see also chapter M.011 above).

The graph opposite shows that the number of MAC related events reported to the IAA under the Mandatory Occurrence Reporting scheme is relatively stable albeit with an increasing trend since 2013. Based on a seven year analysis conducted by the IAA, MAC is one of the main causes attributed to serious incidents involving Irish operators.

Several EU MS have reported an increase in loss of separation occurrences involving civil and military aircraft and more particularly an increase in non-cooperative military traffic over the high seas. The IAA has received reports of airspace infringements by non-co-operative military aircraft in the Shannon FIR. An EASA technical

analysis “Report on occurrences over the high seas involving military aircraft in 2014” contains a number of recommendations for the EU Member States and these are currently under review in Ireland for relevant action (New action item e) below).

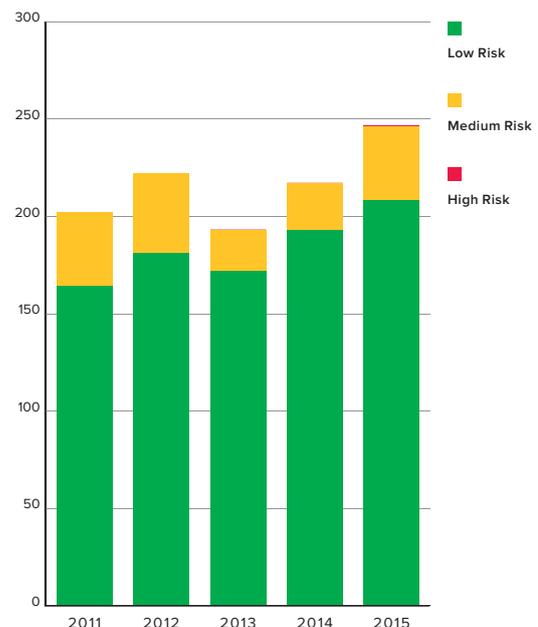


Figure 3: MAC Events

The IAA plan to perform a detailed analysis of MAC related events reported to the IAA was superseded by an EASA Network of Analysts (NoA) analysis of MAC based on information contained in the ECR and other sources. An IAA safety analyst participated in this EASA analysis. The EASA NoA report is under detailed review in order to identify the main causes and consequences and to help develop further means to mitigate against this hazard. Action item d) below is amended accordingly).

One of the findings of the EASA MAC analysis is that the TCAS system has proven an effective barrier to prevent CAT/CAT encounters from escalating into an accident, however barriers to prevent CAT/GA accidents are

somewhat weaker, as most GA aircraft are not equipped with the transponder equipment necessary for TCAS to work. The two scenarios to be addressed are airspace infringement (ie deliberate or accidental entry by non-equipped GA traffic into controlled airspace) or flight by CAT traffic into uncontrolled airspace. The IAA will ensure that Irish operators fully address the risks associated

with operations into uncontrolled airspace in their safety management system. New Action item f) below).

Specific actions (see also Chapters FOD.017, FOD.020) to address the risks of MAC for general aviation (including airspace infringements by GA aircraft) are included in the General Aviation section of this Plan.

NEW ACTIONS

- | | | |
|-----------|--|--------------------------------|
| e) | The IAA will review the recommendations for EU Member States contained in EASA technical analysis "Report on occurrences over the high seas involving military aircraft in 2014" and implement these recommendations as appropriate, in conjunction with relevant State authorities. | Target Date:
Q4 2017 |
| | EPAS Reference: MST.024 | |
| f) | The IAA will ensure that Irish operators fully address the risks associated with operations into uncontrolled airspace in their safety management system | Target Date:
Q4 2016 |

EXISTING ACTIONS

- | | | |
|-----------|--|--------------------------------|
| d) | The IAA will review the EASA NoA detailed analysis of MAC related events in order to identify the main causes and consequences and to help develop further means to mitigate against this hazard | Target Date:
Q4 2016 |
| b) | The IAA will review the level of implementation of recommendations for service providers contained in the EAPAIRR as part of the oversight cycle. | Target Date:
Q4 2016 |
| | EPAS Reference: MST.010 | |

M.007 Runway Incursions

Risk Area

Runway Incursions have been recognised for some time as a key risk in aviation safety and led to publication of the European Action Plan for the Prevention of Runway Incursions. The EU States wish to reduce the level of runway incursion events in Europe.

A runway incursion (RI) is any occurrence at an aerodrome involving the incorrect presence of an aircraft vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft. The expected benefits of these actions are that there will be no RI related accidents or serious incidents attributed to Irish commercial operators or at Irish runways. In addition the actions are focused on reducing the level of RI precursor events such as stopbar violations, inadequate airport markings, complex runway operations, ATC issues and loss of situational awareness.

Current Status

A great deal of work has been performed on runway incursions over the years and the focus on this key risk has contributed towards improvements in the global rate of Runway Incursion related safety events in recent years, as reported by ICAO and EASA. One of the key EU initiatives was the development of the European Action Plan for the prevention of Runway Incursions (EAPPRI) which contains several recommendations for all stakeholders (ie regulators and service providers) to help mitigate the risk of an RI event. The EU research into RI related safety events has also highlighted that the risk of a runway incursion is highly dependent on the local characteristics of each individual airport.

The actions in this Plan mainly derive from the recommendations of the EAPPRI. The IAA has implemented all of the nine recommendations for regulators included in Section 1.7 of the EAPPRI, and is currently monitoring the implementation of EAPPRI recommendations for service providers (eg Air Operators, ANSP, Aerodromes etc) during oversight activities. One of the key elements of the Plan was the establishment of Local Runway Safety Teams and these have now been established at certified aerodromes in Ireland.

The IAA audits the effectiveness of the Local Runway Safety Teams in reducing RI events as part of the annual oversight programme. The IAA Runway Incursions Action Group led by IAA SRD was re-constituted in 2015 to deal with the broader issue of aerodrome movements and consequently broaden Current Status.

The IAA Runway Incursions Action Group led by IAA SRD was re-constituted in 2015 to deal with the broader issue of aerodrome movements and consequently broaden stakeholder involvement to include airport authorities. This reconstituted group will enhance the ability to analyse runway incursion incidents. This group has an extended remit to analyse ground collisions or near collision events that occur anywhere in the aerodrome (ref also to chapter FOD.004 in this Plan).

The IAA Annual Safety Performance Review 2015 shows that the trends for RI related events at Irish airports has shown a noticeable decrease in 2015 and it can also be seen that occurrences reported are mostly of low severity (eg minor stopbar violations).

Year	Severity A	Severity B	Severity C	Severity D	Severity E	Total
Runway Incursions						
2011	1	0	7	0	7	15
2012	0	1	6	0	17	25
2013	0	0	2	0	15	17
2014	0	2	2	0	24	28
2015	0	1	2	0	9	12

EXISTING ACTIONS

- | | |
|--|--|
| <p>b) The IAA will audit the effectiveness of the local runway safety teams (including effectiveness of SMS in reducing RI precursor events).</p> <p>EPAS Reference: MST.011</p> | <p>Target Date:
Ongoing</p> |
| <p>c) The IAA will review the level of implementation of recommendations for service providers contained in the EAPRRI as part of the oversight cycle</p> <p>EPAS Reference: MST.014</p> | <p>Target Date:
Q4 2015</p> |

CLOSED ACTIONS

- | | |
|--|--|
| <p>d) The Runway Incursions Action Group, tasked (inter alia) with performing detailed analysis of RI events, will be re-constituted and enhanced to include involvement of airport authorities</p> | <p>Target Date:
Q4 2015</p> |
|--|--|



ASL Airlines Boeing 737
Photo by Joe Heeney (joedc29@hotmail.com)

FOD.002 Runway Excursions

Risk Area

Runway Excursions (RE) have been identified by both ICAO and EASA as one of the most common causes of accidents reported annually, in the European region and worldwide. The EU States wish to reduce the level of runway excursion events in Europe through greater coordination of existing efforts.

RE related accidents or serious incidents are thankfully rare in the Irish civil aviation system, nevertheless RE remains one of the common causes of accidents in aviation and it is therefore included in this Plan. The expected benefits of these actions are that there will be no RE related accidents or serious incidents involving Irish commercial aircraft. In addition the actions are focused on improving the reporting of precursor events for RE, such as abnormal runway contact, deep landing, high speed touchdown and unstable approaches.

Current Status

A runway excursion (RE) is an event in which an aircraft veers off or overruns the runway surface during either take-off or landing.

The European Action Plan for the Prevention of Runway Excursions (EAPPRE), was published on 1st January 2013. The Action Plan contains detailed recommended actions and associated guidance material intended for implementation by the relevant stakeholder organisations (including regulators, aircraft and airport operators, ANSP's etc) with the aim of reducing the rate of runway excursions.

The IAA has implemented all the recommendations for regulators of the EAPPRE, albeit, the implementation of joint training exercises involving operatives at ANS, Aerodromes and Flight Operations remains challenging in view of the limited number of RE events that actually occur in the State. The IAA will monitor the implementation of EAPPRE recommendations for operators and other service providers during oversight audits.

The IAA is monitoring EASA Rulemaking plans in this area (eg RMT.0570, RMT.0296) and has reviewed available EASA guidance. EASA SIB 2013-20 addresses bounced landings recognition and recovery training and the IAA has confirmed the implementation of the recommendations of this SIB by Irish operators and training organisations (action item i) is closed). EASA SIB 2014-20 addresses aeroplane operations in crosswind conditions. The IAA will review the implementation of the recommendations of this SIB with Irish AOC holders during the current oversight cycle (new action item k) below).

Revised guidance on the classification of RE events has been issued by EASA in support of the new Regulation (EU) 376/2014 and has been disseminated to all operators (action item h) is closed accordingly)

Figure 4 shows that the rate of RE related events reported to IAA is very low and includes mainly precursor events (eg baulked landings). The chart includes only 11 actual runway excursions and most of these were only minor excursions during entry or turn-off from the runway.

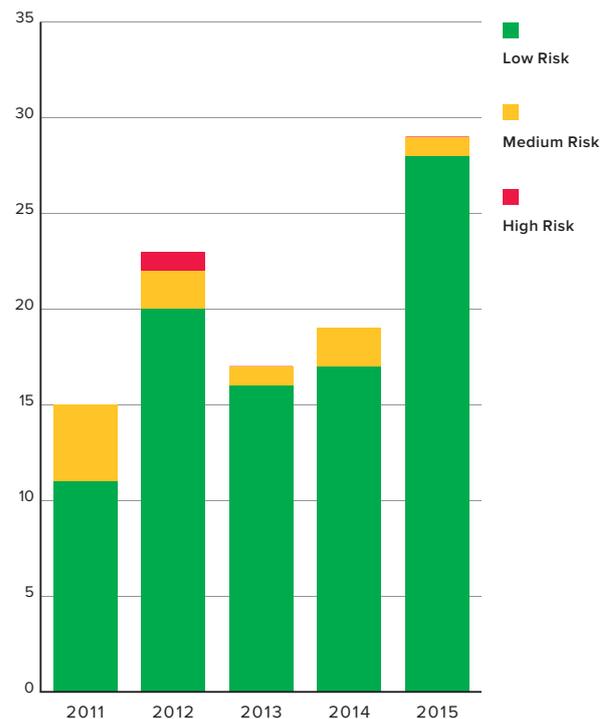


Figure 4: RE Events

NEW ACTIONS

- | | | |
|-----------|--|--------------------------------|
| k) | Review the implementation of recommendations in EASA SIB 2014-20 "Aeroplane Operations in Crosswind Conditions" with Irish AOC holders during the current oversight cycle. | Target Date:
Q4 2017 |
|-----------|--|--------------------------------|

EXISTING ACTIONS

- | | | |
|-----------|---|---------------------------------|
| c) | Share actions and measures in use at national level to address this safety risk and participate in EASA initiatives to share best practice and coordinate actions. | Target Date:
On-going |
| f) | Where practicable, the IAA will ensure that specific joint training and familiarisation in the prevention of runway excursions, is provided to Pilots, Air Traffic Controllers and Aerodrome Operator staff (EAPPRE 3.1.4). | Target Date:
Q4 2016 |
| j) | The IAA will monitor the implementation of EAPPRE recommendations for service providers during oversight audits. | Target Date:
Q4 2016 |
- EPAS References:** MST.007, SPT.075

CLOSED ACTIONS

- | | | |
|-----------|--|--------------------------------|
| h) | The IAA will meet with Irish operators and review the reporting and classification of certain RE precursor events (eg deep landing, high speed touchdown, unstable approaches). | Target Date:
Q4 2015 |
| i) | The IAA will review and promulgate latest EASA publications (policies/SIB) concerning RE and monitor the implementation of recommendations applicable to the Irish civil aviation system | Target Date:
Q4 2015 |

FOD.004 Safety of Ground Operations

Risk Area

Analysis of global accidents has shown that there has been a steady rise in accidents caused either during or as a result of ground operations. EASA has reported that this is the second highest category for CAT accidents between 2003 and 2012. The IAA wishes to improve the safety of ground operations in Ireland.

Ground operations involve all aspects of aircraft handling at the airport as well as aircraft movement around the aerodrome, except when on active runways. The expected benefits of these actions are that there will be a reduction in the number of ground related accidents or serious incidents at Irish international airports. In addition the actions are focused on reducing the level of ground operations related events such as unreported damage, loading errors, inadequate de-icing, fuelling issues and dangerous goods issues.

Current Status

Damage from ground-related occurrences results in both safety risk and economic cost for all organisations involved. The IAA has been targeting this area for specific focus for the past few years, including targeted oversight of the key risk areas, establishment of quarterly safety review meetings with ground operations post holders etc.

Figure 5 shows that the upward trend in the level of reports of Ground Operations related occurrences reversed in 2015 with vast majority of events classified as low risk. The reversal in the number of reports may be explained by a combination of safety improvement but also growing maturity in the reporting processes.

As discussed in topic M.007 (Runway Incursions) above, the Runway Incursions Action Group led by IAA SRD was re-constituted in 2015 to deal with the broader issue of aerodrome movements and consequently broaden stakeholder involvement to include airport authorities. This reconstituted group will provide greater focus on ground collisions or near miss events on the apron or taxiways as well as examining and promoting mitigating measures including structural, technological, operational and training.

De-icing of aircraft has also been an area of recent focus. The IAA consulted with industry to identify their primary concerns in this area and attended the EASA Ground De-icing workshop in April 2013 where a number of EASA initiatives to improve safety, raise standards and improve availability of de-icing fluids were reviewed. The latest guidance was presented to a wide audience of Irish Industry stakeholders during Ground Operations Working Group workshop in October 2015. (Action d) is closed).

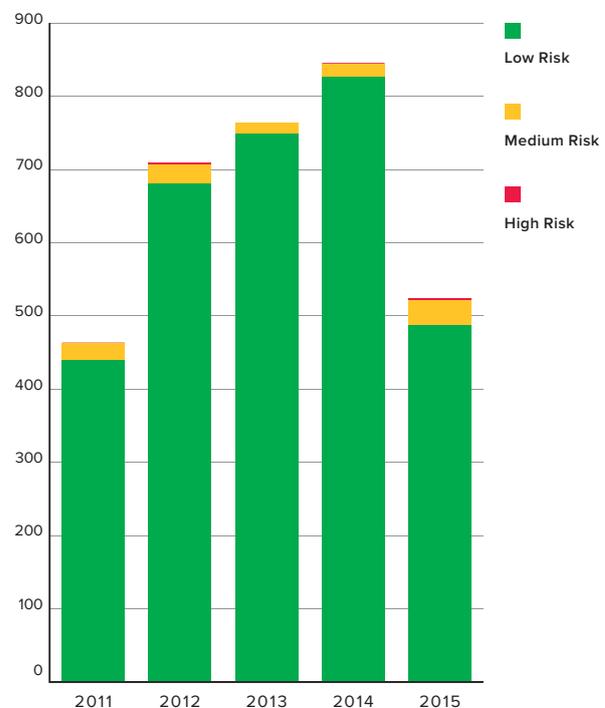


Figure 5: Ground Operations Events

EXISTING ACTIONS

- e) The IAA will review ramp and taxiway events (collisions and near collisions) and develop/promote mitigating measures, including structural, technological, operational and training.

EPAS Reference: MST.018

**Target
Date:**
Q4 2017

CLOSED ACTIONS

- a) The IAA will implement a detailed audit schedule with focus on the three key risk factors: loading error, undetected/unreported aircraft damage and inadequate de-icing procedures

**Target
Date:**
Q4 2015

- i) Following from EASA Icing Workshop, the IAA airworthiness department will review and update de-icing guidance and will conduct briefing sessions with airport authorities to review aerodrome best practices.

**Target
Date:**
Q3 2015



Boeing 767 Freighter
Photo by Paul Daly

FOD.011 Human Factors and Performance

Risk Area

Analysis (ICAO, EASA, IAA) of accidents and serious incidents and occurrences shows that human factors and performance were a contributing factor in a number of risk-bearing events.

In the latest European Plan for Aviation Safety (EPAS) 2016-2020, the human factors and human performance risk has been integrated within the other risk areas so that human factors aspects are considered in an integrated manner when risks are being mitigated.

The IAA accepts the logic of the integrated approach and accordingly Human Factors will no longer be treated as a separate issue in this Plan. Furthermore in recognition of the importance of the integrated approach, a new action has been added to this Plan in Chapter M.011 to address the integration of Human Factors principles into Safety Management processes.

Previous actions under this Chapter have either been closed or moved to different chapters as described below.

Current Status

A European Strategy for human factors in civil aviation was developed by the European Human Factors Advisory Group (EHFAG) and published on the EASA website in 2012. The related actions following this strategy are now integrated into the EPAS and therefore integrated into this Plan as appropriate (Action item b) below is closed).

In September 2014 the EHFAG published the Regulatory Inspector Human Factors Competency Framework. The IAA will use this document when assessing training organisations implementing competency based training programmes. The related action is still active and has been moved to Chapter FOD.001.

In 2013 the IAA conducted a detailed analysis of the Human Factors flight crew related higher risk bearing occurrence reports. The analysis identified amongst others, the number of contributory factors involved in each event, the safety barriers breached and the consequences of each event. Detailed analysis reports were completed and the results were shared with Irish operators and mitigating actions taken are followed up during SMS oversight activities. (Action Item c) below is closed).

CLOSED ACTIONS

- | | | |
|----|---|--------------------------------|
| b) | The IAA will implement any action items arising from the EHFAG action plan for human factors and performance applicable to NAAs | Target Date:
Q4 2015 |
| c) | The IAA will meet and review with each Irish AOC holder the mitigation actions being taken to address the most common contributing factors to high risk bearing HF Crew occurrences | Target Date:
Q4 2015 |

M.009 Fire Smoke and Fumes

Risk Area

Uncontrolled fire on board an aircraft, especially when it is in flight, represents one of the most severe hazards in aviation. This issue was added to the priority action area for commercial air transport in the European Aviation Safety Plan 2014-2017.

Whereas much work has been done to mitigate against this hazard over the past two decades the issue has been brought back into focus in recent years due to increasing reports of fire and smoke related events (eg due to lithium battery fires). The expected benefits of these actions are that there will be no smoke/fire related accidents or serious incidents involving Irish AOC holders.

Current Status

In-flight fire can ultimately lead to loss of control, either as a result of structural or control system failure, or as a result of crew incapacitation. Fire on the ground can take hold rapidly and lead to significant casualties if evacuation and emergency response is not swift enough. Smoke or fumes, whether they are associated with fire or not, can lead to passenger and crew incapacitation.

In 2013 the Royal Aeronautical Society paper "Smoke, Fire and Fumes in Transport Aircraft" was updated. The paper serves as a reference document on current risk and proposed mitigations for smoke and fire events on commercial transport aeroplanes. In the updated edition a new section on lithium batteries, composite materials and predictive technologies has been added together with new recommendations to reflect the current risks.

The recommendations to reduce the severity and effects of in-flight fires focus on:

- i. Equipment design and airworthiness;
- ii. Protective equipment;

- iii. Maintenance;
- iv. Pilot procedures;
- v. Flight and cabin crew training.

The level of occurrences of Fire-NI reported under the mandatory occurrence reporting system is relatively low and most events are categorized as low risk. Nevertheless the IAA will provide a renewed focus on this hazard and has added this specific risk to the appropriate oversight evaluation checklist (accordingly action item a) is closed).

The review of the RAeS document for other mitigating actions is on-going. In addition, in the European Plan for Aviation Safety (EPAS) 2016-2020 action SPT.069, EASA intends to publish guidance material for operators and passengers concerning Lithium Battery Safety. The IAA will ensure this guidance material is promulgated fully within the Irish civil aviation system and will follow up with operators to ensure that the EASA guidance is incorporated as appropriate (new action c) below).

NEW ACTIONS

- | | | |
|-----------|---|--------------------------------|
| c) | The IAA will promulgate EASA guidance for operators and passengers on Lithium Battery Safety and will follow up with Irish operators during oversight activities to ensure that this guidance is incorporated as appropriate. | Target Date:
Q4 2017 |
|-----------|---|--------------------------------|

EPAS Reference: MST.005, SPT.069

EXISTING ACTIONS

- | | | |
|-----------|--|--------------------------------|
| b) | The IAA will review the updated guidance in RAeS document "Smoke, Fire and Fumes in Transport Aircraft" and address any areas of concern for the civil aviation system in Ireland. | Target Date:
Q4 2016 |
|-----------|--|--------------------------------|

CLOSED ACTIONS

- | | | |
|-----------|---|--------------------------------|
| a) | The IAA will provide specific focus on the compliance with regulations related to smoke and fire during the current two year oversight audit cycle. | Target Date:
Q4 2016 |
|-----------|---|--------------------------------|

AED.002 Bird Strike Hazard

Risk Area

Bird strikes may cause significant damage to an aircraft structure or flight controls, and aircraft engines (especially jet-engines) are vulnerable to the loss of thrust which can follow the ingestion of birds into engine air intakes which may lead to an accident.

This Plan addresses the hazards to aviation from bird strikes particularly during take-off, initial climb, approach and landing phase of flight, in and around the vicinity of airports. The expected benefits of these actions are that there will be no bird strike related accidents or serious incidents involving commercial aircraft operating in Ireland. Additionally, Ireland will work with EASA to establish pan-European actions to address this hazard.

Current Status

ICAO Annex 14 requires States to collect and collate reports of bird strikes on aircraft and to report the annual statistics to the ICAO bird strike information system (IBIS). The IAA chairs the National Bird Hazard Committee in Ireland which reviews bird strike analysis reports and assesses the effectiveness of mitigation measures in use in the State.

Analysis has shown that Bird strikes may occur during any phase of flight but are most likely during the take-off, initial climb, approach and landing phases because of the greater numbers of birds in flight at lower levels. Bird strikes can cause significant damage to aircraft and although thankfully fatal accidents due to bird strikes are a rare event, the Bird Strike Committee USA (<http://www.birdstrike.org/>) has reported that over 250 fatalities were caused by this hazard worldwide since 1988.

In Ireland Bird Strikes is one of the top reported occurrences in the mandatory occurrence reporting system, albeit with a reducing trend since 2013. Thankfully the vast majority of these reports led to only minor or no damage to the aircraft involved. An Irish operator suffered a non-fatal hull loss accident in 2010 following loss of both engines due to bird ingestion, during approach to an airport in Italy.

Ireland's aerodromes are required to conduct risk assessments on the bird hazard in the airport's environs and mitigate any bird hazards through a wildlife management and control procedure. The IAA performs an annual analysis of bird strikes at Irish Aerodromes. One of the main findings of this analysis has shown that the number of confirmed bird strikes is significantly higher from June to October (inclusive), which coincides with the breeding season. There was no apparent increase in bird strike rate in line with increasing traffic levels.

One of the key issues the IAA addressed in 2013 is the threat caused by man-made hazards such as mass release of birds (eg racing pigeons).

The IAA has been actively seeking greater global action to address this problem. In particular the IAA would like to see more global statistics published from the ICAO IBIS system and is actively supporting the requests for an ICAO symposium on the subject. ICAO has announced a Wildlife Strike Reduction Symposium for May 2017 (Action c) below is updated accordingly).

The IAA has raised the hazard of Birdstrikes at the European Aviation Safety Advisors Committee (EASAC) in order to encourage a pan European approach to the problem. EASA has already published guidance leaflets on this subject (eg EGAST Safety Leaflet GA6) and the EASA NoA has conducted an EU wide study of Birdstrikes reported to the ECR. The European Plan for Aviation Safety 2016-2020 action RMT.0671 has been established to improve overall safety in relation to bird ingestion through design improvements (action b) below is closed).

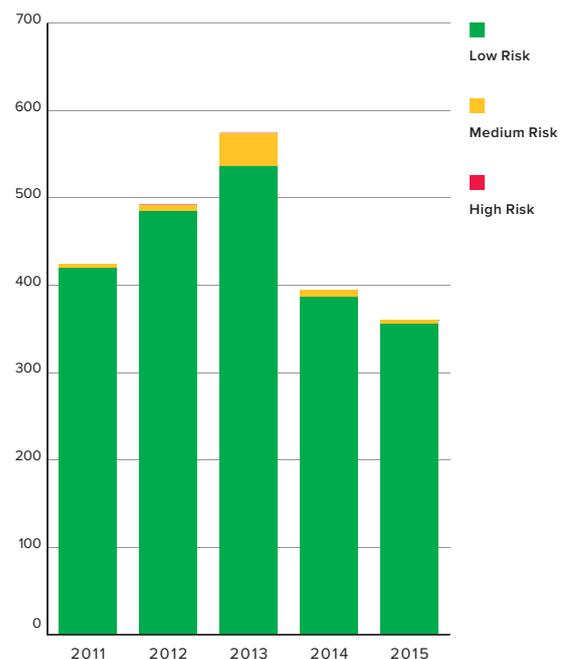


Figure 6: Birdstrikes

EXISTING ACTIONS

- | | | |
|-----------|---|--------------------------------|
| c) | The IAA will encourage ICAO (via ABIS representative at ICAO) to provide global statistics from the ICAO IBIS system and will fully engage with the plans for the forthcoming ICAO Wildlife Strike Reduction Symposium. | Target Date:
Q2 2017 |
|-----------|---|--------------------------------|

CLOSED ACTIONS

- | | | |
|-----------|--|--------------------------------|
| b) | The IAA will raise the risk of Birdstrikes at EU safety forums (eg EASAC and other EASA Safety Meetings) in order to gain support for the development of safety measures in relation to the hazard of bird strikes to aircraft on a pan European level (eg by including specific measures in the European Plan for Aviation Safety). | Target Date:
Q4 2015 |
|-----------|--|--------------------------------|

FOD.019 Laser attacks

Risk Area

There has been a noticeable increase of malicious laser attacks on aircraft pilots both in Ireland and across Europe and the rest of the world. More serious laser attacks can cause eye injury to pilots or flash blindness in the cockpit thereby endangering the pilot's ability to properly operate an aircraft during critical flight phases.

The effects of laser strikes on aircraft pilots can range from low risk distractions to higher risk flash blindness in the cockpit and possibly temporary or permanent eye damage to crews. The expected benefits of these actions are that there will be no laser related accidents or serious incidents involving Irish AOC holders and that the number of reported laser attacks on aircraft in Ireland is reduced.

Current Status

Under certain conditions, laser lights directed at aircraft can be a hazard. The most likely scenario is when a bright visible laser light causes distraction or temporary flash blindness to a pilot, during a critical phase of flight such as landing or takeoff. It is far less likely, though still possible, that a visible or invisible beam could cause permanent harm to a pilot's eyes. The severity of the risk is also greater as the aircraft gets closer to the source of the attack on the ground.

The increasing trend in laser attacks reported to the IAA under mandatory reporting schemes has been reversed since 2013.

Note that fixed lasers or temporary laser shows related to entertainment events can also be hazardous to aircraft in flight however this hazard is not included in the Plan because it is largely controlled through normal IAA approval and oversight activities.

Aviation hazards from laser attacks can be minimized or eliminated in two primary ways. First, the deliberate pointing of lasers at aircraft by members of the public is now an offence under Irish law and offenders can be prosecuted. Second, pilots should have awareness of laser/aviation hazards and knowledge of basic recovery procedures in case of laser or bright light exposure.

The IAA also continues to address Pilot/aircrew hazard reduction measures such as education and training. In 2011 the IAA issued a General Advisory Memorandum (GAM 01/11) that provided guidance to industry of this emerging and growing threat. The IAA is working with Irish AOC Holders to ensure that their flight SOP's and associated crew training plans address the hazard of laser attacks and has included this specific risk in the appropriate oversight evaluation checklist (action item b) is closed).

In the USA, the SAE G-10T Laser Hazards Subcommittee is working on Aerospace Recommended Practice document ARP5598, "Laser Visual Interference - Pilot Operational

Procedures." This document will provide information for pilots on recognising and recovering from a laser attack. The IAA will review this guidance when available and provide any necessary updates to currently published guidance (new action c) below).

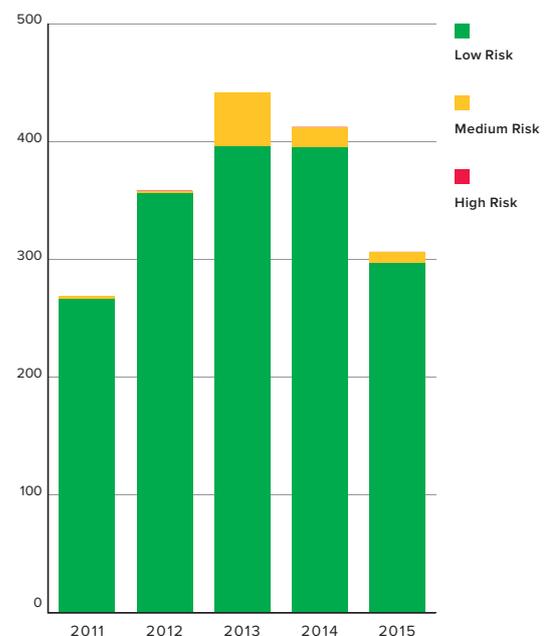


Figure 7: Laser Attacks

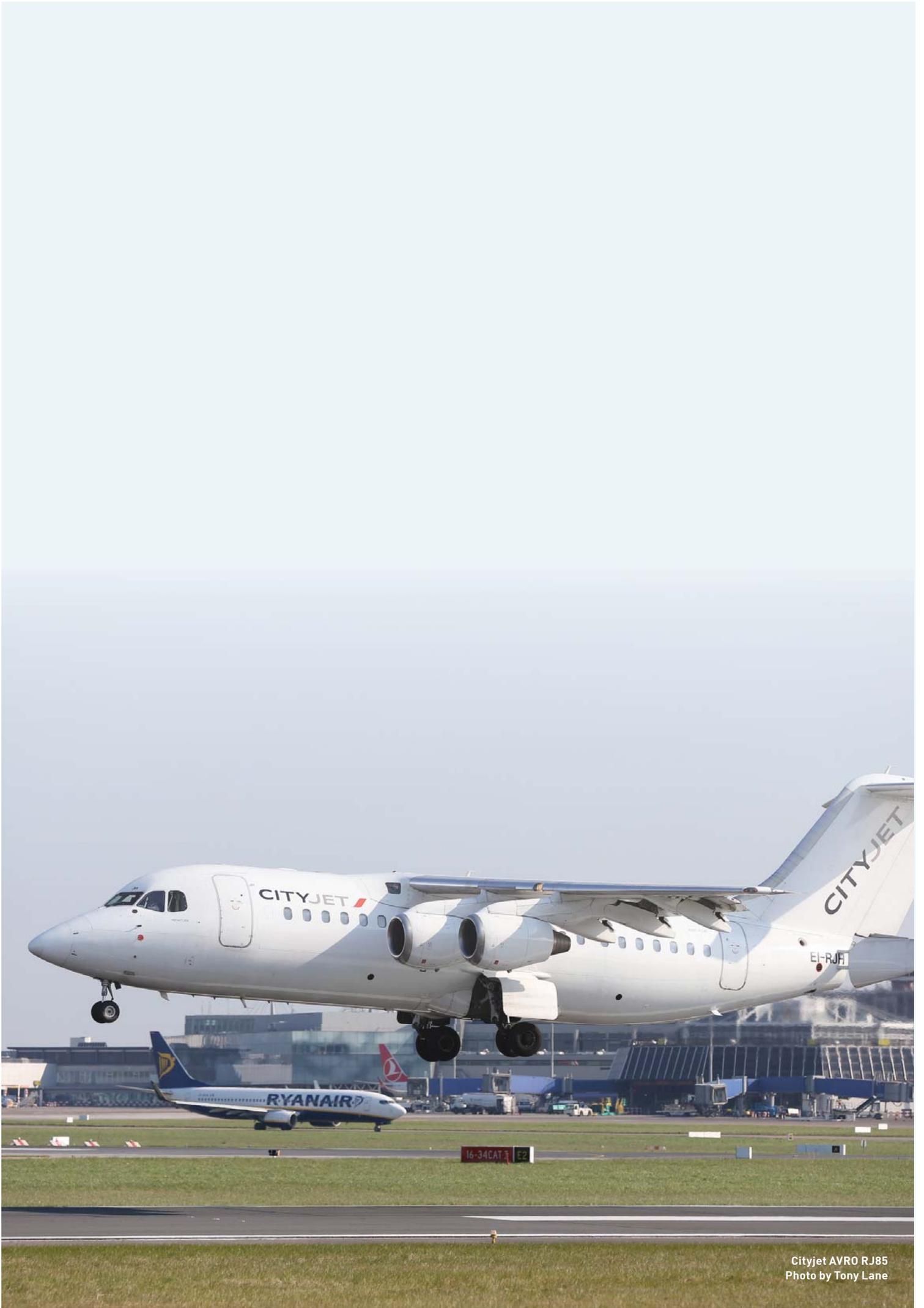


NEW ACTIONS

- | | | |
|-----------|--|--------------------------------|
| c) | Review SAE ARP5598 "Laser Visual Interference - Pilot Operational Procedures" and provide any necessary updates to currently published IAA guidance on this subject. | Target Date:
Q2 2017 |
|-----------|--|--------------------------------|

CLOSED ACTIONS

- | | | |
|-----------|--|--------------------------------|
| b) | The IAA will meet with Irish AOC Holders to review and ensure that their flight SOP's and associated crew training plans address the hazard of laser attacks during the current oversight audit cycle. | Target Date:
Q4 2015 |
|-----------|--|--------------------------------|



Cityjet AVRO RJ85
Photo by Tony Lane

APPENDIX 3

GENERAL AVIATION DETAILS



FOD.017 Airspace Infringement by GA aircraft

Risk Area

The general risk area of a mid-air collision (MAC) is addressed in the Commercial Air Transport section above in chapter ASD.001. The specific risk of airspace infringement by GA aircraft is addressed here, as it is one of the main causes for MAC events reported under mandatory occurrence reporting systems. The IAA would like to see a reduction in the level of airspace infringements by GA aircraft in Irish airspace.

An airspace infringement occurs when an aircraft enters controlled airspace without receiving the appropriate ATC clearance. The expected benefit of these actions is that there will be no accidents or serious incident in Irish airspace as a result of an airspace infringement by GA traffic and that the level of lower risk occurrences (eg cutting corners) is reduced.

Current Status

The problem of airspace infringement is a serious risk to aviation safety and the risk is particularly serious when the infringing aircraft involved is a GA light aircraft as the majority of these aircraft are not required to carry appropriate transponder equipment. This means that major surveillance safety nets (eg ATC control, TCAS) that help prevent mid-air collisions are ineffective.

As discussed in ASD.001 (MAC) the IAA has implemented the recommendation of the European Action Plan for Airspace Infringement Risk Reduction (EAPAIRR) and some of these recommendations address this specific risk.

Figure 8 shows the number of airspace infringement events, involving both commercial and private aircraft, reported in Irish controlled airspace over the past five years.

Thankfully the number of occurrences is relatively low and most are of low severity, such as minor un-intentional infringements at the boundaries of Class C/G airspace, albeit with an increasing trend evident in recent years. Following detailed analysis of three years data, the IAA published an Airspace Infringement (hotspot) Map for Dublin CTA in early 2014 (www.iaa.ie).

The General Aviation Safety Council of Ireland (GASCI) is also considering measures to address this risk. One particular action in the GASCI plan is to explore the opportunities to address specific airspace design issues (including opportunities for re-design or introduction of VFR corridors) at the margins of Class C airspace subject to increased levels of GA traffic. An airspace design review project has been launched by the IAA ANSP with full participation of GASCI to help address this issue (action item a) is updated accordingly).

Year	Severity A	Severity B	Severity C	Severity D	Severity E	Total
Airspace infringement						
2011	0	0	3	0	12	15
2012	0	0	2	0	14	16
2013	0	1	0	0	17	18
2014	0	1	3	0	22	26
2015	0	0	2	0	19	21

EXISTING ACTIONS

- a) The IAA will work with the General Aviation Safety Council of Ireland to review airspace design issues at airspace infringement hotspots with a view to implementing measures to reduce airspace infringements by GA aircraft.

Target Date:
Q4 2016

EPAS Reference: MST.016

FOD.020 Mid-Air Collisions by GA aircraft in Class G Airspace

Risk Area

Mid-Air Collisions (MAC) are accidents where two or more aircraft come into contact with each other in the air. Whereas thankfully a mid-air collision event in Ireland is quite rare, it is included in this Plan because the consequences of a mid-air collision between GA aircraft often lead to loss of life.

The expected benefit of these actions is that there will be no accidents or serious incidents in Irish airspace due to mid-air collision between GA aircraft flying in Class G airspace.

Current Status

Although there have been no accidents in Irish airspace between GA aircraft operating in Irish airspace in the recent past (ref IAA Annual Safety Review 2015) the issue is included in this Plan due to the broader European experience. Recent EASA Annual Safety Reviews show that mid-air collisions are among the main contributors to fatal accidents involving GA aircraft in Europe.

For historical reasons there is insufficient data on the numbers of serious incidents (eg near miss) involving GA aircraft for analysis purposes, due to the lack of voluntary reporting of these events throughout Europe. The new EU Regulation 376/2014 on occurrence reporting aims to address this deficiency by making it mandatory for those involved in GA to report such events from 15th November 2015.

The General Aviation Safety Council of Ireland has been discussing this hazard with a view to identifying possible mitigating actions for GA in Ireland. Issues under discussion include potential improvements to existing Aeronautical Charts (eg identification of Air Traffic Zones) and measures to improve communications frequency management in un-controlled airspace (eg improved AIP guidance for VFR traffic at unattended airfields). The IAA ANSP airspace design review project discussed in FOD.017 will also address planned updates to published charts.

EXISTING ACTIONS

- | | | |
|----|--|--------------------------------|
| a) | The IAA will work with the General Aviation Safety Council of Ireland to assist in the development of improved AIP guidance for VFR traffic at unattended airfields. | Target Date:
Q4 2016 |
| b) | The IAA will work with the General Aviation Safety Council of Ireland (GASCI) to introduce improved symbology in Aeronautical Charts (eg ATZ) for GA airfields and high density GA activity areas. | Target Date:
Q4 2016 |
- EPAS Reference:** SPT.044

FOD.016 Paragliding Safety

Risk Area

This chapter addresses a range of paragliding activities, including, free-flying and powered paragliding. Many of the paragliding activities are un-regulated and it is included in the Plan in order to address the risks involved.

Recent accidents causing serious injury involving paragliding activities in Ireland have brought this leisure activity into focus. The expected benefits of the actions in this Plan are that there will be no fatal accidents in Ireland caused by lack of appropriate training and safety awareness of those involved.

Current Status

Paragliding in Ireland is self-regulated in the main, the exception being powered paragliding and paragliders with maximum empty mass over 80 Kg. Whether regulated or not, the IAA strongly recommends that no person should fly or attempt to fly these aircraft without receiving an appropriate course of training, provided or approved by the relevant sport aviation association covering this activity. The IAA is keen to stress that nobody is entitled to carry passengers on any aircraft type (including paragliders) for hire or reward without the necessary commercial air transport approvals being in place.

During investigation of recent accidents involving paragliding in Ireland it has become apparent that the personnel involved in some cases, although experienced, had not received recognised training and were not affiliated to any of the relevant Irish sport aviation associations.

Whereas, the IAA cannot issue approvals for organisations involved in un-regulated activities, paraglider associations are nevertheless encouraged to develop procedures in conjunction with international best practices, including

a pilot rating system. Considerable work has already been accomplished by one such organisation in Ireland. The IAA will work with GASCI in order to assist paragliding organisations in this regard and the IAA work to issue updated guidance material to clarify the requirements for the paragliding community (action a) below) is planned to complete in 2016.

The IAA is working with the paragliding associations and GASCI in order to identify measures that may be taken to improve the safety awareness among those involved in this leisure activity. One of the challenges is to reach out to foreign visitors who may not be aware of the existing structures in place governing this activity in Ireland.

The IAA has recently implemented regulations and guidance to address the risks of drone operations in Ireland (refer to Section FOD.009 of this Plan for details) and is now considering the applicability and appropriateness of some of these safety initiatives for the paragliding community. New action item c) below refers.

NEW ACTIONS

- | | | |
|----|--|--------------------------------|
| c) | Review recent safety initiatives implemented to address the operations of drones in Ireland and consider opportunities to apply similar initiatives to enhance the safety of paragliding activities in Ireland | Target Date:
Q4 2017 |
|----|--|--------------------------------|

EXISTING ACTIONS

- | | | |
|----|--|--------------------------------|
| a) | The IAA will issue updated guidance material in respect of paraglider flying in Ireland. | Target Date:
Q4 2016 |
| b) | The IAA and GASCI will develop methods to improve safety awareness to those involved in paragliding activities in Ireland, including foreign visitors. | Target Date:
Q4 2016 |

AWSD.006 Safety Information for GA Maintenance

Risk Area

Analysis of accidents in general aviation shows that system component failures, including power plant and non-power plant components, feature very highly in the accident category list. The IAA intends to provide safety information to those involved in flying and maintaining general aviation aircraft to address technical issues.

One of the top causal factors for both fatal and non-fatal accidents involving GA aircraft is system component failures (SCF), whether it be the engine itself or other system component failures critical to safety of flight (eg fuel, oil, landing gear etc). The objectives of this particular section of the Plan is to ensure that lessons learned (eg following investigation of accidents and serious incidents) are promulgated to persons involved in maintaining and repairing aircraft, in order to reduce the rate of occurrence.

Current Status

In many cases the problem of system component failure is exacerbated by poor decision making by either pilots or maintenance personnel in reaction to the failure. Sadly the circumstances of some component failure related aircraft accidents are remarkably similar to previous accidents so it seems that lessons are not being learned from accident reports to help prevent similar tragedies.

The IAA airworthiness department reviews accident reports received from the Air Accident Investigation Unit in Ireland and acts on any safety recommendations and lessons learned from these. The airworthiness

department also reviews safety information provided by other States air accident investigation authorities (eg US NTSB and UK AAIB) for issues affecting aircraft equipment or maintenance. The IAA has promulgated Safety Alerts issued by the US NTSB concerning risk management in maintenance and decision making and awareness in respect of mechanical problems via the IAA website and provides links on the IAA website to safety data and leaflets published by other States (visit <https://www.iaa.ie/general-aviation/safety-information>).

EXISTING ACTIONS

- a) The IAA will review accident reports and safety information provided by air accident investigation authorities and develop safety information (based on effective communication of key messages) concerning aircraft equipment failure and maintenance for dissemination to the Irish general aviation community.

Target Date:
On-going

FOD.009 Small Unmanned Aircraft (SUA)/Drones

Risk Area

The popularity and application of small (ie less than 150 Kg) unmanned aircraft, commonly referred to as drones, continues to grow. The increasing use of drones by members of the public without appropriate understanding of the civil aviation system represents a growing risk to aviation safety.

The proliferation of the use of drones represents an emerging risk to both commercial and general aviation. The expected benefits of the actions in this Plan are that the operation of drones is properly integrated into the Irish Civil Aviation System to ensure that there will be no accidents or serious incidents as a result of conflict between a drone and an aircraft in Irish airspace.

Current Status

ICAO and EASA are addressing future Standards and Recommended Practices (SARPS) for the use of unmanned systems. ICAO established a UAS study group in 2008 to recommend appropriate SARPS to be applicable worldwide. Some SARPs in the areas of Annex 7 - Aircraft Nationality and Registration Marks and Annex 2 - Rules of the Air became applicable in 2012 and ICAO will continue to develop further SARPS for all aspects of drone operation. In addition an ICAO iKIT on unmanned systems contains latest regulatory and guidance material from a number of contracting States. Similarly EASA has included actions in the European Plan for Aviation Safety to address unmanned systems, albeit EASA actions are aimed at the higher weight devices (more than 150Kgs) and are therefore not relevant to this particular discussion.

In Europe the Joint Authorities for Rulemaking of Unmanned Systems Group (JARUS) was established to recommend a single set of technical, safety and operational requirements in this area. The IAA is actively involved in three working groups of JARUS (CONOPS, Operations and Licencing). The JARUS plenary session was hosted by the IAA in 2015.

Significant progress was made in Ireland in this area in 2015, including updated regulations, guidance and safety promotion. New regulation SI 563 of 2015 specifies

operational requirements and establishes registration requirements for drones. A dedicated website <https://www.iaa.ie/general-aviation/drones> provides all the latest guidance for those interested in operating drones for either business (aerial works) or leisure purposes including relevant links and guidance for the on-line registration system. A full media campaign (TV and radio) was launched in the run-up to Christmas 2015 to highlight the dangers of inappropriate use of drones and guidance was distributed to major drone suppliers. The IAA has also been actively encouraging and supporting the establishment of drone users associations or clubs, including engagement with the Model Aircraft Council of Ireland in order to improve safety promotion opportunities.

This level of engagement with the public and drone sector is expected to continue into the next two years as further experience of the growth and operational use of these devices emerges. The IAA is also considering means to introduce the subject into the national education system, at second level.

As part of a new initiative the IAA is also working with the main Irish airports in order to establish prohibited zones for drone flying in close proximity to an airport along with associated road-signage, promotional campaign etc (new action g) below).

NEW ACTIONS

- | | | |
|----|--|--------------------------------|
| g) | The IAA will work with the main Irish airports in order to establish prohibited zones for drone flying in close proximity to an airport along with associated road-signage, promotional campaign etc | Target Date:
Q4 2016 |
|----|--|--------------------------------|

EXISTING ACTIONS

- | | | |
|----|---|--------------------------------|
| c) | The IAA will continue to participate in the development of appropriate guidance concerning the operation of drones through its collaboration in the Joint Authorities for Rulemaking of Unmanned Systems Group (JARUS). | Target Date:
Ongoing |
| f) | The IAA will provide relevant public guidance to raise awareness of the regulatory requirements and safety hazards associated with operating drones. | Target Date:
Q4 2017 |



SUA/Drone at Weston Aerodrome
Photo by Pieter Van Velsen

FOD.014 Safety Information for General Aviation

Risk Area

The European General Aviation Safety Team (EGAST) is a voluntary safety partnership between General Aviation associations and authorities from across Europe. EGAST creates a forum for mitigating risks by sharing best practices, improving data sources, and promoting safety.

The aim of EGAST is to promote and initiate best practices and awareness in order to improve safety for all sectors of General Aviation in order to help reduce accidents. The objectives of the actions in this Plan are to adapt this safety information to the Irish environment (where appropriate) and ensure widespread promotion of this information.

Current Status

EGAST produces safety promotion material based on lessons learned throughout the European General Aviation system. This material is provided in the form of Safety Leaflets, Safety Presentations and Safety Videos any or all of which can be used as training aids by Approved Training Organisations and Registered Training Facilities or can be distributed directly to those involved in private flying for their own personal use. The IAA is an active participant in EGAST.

The IAA has published EGAST Leaflets on the IAA website in the past; however, more recently the IAA has been working closely with the General Aviation Safety Council of Ireland (GASCI) in order to ensure more effective promulgation of this information. The review of latest EGAST material is a standing agenda item for each GASCI meeting.

In the past EGAST Leaflets have been formally adopted and endorsed by both the IAA and GASCI and disseminated via IAA and GASCI website with printed handbooks distributed to flying schools and associations and at GASCI Safety Evenings. Feedback from GA community is that the promulgation of safety information via electronic media (website/facebook) is far more effective than printed material.

Although the EGAST role is currently being re-organised to align with the new EASA Consultative Bodies, which will fundamentally change the workings of EGAST in the future, the proliferation of EGAST branded safety material is set to continue for the next few years at least, and thus the issue is retained in this Plan.

EXISTING ACTIONS

- | | | |
|----|--|---------------------------------|
| a) | The IAA will work with GASCI to develop and promote EGAST Safety Material to general aviation community in Ireland. | Target Date:
On-going |
| b) | The IAA will work with GASCI to organise/facilitate regular general aviation safety events, during which EGAST safety material will be promoted. | Target Date:
On-going |

FOD.015 Safety Information for Helicopters

Risk Area

Analysis of accident and occurrences involving helicopters over the past decade has shown that helicopter operations are exposed to specific risks. In Europe, the European Helicopter Safety Team was developed to provide a focus for helicopter safety initiatives to address the safety concerns.

The aim of EHEST is to promote and initiate best practices and awareness in order to improve safety for helicopter operators in order to help reduce accidents. The objectives of the actions in this Plan are to adapt this safety information to the Irish environment (where appropriate) and ensure widespread promotion of this information.

Current Status

The European Helicopter Safety Team (EHEST) was launched in November 2006 and brings together manufacturers, operators, research organisations, regulators, accident investigators and a few military operators from across Europe. EHEST is the helicopter branch of the ESSI, and also the European component of the International Helicopter Safety Team (IHST). The IAA is an active participant in EHEST.

The EHEST/IHST work in collaboration to develop risk awareness, safety promotion and training material. The European Plan for Aviation Safety has identified a number of safety issues to be addressed in forthcoming EHEST safety brochures.

The IAA has promulgated EHEST Leaflets on the IAA website in the past but more recently has been trying to find a more effective means of promulgating this

information via the General Aviation Safety Council of Ireland (GASCI). In view of the relatively low activity levels of helicopter activity in the State, specific helicopter safety events are not held, however, helicopter operator representative groups are represented in GASCI and safety information in respect of helicopters are included in GASCI safety evenings. In some cases EHEST Safety Material has been directly distributed by the IAA to licenced helicopter pilots in Ireland.

Although the EHEST role is currently being re-organised to align with the new EASA Consultative Bodies, which will fundamentally change the workings of EHEST in the future, the proliferation of EHEST branded safety material is set to continue for the next few years at least, and thus the issue is retained in this Plan.

EXISTING ACTIONS

- | | | |
|----|---|---------------------------------|
| a) | The IAA will work with GASCI to develop and promote EHEST/IHST Safety Material to general aviation community in Ireland. | Target Date:
On-going |
| b) | The IAA will work with GASCI to organise/facilitate regular general aviation safety events, during which EHEST/IHST safety material will be promoted.

EASA Reference: MST.005 | Target Date:
On-going |

AWSD.003 Time between Overhaul (TBO) for GA Aircraft Engines

Risk Area

Requirements and guidance material for private aircraft engine overhaul and manufacturers specified time between overhaul (TBO) requirements are not consistent across Europe and need to be updated.

Engine failure is a particular risk to GA operators the majority of whom fly single piston engine aircraft, and the consequences of the failure is a forced landing, possibly with no airfield available to land in. The objectives of the actions of this Plan are to ensure that the engines used on Irish registered aircraft are maintained to the highest safety standards.

Current Status

The IAA Aeronautical Notice A.43, last updated in 2011, details the requirements in Ireland for complying with engine manufacturer's specified overhaul intervals, however, this aeronautical notice does not take account of the new airworthiness oversight regime in place, namely, that most aircraft eligible for a certificate of airworthiness are maintained in a controlled environment by a Part M organisation.

The 20 year engine life limit currently imposed does not take account of the operational environment of each aircraft or the failure rate of newly overhauled engines.

EASA issued amendments to Part M (Decision 2013/025) in Sep 2013 to address this risk but following inputs on the implications of the decision to the GA industry from several States, EASA withdrew this amendment under (Decision 2013/034/R). The IAA has established that 25 aircraft used in Irish approved training facilities would have been affected by EASA Decision 2013/025.

Pending the outcome of EASA rulemaking, the IAA published updates to Aeronautical Notice A43 (visit <https://www.iaa.ie/publications>) based on current best practice in Europe. The action item is now closed.

CLOSED ACTIONS

- a) The IAA will revise IAA Aeronautical notice A.43 to align with the best European practice pending final EASA Regulation in this area.

Target Date:
Q3 2015

FOD.006 Operation of N registered aircraft and FAA Airman Certificate holders in Ireland

Risk Area

American (N) registered aircraft and FAA Airman Certificates have been involved in a large percentage of aircraft accidents and serious incidents in Ireland.

The FAA have limited opportunity to perform safety oversight checks of American registered aircraft and US licence holders outside the USA and it is also possible that neither EU nor Irish operational and airworthiness safety requirements are being addressed by the "N-Reg" community. The expected benefits of the actions of this Plan are that all those involved in the "N-reg" community will meet or exceed the safety standards applicable in Ireland.

Current Status

All aircraft registered in the United States of America have registration markings beginning with the letter N followed by a sequence of numbers or letters. Previous analysis of accident and serious incident data in Ireland showed a large percentage involved N-registered aircraft.

An ICAO Article 83 Bis agreement between the USA and Ireland was signed in 2013 to provide for the transfer of ICAO Annex 1, 2, 6 and 8 State responsibilities for N-registered general aviation aircraft. This in effect transfers oversight responsibilities from the FAA to IAA for affected N-registered aircraft. The FAA have also taken action on this subject by amending their code of federal regulations CFR 47 – Aircraft Registration introducing a requirement for all aircraft owners to re-register their aircraft on a three year basis and by introducing changes to who can register and where the aircraft may be based.

New EASA regulation on pilot licensing also impacts on the automatic acceptance of US pilot licences in Europe which require pilots of EASA type certified aircraft in EU Member States to be compliant with EU pilot licence requirements. In addition, new EU regulations which will require third country (non-EU States) operators to seek a specific approval before operating in Europe will also help address this risk.

The IAA has actively promoted the requirements of the new EU Regulations and latest EASA guidance and interpretative material with Irish Industry and specific issues relating to validation of non-EASA Member State licences and conversion of pilots licences (including US) are now closed. (Action a) is closed).

CLOSED ACTIONS

- a) The IAA will implement and promote the requirements for the conversion of third country pilot licences to licences issued or validated iaw EASA Part FCL.

Target Date:
Q2 2016

FOD.021 Planning for GA flights in uncontrolled airspace.

Risk Area

The vast majority of GA light aircraft flying occurs in uncontrolled Class G airspace from/to private licensed airfields and take place in conditions where there is no requirement to file a flight plan, which exposes many GA pilots to higher levels of risk.

Inadequate planning for the conduct of a GA flight exposes the GA pilot to additional risk of death or serious injury following a survivable accident or emergency landing. The objectives of the actions of this Plan are to enhance GA pilot awareness of the need to consider all risks and fully prepare for a GA flight in uncontrolled airspace, including the carriage of appropriate clothing and equipment, and the need to ensure that another person is aware of the intended flight plan.

Current Status

The General Aviation Council of Ireland has been considering this subject for some time and has already published a safety leaflet to help improve the chances of an aircraft being located quickly after an accident or after it has been forced to execute an emergency landing in a remote location. The Safety Leaflet entitled "Tell someone who cares" is available on the GASCI website <http://gasci.weebly.com/tell-someone-who-cares.html> and GASCI facebook and it promotes the concept of a "buddy system" between GA pilots to ensure that "missing" aircraft are identified as quickly as possible, so that emergency services can be alerted and the location of the accident site can be

quickly established. GASCI will promote this Safety leaflet during planned public Safety Information evenings (Action Item a)

GASCI is also planning to develop further guidance to address the need for GA pilots to consider issues in the pre-flight planning stage, such as appropriate clothing, carriage of appropriate equipment etc, to enable the GA pilot to alert authorities or others in case of an emergency, and to be properly protected from the elements to give the greatest chance of survival until emergency services or other help arrives. (Action Item b)).

NEW ACTIONS

- | | | |
|----|--|--------------------------------|
| a) | The IAA will work with GASCI to raise awareness of existing GASCI Safety Information on the need for appropriate pre-planning for GA flights in uncontrolled airspace to consider the risk of a survivable accident or emergency landing. | Target Date:
Q4 2016 |
| b) | The IAA will work with GASCI to develop and promulgate guidance information to GA pilots to ensure they are properly prepared for flight in uncontrolled airspace by carrying appropriate equipment and clothing in case of a survivable accident. | Target Date:
Q2 2017 |

FOD.022 Conduct of Air Displays

Risk Area

The fatal accident in 2015 involving an air display aircraft in Shoreham, UK, has highlighted the risks posed to participants, spectators and the non-involved public, during the conduct of air displays.

Whereas there have been no accidents or serious incidents in Ireland during air displays, the Shoreham accident in 2015 in the UK provides a stark reminder of the need to remain vigilant to ensure that those managing and participating in air displays properly assess all the risks involved. The objectives of the actions of this Plan are to ensure that there are no accidents or serious incidents during the conduct of air displays in Ireland.

Current Status

Air displays are both a necessary and exciting component of civil aviation and are enjoyed by many thousands of spectators in Ireland each year. Following the tragic fatal accident in Shoreham, UK, in 2015, the IAA is now conducting a review of the policies and procedures in place in Ireland in relation to air displays, to ensure that the lessons learned from this accident are fully incorporated.

As part of the review the IAA will examine policies and procedures relating to:

- The acceptance of personnel responsible for organising and managing air displays

- The acceptance of personnel participating in air displays
- The issue/validation of permissions for display aircraft
- The acceptance of individual display plans/schedules and associated risk assessments.

As part of its review the IAA will consider the UK AAIB Safety Bulletins and recent UKCAA publications issued following the fatal crash in Shoreham.

NEW ACTIONS

- a) The IAA will review the policies and procedures in place for the conduct of air displays in Ireland to ensure that they incorporate latest recommendations arising from recent UK AAIB accident investigations.

Target Date:
Q4 2016



Chipmunks Air Display
Photo by Frank Grealish/IrishAirPics.com

GLOSSARY OF TERMS

A

AAIU	Air Accident Investigation Unit
ANSD	Air Navigation Services Department
AOC	Air Operators Certificate
ARMS	Aviation Risk Management Solutions
ATC	Air Traffic Control
ATS	Air Traffic Service

C

CAST	Commercial Aviation Safety Team
CFIT	Controlled Flight Into Terrain

E

EASA	European Aviation Safety Agency
EASA MS	EASA Member States (28 EU Member States plus Iceland, Liechtenstein, Norway and Switzerland)
EASp	European Aviation Safety Plan
EC	European Commission
ECR	European Central Repository
EGAST	European General Aviation Safety Team
EHEST	European Helicopter Safety Team
ERC	Event Risk Classification
EU	European Union

F

FAB	Functional Airspace Block
FDM	Flight Data Monitoring

G

GA	General Aviation
GASCI	General Aviation Safety Council of Ireland

I

IAA	Irish Aviation Authority
ICAO	International Civil Aviation Organisation

K

KSI	Key Safety Indicators
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L

LOC-I	Loss of control in flight
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M

MAC	Mid air collision
MOR	Mandatory Occurrence Report
MTOM	Maximum Take-Off Mass

N

NoA	Network of Analysts
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P

PBN	Performance Based Navigation
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R

RI	Runway Incursion
RE	Runway Excursion
RIAG	Runway Incursion Action Group
RST	Runway Safety Team
RPAS	Remotely Piloted Aircraft System

S

SAR	Search and rescue
SMS	Safety Management system
SOTS	Safety Occurrence Tracking System

U

UAS	Unmanned Aerial Systems
UN	United Nations

Photo Credits

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Beech C-90 Business Jet at Cork
Photo by Paul Daly



Scenic Flights at Cliffs of Moher
Photo by Executive Helicopters