Loss of Control in General Aviation

Introduction

General Aviation (GA) pilots face many different challenges during their flights and it is important that simple information is provided to pilots on potential risk areas and associated safety issues to raise awareness of how to improve the safety record and importantly keep themselves safe. The purpose of this information is to highlight some of the issues related to Loss of Control – In Flight (LOC-I), which is the most deadly cause of fatal accidents in GA. Last five years there were close to 39 fatal accidents on average in GA. These accidents caused on average 66 persons to lose their lives every year due to LOC-I. This is only initial, headline information that will be built on as part of EASA's development of a range of Safety Risk Portfolios for different aviation sectors.

It needs to be noted that the figures shown do not contain rates, only actual number of accidents. This is due to lack of exposure data for GA. The Agency is working on that issue and plans to update this document when that data becomes available. The Agency also recognises that the rates can significantly change the perspective and priority of how and in what order these safety issues are tackled.

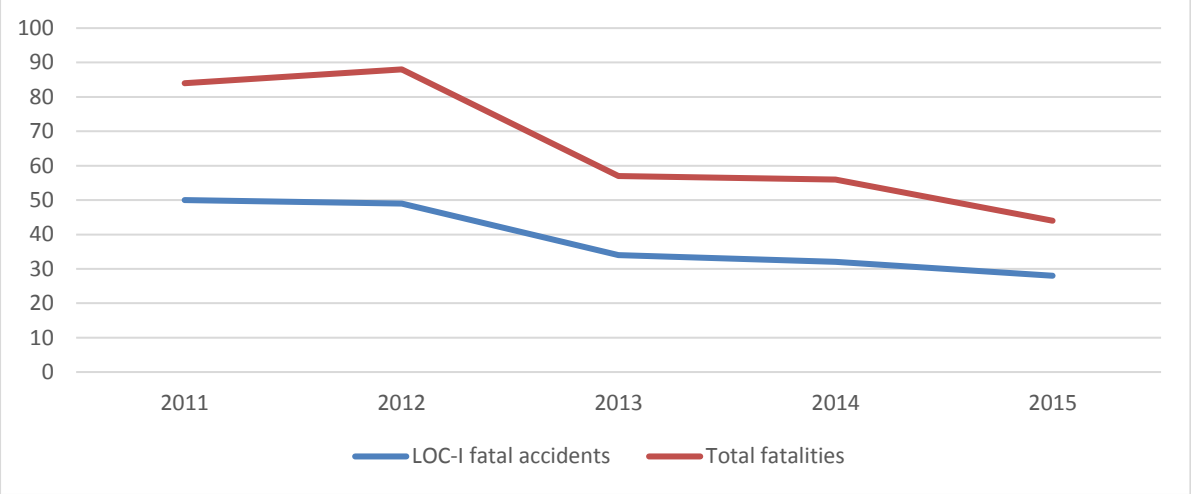

Figure 1 - Loss of control in flight accidents and fatalities in General Aviation 2011-2015

LOC-I – The Main Cause of GA Fatal Accidents.

Figure 4 demonstrates the risk areas in the GA sector over the last 5 years. This is shown by looking at the Occurrence Categories used to classify all safety occurrences in Europe. It is clear from this chart that LOC-I is considerably the greatest risk area.

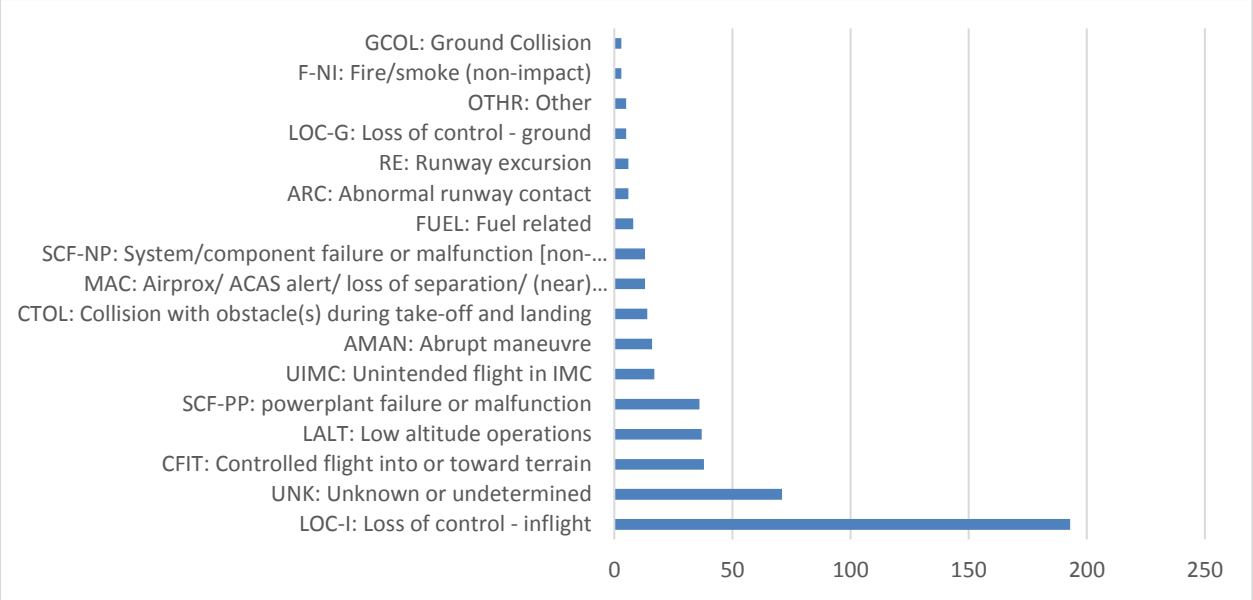

Figure 2 - Risk areas in GA – fatal accidents 2011-2015

When examining the LOC-I accidents both fatal and non-fatal it can be seen in Figure 3 that the highest number of accidents occur during Take-off as well as, when joined together, Approach and Landing phases of flight.

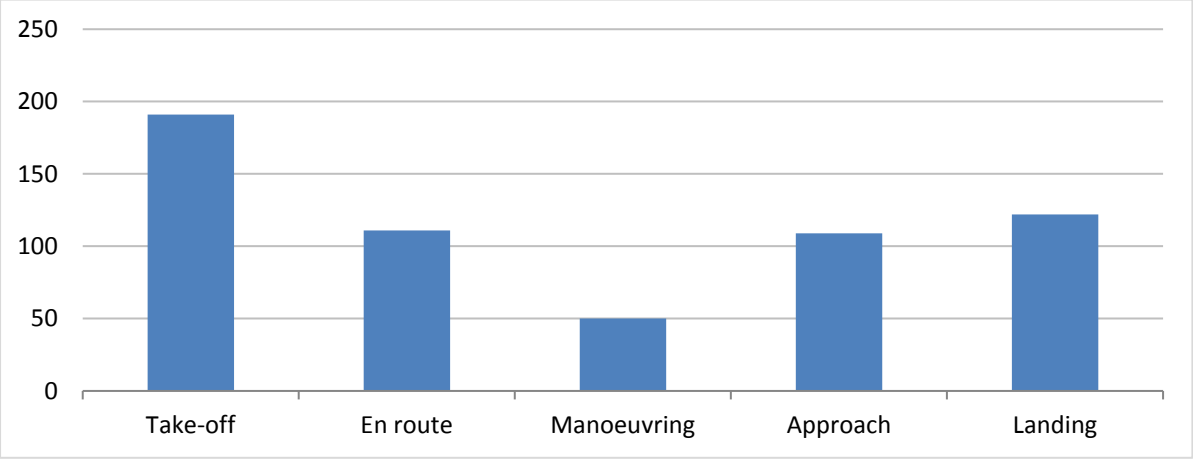

Figure 3 - LOC-I accidents 2011-2015 per flight phase

Figure 4 shows that the most common type of Aircraft Upset is an aerodynamic stall during take-off and during approach and landing, following are spins and rolls.

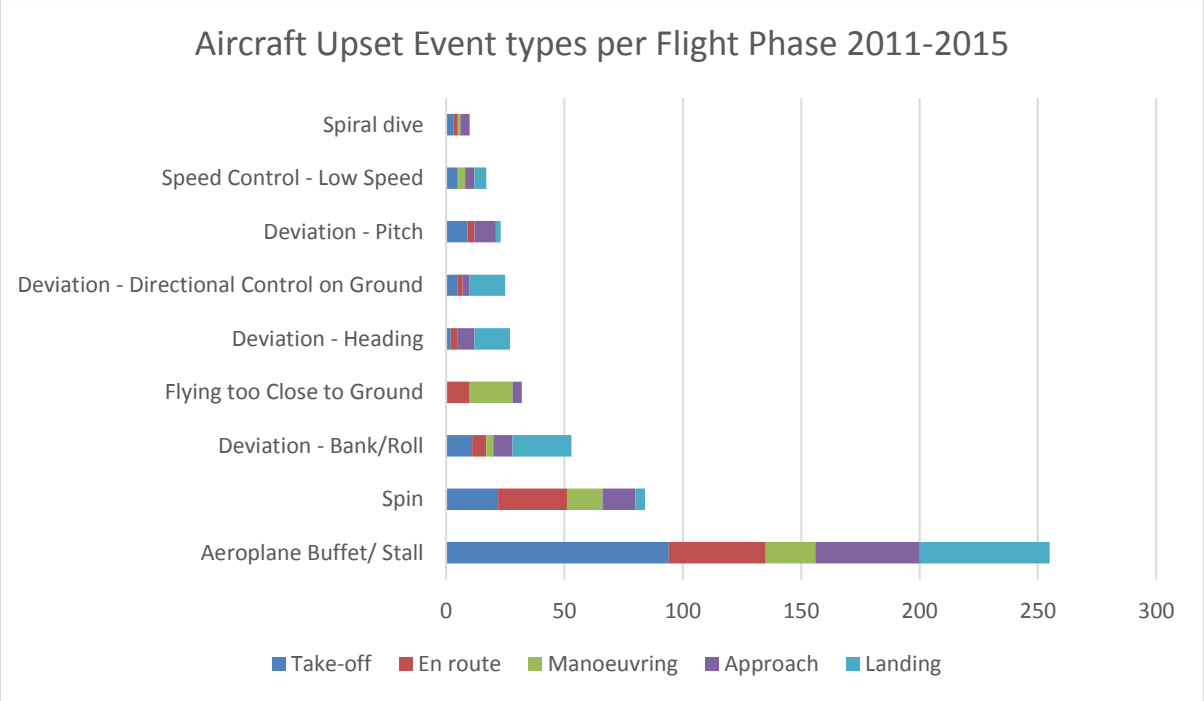

Figure 4: Fixed Wing Aeroplane fatal accidents per aircraft upset event types 2011-2015

Safety Risk Portfolio and Key Risk Areas

Because accidents often involve a complicated chain of events, looking at LOC-I in isolation only shows part of the picture. Accidents are therefore often classified using more than one Occurrence Category, therefore it is important to consider the relationship between LOC-I (Aircraft upset) and other risk areas. In most cases aircraft upset accidents occur either during take-off or during the approach and landing phases of flight. En-route phase of flight is also relatively high in many of the combinations. Figure 5 is the newest version of the GA Fixed Wing (FW) Safety Risk Portfolio (SRP) showing the main safety issues in relation to the identified Key Risk Areas. Note the safety issues are categorised into Operational, Technical and Human safety issues. The main changes from its last publication is the split of two safety issues according the main identified flight phases.

NON-COMMERCIAL OPERATIONS - AEROPLANES											
Outcome Percentage of Fatal Accidents (2011-2015)	397			46.7%	14.7%	9.1%	5.5%	3.4%	2.5%	1.3%	0.6%
Outcome Percentage of Non-Fatal Accidents (2011-2015)	2,574			8.0%	0.8%	16.7%	2.2%	18.8%	3.5%	24.8%	12.4%
	Total number of accidents in 2011-2015 per safety issue			Key Risk Areas (Outcomes)							
Safety Issues	Serious	Total Accidents	Fatal Accidents	Aircraft Upset in Flight	Terrain Conflict	Engine Failure	Airborne Conflict	Other System Failures	Obstacle Conflict	Abnormal Runway Contact and Excursions	Aircraft Upset on Ground
Operational											
Detection, Recognition and Recovery of Deviation from Normal Operations during Take-off	3	215	54	•	•	•		•	•	•	•
Detection, Recognition and Recovery of Deviation from Normal Operations during Approach and Landing	16	610	50	•	•	•	•	•	•	•	•
Maintaining Adequate Separation Between Aircraft	41	434	49	•	•	•	•	•	•	•	•
Operation in Adverse Weather Conditions	10	311	31	•	•	•	•	•	•	•	•
Pre-Flight Preparation/ Planning and In-Flight Re-Planning	3	70	19	•	•	•		•	•	•	•
Intentional Low Flying during Manoevring	0	16	11	•							
Intentional Low Flying during Enroute phase of flight	0	14	9	•	•	•					
Aircraft Maintenance	4	23	6	•		•		•	•	•	
Aircraft Weight and Balance	0	10	6	•					•	•	
Unstabilised Approach / Landing	2	53	2	•				•	•	•	•
Birdstrikes and Brid Control	1	20	1	•		•		•	•	•	•
Technical											
Diagnosis and Management of Engine Failures in Flight	6	50	5	•	•	•		•	•	•	•
Management of Landing Gear System Malfunctions	19	521	0	•	•	•		•	•	•	•
Human											
Flight Crew Perception and Awareness, Decision Making and Planning	7	81	18	•	•	•	•	•	•	•	•
Pressure during operation	6	74	12	•	•	•	•	•	•	•	•
Use and Adequacy of Rules and Procedures (incl. Checklists)	2	13	1	•		•		•	•	•	•
Knowledge and Competency of Individuals	2	31	0	•		•	•	•	•	•	•
Navigation during operation	3	1	0		•		•				

Figure 5 - GA FW Safety Risk Portfolio 2016

Safety Issues in GA related to Aircraft Upset in Flight

The top part of the SRP in Figure 5 above shows us the percentages of both fatal and non-fatal accidents in each risk area ordered accordingly. As can be seen the Aircraft Upset in Flight is on top resulting in 46.7% of fatal accidents in the time frame from 2011-2015. Below are the main safety issues with explanations:

- ***'Detection, Recognition and Recovery of Deviation from Normal Operations'*** safety issue captures stalls, spins, rolls and other abnormal positions of the aircraft. It is now split between Take-off phase of flight on one hand and Approach and Landing on the other. This is done to better identify the issues and take appropriate action accordingly.
- ***'Intentional Low Flying'*** safety issue captures flight where incidents – often related to engine failures result in accidents showing that the pilot had no chance of a successful emergency landing. This issue is also split between two flight phases to better identify possible problems.
- ***'Maintaining Adequate Separation between Aircraft'*** is touching on Aircraft upset issues due to loss of control after mid-air or near mid-air collision occurrences.

- ***'Operation in Adverse Weather Conditions'*** causes loss of control due to lack of visibility during flight which is often directly related to the next safety issue.
- ***'Pre-Flight Preparation/Planning and In-Flight Re-Planning'***. It occurs that pilots are not properly planning their flight causing them to enter situations they have not foreseen and are therefore not ready to tackle when needed.
- ***'Flight Crew Perception and Awareness, Decision Making and Planning'*** is an issue related to the one above but addresses situational awareness and decision making. Flights in critical weather conditions and low flying can cause misjudgement of the environment leading to wrong decision making.
- '***Pressure during operation'*** relates high stress situations. Entering unexpected bad weather, experiencing technical difficulties, unexpected incidents due to poor planning and other startling situations increasing the pressure the pilot is under which can lead to the aircraft being upset during flight.