



Safety Management System

Safety Bulletin

No. 03/23

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Safety Considerations in Aerodrome Environments

This Safety Bulletin discusses some key safety considerations affecting operations and operational oversight in aerodrome environments, with links to key references. Occurrence data affirms a high incidence of runway incursions, arrivals and departures from incorrect runways or thresholds, various runway conflicts, incursions by other traffic in the circuit area, breakdown of separation, near misses, and in worst case mid-air collision events.

Examination of all SOAR report data from 2011 to 2023 inclusive, indicates that the top three occurrence categories for number of SOAR reports are:

- Aircraft Control – 20.9% of all SOAR reports, for comparison to these subject categories
- Aircraft Separation / Collision – 12.5%
- Runway Events – 12.0%

Here we are NOT suggesting that all these occurrences have been raised for operations in complex aerodrome environments, nor that they have resulted in actual damage, injury or fatalities. There are many close shaves and near misses in this mix. Some of the control problems, separation breakdowns and collisions have occurred far from the home aerodrome.

The data shows that risk management actions are needed to reduce the incidence of these occurrence categories. Too many, and sometimes catastrophic consequences! Table 1 refers.

Risk drivers include many factors that affect the level of traffic, potential for conflict, and the complexity of the aerodrome environment:

- Number of operational runways, orientation, length, surface, slope
- Terrain, hills, obstructions, non-flying areas, non-maneuvring areas, obstacles on approach/departure
- Impaired visibility of approaches or operations on other runways, remote winches
- Taxiways, tow-out strips, runway entry points, thresholds
- Prevailing wind and weather conditions, turbulence, shear, relative to traffic
- Launch methods used for gliders, launch paths, approach and landing paths
- Aerodrome location relative to IFR and VFR waypoints, traffic routes

- Passing IFR and VFR traffic mix, volume, altitude, airspeed, proximity
- Airspace design in proximity to aerodrome, Class of airspace, CTAF
- Chart markings for aerodrome, clarity on charts and approved devices
- Aerodrome type (towered, non-towered, registered, ALA, paddock)
- Traffic mix, number and type of other aviation users, frequency of movements
- Presence or absence of prescribed circuit directions, gliding runways
- Presence or absence of Joint Operations Manuals for Multi-User aerodromes
- Radio frequencies, radio traffic levels, interference issues
- Level of dialogue and effectiveness of problem resolution for multi-user aerodromes
- Pilot situational awareness, airmanship, discipline, training and risk awareness
- Level of use of radio, FLARM, ADS-B IN, ADS-B OUT and EC
- Effectiveness of operational oversight, launch point situational awareness
- Workload of PICs, other pilots, all operational staff, associated human factors
- Risk appetite, safety culture, organisational and human factors.

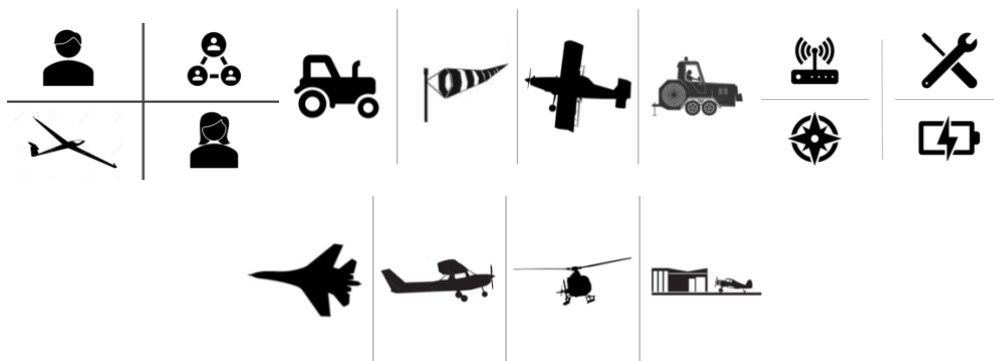
Consider these scenarios:

Scenario 1. Simple gliding operation, single runway, minimal slope, benign terrain, close to prevailing wind, in Class G airspace, ALA, remote from high traffic areas, with no other regular aerodrome users. Well established low complexity operational procedures.

Scenario 2. Busy gliding operation, mixed performance levels, XC and training, so higher gliding activity, multiple runways available, some slope and terrain aspects, variable wind and weather. Class G airspace and ALA, moderate passing traffic, occasional visiting aircraft. Well established operational procedures, busy radio traffic, moderate demands on PICs and duty crew to ensure deconfliction and situational awareness. Prescribed multiple runway operations in some wind conditions due to terrain, slope, glider performance.

Scenario 3. Complex mixed operation, with gliders, general aviation, multiple aerodrome users. Multiple launch methods or multiple towplanes. Mixed performance levels. Mix of XC and training gliding activity. Class G airspace, CTAF procedures, close proximity to passing air traffic and prescribed VFR waypoints. Many independent operators. Some traffic using sealed surfaces, others grass. Busy radio traffic, some interference and comms issues. Variable weather, sometimes strong winds. Some multiple runway operations requiring active deconfliction, situational awareness. Aerodrome user meetings tackle potential conflict issues.

So, there are no simple silver bullet risk mitigation solutions, many local factors to consider in a variable context, and complexity drives increased risks. Layered risk management approaches are needed. We must mix it, professionally, with all airspace users in complex environments as well as simple gliding operations.



Operations Advice Notice [OAN 02/23 Aerodrome Operational Standards and Procedures](#) is a comprehensive reference on requirements for operational approval of gliding aerodromes, including multi-user environments, with operational procedures for standard arrangements:

- Single strip operations, (small operations only) where gliders (and tug aeroplanes if launch is conducted by aerotow) and other aircraft operate from runways within a common runway.
- Dual strip operations, (the preferred standard) where gliders (and tug aeroplanes) and other traffic operates to a common circuit from separate, closely spaced runways; and
- Parallel runway operations, (very busy aerodromes) where gliders and tug aeroplanes operate to a contra-circuit pattern from other traffic, using separate parallel runways with centrelines at least 120 metres apart.

Reference should also be made to CASA [Advisory Circular AC 91-02 'Guidelines for aeroplanes with MTOW not exceeding 5 700 kg - suitable places to take off and land'](#). For Certified Aerodromes, or those supporting Charter or RPT operations, CASA's Manual of Standards [MOS Part 139 Aerodromes](#) should be consulted.

Another important reference is Operational Safety Bulletin [OSB 02/14 See-and-Avoid for Glider Pilots](#), addressing issues affecting lookout and situational awareness, including interactions with other aircraft at or near uncontrolled aerodromes.

These also refer to legislated requirements for collision avoidance and circuit operations in Civil Aviation Regulations¹, supported by Civil Aviation Advisory Circulars [AC 91-10 Operations in the Vicinity of Non-Controlled Aerodromes](#) and [AC 91-14 Pilots Responsibility for Collision Avoidance](#).

Beyond Rules and Regulations. More rules cannot fix everything nor mitigate highest risks. Yet ignorance of rules, mandated procedures, lack of awareness, drives up risks of “unpredictable behaviours”, impedes our ability to mix it professionally with other airspace users, other aerodrome traffic. So, what can we do? Examples include:

- Multi-user dialogue, discussions, awareness, respectful dialogue
- Agreement and reference to Multi-User Aerodrome Operations Procedures, deconfliction protocols and radio advice
- Shared experience, providing opportunities to fly in other aircraft types, understand risks and constraints faced by other aerodrome users
- Safety briefings, clear decision criteria for preferred operations, managing threats and errors, planning for changing weather and environment
- Occurrence reporting, analysis, feedback, shared lessons
- Ground school, pilots' nights, theory sessions for education and training
- Launch point situational awareness, launch point hygiene, minimised distractions, radio equipment redundancy, listening watch, binoculars, use of webcams for remote ground movement observations
- ADS-B, OGN, Flight Radar 24, AvPlan / OzRunways, FLARM monitoring
- Alternate landing areas, widened landing area options if primary runway areas are occupied by other aircraft or vehicles
- Increased duty crewing, workload management for tug pilots, winch operators, operations supervisors and instructors
- Ground vehicle movement procedures, taxiing procedures.

¹CAR 161 Right of Way, CAR 162 Rules for Prevention of Collision, CAR 163 Operating Near Other Aircraft, CAR 166A General requirements for aircraft on the manoeuvring area or in the vicinity of a non-controlled aerodrome, CAR 166B Straight In Approach, 166C Requirements for Broadcasting on VHF radio – and many more!

There are unique operational factors and constraints at every aerodrome, every choice of operational runway. On any flight, emerging risks, weather and environment may require changes to circuit plans and runway choice, so local procedures must include measures to ensure situational awareness for all traffic, minimisation of potential conflicts. This may require brief operational pauses and other separation strategies. Early radio communications is critical.

Assessment of organisational, human and cultural factors may reveal other risk treatments. Where multiple clubs are operating, these aspects may be more complex or contentious. Focus on collaborative cultural and safety outcomes rather than political differences!

A positive safety culture (see [MOSP Part 5 SMS](#) Sections 6 and 7) sets the tone for open, respectful, educative disclosure and discussion of risks and remedies. Normalised deviance, acceptance of shortcuts, convenience-driven decisions (see [OSB 01/09 Convenience Accidents](#)) or shutting down open dialogue on safety concerns may increase errors and risks. The club's risk appetite, set by both Committee and Panel, preferably with input from other aerodrome users, should be well defined and regularly explained to members to reinforce preferred practices. Safety reviews or audits might inform of opportunities for improvement or help guard against complacency. Club Safety Policy Commitments (see [MOSP Part 5 SMS](#) Sections 3 and 7) have a place, when supported by authentic behaviours.

Gliding Australia engages with many other organisations² to improve safety awareness of gliding operations including airspace, avionics and aerodrome issues. This includes seeking changes in aviation charts and information in En Route Supplement Australia (ERSA), airspace procedures, and safety guidance to other aviators. The Gliding Australia Operations department is supported by the Avionics Airspace and Aerodromes Officer (AAAO) and Regional AAAOs, representing our interests in advocacy and formal working groups with CASA and Airservices Australia. Clubs are encouraged to use the AAAO network via aaao@glidingaustralia.org on issues of concern.

In the air, safe interactions with other aviation traffic in aerodrome operations depends on Pilots In Command maintaining highest levels of airmanship, situational awareness, self-discipline, application of alerted see-and-avoid, fatigue management, with Threat and Error Management to mitigate emerging risks. Mixed aviation operations places high demands on pilots to broadcast intentions clearly, intelligibly for other users, early enough to respond to avoid conflicts.

CFIs and Panels have important obligations in maintaining operational standards, ensuring appropriate training, responding to incidents, including correcting hazardous attitudes if patterns of unsafe behaviour emerge. Committee management, resourcing, facilities and safety policy roles also shape the operational safety environment. Club Safety Officers (CSOs) have important roles in engaging with Panels and Committees, raising concerns and suggesting remedies. Chair of Operations Panel (COP) and Regional Managers Operations (RMO), as well as Safety Manager (SM) are available to assist club officials with advice on resolving difficult situations.



A.R. (Drew) McKinnie

**Gliding Australia
Safety Manager**

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² [MOSP Part 5 SMS](#) Section 14
SB 03/23 of 28 August 2023

Class 2 Category	Class 3 Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total	% of Total
Aircraft Control *See Note	Airframe overspeed	0	0	1	1	0	0	0	0	0	0	0	0	0	2	
	Control issues	1	4	1	5	4	5	5	5	4	3	5	4	2	48	
	Hard landing	6	7	9	8	24	8	14	7	17	8	8	8	5	129	
	Incorrect configuration	0	1	5	3	8	4	2	0	2	2	2	5	2	36	
	Loss of control	0	0	1	0	3	2	2	1	3	0	3	3	1	19	
	Pilot Induced Oscillations	1	4	2	1	2	4	1	1	2	1	3	1	2	25	
	Wheels up landing	7	5	7	18	15	15	9	6	5	17	10	8	4	126	
	Subtotal	15	21	26	36	56	38	33	20	33	31	31	29	16	385	20.9%
Aircraft Separation / Collision	Collision	1	0	4	0	1	1	2	0	0	0	0	1	1	11	
	Aircraft Separation Issues	0	0	0	1	1	2	15	7	9	3	9	8	8	63	
	Near collision	6	2	11	9	13	18	28	20	15	10	10	8	7	157	
	Subtotal	7	2	15	10	15	21	45	27	24	13	19	17	16	231	12.5%
Runway Events	Depart/App/Land wrong runway	0	0	4	2	1	1	1	1	1	1	2	2	1	17	
	Other Runway Events	0	1	0	0	1	0	4	12	5	2	5	11	0	41	
	Runway excursion	5	1	2	12	7	2	9	7	10	5	9	6	0	75	
	Runway incursion	0	4	5	8	9	12	5	11	6	1	7	7	3	78	
	Runway undershoot	0	0	0	0	1	0	1	2	3	2	0	1	0	10	
	Subtotal	5	6	11	22	19	15	20	33	25	11	23	27	4	221	12.0%

Table 1: Extract of SOAR Occurrence Data 2011-2023, Top 3 Categories by Number of Reports

Note: Aircraft Control Data provided for comparative reference. Those occurrences are independent of separation, collision and runway events.

Class 2 Category % Chart - All Occurrences 2011-2023

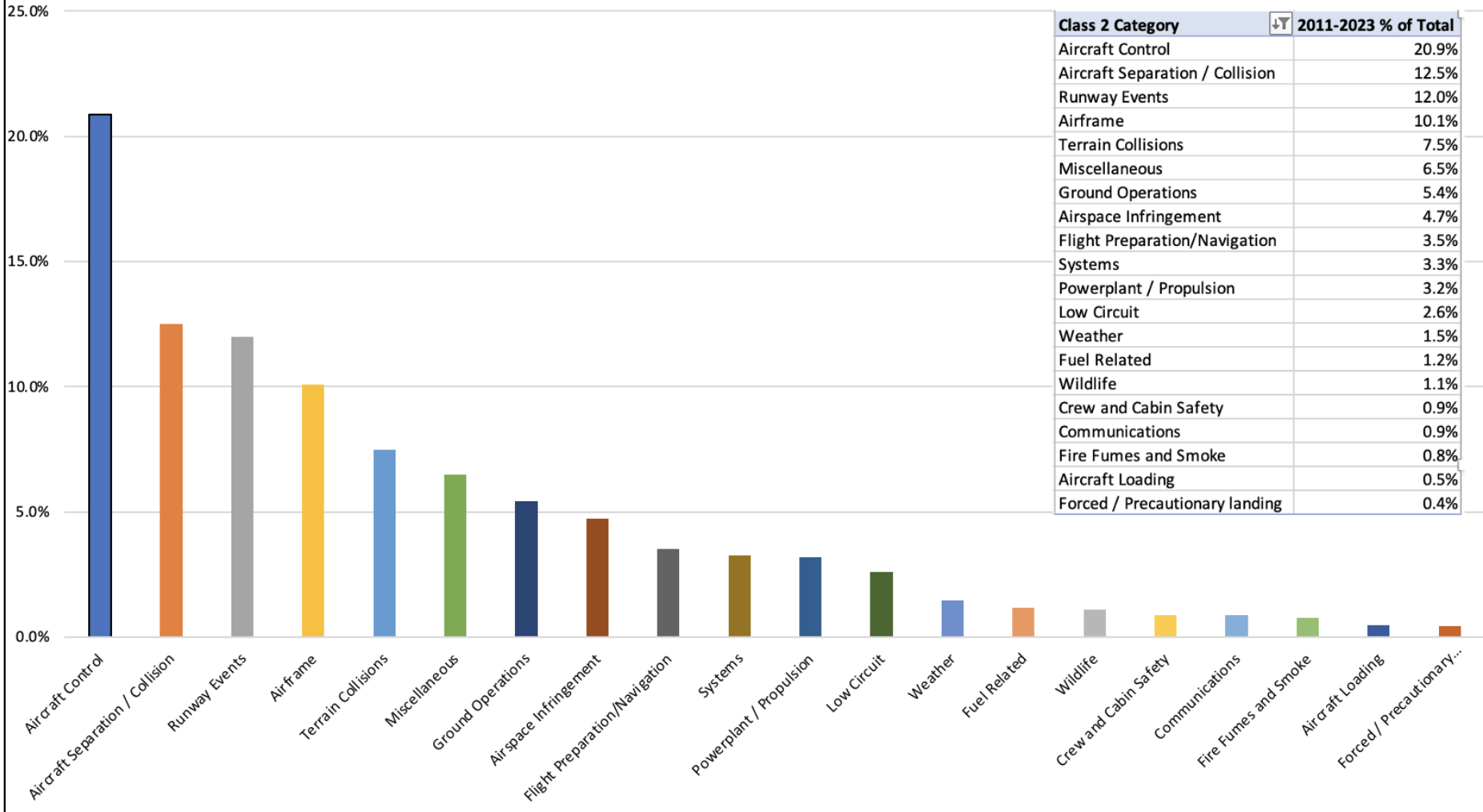


Table 2: Aggregated SOAR data by Major Category
 Note: Provided for safety awareness, comparative purposes