

**South African**  
**Special Air Event Manual of Procedures**

***The South African Special Air Event Manual of Procedure***

**Has been compiled in accordance with the South African  
Civil Aviation Regulations of 2011**

and

**The Memorandum of Agreement  
Between  
SACAA and RAASA**

in cooperation with

**Air Show South Africa  
and  
The Display Authorisation Committee**

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## **Foreword**

With the establishment of RAASA in 2008, it assumed the designated function to, amongst others, oversee, control and coordinate Special Air Events. This was a function of the Aero Club of South Africa previously, and all the manuals and personnel (Safety Officers and Flight Directors) were brought into this new arrangement.

This manual evolved from the early manual, and is updated from time to time to keep pace with changes in the environment of these events.

Over the last two years, the Operations manager of RAASA has contributed immensely to ensure the recency and relevance of the rules and guide lines contained of this latest manual.

The latest amendments contained in this manual reflects a deep and considered comparison with the rules for similar event in the rest of the world, both in the developed USA, UK and Europe, as well as the developing eastern European community.

The manual contains both suggestions and rules applicable to Special Air Events, but nothing herein absolves the organiser to abide by other legislation, which may bear on these activities, such as the Safety at Sport and Recreational Events Act and the disaster management act (see Chapter 2 for a more comprehensive coverage of this topic).

This manual brings together the role players for ensuring the success of the event with a focus on the airside. These include Safety, Flight planning, Air Traffic Control, Civil Aviation Authority, emergency medical service (EMS), SAPS and all support services. It is important to point out that this manual does not prescribe the operational aspects or qualifications of persons involved in these services, but provides that their services are required at these events.

## **Acknowledgements**

The Following instances are thanked for contributions towards this work:

- Air Show South Africa, for their continued support in promoting and developing airshows in South Africa.
- The Air Show Display Authorisation Examiner committee, for their continued endeavours to promote and develop safety standards and accreditations of display pilots.
- Sports Aerobatic club, for their support and development of sports aerobatics and aerobatic display pilots.
- Stan Oliver, for his guidance in developing safety standards to airshows.
- Gen. Desmond Barker, for his continued support and contributions to airshow safety.
- Charlie Marias, for reviewing and assisting with the content of this document.
- Chris Linakis, for reviewing and editing the contents of this document.

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References.

Appendixes

**AMENDMENT RECORD SHEET**

Amendment No	Pages	Date Effective	Amendment	Effected by	Remarks
01	10-71	01/02/2009	Original	Aeroclub/ASSA airshow manual	Existing MOP
02	8 - 13	03/10/2009	General	Pierre Laubscher	NA
03	37- 38	06/01/2010	Public commentators Airside Media	Pierre Laubscher	NA
04	55 -58	23/02/2010	DAE	Scully Levin, Pierre Laubscher	Appointments
05	22- 24	18/03/2011	Airshow Categories	Pierre Laubscher	NA
06	28	7/06/2013	Chief Safety Officer	Pierre Laubscher	Appointments
07	44-47	11/10/2013	Minimum distances	Pierre Laubscher	International best practice
08	14 - 15	16/10/ 2013	Time Lines	Pierre Laubscher	NA
09	12	11/02/2014	General Risk	Chris Linakis, Neil de Lange	Risk considerations
09	13	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	16	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	18	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	20	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	25	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	32	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	37	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	42	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	52	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA
09	71	11/02/2014	General Risk	Chris Linakis, Neil de Lange	NA



### **Functions**

In terms of the Memorandum of Agreement between the SACAA and RAASA, RAASA is responsible for the approval, control and co-ordination of special air events as contemplated in AIC 19.1., AIC 19.2.

This document sets out guidelines and minimum standards for the airside and aviation aspects of displays at special air events or airshows.

This document does not apply to the public or spectator side of special air events, organisers should take cognisance of the fact that they remain responsible to ensure that administrative, legislative, safety standards are complied, and that approvals are obtained from the relevant authorities to plan and host public or spectator events.

### **Deviation**

Any deviation, alternate means of compliance or exemptions from the provisions of this manual, shall only be considered upon formal application by the organisers. The relevant supporting material or any further material required by RAASA shall be submitted to RAASA.

RAASA may consider and approve such an application, once RAASA is satisfied that adequate mechanisms, plans and processes have been put in place to adequately manage the intended event or activity.

Such approval shall be issued in writing and signed by the CEO of RAASA.



**1. Definitions as Contained in the MOA and SLA between RAASA and the CAA**

- a) The determination of standards for the operation of aircraft involved in aviation recreation means the setting of acceptable flight related rules applicable to both type certified aircraft as well as non-type certified aircraft when such aircraft engage in any activity which could be considered as a special air event, national competition, contest or any event belonging *eusdem generis* to such class;

**2. A special air event means:**

- a) Any activity which imposes an increased workload on the pilot in an aircraft in order to participate or compete in any event designed to either entertain or display to a crowd of spectators, or achieve a result which result shall be measured against other pilots in the same event; or
- b) Any event where any participant, whether solo or as part of a group, flies any sequence designed to have entertainment or educational value, and participating pilot shall be deemed to be a participant at such event.
- c) Notwithstanding anything contained elsewhere in this manual, a special air event is any flying activity during which aircraft may not necessarily comply with the Rules of the Air and/or normal Air Traffic Control rules as contained in the CARS, and which requires consideration of one or more of the following:
- aa) the issue of special procedures;
  - bb) the level of an "air traffic service" to be provided;
  - cc) the establishment of Restriction of Flying Regulations

**3. Terminology**

<b>No</b>	<b>Terms</b>	<b>Description</b>
(a)	<b>Flying Display</b>	Any flying activity deliberately performed for the purpose of providing an exhibition or entertainment, at an airfield open to the public, irrespective whether there is a gate charge or not.
(c)	<b>Crowd Line</b>	The forward edge of the areas intended for spectators or car parks to which the public has access during a Flying Display.
(d)	<b>Display Line</b>	A line defining the closest a display aircraft may fly parallel to, or approach the Crowd Line.
(e)	<b>Hard Deck</b>	The minimum height determined by the SO, that any pilot of a display aircraft may fly during an event or display, i.e. All pilots incl zero ft rated pilots will deem the hard deck as zero ft and adjust their approved display heights accordingly

<b>No</b>	<b>Terms</b>	<b>Description</b>
(f)	<b>Event Organiser or applicant</b>	<ul style="list-style-type: none"> <li>a) The Organiser of an event.</li> <li>b) The organisers remains the applicant, even if the application is submitted by an agent or nominated persons other than the organiser.</li> <li>c) The event organiser remains the person responsible for all matters related to legal and regulatory compliance, safety and risk to participants, officials and members of the public be they spectators or otherwise.</li> </ul>
(g)	<b>Flying Safety Officer (Safety Director)</b>	The person appointed to oversee airside safety at a special air event, and promote the safe conduct of airside and aerial activities.
(h)	<b>Flight Director (AIRBOSS)</b>	The responsible person appointed to observe, manage and co-ordinate all airside officials and participants through feedback from the SO, ATC, EMS, Fire, Marshalls, Security etc.
(h)	<b>Display Pilot</b>	A pilot who holds a Display Authorisation or Exemption, that allows him to take part in a flying display.
(i)	<b>Spectator</b>	Any person attending a Flying Display and remaining in the areas set aside for the public
(j)	<b>Display Authorisation</b>	A RAASA issued document detailing the types or groups of aircraft in which a pilot is authorised to display, together with any limitations or specific endorsements.
(k)	<b>Skills Levels for Authorisation of Aerobatic Displays</b>	The skill levels are as defined by the Sport Aerobatic Club of SA, or by an approved ATO or military air force. The skill levels used on Display Authorisations, are: Sportsman, Intermediate, Advanced, Unlimited Note: Included are categories for vintage, military, fast jet and aerobatic aircraft.
(l)	<b>Pleasure Flights</b>	Any passenger flight starting from, or arriving at, the display site purely for the purpose of a Pleasure Flying.
(m)	<b>Static Aircraft Park</b>	Park for aircraft to which the public has access, where there will be no aircraft movements or engines running for the duration of the event.
(n)	<b>Flight Line Aircraft Parking Area</b>	A park for aircraft to which the public has no access.
(o)	<b>ATC</b>	The person or persons appointed by ATNS to control aircraft arrivals, start clearances, departures and to maintain safe separations. Also to maintain any restrictions, heights or distances, as per the safety officers instructions as determined or deemed necessary during the event audit and safety briefing by the safety officer or at any other time during an event.
(p)	<b>AFIS</b>	The person or persons approved to conduct a flight information service, and to advise on any conditions relevant to arriving and departing aircraft. Also to advise all pilots on any restrictions, heights or distances as per the safety officers instructions as determined or deemed necessary during the pre-event audit and safety briefing by the safety officer or at any other time during an event.

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**CHAPTER 1**

**GENERAL INFORMATION**

1. Introduction.

- 1.1 This document sets out the minimum standards for safety and administrative procedures to be followed by all organisers and participants at and during such events on the airside or aviation side.
- 1.2 Guidance is also provided, beyond the statutory requirements, so that the experience gained from past displays can be of use to those new to the organisation of such events.
- 1.3 For the same reason, some basic advice is included on aviation air shows, air races, rallies, helicopter displays, contests or competitions, some of which may not be subject to the regulations governing flying displays, provided there is no display element included in the event. Supplementary guidance is provided for microlighting, gyrocopters, gliding, para gliding, balloon and parachute displays.
- 1.4 Special Air Event Organisers, when making application for a Permit to hold a Special Air Event, are required to confirm that the organisation and conduct of the Special Air Event will be in accordance with the provisions of this Manual.
- 1.5 Nothing in this publication is intended to conflict with the CAR's or other legislation, which, in case of doubt, the CARS must be regarded as superior.
- 1.6 The participation and hosting of a special air event carries a lot of responsibility and risk. Planning and mitigating this risk to ensure safety of participants, and arguably most important the spectators, irrespective if they are paying or not to gain entrance or observe such activities is of paramount importance. All aspects of such events must be carefully planned, and all activities should be thoroughly considered prior to their approval.
- 1.7 Any unplanned, impromptu, ad hoc or unrehearsed display shall not be attempted or permitted.

**NB! NOTE TO ORGANISERS/APPLICANTS.**

This document only applies to applications and approvals from the designated body or civil aviation authority that relates to aviation displays at special air events, and pertains to minimum safety standards on the airside at such events.

It remains the responsibility of the organiser to ensure compliance with all administrative and legislative requirements and safety standards for public events are adhered to.

It remains the responsibility of the organiser to ensure that all applicable approvals are obtained in writing from the various and respective authorities to plan and host public events.

It remains the responsibility of the organiser to apply a duty of care, to ensure adequate and suitable safety personnel and emergency services are physically present for the duration at such events for the benefit of public safety.

RAASA, CAA and ASSA duties for Special Air Event applications.

2.1 RAASA

- a) All formal applications shall be submitted to RAASA within the prescribed time lines for processing,
- b) RAASA shall consider and make recommendations for available dates for all Special Air Events.
- c) All further documentation required for airside shall be submitted to RAASA i.e.
  - aa) Pre-Event Audit;
  - bb) Emergency response and evacuation plan,
  - cc) Operations plan;
  - dd) Provisional program;
  - ee) Post Event reports etc.
- d) RAASA shall notify CAMU or AIS of all matters related to airspace for Special Air Events.
- e) RAASA may request ATC from ATNS, or a suitable service provider at all Special Air Events requiring controlled airspace.
- f) RAASA may approve and issue an Event Permit to the organizer once all administrative requirements have been satisfactorily supplied.
- g) RAASA to oversee special air events.
- h) RAASA shall confirm appointed Safety officers and Flight, or appoint approved safety officers and flight directors if for special air events if required.
- i) RAASA shall maintain records of all air shows in its filing systems for a minimum period of 5 years.
- j) RAASA shall take action in the event of transgressions or non-compliances.

**NB! All correspondence to and from RAASA related to all SAE or any other Aviation Event shall be copied to [tania@raasa.co.za](mailto:tania@raasa.co.za) , [pierre@raasa.co.za](mailto:pierre@raasa.co.za) , and [willem@raasa.co.za](mailto:willem@raasa.co.za) to ensure an efficient and continued service from the SAE team.**

2.2 ASSA:

- a) ASSA may accredit an air show on application from the organiser, once ASSA is satisfied that the event has adhered to ASSA standards for planning and hosting an event. This shall entitle the organiser to promote and brand his/her event as an ASSA Accredited Air show.
- b) ASSA remains responsible for ensuring that all participants and organizers at air shows are current and paid up members of ASSA.
- b) ASSA shall assist with the promotion and development of Air shows in SA, ASSA shall support, guide and assist air show organizers in the planning and organizing of air shows by ensuring that all participants are suitably provided for by the organizer
- c) ASSA to identify, train and mentor Safety Officers and Flight Directors through approved training and mentorship programs.
- d) Once a SO or FD candidate is ready, ASSA may recommend such individuals to RAASA for consideration, who in turn may approve and appoint such persons to act as a Safety Officer or Flight Director.
- e) ASSA shall manage and ensure that good conduct and ethics are maintained by all ASSA members at Air shows.
- f) ASSA shall vet and validate all air show organizers to ensure that the organizer for the event is suitably experienced to plan and organize such an event, and to ensure that the organizers are suitably assisted and funded to ensure a successful event.
- g) ASSA to identify, develop, and recommend all other personnel essential to airside operations at air shows.
- h) ASSA shall ensure that Transformation and Development programs at events are bona fide and well managed.

***(NB! ASSA does not approve Special Air Events, but accredits the event by ensuring ASSA standards are adhered to)***

2.3 SACAA

- a) CAA shall support and assist RAASA with oversight at air shows if so required or requested by RAASA
- b) CAA to support and assist RAASA with enforcement, or any legal matters resulting from airshows.

2. Procedures when for applying for a Special Air Event Permit

- a) An organiser/applicant must be mindful of the effect and the importance of scheduling the intended event date, special consideration must be given to the availability of display pilots and other participants, i.e. ATC's, and any other service providers as it may apply.
- b) Alternate dates should be considered in the case of conflicting or unavailable dates,
- c) The Special Air Event application forms or information can be obtained on the RAASA, or ASSA website.
- d) All Air shows: the completed application form and supporting documents need to be submitted to RAASA, no less than 150 days prior to an event.
- e) Other Aviation events: Multi Discipline events and for International, National, Provincial or Regional competitions, a formal application needs to be submitted to RAASA no less than 150 days prior to an event.
- f) ARO, section specific or single discipline events as approved in their respective MOP, s: No less than 90 days prior to the event, if uncontrolled airspace is acceptable for the event or a competition.
- g) If an organsier chooses to use ASSA as their agent, or a formal application has been received by ASSA, then ASSA shall ensure that RAASA receives the application supporting documentation and recommendation letter within the prescribed 150 day application deadline.
- h) RAASA will forward the approved permit to the organizer and/or safety officer

**NB! (Contact RAASA to confirm the type of Airspace required if Unsure)**

4. Time lines and administrative requirements for SAE applications

4.1: 160 days prior to SAE.

- a) The event organiser may choose to directly, or through ASSA apply to or notify, all persons, bodies, departments and agencies as required by legislation, regulations including by laws of their intended event within the applicable periods.
- b) The organiser/applicant or ASSA shall first request confirmation from RAASA, the availability of ATC, s or AFIS as the case may be for the proposed SAE.
- c) RAASA will confirm availability of ATC's or AFIS as the case may be, and the acceptance of the proposed event date.

4.2: 150 Days prior: ALL SAE Formal Application submitted to RAASA:

- a) The event organiser shall submit and ensure that RAASA has received the completed SAE application forms with the following supporting documentation;
  1. Municipal and/or land owner's signed letter of permission; and
  2. The property owner or local authority signed letter of permission in the event where the flying display or display box is performed off airfield, or over a property other than the airfield where the event is held.
  3. Proof of application to the SAPS for Event risk categorisation.
  4. Written confirmation that the airfield complies with all minimum requirements.
  5. Copy of site plane and layout indicating crowd line in relation to the runway edge, public areas, settlements, car parks etc.

4.3: 120 days prior:

- a) All Safety Officers and Flight Directors shall be confirmed by RAASA.

4.4: 90 days prior:

- a) Full payment to RAASA of any applicable fees as agreed on by all relevant parties for the appointment of safety officers and flight directors
- b) Deadline for formal applications of events such as class D not requiring controlled airspace.

4.5: 60 days prior:

4.5.1 The organiser remains responsible for and shall ensure that the following documents are complete, approved, signed, and submitted to RAASA no less than 60 days prior to the event as applicable to the airside.

- a) Emergency response plan, (Approved and signed by a Senior person qualified to develop and approve disaster management, emergency response and evacuation plans, and submitted to the organiser)
- b) Evacuation Plan, (Approved and signed by a Senior person qualified to develop and approve disaster management, emergency response and evacuation plans, and submitted to the organiser)
- c) All names and contact details of emergency services personnel, JOC; VOC etc.
- d) Pre Event Audit, (Signed and submitted by the Safety Officer)
- e) Signed proof of applicable insurance, i.e. 3<sup>rd</sup> party, public liability etc as required in the "*Safety at Sports and Recreational Events Act (Act 2, of 2010)*"
- f) An operational plan detailing the ground plan and layout for the event, indicating the airside vs. public side with demarcated crowd line min distances, first responder/emergency vehicles parking, ATC tower, PA stand/tower, emergency exits, display aircraft parking, arriving aircraft parking etc.



**NB! Also refer to any applicable insurance Act's, and the Ombudsman for the short term insurance industry.**

**4.6: 30 days prior:**

- a) All final airside arrangements with supporting documentation needs to be complete and already submitted to RAASA.
- b) Provisional air display program, (SO and FD)
- c) A list of all pilots/displays that will be validated by the SO for flat displays or a DAE prior to the show (SO)
- d) Copy of pilots briefing and safety minima's, (SO)
- e) All names, contact details and duties of any other personnel and committee members that will have an active duty or function on the day of the event. (Organiser)
- f) A signed letter of confirmation from the organizer that all municipal and emergency services, Fire department, Ambulance, Hospitals, SAPS and Traffic etc, have been alerted and will be available in accordance with the emergency response and evacuation plan, and necessary permissions or permits have been obtained. Including adherence to any applicable Laws, Regulations and Municipal by laws. (Organizer)
- g) A detailed airside operations plan shall be prepared and implemented by the organiser, in consultation with the safety officer and flight director prior to and during the air show.
- h) This shall include a detailed plan of the crowd line in relation to the airside layout, airside positions for emergency and support personnel, checks and procedures that need to be implemented and adhered to prior to and during the event, including the type and number of radios or other forms of communications, positions of all marshals, airside personnel positions and permitted areas.
- i) Flight Directors or Safety Officers may allocate pre-determined times for all arrivals and departures on application, no other times will be accommodated if the air show program does not permit these delays.
- j) The air show program will take preference over GA arrivals and departures, except in the case of prior arrangements or emergencies.

**4.7: 14 Days prior:**

- a) Final written confirmation from the organiser that all safety standards, arrangements, and that participants, programs are complete and finalized.
- b) RAASA may issue a Special Air Event permit if all administrative requirements and payments have been satisfactorily met and submitted within the prescribed timeframes.

**4.8: Post Event Requirements**

**4.8.1 Debrief**

- a) The Safety Officer, Flight Director and other event officials shall perform a debrief within 7 days after the event. This may be conducted in person, by telephone or by e-mail with all participants and the organizing committee.

#### 4.8.2 Post Event report

- a) Once the debrief is completed the Safety Officer and Flight Director shall each compile a post event report and submit this directly to RAASA no later than 14 days after the event.

#### 4.9. Notes

- a) RAASA may at any time during the above stated timeline request confirmation of any additional information
- b) RAASA must be advised ASAP of a cancelation of an event

**NB! If any of the conditions above have not been satisfactorily met or adhered to within the required timeframe, or sufficient reasons for any delays supplied in writing to RAASA within reasonable time, the event permit may be declined, and the event removed from the calendar.**

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<b>CHAPTER 2</b>	<b>LEGAL REQUIREMENTS</b>
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2.1

- a) The event organiser/applicant remains the person responsible for all matters of the event, to ensure legal and regulatory compliance, to put into place and apply effective safety and risk management measures, to protect participants, officials and members of the public be they spectators or otherwise.
- b) It remains the responsibility of the event organiser, property owner, main sponsor and their agents to familiarize themselves and comply with the following legislation as applicable;
- g) ***Safety at Sports and Recreational Events Act (Act 2, of 2010)***
- h) ***Occupational Health and Safety Act (Act 85, of 1993)***
- i) ***Disaster Management Act (Ac, 57, of 2002)***
- j) ***Fire Brigade Services Act (Act 99, of 1987)***
- k) ***South African Police Service Act (Act 68, of 1995)***
- l) ***Liquor Act (Act 59, of 2003)***
- m) ***Explosives Act (Act 15, of 2003)***
- n) ***Civil Aviation Act (Act 13, of 2009) As well as the Regulations issued in terms thereof;***
- o) ***Any regional or local bylaws incidental to the planning and organizing of an event.***
- p) ***The contents of this manual.***

2.2 CIVIL AVIATION REGULATION (CAR) REQUIREMENTS

- a) AIC 19.1 & AIC 19.2 Where such an event or flying display is at an event open to the public, this places responsibilities on the organiser of a special air event and/or flying display, the safety officer and the participating pilots to ensure that all minimum safety standards and emergency response plans are adhered too.
- b) For such an event, the Organiser must obtain a permit in writing from RAASA.
- c) Pilots performing displays must hold a valid display authorisation (DA).
- d) Before an approval can be considered, RAASA must be satisfied that the organiser, safety officer and flight director are in good standing, be fit and competent for their role, having regard in particular for their previous conduct and experience, their administration, organisation, staffing and other arrangements, and to safely oversee a special air event.
- e) RAASA may consider such a person to be in good standing, fit and competent if a written recommendation has been submitted to RAASA by ASSA.
- f) In deciding if an application for approval should be made for a Special Air Event permit, organisers should note that the “accessible to the public” requirement is the principle requirement for complying with the “*Safety at Sports and Recreational Events Act (Act 2, of 2010)*” rather than relying on the “Fly-in” or “free entry” element. Members of a club, or organisation, their friends and family are also considered public.
- g) Different conditions may apply to balloon and parachute events and these are covered separately in Chapter 7.

- h) Races and contests, Competitions, Fly-ins and Special Air Events, whether part of a Flying Display or not, may be exempt from the certain requirements of Part 91 and 94 of the SACAR's.
- i) Where the public has access to the site or may be in close proximity of the race or contest, competition, fly-in or special air event, the organiser shall comply with requirements relating to public safety, particularly in relation to minimum separation distances between aircraft, in flight and on the ground, and the public as well as access to the active or airside.

### 2.3 MILITARY EVENTS, VENUES AND MILITARY PARTICIPATION IN CIVIL FLYING DISPLAYS

- a) Although there is no legal requirement for a civilian pilot performing at a military Flying Display to hold a display rating, Military rules requires civilian display pilots flying at military displays to hold a DA or DA Exemption as evidence of display competence and limitations.
- b) Participation by civilian pilots in such displays will be subject to compliance with display limits approved by the military authority.
- c) Before any military aircraft may participate in a civil flying display its participation must be approved by the South African Air Force (SAAF).
- d) In the case of military aircraft, it can be reasonably assumed that the required approval has been given by the SAAF when the display aircraft is allocated to the Flying Display by the Participation Committee of the relevant service.

### 2.4 FOREIGN PARTICIPATION

#### 2.4.1 Foreign Civil Participants from Countries Operating a DA System

- a) Certain countries have issued, or are in the process of issuing, DAs to their display pilots.
- b) DA's issued by other countries may be validated for pilots participating in displays in SA.
- c) The limitations imposed on pilots holding a DA issued in another country whilst displaying in the SA may be the higher of the limits specified in the pilot's DA or the limits imposed in the Appendix I.
- d) Pilots from other countries may hold, if they wish, a SA DA provided they have met all the requirements as specified in Chapter 6 and have been recommended to RAASA by a SA Display Authorisation Examiner or Evaluator.
- e) The limitations of the SA DA will apply to Flying Displays flown in the South Africa.
- f) Foreign Civil Participation from non-ICAO Countries or Countries without a DA system
- g) A foreign civil licensed pilot from non-ICAO countries or countries without a DA system wishing to take part in Flying Display permission is required to hold a SA DA or an exemption from the need to hold a DA.
- h) Where a foreign, qualification equivalent to a DA is held, RAASA may be prepared to accept it as confirmation of competence in considering the issue of a SA DA or an exemption from the need to hold a DA.
- i) Further details may be obtained from the RAASA Operations Department.

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<b>CHAPTER 3</b>	<b>AIR EVENT CATEGORIES</b>
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3.1 General.

- a) Due to diversity of aviation and the South African airshow circuit in terms of the number of partaking aircraft, and people expected it is recommended that the following categorisation of aviation events is used:
- b) See Part 97 for further event definitions and requirements.

3.2 Definitions for Categories or Types of Events

3.2.1 Fly-in.

- a) An event or gathering of pilots at an airfield by means of flying their aircraft to a particular destination, for the purposes of a social get together as individuals, a group or club.

Limitations

- b) A fly-in is not for the purposes of a public gathering or entertaining the public, fly-pasts or flying displays in level flight or aerobatic manoeuvres are not permitted.
- c) After landing, Aircraft are shut down until departure.

Exemptions

- d) Flying displays or fly-pasts performed by no more than one AOC holder as approved by the SACAA.

Approval

- e) A fly-in does not require a special air event approval permit from RAASA, providing the event does not contain any of the activities of a special air event, or be considered a public gathering in terms of any other legislation.
- f) The organiser of a fly-in remains responsible for all matters including safety at such an event, further to ensure proper diligence and a duty of care is applied.
- g) Any airspace publications or obtaining approvals other than those for a special air event shall remain the responsibility of the organiser.
- h) All flying activities shall be conducted in compliance with the SACARS.

**NB! If more than one AOC holder is performing a display at a particular air event or public gathering, the event shall be considered to be a special air event and shall comply with the requirements of this manual for approval, unless exemption from the DCA has been obtained in writing .**

3.2.2 Restricted Event or Mentorship Event: (Category D Special Air Event).

- a) A special air event or gathering of pilots as members of an approved ARO, aviation club or aviation organisation at an airfield by means of flying their aircraft to a particular destination for the purposes a social get together.
- b) For the development and promotion of aviation safety through improving skills, gaining experience by performing or taking part in flights, fly-pasts, displays, competitions, races, or spot "accuracy" landing competitions under the mentorship and direct supervision of approved DAE's, Instructors and approved safety officers.

- c) These are section or discipline specific events and are organised by approved ARO's, club or organisations in accordance with an approved MOP.

#### Limitations

- d) A category D event is not for the purposes of a public gathering or entertaining the public by means of fly pasts or flying displays in level flight or aerobatic manoeuvres.

#### Exemptions

- e) Flying displays or fly-pasts performed by no more than one AOC holder as approved by the SACAA.
- f) Aerobatic sequences flown by members of the sports aerobatic club with the appropriate ratings and approved by the SAC, as a SAC sanctioned event or competition.

#### Approvals

- g) Approvals shall be obtained from RAASA.
- h) In the event where an ARO, club or organisation is planning to hold an event in accordance with an approved MOP, RAASA shall be notified in writing no less than 90 days prior to the event, with written confirmation that all requirements have been adhered to in accordance with their approved procedures, and this MOP as applicable.

#### 3.2.3 Small Airshow: or (Class C Special Air Event)

- a) A special air event or gathering of pilots at an approved aerodrome or airfield specifically for the purposes of a public gathering and entertaining the public by means of a limited number of aerial displays including flat displays, and formation displays by suitably rated pilots.
- b) This category is allocated to an event that consists of no more than **15** individual acts.
- c) A formal application needs to be submitted to the RAASA No less than 150 days in advance.
- d) Uncontrolled airspace with AFIS may be considered upon receipt of a formal application , or controlled airspace may be declared subject ATC availability and the size and complexity of the intended event and displays.

#### Minimum requirements and limitations

- a) Limited types of flying displays are permitted by suitably rated display pilots for the purposes of entertaining the public.
- b) Controlled airspace is required if aerobatic displays are included.
- c) A clear and solid barrier needs to be in place between the public/crowd line and the active airside of such an event.
- d) This category of event requires at least one approved airshow safety officer as determined, with at least one assisting safety officer as part of a mentoring program.



### 3.2.4 Medium Airshow: or Class B Event

- a) A special air event or gathering of pilots at an approved aerodrome or airfield for the purposes of a public gathering and entertaining the public by means of a limited number of aerial displays including flat displays, aerobatic displays and formation displays by suitably rated pilots.
- b) This category is allocated to an event that consists of **16-20** individual acts.
- c) A formal application needs to be submitted to RAASA no less than 150 days in advance, controlled airspace shall be declared, and ATC availability confirmed.

#### Minimum requirements and limitations

- a) Most types of flying displays are permitted by suitably rated display pilots for the purposes of entertaining the public.
- b) A clear barrier needs to be in place between the public/crowd line and the active airside of such an event.
- c) This category event requires at least two approved airshow safety officers and one approved Flight Director

### 3.2.5 Large Airshow: or (Class A Event)

- a) A special air event or gathering of pilots at an approved aerodrome or airfield for the purposes of a public gathering and entertaining the public by means of any number of aerial displays including flat displays, aerobatic displays and formation displays by suitably rated pilots.
- b) This category is allocated to an event that consists of **21** or more individual acts.
- c) A formal application needs to be submitted to the RAASA no less than 150 days in advance, controlled airspace shall be declared and ATC availability confirmed.

#### Minimum requirements and limitations

- a) All types of flying displays are permitted by suitably rated display pilots for the purposes of entertaining the public.
- b) A clear and solid barrier needs to be in place between the public/crowd line and the active airside of such an event
- c) In the case of a Military Event all procedures will be under the MOP's and regulations of the Military.
- d) In the case or large commercial or airline aircraft prior approval will need to be obtained from the SACAA Part 135 or Part 121 department managers.
- e) This category event requires at least three approved airshow safety officers and one approved Flight Director, an Event Committee as well as a Ramp controller and Chief Marshal.

### 3.2.6 International Airshow

- a) Same a Class A Event, This is an event held according to International standards and will be evaluated on an individual basis.

3.3 Competitions, Races and Rallies.

- a) Unless an event is single discipline specific, organised and managed by an approved ARO and its members in accordance with standards and procedures approved in their MOP, any other event that is not an airshow, at a gathering on or off an airfield, by a group of pilots, including but not limited to competitions, races, rallies, accuracy landing, navigation, flour bombing, displays, or to compete against another pilot or pilots.
- b) Such events shall all be considered to be at least a Category D Special Air Event, and adhere to all the administrative, safety and approval requirements as determined for such an event.
- c) If RAASA deems the event equivalent to, or higher than a category C special air event, the organiser shall ensure administrative and safety requirements for that category of event are adhered.

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**CHAPTER 4 | PERSONNEL AND PRELIMINARY PLANNING**

**4.1 THE EVENT ORGANISER/APPLICANT DUTIES**

- a) An Event Organiser/Applicant is a person who may be accredited by ASSA as fit and competent with the required knowledge and experience to plan, organise and apply for a special air event approval.
- b) One person shall assume overall responsibility for all aspects of an event as the Event Organiser/Applicant.
- c) The event organiser remains responsible for all matters of the event, to ensure legal and regulatory compliance, to put into place and apply effective safety and risk management measures, to protect participants, officials and members of the public be they spectators or otherwise.
- d) The organisers has the responsibility to ensure all applicable approvals from the various and respective authorities have been obtained in writing, and to appoint suitable personnel, emergency services and other service providers to ensure compliance with legislation and regulations, safety, planning, administration and notification of particular aspects should only be allocated to people with the appropriate knowledge and experience.
- e) Appoint a team or committee in two parts, to fulfil specific planning, functions and control.
  - (1) air/aviation side; and
  - (2) public/spectator side,

This should consist of at least the following,

**4.2 Chairman/Organiser**

- a) To apply for approval and notify the;
    - aa) South African Police Services,
    - bb) Local Authorities; and
    - cc) Emergency services
    - dd) RAASA
- of the intended event in advance of the required timeframes.

**4.3 Event Secretary**

- a) Shall be responsible to ensure that administrative requirements and documentation is adhered, communicated and disseminated to all relevant parties within the applicable timeframes.

**4.4 Public side coordinator (*All non airside planning and activities*)**

- a) Ensure adherence and conformance to all applicable legislation related to public events.
- b) Liaise with vendors, food & beverage providers, and suppliers of toilets, dustbins, entrance/gate staff and security, parking marshals, emergency services, cleaners, general media & photographers.
- c) Obtain liquor licenses, entertainment for kids, sufficient foods stalls, standing and seated areas for the public, signage for parking, entry and exit points, emergency

exit routes, public liability statements, any other requirement on the public side, etc

#### **4.5 Public side Safety Officer. (All public safety and security matters)**

- a) Plan and ensure all matters related to public and spectator safety, and that the event is held in accordance with the Safety at Sports and Recreational Events Act, 2010; Health and Safety Act, local authorities' bylaws and any other applicable legislation or regulation relevant to such an event, and that an approved and signed disaster management and evacuation plan is in place.
- b) Engineering certificates for any structures erected on the site.
- c) Sufficient and applicable insurance covers are obtained.
- d) Apply to, notify, negotiate with to arrange within the required time frame, for
  - 1) Municipal approval,
  - 2) SAPS, event risk categorisation,
  - 3) Metro or Traffic police to manage and control traffic,
  - 4) Fire Departments,
  - 5) Ambulances with advanced life support at the airfield,
  - 6) Hospitals and local Doctors and see if they are able and willing to assist in the case of an emergency,
  - 7) Meet with airside SO, VOC/JOC;
  - 8) Disaster management and other emergency services to plan, develop and approve emergency response, disaster management and evacuation plans.

***NB! (This is a separate responsibility from the RAASA approved airside safety officer who is responsible for aviation safety).***

#### **4.6 Treasurer/finance**

- a) Manage financial matters, plan budgets, ensure that there are sufficient funds, funding or sponsors to cover the expenses prior to applying for an event permit. (Relying on Gate/Entry fees is normally not sufficient for such an event).
- e) Ensure event insurance in case of poor weather

#### **4.7 Chief Marshall**

- a) To provide for and/or train sufficient marshals to manage and maintain separation and discipline at all times on the airside and to ensure that no unauthorized persons enter the airside or approaches any aircraft.

***NB! Special precaution and attention by the organiser and marshals needs to be paid to children as they are not aware of turning propellers and moving aircraft or vehicles***

- b) To ensure that all airside accredited or authorized personnel wear reflective vests and/or display an airside accreditation card as issued by RAASA before being permitted on the airside.

#### **4.8 Marketing, Promotions and Sales**

- a) To liaise with publications, newspapers, local businesses and shopping centres, schools, public adverts, produce and distribute, flyers, posters, e-mails, develop website and blogs, advertise on aviation forums.
- b) Market and sell advertising and static display stands to aviation organizations local businesses, and general exhibitors.

- c) Invite VIP, s, Dignitaries and Special guests.

#### 4.9 PRO and Sponsorships

- a) Liaise with ASSA for accreditation and sponsors, approach sponsors other than those from ASSA, meet and plan with marketing, promotions and sales, to include sponsors logo's and branding on flyers, posters and adverts.
- b) Plan and coordinate programs for any special activities such as dinners or award ceremonies, the evening before or after the event, liaise with celebrity guests for entertainment.
- c) Arrange for interviews with newspapers, TV, local radio stations.
- d) Plan and invite previously disadvantaged persons and children from the local communities.
- e) Plan a transformation and development program, in conjunction with ASSA and the Aero club of SA

#### 4.10 Head of Security or Security Company

- a) As per the organizer, safety officers, and SAP arrangements and security plans.

#### **4.11 Airside and Aviation related duties as required by RAASA for Airside event approval.**

##### 4.11.1 Airside/Aviation display coordinator (Critical Function)

- a) Airside coordinator to contact and liaise with RAASA, ASSA, flight director, safety officers, display pilots, skydivers, and all other participants or persons to attend and perform displays', as well as ensuring that all minima's are adhered to as per the SAE MOP and instructed by the SO and FD.
- b) To provide a clear and solid demarcations/barriers or fencing between the airside and public side with the correct distances as to ensure that the public is not able to gain access to the airside.
- c) Provide demarcated areas for static aircraft, and arriving aircraft that may want to depart during the day, no public may enter or approach the area for arriving and departing aircraft.
- d) Ensure that a suitable Tower is erected with an engineer's report for the ATC, SO, and FD, in cooperation with the SO, that is elevated above the crowd with a full view of the rwy, taxi ways, AC parking, and flight line.

***NB! It is essential that the airside co-ordinator has the required experience and knowledge in this regard and that Airside matters in particular safety and regulatory issues, ASSA to train and validate such persons.***

#### 4.12 APPOINTMENT OF OFFICIALS

- a) Suitable staff must be detailed to supervise the parking of aircraft and vehicles, to operate any public address system, and to control messengers and other staff.
- b) Sufficient marshals must be available, either from the police or within the airshow arena, to control members of the public, to ensure that emergency vehicle access

is kept clear, to be available in the case of emergency and to prevent public access beyond the crowd line.

- c) It is generally possible to find persons competent to undertake such duties from among the membership of a flying club or other suitable aviation organisation.
- d) At a large Special Air Event, only persons experienced in flight line ground handling of aircraft should be used in the aircraft movement area if possible.
- e) All officials must be thoroughly briefed in the duties expected of them and provided with some means of identification, such as armbands.

#### **4.13 THE CHIEF SAFETY OFFICER**

- a) On application, RAASA may appoint at least one safety officer, and take into consideration the geographic proximity and level of experience of the appointees in relation to the size and complexity of the event.
- b) The Safety Officer is the person appointed to oversee airside safety at a special air event, and promote the safe conduct of airside and aerial activities
- c) It therefore follows that the Safety Officer must be suitably knowledgeable or experienced to manage the size and complexity of the flying displays, in all matters relating to flying in general and flying displays.
- d) The safety officer is responsible for flying discipline, the approval of individual display routines, and managing of all flying activities.
- e) The safety officer has the authority to set higher limits than the minima specified in the display permission, either individually, if he has reason to believe an individual pilot requires greater safety margins, or generally, if he believes that the whole flying display should be flown to a higher or further minima.
- f) This may be done in consultation with participating pilots and/or DAEs if so required.
- g) At a Fly-in, the operator or pilot in command of a participating aircraft may be nominated as the safety officer by the organiser if suitably experienced.
- h) At Category A & B events, it is required that a separate Flight Director is nominated to control the flying program. He must be approved by RAASA, and have been the understudy at, at least 3 Category A or B events.
- i) The Safety Officer, Flight Director at Special air events may not take part in any flying role in the Flying Display.
- j) A participating pilot may not act in any other capacity such as a SO, FD or organiser.
- l) It is essential that the Safety Officer has adequate communications with appropriate personnel and the display participants throughout all displays.
- m) All airshow organisers shall ensure that at least one or more safety officers are appointed to assist the chief safety officer in various safety and supporting roles.
- n) At special air events all second and third safety officers shall assist and report to the chief safety officer.
- o) A suitable second safety officer may relieve that chief safety officer for a specified period in order to take comfort or lunch breaks.

##### **4.13.1: Safety Officer Duties prior to the Event.**

- a) The SO shall meet with the organiser and the airside coordinator/committee to discuss the scope of the planned event, displays and airside activities; it is the SO's duty to advise the organiser of the minimum requirements, safety standards and administrative requirements and time lines well in advance.
- b) The SO shall prepare an operations plan with a detailed checklist (same as a project manager) to monitor the progress of the airside preparations.

- c) The SO shall conduct a physical pre-event audit and complete the SAE audit form, this is a physical visit to the airfield and meeting with the organizing committee to discuss all relevant issues as per the audit form.

***NB! (This is not a duplicate of the previous year's audit form, and shall be a new physical visit as there may be changes at the airfield from the previous event)***

- d) Conduct early meetings with the relevant emergency services, to discuss the scope and complexity of air events and possible emergencies or disasters in order to compile a disaster management and evacuation plan, discuss the positioning of the first and second responders in relation to the runway and flight line, prepare and discuss the hazards unique in aviation such as avgas, Jet A1, smoke oil, ejector seats, magnesium components, pyrotechnics etc.
- e) Ensure that the disaster management and evacuation plan is developed, approved and signed by the head or manager of Disaster Management, JOC or VOC as applicable and SAPS.
- f) Discuss and plan with the emergency services and organiser where the VOC/JOC will be positioned in relation to the SO/ATC tower, and the activation or operations plan.
- g) Assist the organiser with a ground plan and layout of all airside activities and operations, and to ensure that all minimum distances from the public side/crowd line to the nearest runway edge, flight/display line, refuel areas, taxiways, jet or prop blast areas, and any other areas that may pose a hazard to persons or property.
- h) Prepare a provisional program in conjunction with the Flight Director and organizer.
- i) Submit all required administration to RAASA within the required periods.
- j) Plan a safety briefing for pilots and airside participants and all marshals, crew and airside personnel.
- k) Validate all airside crew prior to the event, and ensure that they are issued with Day-Glo vests.
- l) Validate none display rated participating pilots for flat display routines at least one day before the event.

#### 4.13.2: Safety Officer Duties during the Event

- a) The SO shall start his duties on the day of the event with an inspection of the airfield, runway, services and facilities to see if anything has changed since the pre-event audit and that all requirements are in order for the event to take place.
- b) The safety SO shall ensure that all emergency services are at their post and in the correct positions, followed by a safety briefing with the relevant emergency crews prior to starting with air displays.
- c) The SO shall determine the days conditions i.e. weather, wind direction and speeds, temp & humidity, density altitudes, visibility, and other factors that can affect display pilots and aircraft on the day.
- d) The SO shall discuss all relevant matters with Flight Director, ATC/AFIS.
- e) The SO shall finalize details for Safety briefing by including any new information as well as the day's minimums.
- f) The SO shall ensure that all relevant attendees complete an attendance register and sign indemnity forms with contact details and e-mails prior to the briefing.
- g) The SO shall conduct a Pilots Safety Briefing with all relevant parties i.e. Display pilots including Skydivers, Paragliders, ATC/AFIS, Organiser, Public commentator, Emergency services, Marshalls, airside approved media/photographers i.e. all parties performing a function related to airside activities including cars, bikes, cheerleaders etc.



- j) The SO shall observe and manage the air displays at all times from a suitable position in close cooperation with the Flight Director.

*(NB! If time does not allow for ATC/AFIS and Public commentators, Marshalls, and emergency services to attend briefing then this should be done prior to the event or pilots briefing, a separate person may be appointed by the SO to perform a briefing with media, marshals, providing the SO held a briefing with the appointee on these matters)*

*(NB! Any late arrivals that have not made prior arrangements, attended a briefing or have not had their validations done on the day prior to the event may not take part in the event, the SO shall ensure that such late requests do not place him or her under any duress)*

#### 4.13.3: Safety Officer Duties Post Event

- a) Once the air displays that formed part of the official program have ended and called to a close by the safety officers, the safety officer's duty ends.
- b) The SO shall conduct a post event briefing with the participants, organisers and flight director, this brief may be done in person or by means of e-mail, conference call or any other acceptable method of communication.
- c) The SO shall compile and submit a post event report directly to RAASA within 14 days after the event.
- d) All incidents, accidents, safety or regulatory occurrences and violations shall be addressed by the safety officer and reported to RAASA on the next working day.

#### 4.14 Approved Safety Officers Booklet (Example)

<p><b>RECREATION AVIATION ADMINISTRATION OF SOUTH AFRICA &amp; AIRSHOW SOUTH AFRICA - ACCREDITED SAFETY OFFICER -</b></p>   <p>Name: <b>Peter Mc Safety</b> ID no: <b>123456789007</b> AeCSA no: <b>9876</b> Telephone no: <b>011 082 1000</b></p>	<p><b>In terms of Part 149 of the Regulations RAASA is the body designated by the DCA to Manage, Control and Approve all Special Air Events in SA as contemplated in AIC 19.1</b></p> <p>The Safety Officer is an official of RAASA and thus SACAA. All non-compliances, incidents or irregularities shall be reported to a RAASA ASAP, and included in the post event report as submitted to RAASA.</p> <p>Safety and security are non-negotiable and an absolute criteria, managing the airside of a Special Air Event on the airside is the function of the appointed officials. Only authorised and approved participants (on the ground and in the air) are sanctioned to participate in any Airshow activity or gain access to the airside if so approved by the Safety Officer.</p> <p>By signing this document all Safety Officers of RAASA agree to abide by its code of conduct as contemplated in the SAE Manual of Procedure and subject themselves to its Ethics and Disciplinary code</p>
 _____ <b>CEO RAASA</b>	_____  <b>Safety Officer</b>

**- PRIVILEGES & LIMITATIONS –**

**The Safety Officer**

Shall be permitted to have access to all areas of a Special Air Event in South Africa. (excl Military events)  
Shall determine the times when a Special Air Event Starts and Finishes in accordance with the provisions of permit.  
Shall ensure that all participants are briefed prior to the start of an event.  
Shall be entitled to suspend or cancel a Special Air Event on reasonable grounds or in the event of a Safety or Security risk.  
May request assistance from a RAASA, SACAA official or the SAP in the event of non compliances.  
May request assistance from the SAP in the event of disorderly, non compliant or dangerous conduct from any participant or member of the public or person.  
Shall not permit any member of the public or participants to interfere with or influence the SO or ATC in the performance of their duties.  
Shall ensure that the Control tower remains clear of and with no access or interference of any unauthorised persons  
Shall not leave his or her post unless replaced by another suitable SO or FD





**Emergency Responses**

Shall inform the VOC/JOC immediately in the event of an incident or accident.  
Shall not, nor allow any person to interfere or attempt to interfere with the VOC/JOC and Emergency services in the Performance of their duties.  
The first priority at any incident or accident site is to preserve life and/or prevent any further injury or death  
Only a doctor or coroner may declare a person deceased.  
In the case of a fatality the scene or accident site is considered to be a crime scene and only the SAP shall remain in charge of the site.  
Only the SAP may order or instruct a body or bodies of the deceased to be removed from the scene  
Once all injured persons and/or bodies have been removed and no further rescue work is being carried out the site shall be guarded with two perimeters by the SAP or other Emergency services until, An appointed Air Accident or Pro Tem accident investigator will now be in charge of the site, and only persons permitted by the accident investigator may enter the site.  
If applicable the accident investigator may order the plane to be removed from the accident scene or site, where no investigator is present or enroute the SO may instruct the AC to be removed from a runway.



<b>- AIRSHOW ACCREDITATION -</b>		<b>- AIRSHOWS -</b>																																													
<table border="1"><thead><tr><th>TYPE CLASS</th><th>ACCREDITATION</th></tr></thead><tbody><tr><td>A</td><td>NO</td></tr><tr><td>B</td><td>YES</td></tr><tr><td>C</td><td>YES</td></tr><tr><td>Other Special Air Events</td><td>YES</td></tr></tbody></table>	TYPE CLASS	ACCREDITATION	A	NO	B	YES	C	YES	Other Special Air Events	YES		<table border="1"><thead><tr><th>Date</th><th>Airshow</th><th>Sign</th></tr></thead><tbody><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></tbody></table>	Date	Airshow	Sign																																
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**- MEMBERSHIP -  
OF THE AEROCLUB OF SOUTH AFRICA**  
**Expiry date**  
Aero Club of SA  
**31/12/2014**  
Airshow South Africa  
**31/12/2014**



**4.15: Flight Directors (AIRBOSS) duties and responsibilities.**

- a) The Flight Director (Airboss) is the person appointed to observe, manage and co-ordinate all airside officials and participants through feedback from the SO, ATC, EMS, Fire, Marshalls, Security etc.
- b) The FD shall oversee, manage and co-ordinate all personnel and airside Operational aspects of a SAE.
- c) The FD shall plan, manage, control and adjust the airside or flight program to remain on time, and communicate the progress and/or any changes to all relevant role players.
- d) The FD shall support the safety officer by co-ordinating the joint operations of the various service providers and role players that manage and control the airside and flying display activities of an event, i.e.
  - aa) Safety Officer
  - bb) ATC,s
  - cc) Ramp starter/controller
  - dd) Chief Marshall
  - ee) Public Announcer
  - ff) VOC/JOC Commander and/or Emergency Services
  - gg) Security Chief.
  - hh) Event Organiser.
  - ii) Any persons that have a role in any activities that take place on the airside of a Special Air Event.

- jj) Pilots and display members or teams
- e) In the case of an accident or incident, the FD shall maintain his position to observe the situation in order to communicate, co-ordinate and update the information to the relevant persons or organisations as required i.e.
  - aa) ATNS/ATC
  - bb) Public announcer,
  - cc) JOC,
  - dd) Emergency services,
  - ee) SAPS,
  - ff) Hospitals,
  - gg) Marshalls,
  - hh) Accident investigations department,
  - ii) Security,
  - jj) CAA,
  - kk) RAASA,
  - ll) Media, etc.
- f) The FD shall also ensure that the crash site is contained and protected by the security and SAPS once the emergency services have complete any fire and rescue duties.

#### **4.16 FLYING DISPLAY COMMITTEE (FDC)**

- a) A Flying Display Committee (FDC) must be utilised at all events.
  - aa) to assist the safety officer in the assessment of submitted display profiles;
  - bb) to assist the safety officer in monitoring display standards;
  - cc) to provide specialist knowledge for specific display items; and
  - dd) to offer in depth knowledge in the case if infringement of the regulations.
- b) The majority of the FDC should be available throughout the period of the Flying Display.
- c) They should assess all items for breach of the display regulations, passing their comment to the Safety Officer for appropriate action.
- d) At least one member of the FDC should be positioned on the crowd line, with direct communication to the Safety Officer whilst flying is in progress.
- e) At least one member of the FDC should hold a current DA or be a nominated buddy as per the display pilots buddy system.
- f) Members of the FDC should ideally not take part in the display that they are monitoring.
- g) Part of the FDC's planning for Category A and B Events must include a Joint Operations Centre (JOC) that will control the logistics and liaise with the Event Organiser for the show, as well as an Emergency Control Centre (ECC) the role of which is the following:
  - h) Assisting the safety officer and flight director to manage any emergencies.
  - i) Liaising with the emergency services in the area on all matters related to possible emergencies.
  - j) Assist the safety officer to develop a checklist of possible occurrences, with names and contact numbers in such an event.
  - k) Ensure that all personnel have a list of the relevant names and contact numbers, i.e. Safety Officer, Flight Director, ATNS, CAA, Accident Investigators, SAPS, Ambulance, Fire Department, Hospitals, VOC/JOC personnel, Organiser etc.
  - l) Identify and clear emergency routes to all possible areas that may need to be reached in an emergency.
  - m) Co-ordinate the safety and crash plan with the Safety Officer and Flight Director and emergency services.

***NB! The VOC and ECC must be manned at all times during the event.***

***4.17 Airspace and ATNS/ATC duties***

- a) Where possible all air shows shall have controlled airspace (Class D) with suitably experienced ATC's to ensure proper control can be maintained.
- b) Once an air show has started and an ATC instructs a pilot to remain clear of the airspace or on the ground, this is a legal instruction and not a suggestion, the same applies for aircraft wanting to perform an impromptu fly past/display or request early departure.
- c) The airspace needs to remain sterile once an air show starts until it is complete.

*NB (AFIS may not be sufficient for air shows. AFIS cannot control, issue instructions and maintain sterile airspace.)*

- d) Due to limited ATC personnel approved for air shows and special air events, a limited number of air shows or special air events will have ATC provided, should your event application not be submitted on time to allocate personnel your event will not be able to be approved.
- e) A proper protocol for communication to be briefed and followed for communications between the Safety Officer/Flight Director and the ATC at event to have a clear understanding of the others operational requirements and duties and to ensure that no confusion and/or conflict exists.
- f) Should the SO or FD need to communicate with Pilots who are not complying with any minimums as determined by the SO, these need to be communicated by the SO on the Box frequency if the display is in the box, or through the ATC without interfering or disrupting the others duties or as briefed prior to the event.
- g) It is essential that a separate briefing is held between the SO/FD and ATC prior to the start of the air show or event to clarify the minimums and standards as well as the SO/FD's expectations to manage a safe event.
- h) The ATC performs a supporting role at an Air show to the SO/FD and needs to clearly understand the safety minimums, whilst still being allowed to perform their duties in controlling air traffic and maintaining separations for arrivals and departures.
- i) The SO or FD may communicate with aircraft if in position of a valid restricted or general radio license during their display or validation whilst the aircraft remains in the display box as part of their routine; however any RT from the SO to the display pilots or team should be kept to a minimum and essential communications only or as briefed prior to the event.
- j) A clear understanding should be achieved between each role players Expertise vs. their Responsibility, i.e. the ATC is the expert in controlling air traffic and maintaining safe separations for arriving and departing aircraft, i.e. wake turbulence etc, and this is their responsibility,
- k) It is the SO's expertise to observe and ensure that display pilots and their perform according to the display authorizations limitations and routines and that aircraft maintain the minimums heights and distances from the public area/crowd line.
- l) Should the need arise for the SO to inform a display pilot or any other pilot's that may be infringing on these safe minima's to abort or remain clear, higher or further it is the SO responsibility to take action to communicate through the ATC or directly if required to the pilot to act accordingly.
- m) Should the Pilots or ATC not respond as per the SO's request or requirements to adhere to minimums for the benefit of safety, the display or event may be suspended by the SO/FD until the situation has been resolved, during a

suspended period the ATC may permit regular arrivals or departures, but no display or fly past activities may take place

- n) After the event has been announced as closed the ATC remains responsible to ensure that all pilots that depart, adhere and comply with regulations and general safety procedures until all departures are complete as per the NOTAM, AIC or AIP and/or the ATC has reported on air that *unmanned* procedures now apply.
- o) Any safety violations should be addressed by the safety officer and reported to RAASA on the next working day.

#### **4.18 FLIGHT CREW**

- a) Any civil pilot taking part in a Special Air Event, which requires Permission from RAASA, must possess a current and valid DA issued by RAASA.
- b) Details of the DA system, validity of DA's and DA Requirements can be found in Chapter 6.
- c) Additional information may be sought from the RAASA Operations Department.
- d) Exemptions from the need to hold a DA may be considered by RAASA.
- e) This is of particular advantage to Air Operator's Certificate (AOC) operators (large transport aircraft, police, medical and S & R helicopters, etc.) where the display given is a role demonstration or simple flypast.
- f) Before a DA Exemption can be considered, a detailed description or if considered necessary demonstration must be provided to the Safety Officer.
- g) Military display pilots are approved and authorised as specified by the SAAF. Safety Officers should note, however, that military pilots are subject to the limitations imposed within the flying display permission when they appear at a civil flying display.
- h) In practice, this rarely causes difficulty because the limits set down in by the SAAF are generally at least the same, or higher, than those imposed in this MOP.
- i) The only conflict that may arise is on an off-airfield site where special considerations have led to the imposition of a higher than usual minimum display limitations in the Permission.
- j) A participating civil pilot must hold a valid flight crew licence, which entitles him to fly the type of aircraft that is to be displayed.
- k) An aircraft with a MTWA not exceeding 5700kg may be flown by a PPL holder, or by a professional pilot exercising the private privileges of the licence, provided the licence holder remains current as contained in their logbook, or Test for the relevant aircraft Groups A and/or B.
- l) For an aircraft in excess of 5700kg MTOW an individual type rating or, in the case of aircraft where no type rating exists, a valid exemption from the need to hold a Type Rating, is required for either the private or the commercial privileges of a SA civil licence.
- m) Applications for exemptions shall be made to the CAA.

#### **4.19 Responsibility of Pilot in Command**

- a) The responsibility for ensuring that an aircraft is operated in accordance with its POH and Certificate of Airworthiness or Authority to Fly rests with the pilot in command.
- b) The pilot in command remains responsible to ensure that no persons are on board any aircraft during a fly-past or display routine.
- c) The pilot in command remains responsible to ensure that he observes all applicable regulations at all times.

#### 4.20 Minimum Fuel Requirements

- a) The pilot in command shall ensure that the minimum required fuel for the display shall include:
  - aa) Fuel for the display,
  - bb) Sufficient fuel for holding,
  - cc) Sufficient fuel to reach a suitable alternate runway,
  - dd) Sufficient reserve fuel as per the regulations
- b) If an aircraft is unable to comply with the above, the runway must be made available to that aircraft for the duration of the display, including take-off and landing and no other movements may be permitted on the runway.

#### 4.21 Emergency Services Duties & responsibilities

- a) Supply the necessary personnel to man the VOC/JOC.
- b) Develop and approve the Disaster management and Evacuation plans.
- c) Ensure that they understand the full scope and complexity of the event, its activities, machinery, participants, hazardous materials and foreseeable emergencies that may arise.
- d) Ensure that they have the appropriate training and equipment in a ready state to expedite, manage and bring under control any foreseeable emergencies that may arise within the event property and immediate surrounds.
- e) Maintain a vigil and visible presence throughout the entire event
- f) Maintain a ready of state, awareness and surveillance of all activities on both the airside and public side for the duration of the event.
- g) Ensure that adequate planning and preparation is in place to react to, locate, travel, manage and bring under control any foreseeable emergency within a 5NM radius of the airfield or event location.
- h) Maintain a listening radio watch with the Safety Officer, Flight Director, ATC/AFIS, JOC and the organiser throughout the event

#### 4.22 Public Commentators duties, privileges and limitations

- a) Ensure that there are sufficient quality speakers to cover the entire distance of the public/crowd line, for all too clearly hear any announcements that may occur or be deemed necessary in the event of an emergency or an evacuation.
- b) Arrange that the Public commentator's tower or raised platform allows for an unobstructed view of the entire public/crowd line and airside display line to accurately announce the display program in real time.
- c) Ensure that there is no radio, noise or signal interference with the ATC and SO radio's, and that the public commentators speakers do not prevent the ATC, SO, FD and JOC from hearing each other and pilots or marshals on their radio's, and cannot communicate without the need for headsets.
- d) Entertain the public by playing music, announcing activities, reporting on the displays, advertising exhibitor's products and stalls in accordance with the organiser's approval.
- e) In case of an Emergency it is the public commentator's responsibility to remain calm and remain at his post at all times in order to ensure that the public remains calm, by reassuring them; and by keeping them informed should they need to move in an orderly fashion towards emergency exit points on instruction from the JOC, SAPS or Safety Officer.



- f) The Public commentator may not under any circumstances interfere with the Safety Officer, Flight Director, ATC, Pilots, Marshalls and/or Emergency Services during the performance of their duties.
- g) The public commentator may not issue any warnings or comments about accidents, incidents, injuries or any other emergency unless it is with the clear permission of the Safety Officer, Flight Director, ATC, SAPS or JOC, all such personnel shall co-ordinate through the FD.

#### **4.23 Airside Media/Photographers Duties & Responsibilities**

- a) It is understood that access to the airside by approved persons is undertaken entirely at a person's own risk if they are working for the media, be it full or part time or as a freelance.
- b) It is further understood that an airside accreditation from RAASA does not entitle or guarantee a person access to the airside, and would require specific approval from the safety officer to go to pre determined areas only.
- c) Obtain an airside photographer's accreditation from RAASA.
- d) Register and display their airside clearance for the day with a visible Media badge/ticket to be displayed at all times for each specific event
- e) Ensure that a clearly defined Day-Glo vest and media number is worn at all times
- f) Attend the media safety briefing prior to gaining access to the airside.  
(Organisers responsibility)
- g) Remain well clear of runways, taxi ways and any other areas as per the Safety Officers briefing or instructions at any time.
- h) Never approach or cross runways with the prior permission of the SO and ATC
- i) Should any special clearances be sought, i.e. air to air photo shoots clearance should be applied for with the Safety Officer and ATC prior to event, if no clearance has been approved with a pre declared time slot approved no departure will be allowed.
- j) In case of an Emergency (accident) all Media are to remain well clear of the sight to allow the emergency services access to perform their duties.

***NB! (Any media or photographers attempting to interfere with officials or the emergency services by getting in the way to take will be severely dealt with, images of this type of accident for publication is in poor taste and will not be tolerated, if used for accident investigation at the request of the SO or accident investigator this should be done at a safe distance and accompanied by the SO or AIID investigator)***

#### **4.24 PRELIMINARY PLANNING**

- a) The Event Organiser will need to consider and make arrangements for the following:
  - aa) Event site and Flying Display management, including adjoining or off airfield properties and permissions where display flight may be performed,
  - bb) Pre Event Audit and site assessment,
  - cc) Spectator enclosures, car parks and public address system;
  - dd) Parking and ground manoeuvring of aircraft (participants, visitors, and static displays)
  - ee) Distance from crowd line to nearest rwy edge no less than 100 meters
  - ff) Flight display line parallel to crowd line and no less than 150 meters,

- ff) Minimum heights and direction for overflight of spectators and car park,
- gg) Determining minimum heights (Hard deck) for all displays,
- hh) Aircraft minimum and maximum speeds;
- ii) Weather minima;
- jj) use and allocation of radio frequencies;
- kk) ground special effects safety;
- ll) safety briefings;
- mm) aircraft and pilot document checks and insurance
- nn) pilot display programmes,
- oo) Aircraft scrutineering
- pp) pleasure flights;
- qq) parachuting or paragliding as part of a Flying Display;
- rr) model aircraft as part of a Flying Display.
- ss) Actions in the event of an aircraft accident
- tt) Etc

- b) Liaison with RAASA, ATNS, CAA, AIID and the Local Authority and Emergency Services including:

- aa) prior application for the event to RAASA;
- bb) notification time scales;

NOTE: Certain of these aspects are discussed in detail under separate chapters.

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**CHAPTER 5      THE FLYING DISPLAY – SITE AND DISPLAY MANAGEMENT**

**5.1 SITE ASSESSMENT**

- a) Where the Special Air Event is held at a licensed or registered aerodrome the licensee remains responsible for ensuring that the conditions of the aerodrome licence are not infringed.
- b) If any such condition is likely to be infringed then early, discussion must take place between the Event Organiser the Safety Officer and the Aerodrome Licensee.
- c) The Aerodrome Licensee or his representative (or the aerodrome operators if the aerodrome is unlicensed) must be involved in the preparation for the Special Air Event.
- d) While many Flying Displays and Special Events are held at licensed or registered aerodromes and can take advantages of facilities already available, a number are staged at other sites, in such cases the organiser shall prepare a manual of procedures specific to that event, and submit such MOP for approval no less than 180 days prior to the event.
- e) A site is sometimes used merely for the assembly of spectators and aircraft do not take-off or land there.
- f) Proper consultation and written approvals shall be obtained from adjoining or off airfield property owners or local authorities, where the display box or activities are not contained within the lateral limits of the airfield boundaries.
- g) Having obtained written permissions, in the event where display boxes or display activities encroach or are performed over an adjoining property, properties or an area, such as beaches, bodies of water, settlements etc, sufficient measures shall be in place to prevent access and entry by the public. Failing such measures, displays may not take place over these areas
- h) Safety Officers should impose the appropriate minimum height restrictions over local sensitive and congested areas. Details of any restrictions imposed should be clearly communicated to participating pilots in the Flying Display instructions.
- i) Gas/Helium filled toy balloons when released are a potential hazard to aircraft.
- j) Event Organisers must ensure that the vendors of such balloons are not allowed into the public enclosures.
- k) Existing legislation provides that unmanned, gas-filled, advertising balloons should not be flown in captive flight at or near an aerodrome.
- q) Organisers are reminded that it is compulsory to obtain public liability insurance for the event in accordance with the "*Safety at Sports and Recreational Events Act (Act 2, of 2010)*"

**5.2 SPECTATOR ENCLOSURES, CAR PARKS AND PUBLIC ADDRESS SYSTEM**

- a) The Airshow Organiser and safety officer must carefully select sites for the spectator enclosures and car parks in relation to the aircraft landing areas and flight paths during the Flying Display.
- b) Spectator enclosures shall be positioned behind the crowd line, which is parallel to the Display Line.
- c) Normally spectator enclosures and car parks should be confined to one side of the site thus allowing aircraft maximum freedom of movement on the other side.
- d) A public address system covering the spectator enclosures is required and of great assistance in crowd control, and is essential where large numbers are involved.
- e) Such a system, when installed, must be audible along the entire length of the Crowd Line.

- f) The Commentator should be in a position where important messages or emergency information can be given to him for rapid broadcast to the public.
- g) Consideration should be given to pre-planning certain messages to cover possible major emergency situations.

### **5.3 PARKING AND GROUND MANOEUVRING OF AIRCRAFT**

- a) Aircraft taking part in the airshow should be segregated from both visiting and static aircraft parks unless arrangements are made to tow aircraft from the static aircraft parks to an aircraft parking or manoeuvring area, appropriately segregated from the public, prior to start.
- b) In this case, adequate arrangements must be made to ensure public safety during the aircraft move.
- c) Under no circumstances or at any time will aircraft have any engines running or move under their own power in and around or in close proximity to members of the public and spectators, unless such spectators are positioned behind a secure solid barrier that separates them from the aircraft and aircraft movements.
- d) Appropriate security should be in place to guard against interference with aircraft.
- e) Pilots should be advised to ensure that starting systems etc are isolated.
- f) Fire extinguishers should be readily available and aircraft should be parked so that fire vehicles can achieve easy access and move freely among them.
- g) Aircraft parking areas shall be out of bounds to spectators when aircraft engines are running or aircraft are taxiing.
- h) Spectator enclosures should be sited away from taxiways and runway strips and so arranged that no part of a taxiing aircraft passes within 10 metres of them.
- i) This distance will need to be increased if spectators are positioned behind or close to where aircraft are ground running engines particularly in the case of high powered aircraft, jet aircraft or large helicopters, and more particularly when aircraft are likely to use significant amounts of power such as when turning.
- j) Helicopters should only be permitted to ground taxi far away from spectators, aircraft parking and car parking areas.
- k) Spectators shall not be allowed closer than 30 metres to any fixed refuelling area, nor closer than 30 metres radial from any fuelling or venting point on an aircraft or bowers whilst refuelling is being carried out.
- l) Effective barriers (Not barrier tape or soft moveable barriers) and marshalling arrangements are required to keep spectators clear of aircraft manoeuvring areas.
- m) Areas in which spectators are not permitted must be properly enclosed at all times.
- n) Marshals must be detailed to control the movement of spectators throughout the event.
- o) Smoking shall not be permitted in aircraft or closer than 50 meters of aircraft parking areas or static aircraft parks, fuel bowers or refuelling areas.
- p) Light aircraft may take-off and land provided the runway is not less than 100 metres from the crowd Line.
- q) The runway should be kept available to the maximum extent for emergency purposes during the Flying Display and aircraft departing and landing should minimise the time they occupy the runway whilst other aircraft are displaying.

#### 5.4 THE DISPLAY LINE

- a) Displaying aircraft perform relative to a display line, which must be clearly identified.
- b) On an aerodrome, this is normally parallel to the far side of a runway or the crowd line, on off-aerodrome sites, parallel to any spectators and some significant feature.
- c) Where the Display Line is not clearly delineated by a paved runway or other obvious line feature it can be marked with day-glo pyramids or panels, whitewashed lines, or by some other suitable method such as an imaginary line running parallel to a defined feature such as a road, runway, taxiway or structure.
- d) For aircraft flying in formation, the distances are applicable to the aircraft performing nearest to the Crowd Line.
- e) Whilst the minimum distance shall be as per the table in 5.5 below, the minimum distance between the display line (flight line) and crowd line, shall be further as determined by the safety officer based on the type, size, weight, complexity and speed of the aircraft and display sequence, as well as any other factors that may have an influence on the safety of the display and spectators, such as topography, geography, fauna and flora and the layout of the airfield, buildings, structures and surrounding areas.
- f) Speciality acts such as ribbon cuts, knife edge fly pasts, touch and goes, short field take offs and landings etc, may be considered providing that a suitable plan to mitigate the risk and manage public safety, has been developed or the runway to crowd line distances are further away to permit this.
- g) In the case where faster, heavier or more complex aircraft are landing and taking off at an event, the minimum distance from the nearest edge of the runway and/or flight/display line to the closest point of the public/crowd line should be extended accordingly, special consideration should be given to the active runway in terms of landing and taking off in relation to where the spectators are positioned and the energy of the arriving and departing aircraft.
- h) Pilots should plan their flying sequence such that they can always regain the Display Line without infringing the minimum lateral separation distance from the Crowd Line.
- i) Effects of any on-crowd velocity vectors and on-crowd wind components must be taken into account to further extend the display line.
- j) No flights may be flown towards the crowd line or open assembly of persons.
- k) Notwithstanding the requirements above approved manoeuvres such as a formation switchblade with aircraft flying toward the crowd line must at all times remain outside a 45° or greater cone depending on the width of the crowd line, and may not extend closer than the distance of the applicable display line.
- l) The safety officer, based on the type, size, weight, complexity and speed of the aircraft and display sequence should determine further distances of such a manoeuvre.
- m) No flights may be performed while approaching the crowd line from the rear, unless specifically approved by the safety officer and must at all times remain outside a 45° or greater cone of the crowd line and at least 1000ft above the crowd.
- n) Rotorcraft must not be flown in such proximity to spectators' enclosures, buildings or aircraft on the ground as to cause a possible hazard or nuisance either from down wash or as a result of control difficulties.
- o) Similarly, helicopters with underslung loads should only be flown over open and clear areas.

**5.5 MINIMUM DISTANCE FROM CROWD LINE TO THE DISPLAY LINES**

<b>A) ALL MICROLIGHT AND LIGHTSPORT AIRCRAFT WITH A MTOW BELOW 600kg</b>			
AIRCRAFT DISPLAY SPEED	Type of Display		
	Flat Fly Past (Wings Level)	Aerobatics or Aerobatic manoeuvres	Rotorcraft
Model aircraft (excluding Jets)	50m	100m	50m
Model Jets	70m	100m	NA
Less than 50kts TAS (Microlights)	70m	100m	NA
50kts to 90kts TAS	100m	150m	200m
Greater than 90kts TAS	150m	200m	250m
<b>B) ALL LIGHT AIRCRAFT WITH A MTOW BELOW 1020kg</b>			
Less than 150kts TAS	150m	200m	250m
150kts to 240kts TAS	150m	250m	250m
Greater than 240kts TAS	150m	250m	300m
<b>C) ALL AIRCRAFT WITH A MTOW GREATER THAN 1020kg AND LESS THAN 2545kg</b>			
Less than 150kts TAS	150m	250m	300m
Greater than 150kts TAS	200m	300m	300m
<b>D) ALL AIRCRAFT AND JETS WITH A MTOW ABOVE 2545kg</b>			
All Speeds	200m	350m	300m
<b>E) ALL COMMERCIAL AIRCRAFT OPERTING UNDER PART 135 AND PART 121</b>			
All Speeds	400m	NA	NA

**FIG: 5.1 Minimum Display line distance, (see aircraft categories for weight, speed and display in table above.)**

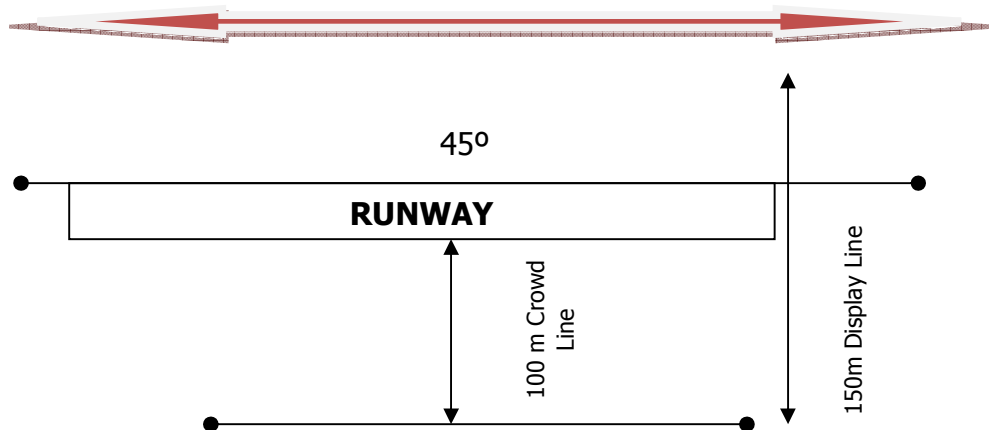


FIG 5.2-Increased Distance for Aerobatics, heavier and faster aircraft as per table above

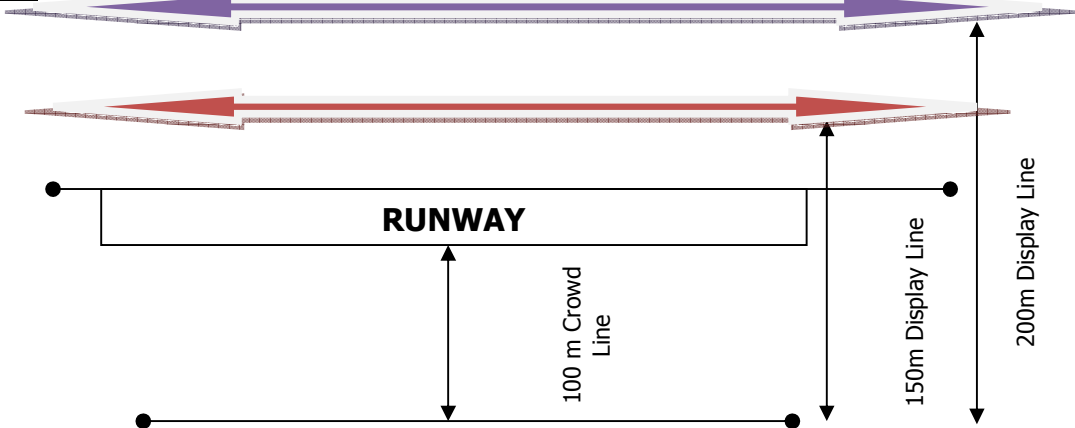
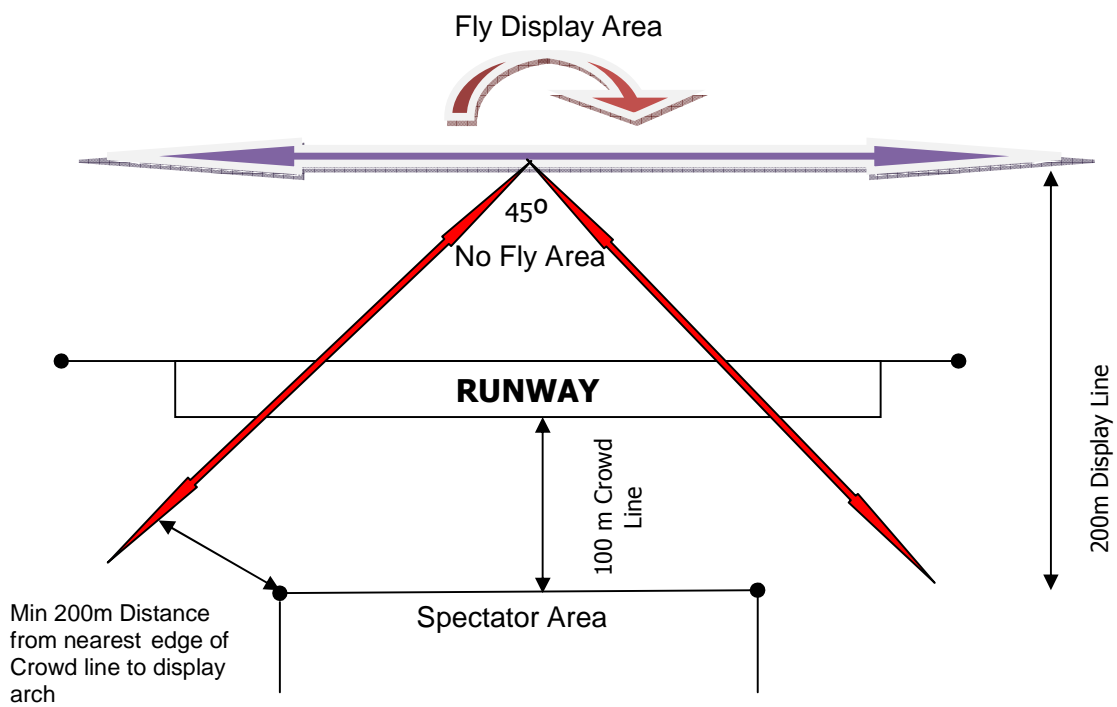


FIG5.3 No Fly Area inside of 45° arch

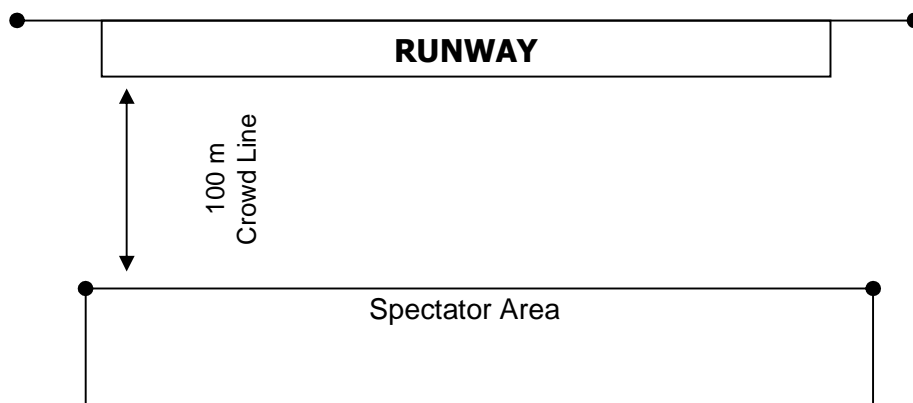




### 5.6 MINIMUM DISTANCES FROM CROWDLINE TO EDGE OF RUNWAY

- a) The minimum distance from the front of the crowd line (closest to the runway and display line) to the nearest edge of the runway, shall be a horizontal distance of no less than 100 meters or further depending the size, weight speed and complexity of the aircraft.
- b) In the case of a microlight, model aircraft, paraglider or parachute only events where the MTOW weight of an aircraft does not exceed 450kg the minimum distance may be reduced to no less 50m
- c) In the case of model jet aircraft the minimum distance shall be no less than 70m

FIG 5.4 Minimum Distance between forward part of crowd line and runway edge



### 5.7 OVERFLIGHT OF SPECTATORS

- a) Display aircraft are NOT permitted to overfly the spectator enclosures.
- b) Display aircraft may not fly towards spectators and shall remain outside of a 45° arch of spectators, however when performing a switchblade or any other manoeuvre with the energy vector directed towards the crowd, the manoeuvre shall terminate no closer than the edge of the display line or 150m whichever is the greater.
- c) No display shall be flown overhead the spectators, unless a flat flight approved by the safety officer and is performed no less than 1000ft AGL or higher.

### 5.8 SETTING OF MINIMUM HEIGHTS

- a) When Airshows are held at aerodromes, the absolute minimum height shall be 35ft AGL at ISA i.e. (15deg C at 1000ft) this shall be known as the hard deck, the SO may increase the hard deck height based on an increase of density altitude relative to ISA.
- b) The Safety Officer may allow participants to fly to the minimum height specified in their individual DA providing it is not lower than the hard deck, or higher as determined by the safety officer, based on the pre event audit and the type, weight, complexity and speed of the aircraft and display sequence, as well as any other factors that may have an influence on the safety of the display and spectators, such as topography, geography, fauna and flora and the layout of the airfield, buildings, structures and surrounding areas.

- c) Irrespective of the location, Safety Officers have the duty to impose higher limits if deemed necessary, these higher limits shall be known as the hard deck or airshow minimum height. The hard deck shall become zero height for pilots with a zero foot rating.
- d) All pilots shall adhere to this minimum height as briefed by the SO prior to the event, any non-compliance may result in a yellow or red card or further action as may be determined.
- e) Safety Officers should ensure that pilots are advised of the minimum heights applicable at the Flying Display in both verbal and pre-circulated written briefings.
- f) Pilots of military aircraft participating in a civil event should advise the Safety Officer of their individual height minima.
- g) Where the limits laid down in the permission issued are higher than the military pilot's limits, the pilot is to be informed that the more stringent limit applies during the Airshow.

**These recommended minima's does not relieve the organiser from obtaining the required permission or exemption.**

FIG 5.5 Minimum Display Height or Hard Deck, Flat area and no hazards i.e. buildings, power lines hills etc.

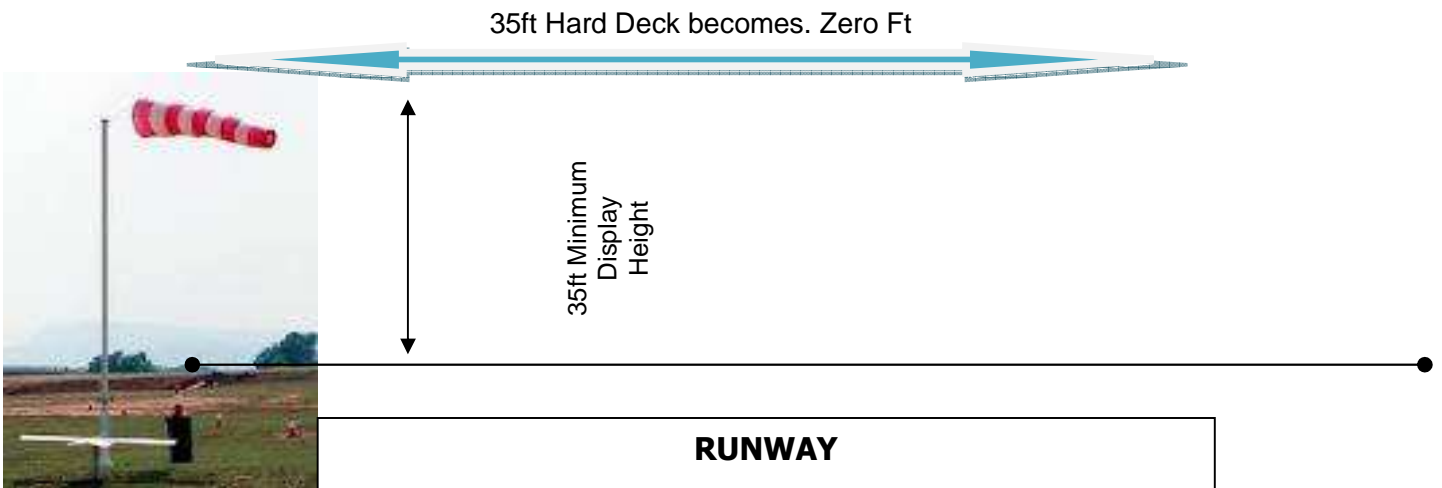
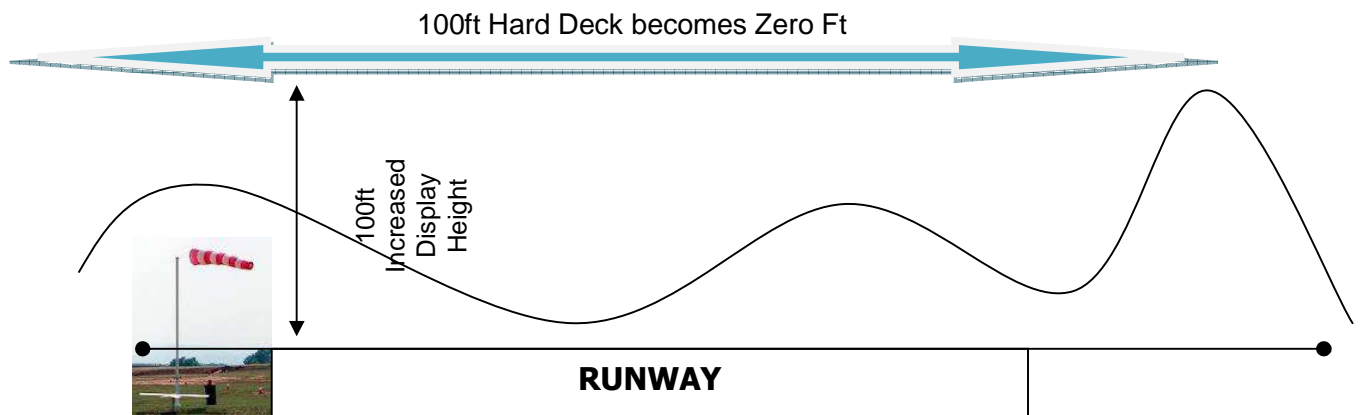


FIG 5.6 Increased Display Height due to hazards, buildings, power lines, topography etc



### 5.9 AIRCRAFT MAXIMUM SPEEDS

- a) An absolute true limit of Mach 0.90 or 600kts, whichever is reached first, is not to be exceeded in straight and level flight parallel to the crowd line, and at no less than 300ft height and 500 meters horizontally away from the crowd line.
- b) Aircraft flying at or approaching this speed should reduce speed further before initiating any manoeuvre to avoid inadvertent sonic booms.
- c) Aircraft taking part in Flying Displays for which permission has been granted may be exempted from the maximum speed limit of 250kts IAS when flying below the relevant TMA provided ATNS is timeously informed.
- d) Safety Officers should be aware that this exemption only applies during the validity period of the Flying Display Permission and within the vicinity of the Special Air Event site.
- e) SA civil registered aircraft, which are exceeding 250kts in controlled airspace, should also have obtained an individual permission from RAASA.

### 5.10 WEATHER MINIMA

- a) Safety officers should consider carefully the operating characteristics of participating aircraft that may necessitate specific increases in the above minima.
- b) Military displays, particularly jet formations, may have significantly higher weather limitations than those specified.
- c) It should be borne in mind that participants may be restricted by their licences or rating privileges.

### 5.11 USE AND ALLOCATION OF RADIO FREQUENCIES

- a) Airshows and Flying events will require the use of radio communications.
- b) Where feasible and within the constraints covered in Chapter 5, Safety Officers should endeavour to allocate a box frequency for use during the Special Air Event with another frequency being available for administrative requirements and control of non-display aircraft.
- c) If only one frequency is available, the Safety Officer must emphasise, in the briefing, the need for good RTF discipline and for the minimum use of RTF.
- d) The Safety Officer if and when required may communicate on the box or operational frequency if they observe any situation to alert or inform display or other aircraft in the display box of any potential hazard or requirements to reposition higher or further away should the need arise due to safety considerations, as well as calling a hold or abort message in case of any infringements, safety considerations and other incident or emergency, even if the safety officer is not an ATC or AFIS.
- e) A Safety Officer should hold at least a restricted radio licence before communicating on any Airband frequency with aircraft in the display box.
- f) A Display frequency may be applied for from the SACAA.
- g) Certain teams may have their own approved discreet frequencies, these should be provide to the ATC/AFIS and safety officers prior to the show.

### 5.12 GROUND SPECIAL EFFECTS SAFETY

- a) The use of explosives for simulated ground bursts, smoke and other special effects must be strictly controlled by a competent and duly licensed and registered person appointed by the Event Organiser.
- b) All pyrotechnics at air event shall be done in accordance with an approved manual of procedures as approved by the SAPS Explosives unit.
- c) A qualified member of the SAPS shall inspect and sign off on all charges prior to the event.
- d) Debris from such effects must not impinge on aircraft, the spectators or the runway/taxiways and to this end the scale of any effects must be known before the event.
- e) Briefings for ground officials and display pilots must draw attention to the hazardous nature of such devices and approval of all involved display pilots must be achieved before any demonstration goes ahead.
- f) The location of the explosives and safety radius, if appropriate, are to be out of bounds to all staff except those directly involved with their operation.
- g) Organisers shall also ensure that adequate fire protection is available for the type of display.

### 5.13 BRIEFING

- a) Regardless of the size of the Flying Display, the importance of a thorough formal briefing cannot be over-emphasized.
- b) The airshow briefing template that forms part of this manual shall be used as a minimum standard by safety officers.
- c) No pilot may take part in a Flying Display unless he has not received an appropriate briefing at the event by the appointed safety officer.
- d) A comprehensive written brief on the arrangements for the flying programme shall be circulated in advance to all participating pilots, Air Traffic Control, pleasure flight operators and those in charge of particular aspects of the airshow, such as a safety service.
- e) A formal verbal briefing should be given on each day of the airshow and at any rehearsal or press day, and all participants and persons entering the airside must attend physically.
- f) Air Traffic briefing, a time check, any changes to the programme or procedures, and a reminder about the authority of the Flight Director to curtail or modify the display programme once it has started providing sufficient time has been allocated to notify the display pilots.
- g) The need for strict adherence to procedures should be stressed, particularly in the event of cancellation as part, or the whole programme.
- h) Pilots must also be reminded that they may not fly over spectator enclosures or make turns towards them, which cannot be completed without infringing the safety zone between the Display Line and the Crowd Line.
- i) If a NOTAM or Temporary Air Traffic Zone (ATZ) has been issued, specifying the limits of the airspace within which the aircraft will be performing, pilots must be reminded of the need to keep within those boundaries, and of the fact that they are still required to observe the rules for avoiding aerial collisions.
- j) The display minima, whether these are determined by the DA, or other limits imposed by the safety officer, should be confirmed at the verbal briefing.
- k) The extent and method of marking the display line(s) and display datum must be confirmed, preferably with the use of a large-scale map.
  
- l) Participants flying fast military jets, or large commercial aircraft that are not able to land at the flying display site or flying into a display routine prior to landing, shall

contact the safety officer, immediate prior to the display to obtain a briefing per telephone and to confirm the display flight line, height and timing as per the briefing notes sent to the pilots in advance.

#### **5.14 DOCUMENT CHECKS AND INSURANCE**

- a) Safety officers or authorised persons may check all required display pilot/aircraft documentation details if deemed necessary i.e. (pilot license, DA, display currency confirmation, aircraft airworthiness documents (C of A or ATF), etc, prior to or during to the day of the Special Air Event.
- b) Event Organisers are advised to seek professional guidance on liability aspects and to obtain advice from a reputable insurance broker with aviation experience as to the appropriate level of third party liability coverage that should be affected.
- c) This should be done at the earliest possible stage in planning.

#### **5.15 PILOT DISPLAY PROGRAMMES**

- a) The Safety Officer's and Flight Director should familiarise themselves with each pilot's planned sequence of display and to ensure that it complies with the appropriate safety criteria.
- b) Both the full display sequence and any bad weather alternatives should comply.
- c) Safety Officers are to ensure that pilots of display aircraft do not carry out any form of impromptu display such as on arrival (unless a pre-planned and agreed display practice) or departure.

#### **5.16 CARRIAGE OF PERSONS ON BOARD DISPLAY AIRCRAFT**

- a) No persons other than minimum and essential crew shall be on board a civil aircraft during the display.

#### **5.17 DISPLAYS BY AIR OPERATOR'S CERTIFICATE HOLDERS**

- a) Displays by AOC operators (large transport aircraft, police, medical and S&R helicopters, aerobatic teams etc.) will normally be conducted under an approved MOP and AOC certificate as issued by SACAA, with written approval from the SACAA prior to each such display event
- b) The AOC holder shall in addition the written approval above obtain prior approval from CAMU for flexible use of airspace and publish a NOTAM.
- c) The OAC holder remains responsible to apply diligence and adhere to minimum safety standards by appointing their own safety officer and ensuring that disaster management plans, emergency responders, local authority or land owners permissions are obtained, minimum distances and heights are observed etc.
- d) Two or more AOC holders performing more than one act at any public/spectator or multi disciplinary event shall be considered to be a special air event and adhere to the requirements of this manual.
- e) At RAASA approved Special Air Events, the holder of an AOC will still be required to adhere to a DA and to the Event Safety Officers brief and minima's or any other requirement that the Safety officer deems necessary.
- f) Formation flights by large commercial air transport aircraft will not normally be permitted, but specific applications will be considered on their merits with prior approval from the SACAA Part 135 or Part 121 departments

#### 5.18 PLEASURE FLIGHTS at Special Air Events

- a) Pleasure flights may not be conducted during an airshow unless;
  - aa) specifically approved by the safety officer and flight director in advance after consultation with the organiser and ATC.
  - bb) Pleasure flights for reward may only be conducted by organisations holding an AOC and domestic air services licence,
  - cc) Any pleasure flights not for reward, but as part of an educational or development program may be performed, if planned and approved with the SO in advance.
  - dd) Safety Officers are to ensure that pleasure flights do not take place during the flying display period, these may be conducted before or after the conclusion of the flying displays.
  - ee) Aircraft engaged on pleasure flights before or after the airshow program must be parked away from the public and aircraft taking part in the airshow, and passengers shall be escorted between the spectator enclosures and the aircraft before and after each flight.
  - ff) This route shall be properly planned to take them well clear of other aircraft.
  - gg) Smoking is not be permitted in or close to the aircraft parking area.

#### 5.19 HELICOPTER FLIGHTS

- a) If helicopters are used for pleasure flights, they must be positioned and routed away from spectators and car parks so as to prevent problems with rotor downwash.
- b) In all cases the site used for passenger loading and unloading must be well clear of the flying area and remain no less than 300m/1000ft from the crowd line as per the minimum distances from crowd to display line with prior approval by the Safety Officer and ATC/AFIS.
- c) All operators providing flips, scenic flights, introductory flights etc shall do under their approved AOC and air services licence, as well as ensure that they have their own emergency response and service providers.
- d) If the helicopter operating area is not adjacent to the spectator enclosure, as could be the case at off-aerodrome events, those parts of the site at which passengers would be expected to assemble before being escorted to the helicopter should be fenced off securely.
- e) Arrangements must also be made to prevent access to the helicopter operating area by third parties.

#### 5.20 MARSHALS, OFFICIALS, ESCORTS

- a) Marshals must remain on duty until all pleasure flights have been concluded.
- b) Escorts must be briefed on, and demonstrate their knowledge of, the correct manner of boarding and disembarking from aircraft.
- c) A pre-arranged system of signalling between the escort and pilot is essential so that the pilot may know when passengers and escort are clear of the aircraft.
- d) To avoid the possibility of any misunderstanding between the pilot and escort they must, before the start of flying, discuss and agree on matters as the positioning of the aircraft at the change-over point, and the procedures to be used.

**5.21 PARACHUTING AS PART OF THE FLYING DISPLAY**

- a) Any person wishing to perform a display parachute jump at a special air event, shall be a member of the applicable ARO, and have a current Pro or Display rating, or an approval from the designated body or SACAA, and be prepared to show the SO such rating card.
- b) Aircraft landing and taking off, or other aircraft with engines running and turning propellers or rotors or jet blast may constitute a hazard to parachutists.
- c) In order to minimize the risks Flying Safety Directors are to ensure that the following procedures are followed:
- d) All pilots are to be briefed on the procedures to be followed during any parachute drop.
- e) Under no circumstances may jet engines or helicopter rotors to be turning closer than 200 metres to the intended parachute landing site during the period that the parachutists are descending.
- f) Pilots of aircraft outside a radius of 300 metres (600 metres in the case of pleasure flights), both airborne and on the ground, should remain aware of the progress of the descending parachutists.
- g) Safety Officers/Flight Directors should consider programming events in such a manner that potential conflicts between aircraft and parachutists are minimized.
- h) A suitable area needs to be kept open for parachutists to land safely, depending on wind direction parachutists may need to land on the runway, the safety officer and ATC/AFIS needs to ensure that the runway remains clear during this period.

**5.22 PARACHUTE DROPPING AIRCRAFT AND PARACHUTISTS**

- a) The aircraft containing a parachute team may overfly the spectator's enclosures whilst positioning to drop the team, but not below a minimum height of 3000 feet above the airfield.

**5.23 MANNED BALLOON SEPARATION CRITERIA**

- a) Manned balloons should not overfly the spectator enclosures below the following minimum heights:

Type of display	Separation Distance	Minimum Height and Conditions for Overflight of the Spectators
Tethered Flight	50 metres	N/a
Free flight take-off from the display area	50 metres	75 feet above ground level in climbing flight 50 feet clear of obstacle
Free flight landings into the display area	100 metres	50 feet above ground level for overflight in level flight 50 meet clear of obstacle

#### 5.24 MODEL AIRCRAFT AS PART OF A FLYING DISPLAY

- a) Any person wishing to fly a model aircraft at a special air event, shall be a member of the applicable ARO, (SAMAA) and have documented proof from SAMMA that they are rated to fly models aircraft at public events.
- b) At an airshow, model aircraft flying should come under the control of a Flight Director who should preferably have experience with model aircraft and be responsible to the Safety Officer for the safe conduct and control of the model flying activities.

#### 5.25 MODEL DISPLAY LIMITATIONS

- a) Uncontrolled free flight models should not be flown during the period of the airshow.
- b) Where the designated model aircraft display area is in an area set aside for the spectators it should be safely enclosed.
- c) The Safety Officer or the Flight Director shall add an additional separation distance for models of exceptional dimensions or performance.
- d) The Safety Officer should ensure that model aircraft displays are adequately separated in distance or time from other flying events.
- e) Where the model flying is taking place on the display side of the event, there should be direct communications between the Safety Officer and the Flight Director to ensure that in the event of an aircraft emergency the model flying can be stopped as quickly as possible.
- f) The Flight Director is responsible for arranging strict control and use of model aircraft transmitters and frequencies.



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**CHAPTER 6**

**PILOT DISPLAY COMPETENCY**

6.1 General

In order for any pilot (other than pilots of military aircraft) to fly at a Special Air Event or Airshow, the pilot must hold a valid DA issued by the RAASA.

6.2 Display Authorisation Examiners (DAE)

- a) RAASA shall appoint or authorise a person or body of persons to conduct such examinations or tests, as it may specify and approve a person or body of persons as qualified to furnish reports to RAASA.
- b) Such persons are known as Display Authorisation Examiners (DAE).
- c) The body of persons to recommend the DAE's to RAASA are known as the Display Authorisation Committee or DAC.
- d) RAASA will refer any pilot who is seeking a DA to a DAE in his discipline and area.
- e) A list of approved and current DAE's may be obtained from RAASA.

6.3 Requirements

- a) To be nominated as a DAE an individual must have received a written recommendation from an organisation associated with a particular display discipline, or from another DAE and recommended by the DAC.
- b) The sponsor must have personal knowledge or equivalent experience acceptable to the DAC, hold a valid pilot's license with normally a minimum of 1000 hours as pilot in command or equivalent experience acceptable to the DAC.
- c) Normally be an active display pilot who has participated in at least 4 displays or aerobatic competitions within the previous 12 months at RAASA approved SAE's, or SAC approved competitions, unless proof of a recent military rating can be provided.

6.4 Responsibilities and Limitations

- a) A person who is approved as a DAE is authorised to evaluate a pilot's display competency and submit a report for RAASA on the operations form (appendix B) in his area of competence.
- b) If subsequent to the initial grant of a DA it is necessary to recommend an amendment or revocation of the Authorisation then this should be done in writing by RAASA and/or the recommendations of the DAC.
- c) Any pilot who is denied a recommendation by a DAE may apply directly to RAASA, who may at their discretion recommend an alternate validation by another approved DAE.
- d) When a DAE has prepared a report recommending issue of a DA this should be forwarded directly to RAASA for approval and issuing of a DA rating card.
- e) Individuals who are appointed by RAASA as DAEs may continue to conduct display competency evaluations as long as they remain current in air display activity.
- f) If it becomes necessary to remove an evaluator from the list of DAEs due to inactivity or deficient performance, then RAASA will give notification in writing explaining the reason for such termination.
- g) Appointments are for a maximum of 24 months terminating on 31<sup>st</sup> December each year
- h) All DAEs shall receive a copy of and familiarise themselves with the RAASA SAE MOP.

- i) All DAE's are the appointed and recognised subject experts of RAASA and thus a representative of RAASA, and shall act and conduct themselves in accordance with the objectives and safety standards as determined by RAASA.

#### **6.5 DISPLAY COMPETENCY DEMONSTRATIONS**

- a) In order to establish a standardised evaluation of all pilots who request a DA the following guidelines will be used by RAASA and DAEs for the issue and renewal of DA's

#### **6.6 Documentation**

- a) The DAE shall inspect the applicant's logbook to determine total flying experience, display experience, aerobatic or other relevant experience and total time on the aircraft type that will be used in the flight demonstration.
- b) Check the applicant's pilot licence, to enable particular aircraft types to be included in the DA.
- c) Check the aircraft documentation including the certificate of airworthiness or authority to Fly, certificate of registration and aircraft radio station licence.
- d) If the aircraft is operated on any alternative system of certification then all relevant documents should be checked.

#### **6.7 Oral Examination**

- a) The DAE should discuss the;
  - aa) Weight & balance
  - bb) loading limitations
  - cc) airframe and engine operating limitations
  - dd) "G" load restrictions
  - ee) any other operating limitations that are applicable to the demonstration aircraft.
- b) Discuss;
  - aa) personal motivation,
  - bb) philosophy
  - cc) reason for applicant's wish to obtain a DA.
- c) Include in the discussion common cause of air display accidents.
- d) Require the applicant to describe the sequence of the display which he intends to demonstrate.
- e) Discuss the;
  - aa) logic of his sequence,
  - bb) energy management of manoeuvres,
  - cc) the planning of the manoeuvres in relation to the aircraft limitations,
  - dd) the effects of density altitude,
  - ee) the effects of surface and upper winds and how to adjust the sequence to compensate for external constraints.
- f) Discuss the applicant's emergency planning for items such as awareness and avoidance or inadvertent stalls / spins, engine or system failures, key heights and speeds and actions if these are not achieved and changes in the weather during the display.
- g) Discuss the pilot's responsibilities at a formal display pilots safety briefing and on receipt of any written brief
- h) The DAE should determine the applicant's familiarity and knowledge of limitations imposed by the pilot's licence.
- i) The actions necessary to maintain a valid pilot's licence and DA.
- j) The normal separation standards between the crowd line and the display line(s)

- k) Mandatory requirements to adhere to minimum heights specified.
- l) The need to establish clear visual signals for the control of any display in the event of radio failure together with the need to observe extra precautions while starting or taxiing at an air display

#### **6.8 Pre-flight Inspection**

- a) The normal pre-flight inspection is to be carried out before each display with special emphasis on the following areas:
  - b) Fuel and oil adequate for the planned flight with contingency reserve,
  - c) Aircraft structural integrity and freedom of flight and engine controls,
  - d) Thorough check for loose objects in the cockpit and elsewhere in the aircraft,
  - e) Parachute, if carried, and emergency equipment inspection, repack within date,
  - f) Altimeter setting to proper reference,
  - g) Planned use of transponder if applicable,
  - h) Emergency door or canopy releases inspected for proper operation and security,
  - i) Safety precautions and checks on ejection seats, pins and explosive canopy release, ensure emergency crew and the relevant officials are briefed on their locations and operations.
  - j) Ensure that a nominated crew member or official has the ejection seat pins during flight and understands their use and how to secure the aircraft.

#### **6.9 Flight demonstrations**

- a) At the discretion of the DAE, pilots who are demonstrating aerobatic manoeuvres for the first time may be required to conduct an initial flight at or above 1000 feet AGL before demonstrating at such lower height as may have been requested.
- b) Evaluation criteria must include:
  - aa) precision of manoeuvres,
  - bb) orderly execution of planned sequence,
  - cc) airspeed and height control,
  - dd) ability to remain within the display area and to conform to display axis separation minima,
  - ee) ability to compensate for wind drift,
  - ff) ability to adjust sequence to accommodate unplanned constraints,
  - gg) ability to handle emergencies during air display performances,
  - hh) maintenance of planned sequence slot times and duration.

#### **6.10 Spin Training and Departure Awareness**

- a) An initial application for a DA that includes an authorisation for display aerobatics must include evidence that the applicant has received appropriate spin training in addition to having achieved a minimum of 70% or higher in the sportsman's class for competition aerobatics at a SAC approved event.
- b) Additionally, the applicant must show that he is current on standard spin entry and recovery techniques preferably on the aircraft type flown during the evaluation, if permitted. DAE's are to indicate that these conditions are satisfied.
- c) If the DAE is not satisfied that the applicant is sufficiently aware of, or current in, spin entry and recovery techniques he is to restrict the recommendation to non-aerobatic displays until the applicant has received additional appropriate training.
- d) During the oral examination of initial candidates and the renewal of existing DAs, the DAE is to discuss the symptoms of, the avoidance of and the recovery from inadvertent departure from controlled flight.

- e) Particular reference is to be made to the characteristics of the aircraft flown in the demonstration.
- f) Potential danger areas associated with aerobatic displays and the techniques to avoid them are to be reviewed.

#### 6.11 Reporting by DAE's

- a) Following an evaluation for initial issue of a DA or the renewal or upgrade of an existing DA, the DAE is to make a written recommendation and report to RAASA on the appropriate form.
- b) Where a candidate fails to achieve the required standard for either the initial issue of a DA or the renewal or upgrade of an existing DA, the DAE is to ensure that the application form is returned to RAASA clearly indicating that the applicant has failed, stating reasons for the failure and recommending any remedial action such as further training.
- c) The candidate is to contact RAASA prior to arranging any further evaluation.
- d) DAE's should actively monitor display pilot standards throughout the display season.
- e) Where a DAE perceives a lapse in safety standards, he is to bring the matter to the attention of RAASA and in turn to the display pilot.
- f) How the matter is handled from this point is at the discretion of RAASA in cooperation with the DAC.
- g) Where a serious breach has occurred the DAE should report the matter to RAASA ASAP.
- h) In the latter case a clear statement of the perceived breach, with supporting evidence, if possible, will be required before RAASA could consider any action.
- i) The form incorporates a check list to assist DAEs in conducting evaluations.

#### 6.12 Limitation

- a) A 2000ft AGL height limitation for a specified number of displays may be placed on any aerobatic DA issued to a new air display pilot.
- b) This limitation may be removed and a lower base height approved if there is evidence that the sequence has been successfully performed at three or more air displays

#### 6.13 Issue of the display authorisation

- a) A DA consists of a RAASA authorisation and the certificate of the test.
- b) The categories or specific aircraft types authorised, the type of display authorised, the level of formation authorised and the minimum altitude for aerobatics, if authorised, and flypasts will be specified in the DA

#### 6.14 Recency

- a) A DA requires that a display pilots has flown a minimum of four displays as approved in the DA booklet in the preceding year, of which at least one shall have been in the preceding two months, or provides proof of having practiced the intended display routine in the preceding month and can be verified by a safety officer or DAE.
- b) A logbook entry signed by a safety officer, flight director or DAE is sufficient proof that the display sequences or practices have been flown.
- c) Failing the above recency requirements have been met, a display pilot shall in addition to practice flights perform a validation flight to an appropriately rated

DAE, or in the case of flat (non aerobatic) displays to a safety officer no less than two weeks prior to the day of the event

- d) It is emphasised that the above requirement should be viewed as a minimum requirement for display recency and that pilots are encouraged, particularly during pre-season work up, to undertake sufficient practice to ensure that a sufficiently high standard of safety is maintained.
- e) If the display sequence has not been practiced recently, the pilot should set himself appropriately higher minima, for practice or actual display purposes, until such time as full currency is regained.

#### 6.15 Expiry

- a) A DA will expire 12 months after the date of the initial successful test or renewal unless further revalidated by a certificate of test or certificate of competence.

#### 6.16 Renewal

- a) The renewal of a display authorisation shall require an up to date and signed DA logbook; the test being conducted by a suitably qualified DAE.
- b) In the case of an expired DA, where no upgrade of the privileges is being sought, the certificate of test can be revalidated and signed by the DAE, then reissued by RAASA.
- c) Approval of the DA Certificate of Competence by a suitably qualified DAE.
- d) Where multiple aircraft types or categories are held on a DA it is not necessary to renew each individual aircraft type or category if they are similar in their operation and performance, and flown in a similar sequence.
- e) The DA is renewed by demonstrating on any one of the authorised aircraft types of categories.
- f) The recency rules do however apply to individual aircraft types of categories.

#### 6.17 Display criteria

- a) The actual construction of a display sequence will vary considerably from pilot to pilot because of various factors such as experience and competence levels, aircraft capabilities, requirements to deal with varying weather conditions and display sites etc.
- b) For the novice, early guidance shall be sought from a DAE or other experienced display pilot.
- c) The following paragraphs, whilst not exhaustive, are intended to give display pilots some basic guidance in various specific areas

#### 6.18 Vintage or unique aircraft

- a) Owners, operators, pilots and DAEs are encouraged to take into consideration the age, the rarity value and the need for continued preservation of aircraft when developing display sequences.
- b) In general terms, the limitations placed on the operation of the aircraft, either generally or in a display situation, should show a level of sympathetic appreciation of these factors whilst allowing the aircraft to be safely flown and displayed.

#### 6.19 Displaying multi-engine aircraft

- a) Deliberate asymmetric flight as part of a display routine is not permitted at civil flying displays.
- b) Emergency asymmetric handling problems, particularly with some of the older historic aircraft types, are a potential source of difficulties during a display in these aircraft.
- c) Whilst it is impossible to give specific guidance on minimum speeds below which a multi-engine aircraft should not be flown in display, the following should be taken into consideration during the planning process and the actual flying.
- d) A multi-engine aircraft should not be flown below a speed which it is possible to achieve a positive rate of climb, without change of configuration, should any engine fail to respond to an acceleration demand.
- e) DAEs are to ensure, during initial evaluation or renewal, that pilots holding DAs covering multi-engine types have made adequate preparation for asymmetric difficulties during their display planning.

#### 6.20 Crowd separation distances – on crowd wind

- a) During any display, pilots are to be aware of, and make due allowance for, any on-crowd wind component.
- b) Safety Officers shall brief pilots to adjust their display line for any on crowd wind component.
- c) Note that if flying towards the crowd, but inadvertently too close to turn safely, an early decision to determinate the manoeuvre and climb, even if this involves the final resort of overflying the crowd, is preferable to risking an overstress or departure from pulling too hard, the display shall then be aborted.

#### 6.21 Minimum heights during displays

- a) All aerobatic manoeuvres, including inverted flypasts and manoeuvres which involve pulling through the vertical are to be executed above the approved aerobatic display height.
- b) Descent below the approved aerobatic display height to the approved fly-by height is permitted once certain of capturing the aerobatic display height.
- c) Slow speed, high angle of attack flypasts are regarded as aerobatic manoeuvres from the minimum height point of view.

#### 6.22 Spinning as part of a display

- a) Pilots are only permitted to include spinning as part of their display sequence if they hold the appropriate aerobatic DA authorisation and the aircraft is approved for the manoeuvre.
- b) When developing a display sequence that includes spinning the pilot to determine the spin parameters that will ensure adequate safety margins are maintained during every spin.
- c) Specifically, the following should be taken into account when determining the minimum spin entry height:
  - aa) spin characteristics of the aircraft including ability to recover consistently,
  - bb) height lost per spin turn,
  - cc) height lost during normal recovery,
  - dd) margin required to allow for inconsistencies in either the aircraft or on the part of the pilot.

- d) DAE's are to ensure, during initial evaluation or renewal, that pilots holding sportsman or better aerobatic DAs have made adequate provisions for any spinning carried out during their display planning

#### 6.23 Formation flying

- a) In order to take part in any formation display the pilot must hold a DA permitting formation flying in the required category.
- b) Formation DA authorisations are broken down as follows:
  - aa) Where close formation flying is permitted, it will be limited to close formation flying with up to 4 aircraft, or
  - bb) Close formation flying with unlimited numbers of aircraft
  - cc) Where close formation leading is permitted it will be limited to close formation leading with up to 4 aircraft; or
  - dd) Close formation leading with unlimited numbers of aircraft
  - ee) Where tailchasing is permitted it will be limited to tailchasing with up to 4 aircraft; or
  - ff) tailchase leading with unlimited numbers of aircraft; or tailchase leading
- c) Tailchase authorisations will not be issued unless close formation authorisations are already held by the applicants, and recommended by the DAC as part of the application.
- d) Tailchase leading authorisations will not be issued unless a tailchase authorisation and formation leading authorisation are already held by the applicant, and recommended by the DAC as part of the application.
- e) Applications for formation DAs will need to specify the level of authorisation recommended in the 4 categories.
- f) DAEs will need appropriate evidence of competence before recommending a specific formation authorisation.
- g) Extensive formation experience will be a pre-requisite before any of the unlimited authorisations can be considered.

#### 6.24 Close formation

- a) Close formation is defined as when an aircraft is flying in close proximity to another aircraft in such a manner as to require the following aircraft to take all external visual references solely from the lead aircraft.
- b) Close formation leading is defined as being totally responsible for all aspects of the safety, terrain clearance, positioning and handling for a number of aircraft that are formatting in close proximity to the lead aircraft.
- c) The size of the planned formation dictates the DA requirements of all the participants when all the aircraft are to be flown in close formation.
- d) Any close formation group with more than 4 participating aircraft requires all pilots, including the leader, to hold an unlimited numbers formation/leader DA as appropriate.
- e) However, where a large formation is planned with elements consisting of four, or less, aircraft formation/leader DA authorisations may participate subject to the following limitations,
  - aa) the overall formation leader holds an unlimited numbers formation leader DA



- bb) individual formation element leaders hold, at a minimum, 4 aircraft formation DAs
- cc) the elements are flown in trail (line astern) with sufficient separation between each element to enable each element leader to clearly define his own flight path and, if necessary, for him to disengage his element from the formation without endangering other aircraft.
- f) The separation required will depend on individual aircraft characteristics but, as a guide, should be in order of 100 to 200 metres between the rear of one element and the lead of the next element

#### **6.25 Tail chase**

- a) A tailchase is defined as a number of aircraft following a leader in loose proximity, either in line astern or offset to one side in a “fighting battle” formation, whilst the leader carries out a series of manoeuvres of an aerobatic or semi-aerobatic nature.
- b) Each aircraft in turn will generally follow the leader’s flight path but retain a high degree of individual decision making over the exact path taken.
- c) Separation distances vary from 50 to 200 metres.
- d) Mock combat, or dog-fight displays, whilst not necessarily following the above definition of a tailchase, do require many of the same skills such as assessment of closing speed and angle off.
- e) Consequently, these types of displays are to be treated as tailchases from the DA point of view.
- f) An essentially straight and level flypast of aircraft in loose trail (100 metres plus) with manoeuvres restricted to gentle turns is not a tailchase and a formation/tailchase DA is not required for this type of display.
- g) To participate in a tailchase a pilot must hold a tailchase DA authorisation.
- h) To lead a tailchase a pilot must hold a tailchase leader DA authorisation.
- i) Tailchasers are restricted to a maximum element size of 4 aircraft.
- j) However, more than one element may participate in a tailchase with the leader of the rear element(s) deciding the specific flight path for their element under the overall direction of the main leader.
- k) Where more than one element is involved in the tailchase, each element leader must hold a tailchase leader DA authorisation and, additionally, the overall formation leader must hold an unlimited formation leader DA authorisation

#### **6.26 REQUIREMENTS FOR THE ISSUE OF A FORMATION DA**

- a) Only DAEs who are appropriately approved for formation evaluations may recommend an applicant for the inclusion or upgrade of a formation authorisation on a DA.
- b) DAEs hold the following levels of formation approval;
  - aa) basic formation authorisation – allows these DAEs to recommend the issue or upgrade of formation DA, as a member or as a leader, with up to 4 aircraft but not tailchasing unless specifically authorised,
  - bb) advanced formation authorisation – allows these DAEs to recommend the issue or upgrade of any level of formation DA,
  - dd) DAEs are to satisfy themselves that the DA applicant has completed a period of formation training prior to being assessed for a formation DA,
- c) The level of formation authorisation recommended will be dependent on the previous formation experience level of the applicant, the extent and level of the training carried out and the applicants performance during the evaluation

#### 6.27 CLOSE FORMATION FLYING WITH UP TO 4 AIRCRAFT

- a) Before a DAE recommends an applicant for a close formation flying with up to 4 aircraft, authorisation the applicant must demonstrate the following minimum standards during an evaluation.
- b) During the pre-flight briefing the applicant must show a clear understanding of the basic principles of formation flying including;
- c) The principles of safely joining into close formation; the safe escape manoeuvre if the join-up is incorrect; the break from close formation and the rejoin,
- d) The effects of inertia; assessment of closing speed, throttle handling (if appropriate, the differences between jet and piston engine handling and response must be appreciated by the applicant) and flying control effects,
- e) Clear definition of the position cues for the three basic formation positions – echelon starboard, echelon port and line astern – in relation to the aircraft being flown in the evaluation,
- f) Procedures for moving safely from one formation position to another, the executive commands for making a change of formation; the safety aspects and sequence of moving formation when more than two aircraft are involved,
- g) The need for regular monitoring of aircraft parameters, particularly engine temperatures and pressures and fuel contents; the timing of these airmanship checks,
- h) aircraft emergency procedures and handling when in a formation particularly where more than two aircraft are forming,
- i) during the formation flight evaluation of DAE should either fly as a formation leader, or if the applicant's aircraft is suitably equipped, with the applicant.
- j) It is recommended that initial formation manoeuvring be carried out at medium altitude to confirm the applicant's ability.
- k) However, before a recommendation is made representative manoeuvring must be carried out at display height.
- l) The flight should consist of at least two aircraft and should cover the following minimum requirements;
  - aa) if appropriate, a pairs take-off in echelon.
  - bb) Manoeuvres in the three basic formation positions.
  - cc) Within the constraints of the aircraft limitations and performance, the manoeuvres should include straight and level, climbing, descending and turning flight at high and low speeds and power settings; steep turns with moderate "g" loading (2-3" g"); wing-over's to at least 90° of bank with large speed and loading variations and, if required, formation aerobatics,
  - dd) change of formation position in straight and level flight and moderate bank turns breaks and rejoins from both echelon positions in straight and level flight and moderate banked turns,
  - ee) an emergency break during manoeuvre,
  - ff) confirmation that the applicant is carrying out airmanship checks, (fuel calls etc)
  - gg) a close formation run and break into the visual circuit.

#### 6.28 CLOSE FORMATION LEADING WITH UP TO 4 AIRCRAFT

- a) An application for a formation leading authorisation will not be considered unless the applicant already holds, a formation member authorisation
- b) Before a DAE recommends an applicant for a close formation leading with up to 4 aircraft authorisation the following must be considered;

- aa) the applicant must have adequate experience in flying as a formation member in addition to suitable training in formation leading,
  - bb) the applicant must be aware of his responsibilities as a leader specifically in relation to the need to fly smoothly and with consideration for the other formation members,
  - cc) the use of power by the leader and the power margins the leader needs to allow for other formation members, particularly in manoeuvre and where the formation contains more than one aircraft type,
  - dd) the leaders responsibility for terrain clearance, lookout and positioning relative to the display line for all formation members,
  - ee) actions in event of an emergency,
  - ff) the applicant must brief and lead a formation with the DAE acting, ideally, as the applicant's wingman.
- c) The briefing must cover all required aspects, particularly safety precautions, in a logical manner, the in-flight portion of the evaluation must include an assessment of the leaders abilities in all normal and display related manoeuvres including, if appropriate, formation aerobatics.

#### 6.29 TAILCHASING WITH UP TO 4 AIRCRAFT AND TAILCHASE LEADING

- a) An application for a tailchase authorisation will not be considered unless the applicant already holds, a close formation member authorisation.
- b) Before a DAE recommends an applicant for a tailchasing with up to 4 aircraft authorisation the applicant must demonstrate the following minimum standards during an evaluation;
  - aa) during the pre-flight briefing the applicant must demonstrate awareness of the following areas,
  - bb) the various formation positions usually flown – trail or fighting battle,
  - cc) how formation position can be maintained by use of lead and lag and the need to follow the leader flight path without over anticipating the manoeuvre,
  - dd) assessment of separation distances and closing speeds,
  - ee) avoidance of, the dangers of and action in event of hitting slipstream,
  - ff) loss of leader (or aircraft ahead) procedure – safe area, radio call, no rejoin until contact with all other members and they are aware of the rejoining aircraft,
  - gg) The applicant must successfully carry out a realistic tailchase at medium level and at a representative display height during the in-flight portion of the evaluation,
- c) An application for a tailchase leading authorisation will not be considered unless the applicant already holds, a tailchase member authorisation and a formation leading authorisation.
- d) Before a DAE recommends an applicant for a tailchase leading authorisation the applicant must demonstrate the following minimum standards during an evaluation;
  - aa) during the briefing the applicant must demonstrate awareness of the pertinent leadership factors such as maximum speeds and power to be used, maximum “g” loading, type of manoeuvres used in tailchasing,
  - bb) consideration for the other formation members and the emergency and loss of leader procedures,
  - cc) the applicant must demonstrate the ability to satisfactorily lead a representative tailchase

**6.30 UNLIMITED FORMATION AUTHORISATIONS**

- a) Before any unlimited authorisation is recommended, the applicant must have extensive previous formation experience and must have demonstrated a consistently high standard of ability over a number of display seasons.

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7.1 LIGHT AIRCRAFT, MICROLIGHT, GYROPLANE AND GLIDER EVENTS

- a) Any single discipline event organised and hosted by an approved ARO, club or organisation shall plan such events in accordance with the procedures and safety standards contained in that organisations approved manual of procedures, the organisation shall notify RAASA within the prescribed format and time frame in order to be issued a an event permit.
- b) Any event held under the conditions laid down in this document must be subject to the direct authority & supervision of an approved Safety Officer who is nominated by the organisation and who is acceptable to RAASA once they have attended a RAASA approved safety officers training course.
- c) The safety officer may delegate certain duties but retains overall responsibility for safety at the flying event.
- d) It is the responsibility of the event organiser, the safety officer and the pilots of the participating aeroplanes to ensure that the planned activity does not infringe airspace restrictions, minimum distances and height from the other participants or members of the public as contained in this manual.
- e) Facilities must be provided for the booking in and briefing of pilots on all rules laid down for participation in the event and such rules must be in writing and available prior to the event in accordance with the organisations approved MOP.
- f) Appropriate emergency service providers, disaster management and evacuation plans as required in this manual shall be available, with communication to outside services arranged to deal with any emergency.
- g) If any members of the public other than direct members of the organisation, are permitted access to the event irrespective if an entry fee is charged or not, they shall be considered as spectators and the event shall be considered as a public event, therefore, all legislation, regulations and bylaws applicable to the scale and complexity of the intended event shall be adhered too.
- h) If a landing or take-off is to be made at the site of the event, the area available must be adequate for the intended operations, taking into account the aeroplane size, weight and performance, weather conditions and the ability of the pilots.
- i) The minimum operating area provided shall be suitable for the intended operations, with all flight, approach and departure paths remaining clear of buildings, persons, vehicles, trees and overhead electricity or telephone cables.
- j) A suitable forced landing area is to be available and accessible throughout the event.
- k) Each pilot taking part in a navigation rally, race, or any other contest, is to hold at least a valid PPL or NPL; and must have gained at least 100 hours as pilot in command of aeroplanes or microlight aeroplanes, of which at least 50 hours must be on the class of aircraft to be flown and of which at least 10 hours must be on the type of aircraft to be flown at the event.
- l) In this connection class is defined as being either Weight shift, Three axis, Gyro, LSA, Glider etc
- m) To hold and fly in a Special Air Event, prior approval is required from RAASA; see administrative requirements and time lines for application.
- n) Organisers are to ensure that each aeroplane taking part in the event is registered, and is displaying the correct registration markings and has a valid C of A or Authority to Fly.
- o) Engines may be started or run only in areas separated from the public by a suitable solid barrier.
- p) Clearance to a specified holding point clear of the take-off area is to be responsibility of an authorised marshal or, where air traffic/AFIS control is in operation, given by the controller or AFIS.

- q) The decision when to take-off remains the responsibility of the pilot except where air traffic control from ATNS is available.
- r) The safety officer, ATC or AFIS as applicable shall ensure that the number of aircraft in the circuit at any one time does not exceed a safe number.
- s) The safety officer must ensure that all aircraft remain within or outside as the case may be the determined safe zone, flight line and minimum heights.
- t) No local area flying is to be permitted during competitive events taking place on the site
- u) Cross wind limitations are to be those stipulated in the manufacturer's handbook, however, where no published limits exist, the maximum acceptable cross wind component is to be 12 knots.
- v) No aerobatic manoeuvres are permitted. Maximum bank and pitch angles are as prescribed in the permit to fly or other relevant aircraft document, but in any case must not exceed bank 45° pitch 30°
- w) No aircraft may exceed the manufacturer's maximums.
- x) Intentional stalls at events are prohibited.
- y) At any other event where aircraft are to be flown, displayed or used in a competitive manner where the public is present, similar requirements to airshows will apply.
- z) Event organisers should carefully note the definition of an airshow and the advice given.

## 7.2 HOT AIR BALLOON EVENTS

### 7.2.1 LEGAL REQUIREMENTS

- a) It is unlikely that a hot air or a gas balloon will be required to carry out an air display in the normally used sense of performing unusual manoeuvres.
- b) As balloon races or contests are exempt from the requirements, the display element of balloon events is usually restricted to tethered flights at an advertised event open to the public.
- c) Event organisers are reminded that any additional display content, such as airships, powered paragliders, microlights etc, even though the main purpose of the event is a balloon competition or rally the event shall be considered as a multi disciplinary special air event, and a formal application shall be submitted to RAASA within the prescribed format and time frames.
- d) Similarly, balloon items as part of a conventional flying display must be notified on the application form and included in the count of items.
- e) Notification of a balloon event as per the applicable ARO's approved manual of procedure shall be made to RAASA in the prescribed format and timeframe.
- f) If an event includes a flying display element, formal application shall be made to RAASA in the prescribed format and timeframe.
- g) The following specific balloon event considerations augment the general guidance given in the aeroplane chapters and should be read in conjunction with these.

### 7.2.2 SOUTH AFRICAN BALLOON CLUB GUIDELINES

- a) At events organised by, or in association with BAFSA affiliated organisations requiring Support or advertising, the following points should be noted.
- b) An event held under the guidelines contained in this document must be subject to the supervision of a flying director and a safety officer who is nominated by the organisers.
- c) The flying director may act as the safety officer if independent from the event organiser.

- d) The safety officer should be involved in the planning stages of the event and should be present on site during all planned launch and inflation times, except that he may delegate specific duties but retain overall responsibility for the event, including the right to cancel a planned flight due to meteorological or any other reasons bearing on safety.
- e) Except where the safety officer has banned flying, the decision to take-off or not remains with the pilot.
- f) It is the responsibility of the event organiser, the flying director, the safety officer and the participating pilots to ensure that the planned activities do not infringe airspace restrictions.
- g) If at the planning stage, it seems likely that flights may affect an aerodrome then liaison should be established with ATC/AFIS at this stage.
- h) For mass ascents, the use of transponders on some balloons should be considered so that ATC has an indication of the track and extent of the activity.
- i) The relevant ATC/AFIS should also be informed of actual launch time and again when all balloons have landed.
- j) Rules governing the event must be made available, in writing and in accordance with the organisations approved MOP prior to the event.
- k) These must include the limits of acceptable weather conditions for flights, including tethered flights, to be made.
- l) Variations in rules not pertaining to safety may be notified by means of a pilots' briefing.
- m) Adequate emergency services and equipment should be available on site to deal with any incidents.
- n) Prior consultations with outside services should be made and communications established with them on the day of events, so as to facilitate their rapid response in the case of an emergency.
- o) Event organisers are particularly reminded that a large balloon meet necessitates effective control that will require adequate assistance for the safety officer.
- p) An event should not take place unless the safety officer and event organiser ensure that a level of support is provided in the areas of safety and landowner relations appropriate to the number of balloons participating in the event.
- q) Mass take offs should only take place in wind speeds of less than 8 knots on the surface.
- r) In winds exceeding 8 knots, take offs may be staged in waves so as to maximise the separation of balloons.
- s) Prior to take off, pilots must ensure that their projected track out of the site is clear of balloons either on the ground or on the air. A check for balloons overhead must be made immediately before takeoff, either by a member of the crew or by a marshal appointed by the safety officer.
- t) In the wind speed exceeds 5 knots the crowd should be separated from the balloons in such a way that in the event of a change of wind direction prior to launching no part of a balloon will come into contact with the crowd.
- u) All free and tethered flights must be made within the criteria contained in the manufacturers' flight manuals for the specific balloon.
- v) Refuelling should take place in an area to which the public does not have access.
- w) The propane tanker of fuel should be separated from any large gathering of people by at least 100 metres and sited so as to avoid drainage of propane towards such an area.
- x) Competition tasks should be not set in such a way that they cause large concentrations of balloons in the proximity of livestock or sensitive areas.
- y) No event shall be held without prior consultation with the local region.
- z) Officials and commentators must be briefed by the safety officer on the contingency plan to be followed in the event of a fire or other emergency on the launch field.



## 7.3 AIR RACES, TIME AND NAVIGATION RALLIES AND PYLON RACES

### 7.3.1 AIR RACES

- a) Although air racing and rallies has its own manual of procedure and code of conduct and should be consulted in advance, much of the requirements given in the earlier chapters of this document remain relevant.
- b) Where an air race, navigation event, fun rally, pylon race or any other competitive event is organised or planned by a person, club or organisation other than an approved ARO for such events, the organisers or applicant shall submit a formal application for approval to RAASA no less than 150 days prior to the event, such applications shall be accompanied by a detailed manual of procedure and operations plan for the intended competition.
- c) RAASA may require additional supporting documentation prior to considering the approval of such events.
- d) Should the race/rally route pass through, over or close to either controlled airspace or major airports it is essential that proposals are discussed with RAASA and or the authority responsible for the management of the specific airspace prior to any firm arrangements being made.
- e) These discussions should be initiated at least 160 days prior to the date of the event.
- f) The air race will almost certainly require co-ordination with other airspace users, therefore, details should be submitted to RAASA at least 150 days prior to the date of the event
- g) Formal Applications for approval or exemptions must reach RAASA at least 150 days before the event

### 7.3.2 AIR RALLIES

- a) Application shall be made to RAASA for approval and to enable the promulgation of a NOTAM, or in the event of controlled airspace or change of airspace, application shall be made in time for the AIRAC cycle.
- b) Whilst certain of the requirements discussed earlier in this document may not be applicable to rallies, the attention of organisers is drawn to observe the minimum recommended safety standards, and to the need for full written briefings to participants, including the arrangements for notifying a cancellation of the event.
- c) If weather conditions cause a rally to be cancelled, every possible means should be used to ensure that participants are informed before take-off or enroute so as to avoid dangerous congestion at the destination aerodrome.
- d) The aerodrome management and ATNS/CAMU at destination should be consulted about the proposed event so that appropriate safety arrangements may be made and conflicts with other traffic avoided.
- e) The rally will almost certainly require coordination with other airspace users, therefore, details should be submitted to RAASA at least 150 days prior to the date of the event
- f) If an event is intended to attract more than 50 aircraft it is essential that proposals are discussed with the RAASA prior to any firm arrangements being made.
- g) These discussions should be initiated at least 160 days prior to the date of the event.

## 7.4 DISPLAY PARACHUTING

### 7.4.1 LEGAL REQUIREMENTS

- a) Whilst parachuting itself does not constitute a display item requiring an DA, this chapter is included for the assistance of the event organiser and safety officer.
- b) Display parachuting may be arranged as an additional attraction at many events including flying displays, or as an event in its own right.

- c) Display parachutists must be in possession of a valid parachuting display rating "PRO Rating" and approval issued by RAASA.
- d) Note that the parachute dropping aircraft are NOT permitted to execute a low pass after the drop, unless an approval has been issued by the Safety Officer, and the pilot holds a valid DA or has been briefed and validated by the safety Officer.

#### 7.4.2 LIAISON AND RECONNAISSANCE

- a) An experienced team member will need to visit the proposed landing area in order to determine existing and anticipated hazards.
- b) At this visit the following should be considered;
  - aa) weather minima,
  - bb) dimensions of the landing area required by the team,
  - cc) arrangements for crowd control,
  - dd) location of overshoot/undershoot areas,
  - ee) buildings and power lines,
  - ff) locations of spectator enclosures, ensuring spectators especially children are to be kept away from landing areas,
  - gg) car parks,
  - hh) marquees and other hazards (eg cranes used for bungee jumping)
  - ii) first aid
- b) The Safety Officer must ensure that the display team is informed of any other aviation-related activities known to be taking place at the event or nearby (eg helicopter pleasure flights, tethered balloons, model aircraft etc)

#### 7.4.3 THE LANDING AREA

- a) Where the designated landing area is on the display side of the crowd line, no part of that area should be closer than 5 metres to the crowd line.
- b) Where the designated landing area is in an area set aside for the spectators, it should be enclosed with a barrier and no parachutist should land closer than 5 metres to any spectator
- c) The landing area should be suitably marked and should be clearly identifiable by each parachutist from the time he exits the aircraft

#### 7.4.4 The Display

- a) When the display of parachuting forms part of a flying display, the PIC of the parachute dropping aircraft will require a briefing
- b) The event organiser is responsible for the arrangements for crowd control

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## References

1. Air Show South Africa, airshow manual, dated 3 February 2005
2. UK Civil Aviation Authority, CAP403, Flying Displays and Special Events: A Guide to Safety and Administrative Arrangements, dated 29 June 2012.
3. European Airshow Council, Airshow Manual, dated 24 February 2012.
4. International Council of Air Shows, President, John Cudahy, date 11 November 2013
5. FAA, ACRP synthesis 41, Conduction Aeronautical Special Events at Airports, Transportation Research Board

**APPENDIXES.**

