
NZASA

NEW ZEALAND AIRSHOW ASSOCIATION

GUIDE TO AIRSHOW DISPLAY DIRECTOR

v1.0 - July 2017

NZASA MISSION STATEMENT AND ICAS SAFETY CREED

NZASA represents our great industry. The founding members set standards that have contributed to an enviable safety record. These standards are dynamic and continuously honed through years of preparation and experience. NZASA membership carries the responsibility of maintaining these safety standards.

As an NZASA member:

- I shall remember first and foremost that spectators place their trust and well-being in my mature judgment and professional actions. I shall continuously strive to be deserving of this trust.
- I shall not knowingly violate or stand idly by if others violate the spirit of the rules and standards set forth by NZASA or regulatory authorities.
- I shall work to create an environment that does not invite or promote unsafe actions and do my best to instil these values in my fellow NZASA members.
- I shall not think in terms of my event or my performance. Any adverse safety circumstances at one event may bring irrevocable consequences to the entire industry. It is our industry and our responsibility.

TABLE OF CONTENTS

| | |
|--|-----------|
| NZASA MISSION STATEMENT AND ICAS SAFETY CREED | 2 |
| TABLE OF CONTENTS | 3 |
| DOCUMENT CONTROL | 4 |
| DEFINITIONS | 5 |
| BACKGROUND | 7 |
| The Event Organiser | 7 |
| The Flying Display Director (DD) | 7 |
| CHAPTER 1 GENERAL INFORMATION | 9 |
| 1.1 – Introduction | 9 |
| 1.2 – Flying Display Director Bank | 9 |
| 1.3 – Admission to the Bank | 9 |
| 1.4 – Exit from the Bank | 11 |
| 1.5 – Administration of the Bank | 11 |
| CHAPTER 2 - RESPONSIBILITIES | 13 |
| 2.1 – Responsibilities of the Flying Display Director (AC91-1) | 13 |
| 2.2 – Responsibilities of the Assistant Flying Display Director (AC91-1) | 15 |
| 2.3 – Responsibilities of the Flying Display Committee | 15 |
| 2.4 – Qualifications and Ratings of Display Pilots | 16 |
| 2.5 – Display Briefing | 16 |
| CHAPTER 3 TRAINING | 18 |
| 3.1 – Induction | 18 |
| 3.2 – Commitment and Availability | 18 |
| 3.3 – Training Programme | 18 |
| CHAPTER 4 AIRSHOW PROGRAMME | 20 |
| 4.1 – Authorised Airshows (91.703 Aviation Events) | 20 |
| 4.2 – Site and Airspace Assessment | 20 |
| 4.3 – Latest Programme | 22 |
| 4.4 – Human Factors | 23 |
| CHAPTER 5 RISK ANALYSIS | 24 |
| APPENDIX A – DISPLAY BRIEFING | 25 |
| Written Briefing | 25 |
| Verbal Briefing | 25 |
| APPENDIX B – HUMAN FACTORS | 27 |
| Elements of a Human Factors Training Programme | 27 |
| APPENDIX C – RISK ASSESSMENT GUIDE | 28 |

DOCUMENT CONTROL

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Document Development & Review

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| Position | Name | Approval Date |
|--|------|---------------|
| Board of the New Zealand Airshow Association (NZASA) | | 1 July 2017 |

DEFINITIONS

| Definitions | Description |
|--|---|
| Adventure Flights | Any passenger flight starting from the display site purely for the purpose of “Adventure” flying; CAA Part 115. |
| Aircraft Parking Area | A park for aircraft to which the public has no access during the period of the display. |
| Assistant Flying Display Director (ADD) | Works alongside the Flying Display Director (DD) especially in larger airshows. |
| ATC | Services provided by Airways NZ. |
| Aviation Event | Means an event to be conducted below the minimum safe heights prescribed under Part 91 that is – (1) An airshow or practice for an airshow; or (2) An air race or practice for an air race; or (3) An aerobatic competition; or (4) Aerobatic training or practice. |
| Car Parks | Where the words ‘car park(s)’ are used in the text of this guide, the words are only intended to apply to car park(s) to which the public has access during the flying display and as such must be considered the same as the spectator area. |
| Display Area | The ground area the DD intends the display to be confined within. <i>NOTE: This area will vary in size depending on the performance of display aircraft and the numbers of aircraft in any formation.</i> |
| Display Authorisation Evaluator (DAE) | A person authorised by CAA NZ to issue LLDAs. |
| Display Item | A single aircraft, or formation of aircraft, flying as one display ‘act’. <i>NOTE: Random collections of aircraft are not considered to be a single display item unless they are flying together as a formation.</i> |
| Display Line or Axis | A line defining the manoeuvre limit to ensure the minimum separation of display aircraft from the spectator line. |
| Display Pilot | A pilot who holds a Low Level Display Authorisation (LLDA) or exemption, issued by their appropriate national |

| Definitions | Description |
|---|---|
| | <p>authority, which allows them to take part in a flying display.</p> <p><i>NOTE: In NZ this only applies to civil display pilots. Military display pilots are approved and authorised as specified by the MOD.</i></p> |
| Event Organiser | The organiser of an event which includes a flying display. This could be the chairman of an event committee. |
| Flying Display | Any flying activity deliberately performed for the purpose of providing an exhibition or entertainment at an advertised event open to the public. |
| Flying Display Committee (FDC) | The organiser may appoint a group of suitably qualified and experienced pilots to act as the display committee chaired by the Flying Display Director. |
| Flying Display Director (DD) | The person responsible for the safe conduct of a flying display. |
| Low Level Display Authorisation (LLDA) | A national document detailing the types or groups of aircraft in which a pilot is authorised to display, together with any limitations and other specific endorsements. |
| Spectator | A person attending an event and remaining in the areas set aside by the organiser for the public. |
| Spectator Area | Any area that the public can access during flying displays which may include trade sites, tents and spectator grandstands. The boundary of the spectator area closest to the display area is the spectator line. |
| Spectator Line | Means the forward edge of the spectator area. |
| Static Aircraft Park | A park for aircraft to which the public has access at all times. |

BACKGROUND

Flying displays and aviation events form a significant part of the New Zealand leisure industry today and participation, together with their organisation and administration, needs careful consideration if the highest safety standards are to be achieved and maintained. This guide is intended as a code of practice and an indicator of best practice to provide guidance to the Flying Display Director to ensure that the safety of both the participants and the spectators is not compromised.

Participating in or organising flying displays and aviation events carries a heavy responsibility. Safety of the participants and the spectators is paramount. Therefore, only the highest standards are acceptable. Displays must be carefully planned on the ground and in the air and nothing should be considered without ensuring that it is safe. A risk assessment procedure must be included in this process.

The impromptu, ad hoc, unrehearsed or unplanned should never be attempted.

The Event Organiser

One person must assume overall responsibility and identification as the event organiser. Responsibility for particular aspects (such as site survey, air traffic services, provision of emergency services and conduct of flying activities) should only be allocated to people with the relevant experience and, if applicable, licenses.

Rule 91.703(a) prohibits a person from conducting an aviation event or a person operating an aircraft in an aviation event unless the event organiser holds an aviation event authorisation issued by the Director. Under rule 91.703(e) an aviation event authorisation is not required for an aviation event at which not more than 500 people are attending, or there are no more than three (3) participating aircraft, or the aircraft are in one formation.

The Flying Display Director (DD)

The DD is the person responsible for the safe conduct of the flying display and is named as such on the Aviation Event Authorisation. Application for an aviation event authorisation should be made using Form 24091/02 on the CAA website (www.CAA.govt.nz) and in accordance with Civil Aviation Rule (CAR) 91.703 and AC91-1. Alternatively, applications can be made to NZ Warbirds Association on Form WB07 (www.nzwarbirds.org.nz).

Display flying within the airshow environment is unique, and professional standards must be set forth by the industry to maintain public trust. The industry itself is the best source of personnel with the experience necessary to evaluate the competency/safety of individuals wishing to be responsible for flying displays at public events. Membership in NZASA is encouraged. However, membership in an industry-related organisation is not required to participate.

Therefore, the DD must be suitably experienced, subject to the size and complexity of the flying display, in all matters relating to flying in general and flying displays in particular, before being appointed to the position. The DD is responsible for flying discipline, control of the flying display programme, and cancellation or modification to the programme in the case of changing conditions, such as weather, aircraft serviceability or other factors.

The Display Director Programme represents the establishment of a programme within the airshow industry to qualify an individual to control the flying display portion of aviation events in New Zealand.

It is strongly recommended that the DD **should not** be a participating pilot in the airshow.

The DD should ensure that adequate communications are established between all agencies associated with the airshow, for example, emergency services, police, special effects, ground activities, spectator security and flying display participants.

Secondary communications links (land line/cell phone etc.) or secondary radio frequencies should be available for essential control or use in emergencies, to assist the commentator managing the crowd on the public address system.

This manual and its appendices contain the standards and procedures to be used by NZASA in conducting evaluations. It also establishes the process for recommending a Flying Display Director (DD) to the Civil Aviation Authority (CAA).

CHAPTER 1 GENERAL INFORMATION

1.1 – Introduction

To ensure that the Display Director Bank has a future and is sustainable, ADDs who are seen to have qualities of becoming good DDs will be encouraged to participate.

Being a member of the Display Director Bank is seen as a privileged position with NZASA.

1.2 – Flying Display Director Bank

The Flying Display Director Bank is a group of nominated and accepted people for the purpose of being the Display Director (DD) at aviation events. NZASA will maintain the list of qualified DD persons and Assistant Display Directors (ADD).

Before acceptance as a DD or ADD, the NZASA must be satisfied that: **A person is fit and proper as an DD, having regard in particular to his/her previous conduct and experience, his organisation, staffing and other arrangements, to safely organise the proposed flying display.** SEE CAA FPP forms (www.caa.govt.nz).

NZASA will maintain a bank of qualified persons acceptable to NZ CAA to act as DD.

| DD (2017 onwards) | ADD |
|---|---|
| John Lanham Steve Peterson Mark Helliwell Dave Brown Chris Lee Keith Skilling Scott McKenzie Jim Rankin Dean Beverley Gavin Henderson Grant Bisset Merv Falconer | Andrew Love Adam Butcher Ryan Southam Paul Hughan Alan Hogan John Kelly Tim Sullivan Glen Sycamore |

1.3 – Admission to the Bank

A nomination to the NZASA for someone to become a DD or ADD will be in writing with a summary of that person's experience.

The requirements for nomination are industry experience, good attitude, and industry acceptance.

The acceptance into the bank will be a joint decision between the NZASA and the NZCAA. Nominations must be dealt with and the result notified to the nominee within eight (8) weeks.

The NZASA Committee shall list approved DDs and ADDs on the NZASA website (www.NZASA.co.nz).

1.3.1- Qualifications

Only one of the qualifications listed below may be waived by NZASA for the purposes of securing an otherwise well-qualified individual to serve as a DD.

1. Current or previously qualified DD or ADD;
2. Minimum (five) 5 years of airshow event management or airshow performance experience;
3. Able to attend NZASA DD conference / training biennially;
4. Hold a current NZ CAA FPP Status;
5. Written recommendation from a current DD;
6. Hold a current aviation medical or make a Medical health declaration.

1.3.2 - Disqualifiers

DD and ADD applicants may be disqualified if, in the past seven years, the applicant has:

1. Been convicted of a violation of any law pertaining to drugs or alcohol;
2. Been convicted of any misdemeanour or felony offenses;
3. Been imprisoned;
4. Been discharged from the military for disciplinary reasons;
5. Had an aviation certificate (other than medical), rating or authorisation (or foreign equivalent) suspended, revoked or paid a civil penalty as a result of a violation of any NZ CAA or other Civil Aviation Authority regulations.

1.3.3 - Tenure

The NZASA will recommend DDs and ADDs for a three (3) year term. Final approval lies with NZASA but CAA may veto a nomination with just cause.

1.3.4 - Selection

Applicants:

1. Provide written letter of intent/desire for DD or ADD selection;
2. Provide documentation satisfying all qualifications outlined in 1.3.1 above;
3. Provide detail of aviation background (event experience, display experience, etc...);
4. Provide any additional information requested by the NZASA.

NZASA:

1. DD and ADD applications may be submitted once each calendar year;
2. DD and ADD applications will be reviewed by the NZASA at each meeting;
3. The NZASA will approve, disapprove, or request additional information;
4. Upon request, the DD or ADD applicant will provide additional information within 30 days;
5. Upon disapproval, the DD or ADD applicant may re-apply the next calendar year if desired.

1.4 – Exit from the Bank

The bank will consist of DDs and ADDs. In general, an ADD will learn whilst supporting the DD in their role. Retiring DDs have the option of fulfilling the ADD role.

A letter of resignation may be presented if a DD or ADD feels they can no longer contribute or fulfil the role. A resignation letter will be dealt with and communicated to the person within 14 days.

The NZASA may recommend revocation of an individual's DD status. The CAA may also recommend a DD revocation in writing to the NZASA, the NZASA is responsible for conducting a review for revocation.

1.4.1 - The NZASA will use the following criteria when considering DD revocation

1. DD/ADD self-initiated request for revocation;
2. Failure to abide by the NZASA/ICAS Standards and Code of Ethics in the NZASA/ICAS Manual;
3. Safety record of events to which the DD was responsible;
4. Any grievances concerning the DD;
5. Lack of required industry currency for every 3-year period;
6. Lack of attendance at the NZASA conference or completion of biennial refresher training;
7. Inadequate event reports submitted by the DD.

1.5 – Administration of the Bank

A training programme and competency oversight will be part of the regular quarterly meetings. These meetings will have a brief minutes page for coverage of who is present and what training is completed. These minutes are to be kept in a folder marked "Display Director Training" held by the NZASA for future verification, if required.

1.5.1 Personal records

NZASA will be the primary source and information on the DD programme. NZASA is responsible for answering all inquiries related to the NZASA charter, structure, activities operations and DD programme.

NZASA will maintain records on an internal database for a period of no less than five years. Records are confidential and will not be made available to other than NZASA members, unless by court order.

NZASA is responsible for maintaining personal records pertinent to the DD programme, including following:

1. Applicant files including contact information;
2. Personal DD and ADD files;
3. Airshow reports and/or grievances;
4. Details of all individuals within the bank of intermediate and senior Display Directors;
5. DD address and contact information;

6. DD expiration dates;
7. FDC committee proceedings and meetings;
8. Recommendations on the issuance/suspension/revocation of DD competency to the CAA;
9. Any other data pertinent to the administration of the DD programme deemed necessary.

NZASA will maintain the DD bank and provide a repository for records, forms and reports.

1.5.2 Expenses

1.5.2.1- Fees

1. NZASA shall set fees for DD and ADD applications.
2. DDs and ADDs may charge a fee for their services. The fee should be reasonable and relevant to the time, expenses, and the size of the event. Fees should be agreed by the event organiser and the DD prior to the event.

1.5.2.2 - Funding

The NZASA is responsible for establishing and providing funding to support the DD programme. As a minimum, funding will cover:

1. Records maintenance;
2. NZASA committee meetings;
3. Administration.

CHAPTER 2 - RESPONSIBILITIES

2.1 – Responsibilities of the Flying Display Director (AC91-1)

2.1.1- Preliminary Planning

The event organiser must establish in writing the responsibilities of all personnel including the DD so there are no misunderstandings over individual responsibilities. The event organiser is responsible for the overall coordination of planning, supervision of safety, site evaluation, community consultation and risk assessment.

The event organiser and the DD will, in particular, need to consider and be aware of each other's responsibilities including:

1. Event site and flying display management covering:
 - a) Site assessment;
 - b) Airspace/air traffic management requirements;
 - c) Spectator enclosures, car parks and public address system;
 - d) Areas and buildings outside the event where members of the public may congregate, busy roads and railway lines – which are put at increased risk by the fact the display is happening;
 - e) Parking and ground manoeuvring of aircraft (participants, visitors, static display);
 - f) The display line;
 - g) Over-flight of spectators and car parks;
 - h) Setting of minimum heights;
 - i) Aircraft maximum speeds;
 - j) Weather minima;
 - k) Use and allocation of radio frequencies;
 - l) Ground special effects safety;
 - m) Briefing;
 - n) Document checks;
 - o) Flying programmes;
 - p) Pleasure or commercial passenger flights;
 - q) Any hazards in participating aircraft that may need to be made safe for emergency services should an incident occur.
2. Risk assessment;
3. Emergency plan.

2.1.2 -

The DD is the person responsible for supervision of compliance with Civil Aviation Rules and for the safe conduct of the flying display and is named as such on the Aviation Event Authorisation issued for the event.

2.1.3 -

The DD is responsible for flying discipline, control of the flying display programme and cancellation or modification to the programme in the case of changing conditions such as weather, aircraft serviceability or other factors. Where appointed, the ADD will assist the DD in carrying out his duties and responsibilities.

2.1.4 -

At small flying displays – three (3) items or less - the pilot of a participating aircraft may act as the DD.

2.1.5 -

At a flying display with up to six (6) items, the role of event organiser and DD may be combined if the event organiser is suitably qualified. It is however recommended to separate these two duties where possible. At displays of seven (7) items or more, a separate DD should be nominated.

2.1.6 -

It is very strongly recommended that DDs at displays of seven (7) or more items should not take any other part in the flying display, especially as a participant, commentator or organiser.

2.1.7 -

DDs wishing to direct displays of seven (7) or more items are required to undergo further briefing as a condition of their acceptance. Additional information may be sought from the NZASA or CAA SFORA Unit.

2.1.8 -

It is essential that the DD has adequate communications with all appropriate agencies and the flying display participants throughout the flying display. In the event that the DD is sited away from the air traffic services unit, it is recommended that a fixed communications link is established to enable instant two-way communications in the event of an emergency arising. Mobile telephones should not to be used for this purpose, except in extremes.

2.1.9 -

It also follows that there is a robust means of communication with the commentator in order to liaise when programme changes have been made and more importantly if an emergency arises the commentator will be essential if crowd control is required.

2.1.10 -

The DD must take an active role in every aspect of the flying display including selection of display items, display timings including pre-event briefings with on and off site emergency services where appropriate. The DD must ensure display routines are approved.

2.1.11 –

The DD must conduct a display briefing each day of the event prior to the commencement of flying activities.

2.1.12 -

During the display, the DD should monitor the safety of the display, supported by any Flying Display Committee and/or DAEs present, using the information they have about the ground area to be displayed over and the manoeuvres that performing pilots intend to perform. The DD should stop the display item or in some cases the whole display where this is justified by safety concerns.

The DD is also responsible for ensuring that minimum heights and display lines are observed.

2.1.13 -

Prior to the flying display, DDs are responsible for checking all required pilot documentation. Where possible, the DD should receive display pilot certification forms at least seven (7) days before the commencement of the event to allow sufficient time to review pilot qualifications and ensure that currency requirements have been met.

2.1.14 -

Details of any serious breaches resulting in stop calls should be recorded by the DD and included in their report on the event.

2.1.15 -

The DD is responsible to make sure an integrated emergency plan is in place for the event and the emergency plan must be agreed by all the services having a role to play within the plan (the event organiser is responsible for drafting the plan).

2.2 – Responsibilities of the Assistant Flying Display Director (AC91-1)

At larger, more complex aviation events that may involve pyrotechnics, special effects, simultaneous air and ground events, or multiple radio frequencies and communications, an ADD should be appointed.

It is recommended that the ADD work alongside and provide safety surveillance support to the DD during the airshow. If the size or layout of the aviation event precludes adequate coverage by the DD and ADD, then safety observers may be required.

2.3 – Responsibilities of the Flying Display Committee

2.3.1 -

It is strongly recommended that a Flying Display Committee (FDC) is utilised at displays of seven (7) or more items. The roles of the FDC are:

1. To assist the DD in monitoring display standards;
2. To provide specialist knowledge for specific display items;
3. To provide opinion to the DD in the case of any regulatory infringements; and
4. To assist the DD with the planning and conduct of the event.

2.3.2 -

Advice on whether such a committee is required may be obtained from the NZASA or CAA.

2.3.3 -

The FDC should, wherever possible, comprise pilots with experience on the types of aircraft being flown at the flying display. Additionally, members of the FDC should hold, or have held, a civilian LLDA, or have extensive military flying display experience.

2.3.4 -

Early in the planning of an aviation event, the organiser should delegate specific responsibility for some of the activities such as aircraft parking, spectator control and car parking to FDC members. These members should establish a pattern of communication through the DD, ADD or to the organiser. FDC involvement in these areas of planning is necessary to ensure that spectator areas and the display area maintain the minimum separation distances required.

2.3.5 -

FDC members should be available throughout the period of the flying display and some members who have mobile communication equipment should act as safety observers. Hazardous or potentially hazardous conditions should be communicated from the safety observers to the DD, ADD or to the organiser as appropriate.

2.3.6 –

- (a) The display director is solely responsible for stopping a display, or grounding aircraft or pilots.
- (b) The display director is solely responsible or directly gives responsibility to one person to talk to the media in case of an accident.
- (c) The display director is solely responsible or delegates clearly to a person to use the public address system to control spectator movement in case of an accident.

2.4 – Qualifications and Ratings of Display Pilots

The minimum standards for a display pilot's recent experience, display experience, and skills required for formation flight, aircraft handling displays, and aerobatic routines need to be set at an early stage in the planning of an aviation event. These standards are normally set by the organiser and flying display director, through the Flying Display Committee. All display pilots must hold a NZ LLDA or equivalent DA.

2.5 – Display Briefing

2.5.1 -

A thorough and formal briefing is an essential part of any aviation event irrespective of the size or simplicity of the event. No pilot should fly in an aviation event without having received a briefing from the DD, ADD (or other nominated person). A list of relevant briefing points is attached in Appendix A.

2.5.2 -

A complete written briefing should be sent in advance to all participating pilots, special effects personnel, other display personnel and if applicable, any local operators who may be affected by the aviation event.

2.5.3 -

A formal verbal briefing should be given each day of the aviation event, including any practice

days. Weather minima, alternate airports, restricted area boundaries, and any display changes need to be notified at the daily briefing.

2.5.4 -

Any display pilot who does not operate from the venue of the aviation event or is unable to attend the formal briefing should be formally briefed by the DD or ADD by telephone or radio prior to any display.

CHAPTER 3 TRAINING

NZASA will conduct a DD training course each year. Additional 'on the job' experience can be gained by participation at airshows throughout NZ the year. NZASA DD course will follow the ICAS "Air Boss" training syllabus (see Air Boss 201). Completion of the NZASA DD course is mandatory for all DDs and ADDs.

3.1 – Induction

Once accepted to the DD or ADD position, an individual must complete the NZASA 'induction briefing' and "Air Boss 201" presentation. This process enables standardisation, rules currency, inclusion of personal experience, and a review of specific occurrences and local procedures to the programme.

3.2 – Commitment and Availability

The failure of a key system during aircraft operation is likely to lead to catastrophic results. Display Directors play a critical role in the aviation safety system.

The role of the DD is vitally important to ensure a safe operating environment and DD duties must be the primary focus of incumbents.

Where a DD applicant is likely to have responsibility for multiple senior person roles that conflict in interest (e.g. being DD, a display pilot, event organiser, etc.) then their time resource available for DD duties will be considered in their selection.

All DDs and ADDs must attend a biennial NZASA DD course or conference. Each year the NZASA DD course/conference will review "lessons learned" from NZ and international aviation events.

There may be an occasional requirement to hold a special training session or course if urgent changes are needed.

3.3 – Training Programme

The NZASA training programme will include, but is not limited to:

1. CAA rules;
2. Staffing and appointment of support personnel;
3. Site assessment;
4. Risk assessment;
5. Display lines;
6. Display minimum heights;
7. Interaction with local operators;
8. Selection of display elements;
9. Military participation;
10. Display with mixed elements (parachutes, land vehicles, drones etc.);
11. Special effects (pyrotechnics, blank firing, RC aircraft, etc.);

12. Air races and rallies;
13. Non-aerodrome based events;
14. Display pilot approval;
15. Weather minima;
16. Communications;
17. Display briefing and facilities;
18. Parking and ground manoeuvring of aircraft
19. Non-display aircraft movements.

CHAPTER 4 AIRSHOW PROGRAMME

4.1 – Authorised Airshows (91.703 Aviation Events)

No person shall conduct an aviation event, and no person shall operate an aircraft in an aviation event, unless the organiser of the event is the holder of an aviation event authorisation issued by the Director.

NZWA holds a delegation from the Director to authorise aviation events.

4.2 – Site and Airspace Assessment

4.2.1 - Site Assessment

Where the flying display is held at a licensed aerodrome, the aerodrome licensee remains responsible for ensuring that the conditions of the aerodrome licence are not infringed. If any such condition is likely to be infringed then early discussion must take place between the event organiser or the DD, the aerodrome licensee and CAA aerodrome standards. The aerodrome licensee, his representative or the aerodrome operators (if the aerodrome is unlicensed) must be involved at all stages of preparation for the flying display.

4.2.2 -

While many flying displays and special events are held at licensed aerodromes and can take advantage of facilities already available, many are staged at other sites. In assessing any proposed site the DD should take into account:

1. The suitability of surfaces used by aircraft for take-off, landing and taxiing;
2. The take-off and landing distances available and required;
3. Obstructions in the vicinity with regard to the aircraft types which are expected to take part;
4. The proximity of congested areas, particularly if they include schools or hospitals. A congested area is defined as being any area in relation to a city, town or settlement which is substantially used for residential, industrial, commercial or recreational purposes. It should be noted that, with few exceptions, flight below 1000 feet over such areas is illegal except when an aircraft is taking off, practising approaches to or landing at a licensed or government aerodrome;
5. The proximity of any sensitive or restricted areas (refineries or hospitals, etc.). Local police should be able to advise on such areas;
6. The presence of livestock or wildlife conservation areas;
7. The proximity of controlled airspace, aerodromes, heliports, helipads, airstrips, microlight sites, ballooning sites, parachuting, hang gliding, gliding, ridge soaring, paragliding sites and UAV operations.
8. The availability of clear entry and exit routes for on and /or off site emergency service vehicles appropriate to the scale of the event.
9. **Display line**

In order that display pilots can identify the minimum separation distance from the spectator area, a display line should be marked by white-washed lines or “dayglo” panels. This requirement may be waived at the discretion of the DD if there is a suitable and easily recognisable physical feature that can be used as a display line such as a

runway or fenceline, provided that it satisfies the orientation and minimum distance criteria. Display line distances vary depending on aircraft speed and type of manoeuvres, and are specified in AC 91-1.

4.2.3 -

DDs should consider imposing minimum height restrictions over local sensitive and congested areas. Details of any restrictions imposed should be clearly promulgated in the flying display instructions and form part of the application for an aviation event authorisation.

4.2.4 - Airspace

The FDC must establish the lateral dimensions of the display area by considering the factors specified at 4.2.2 and the vertical dimensions of the display area by considering the types of planned display aircraft and proximity to, or availability of, controlled airspace. Consultation may be required with Airways NZ to establish the availability of controlled airspace. Once the event requirements are established the appropriate notices should be filed as early as possible.

Once the dimensions of the display area have been established by the FDC, the DD should provide this information to all participating pilots. Participating pilots must then establish that their planned display can be contained within the display area and confirm this to the DD.

The DD is responsible for issuing the event NOTAM and any Aeronautical Information Publication New Zealand (AIPNZ) supplements if required, please see:

[http://secureorders.airways.co.nz/aimsites/docs/Publishing_and NOTAM Guide.pdf](http://secureorders.airways.co.nz/aimsites/docs/Publishing_and_NOTAM_Guide.pdf).

Notices for inclusion in AIP Supplements must be submitted at least 90 days prior to the event.

A NOTAM can be requested by completing a NOTAM Request Form (see CAA Forms Appendix) or requesting via the Airways IFIS website at www.ifis.airways.co.nz.

Changes that Require the Issue of NOTAM:

A NOTAM is required to be issued by an originator whenever the following is of operational significance:

1. The establishment, closure or a significant change in the operation of a runway that is published in the AIPNZ;
2. The interruption of, or return to operation of, major components of an aerodrome lighting system;
3. The occurrence or correction of major defects or impediments in a manoeuvring area;
4. Changes to and limitations on availability of fuel, oil and oxygen at international aerodromes;
5. The establishment, withdrawal or return to operation of hazard beacons marking significant obstacles to air navigation;
6. Any change in regulations or rules that require immediate action such as prohibited areas for search and rescue;
7. The presence of hazards that affect air navigation including obstacles, military exercises, displays, races, major parachuting events outside promulgated sites;
8. The erection, removal of or changes to significant obstacles to air navigation in the take-off/climb, approach, and missed approach areas, and runway strip;
9. The establishment, discontinuance, activation or de-activation, or changes in the status of prohibited, restricted or danger areas;

10. Any change from the published category of rescue and fire-fighting services available at an aerodrome;
11. Any other operationally significant circumstance.

4.2.5 - Rule exceptions for aviation events

Part 91 provides exceptions from the normal operating flight rules for aircraft that are being operated at an aviation event. These are as follows:

1. Operating on and in the vicinity of an aerodrome
Under rule 91.223(b), a pilot-in-command of an aircraft operating at an aviation event in accordance with rule 91.703 is not required to comply with the requirements relating to performing a left-hand or right-hand aerodrome traffic circuit as specified in the rule, or, unless otherwise authorised or instructed by ATC, any special aerodrome traffic rules prescribed in Part 93;
2. Aircraft speed
Rule 91.237(a) restricts aircraft speed to not more than 250 Kts below 10,000 feet AMSL. However, this restriction does not apply to aircraft being operated as part of an aviation event in accordance with rule 91.703;
3. Minimum height for VFR flight
Rule 91.311 requires the pilot-in-command of an aircraft over any area other than a congested area of a city, town or settlement, or over any open air assembly of persons, to fly at a height of not less than 500 feet above the surface. However, this rule provides an exception from the 500 foot minimum height requirement when the aircraft is being operated at an aviation event in accordance with rule 91.703;
4. Aerobatic Flight Rule 91.701(a)
Rule 91.701(a) prohibits aerobatic flight over, or within a horizontal distance of 600 metres, of a congested area of a city, town, settlement, an open air assembly of persons, or within controlled airspace unless approved by ATC. However, rule 91.701(e) allows a pilot to operate an aircraft within a horizontal distance of 600 metres from spectators at an aviation event if the pilot is participating in that event in accordance with rule 91.703;
5. Aerobatic Flight Rule 91.701(b) & (c)
Rules 91.701(b) & (c) prohibit aerobatic flight below a height of 3000 feet unless the pilot holds an aerobatic rating issued under Part 61. With the appropriate rating, the lower limit is 1500 feet. Rule 91.701(c)(2) allows aerobatic flight below a height of 1500 feet and down to the height specified in the pilot's aerobatic rating provided that pilot is participating in an aviation event. It should be noted that the definition of an aviation event in CAR Part 1 includes practicing for a display;
6. The rule exceptions mentioned above are not applicable outside the aviation event area, nor between non-participating aircraft and participating aircraft at the aviation event.

4.3 – Latest Programme

The DD is responsible for updating or amending the flying programme whenever there are changing conditions such as weather, aircraft serviceability or other factors, and notifying these changes to participating pilots.

The latest version of the flying programme should be distributed at the display briefing and pilots given an opportunity to advise or discuss any conflicts or problems that arise with timing.

Throughout the flying day, programme changes can be notified by using an electronic means or

by using an alternative radio frequency for communicating with pilots.

4.4 – Human Factors

The principal mission of the NZASA and Civil Aviation Authority of New Zealand (CAA) is to promote safety and security. Given the extent to which human factors plays a part in accidents and incidents, it is appropriate that greater importance is placed on the improvement of appropriate human factors skills within the New Zealand airshow industry. This goal is in keeping with the International Civil Aviation Organisation (ICAO) which has also recognised the importance of improving aviation human factors in accident prevention, and has mandated within the Standards and Recommended Practices of the Convention on International Civil Aviation under Annex I (Personnel Licensing) and Annex 6 (Operations of Aircraft) that training of the human performance aspects during aircraft operations be undertaken. The ICAO guidance material to design a training programme and to develop knowledge and skills in human performance can be found in the *Human Factors Training Manual* (ICAO Doc 9683). The DD course will include training on human factors.

Elements of the human factor training which must be addressed in DD course are listed in Appendix B.

CHAPTER 5 RISK ANALYSIS

The safety of the public, whether in the air or on the ground, is the first concern of the NZASA and the Civil Aviation Authority (CAA). Our purpose is to minimise the risks associated with air events. We do this by ensuring that the regulatory framework is well designed and by taking action to see that the standards established in that framework are met by event organisers, display directors, pilots, aircraft operators, aerodromes, engineers and air traffic controllers. We take every opportunity to learn from events that will help us to enhance the safety measures, activities and regulations that we implement.

A risk assessment must be part of the event planning process.

Refer to Appendix C – Risk Assessment

APPENDIX A – DISPLAY BRIEFING

Written Briefing

The DD is responsible for sending a written briefing to all participants in advance of the aviation event. As a guide the following items should be included:

1. Place, date, time and duration of the flying display and place/time of the daily formal briefing;
2. Map of the display location, showing site layout, spectator enclosures, car parking, display lines and any adjacent restricted areas or congested area;
3. Air traffic facilities available, arrival and departure procedures, radio frequencies, procedures during the airshow, local diversion airfields, and any local flying restrictions;
4. Flying display weather minima and flying display minima;
5. Display routine rehearsal, current flight experience, display approval requirements;
6. Display lines and display minimum heights to be strictly observed and only practised manoeuvres including bad weather “flat routines” to be flown;
7. Only essential flight crew to be carried in display;
8. Display pilot certification applies to ALL pilots irrespective of routine or display complexity;
9. Procedures for other events such as parachuting, glider flights and pyrotechnics or special effects;
10. Procedures for any programme cancellation, or variation;
11. Aircraft parking and refuelling facilities;
12. Arrangements for visiting aircraft and local pleasure or commercial passenger flights;
13. Emergency plan and emergency services;
14. Contact details of organiser and DD.

Verbal Briefing

The DD is responsible to ensure that all participating pilots, military display director, special effects personnel, and any ground display personnel receive a verbal briefing prior to the flying display on each day of the event.

The CAA, or delegated Part 149 organisation authorisation for the aviation event, together with any conditions, exemptions or other variations must be available at the briefing.

Non-participating pilots who wish to operate during the period of the airshow must also receive a verbal briefing to confirm or vary established procedures and separation from the display flying.

Pilots of aircraft not operating from the display venue must receive telephone or radio briefings.

The following items should be included in the verbal briefing:

1. Time check (UTC or local time): Advisory Circular AC91-1 Revision 4, 12 April 2012 26 CAA of NZ;
2. Attendance check, and verify pilot certification forms are completed by ALL display pilots;
3. Weather briefing provided for the display area and conditions at alternate airfields are made available to pilots throughout the event;
4. Brief revision of contents of written brief, with particular emphasis on display lines and height minima, adherence to display routines, and no unrehearsed manoeuvres;
5. Latest version of flying programme;
6. Radio frequencies to be used;
7. Airborne holding positions for display aircraft;
8. Start-up, taxi, run-up procedures for available runways;
9. Takeoff, departure and rejoin procedures for available runways;
10. Suitable forced landing and abandonment areas;
11. Specific briefing on other activities such as gliding demonstrations, parachuting, model aircraft display, UAV operations, special effects hazard zones and danger hemispheres;
12. Handling of emergencies and emergency plan as it would affect the flying display. Possible use of a single code word to stop the flying display;
13. Ground handling and fuelling procedures;
14. Any questions or clarification requests including programme timing;
15. Contact details for the DD, ADD, safety officer, pyrotechnics leader and FDC members during the period of the display.

APPENDIX B – HUMAN FACTORS

Elements of a Human Factors Training Programme

| Core Elements | Sub Elements |
|---|--|
| Threats and errors | <ul style="list-style-type: none"> • Types of threat and errors • Threat identification • Threat management strategies • Error chain • Error prevention and detection • Error management strategies |
| Organisational factors | <ul style="list-style-type: none"> • Organisational factors, latent risks • Organisational risk tolerance • SOPs development based on human factors • Organisation culture re SOPs adherence |
| Stress and fatigue | <ul style="list-style-type: none"> • Identify stress • Effects of stress • Stress management techniques • Fatigue and tiredness - causes and symptoms |
| Situational awareness and workload management | <ul style="list-style-type: none"> • Loss of situational awareness - recognition and recovery • Capacity limitations and cognitive overload • Workload management strategies • Prioritization • Managing distractions |
| Decision making | <ul style="list-style-type: none"> • Decision making skills • Problem solving techniques • Risk management |
| Communication | <ul style="list-style-type: none"> • Standard phraseology • Internal and external communication • Briefings |
| Individual responsibilities | <ul style="list-style-type: none"> • I'm Safe • Display practice • Display discipline • Managing ego |

APPENDIX C – RISK ASSESSMENT GUIDE

From NZCAA AC 91-1 Appendix B

This Risk Assessment Guide is one of many ways of assessing risk. All aviation events present hazards that may cause harm to people. For this reason an aviation event organiser should identify hazards and remove or minimise the risks associated with them. This process may also require the assistance of the Flying Display Director and the Flying Display Committee.

1. Avoid making the assessment system too complicated. The following is a suggested method of assessing risk. Risk can be defined as:

Severity of the risk if it occurs × likelihood of the occurrence

2. There are five steps to risk assessment:
 - (a) Identify the activities associated with the event that have hazards and where the hazards occur;
 - (b) Identify those at risk and how they may be harmed;
 - (c) Identify existing precautions;
 - (d) Evaluate the risks. This will involve a combination of the likelihood and severity of the identified risk;
 - (e) Decide what further mitigation may be required.
3. The **severity** of a risk may be assessed under the following headings and points allocated:

| Trivial | Minor Injury | Serious Injury | Single Fatality | Multiple Fatality |
|----------------|---------------------|-----------------------|------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |

4. The **likelihood** of the risk occurring may be assessed against the following headings and points allocated:

| Improbable | Possible | Quite Possible | Likely | Highly Likely |
|-------------------|-----------------|-----------------------|---------------|----------------------|
| 1 | 2 | 3 | 4 | 5 |

5. A suggested matrix to evaluate risk ratings is as follows:

| Risk | Severity | Likelihood | Rating | Mitigation | Mitigation Factor | Final Rating |
|--|-----------------|-------------------|---------------|---|--------------------------|---------------------|
| Aircraft accident involving spectators | 5 | 3 | 15 | Strict adherence to display lines, briefings | Reduces likelihood to 1. | 5 |
| Fire in car parking or spectator area | 3 | 3 | 9 | Provision of mobile fire-fighting and first aid equipment | Severity reduced to 2. | 6 |

This matrix does not assume or infer a risk level. However, it does provide guidance as to the factors to be considered.

A final rating of less than 6 indicates a low risk, between 6 and 15 a medium risk, and above 15 a high risk factor. High risk factors should be deemed unacceptable. Mitigation action should be taken whenever possible even when the risk is low.

6. At an aviation event risks vary from the risks of an aircraft accident involving spectator casualties, to a vehicle fire in the car parking area, to a spectator requiring first aid treatment. The methods of mitigating the various risks will also vary from ensuring a thorough briefing of all display participants, ensuring adherence to display lines, to provision of first aid facilities for spectators and good spectator communication facilities.
7. A good emergency plan will provide a common document for use by the aviation event management and the providers of police, ambulance, fire, and spectator security.
8. Compliance with a Civil Aviation Rules does not in itself ensure safety when viewed in combination with spectators, supporting events, and restricted or concentrated areas of activity which are normally not part of the aviation environment to which the public have access or involvement.