



CAR 102 UNMANNED AIRCRAFT OPERATIONS MANUAL

Revision 4.3 – Aug 2023

Affiliated to the Fédération Aéronautique Internationale

Contact Details
Model Flying NZ
URL: www.mfnz.org
email: president@mfnz.org



Amendment Status

Revision	Change Detail	Date	Approved
1	Initial Issue	Nov 2015	
2	General Update for reapplication	Nov 2017	
3	Change of prime person and address for service. Amend 2.6.1 (original document)	July 2020	
4	Update for 5-year re-entry. Reformatted and expanded, addition of ops above 400ft within 4km of uncontrolled aerodrome, CAT 2 MAUW raised to 150kg, Shielded BVLOS.	August 2022	
4.1	CAA Requested Clarification on Re-Entry. Prime person responsibility clarified. Addition of observer training through wings and On-Site training form. BVLOS Form added. BVLOS clarified along with Figure 1. Risk Assessment Template added to appendices. Night Rating endorsement added to Wings Program. 102 Matrices moved to separate document.	Nov 2022	
4.2	CAA Requested addition on Re-Entry. Addition of Events. Expansion on Night Ops. Addition of initial site approval to Shielded BVLOS	Jan 2023	
4.3	Minor corrections and flexibility added to person able to discharge Prime Person role. Email addresses and URLs updated to new mfnz.org domain 1.4.1 – Prime Person definition amended. 1.4.2 – LMC role removed from senior persons 1.4.2 – President added as Senior Person 1.4 – Resourcing moved to Presidents responsibility 3.1.4 – Amended CAT 3 to align with LMCOP 4.4 – Added President role description References to President amended to Prime Person as necessary.	Aug 2023	





List of Effective Pages

Page	Date	Page	Date	Page	Date
1	19 Jan 2023	21	26 Aug 2022	41	26 Aug 2022
2	19 Jan 2023	22	26 Aug 2022	42	26 Aug 2022
3	19 Jan 2023	23	26 Aug 2022	43	19 Jan 2023
4	19 Jan 2023	24	26 Aug 2022	44	19 Jan 2023
5	19 Jan 2023	25	26 Aug 2022	45	19 Jan 2023
6	19 Jan 2023	26	11 Nov 2022	46	26 Aug 2022
7	19 Jan 2023	27	26 Aug 2022	47	26 Aug 2022
8	26 Aug 2022	28	26 Aug 2022	48	19 Jan 2023
9	26 Aug 2022	29	26 Aug 2022	49	26 Aug 2022
10	11 Nov 2022	30	26 Aug 2022	50	26 Aug 2022
11	30 Aug 2023	31	26 Aug 2022	51	26 Aug 2022
12	19 Jan 2023	32	26 Aug 2022	52	11 Nov 2022
13	26 Aug 2022	33	30 Aug 2023	53	19 Jan 2023
14	30 Aug 2023	34	11 Nov 2022	54	30 Aug 2023
15	30 Aug 2023	35	26 Aug 2022	55	30 Aug 2023
16	30 Aug 2023	36	26 Aug 2022	56	30 Aug 2023
17	26 Aug 2022	37	26 Aug 2022		
18	26 Aug 2022	38	26 Aug 2022		
19	26 Aug 2022	39	26 Aug 2022		
20	11 Nov 2022	40	26 Aug 2022		



Table of Contents

Amendment Status	1
List of Effective Pages	3
Definitions and Abbreviations	10
1 Introduction	11
1.1 About Model Flying New Zealand	11
1.2 Organisational Statement	11
1.3 Model Flying New Zealand Organisation Structure	12
1.4 Senior Persons	13
1.4.1 Prime Person	13
1.4.2 President	13
1.5 Administrative Details	14
1.5.1 Registered Name	14
1.5.2 Address for Service	14
1.5.3 Email contacts	14
2 Scope of Operations	15
2.1 Introduction	15
2.2 Limitations	15
2.3 Areas of Operation	16
2.4 Authorised Departures from CAR Part 101 (“Privileges”)	16
2.5 Operations Not Authorised	16
3 Aircraft	17
3.1 Introduction and Large Model Code of Practice	17
3.1.1 Initial Airworthiness Standards	17
3.1.2 Maintenance	17
3.1.3 Large Model Categories	17
3.1.4 Large Model Code Of Practice Power limits (Category 3)	17
3.1.5 Registration of Aircraft	17
3.2 Categories of Model Aircraft	18
3.2.1 Aircraft with a gross MTOW below 15kg and less than LMCOP power limits	18
3.2.2 Aircraft with a gross MTOW below 15kg and above LMCOP power limits – LMCOP CAT 3	18
3.2.3 Aircraft with a gross MTOW above 15kg and below 25kg – LMCOP CAT 1	18
3.2.4 Aircraft with a gross MTOW above 25kg and below 150kg – LMCOP CAT 2A & B	18
4 Personnel	20
4.1 Overview	20
4.2 General Duties	21



- 4.2.1 Purpose 21
- 4.2.2 Specific Requirements of Model Flying New Zealand 21
- 4.3 Prime Person 22
 - 4.3.1 Purpose 22
 - 4.3.2 Scope 22
 - 4.3.3 Duties and Responsibilities 22
 - 4.3.4 Qualifications 22
- 4.4 President 23
 - 4.4.1 Purpose 23
 - 4.4.2 Scope 23
 - 4.4.3 Duties and Responsibilities 23
 - 4.4.4 Qualifications 23
- 4.5 Large Model Controller 24
 - 4.5.1 Purpose 24
 - 4.5.2 Scope 24
 - 4.5.3 Reports To 24
 - 4.5.4 Duties and Responsibilities 24
- 4.6 Wings Controller 25
 - 4.6.1 Purpose 25
 - 4.6.2 Scope 25
 - 4.6.3 Reports To 25
 - 4.6.4 Duties and Responsibilities 25
- 4.7 Secretary 26
 - 4.7.1 Purpose 26
 - 4.7.2 Scope 26
 - 4.7.3 Reports To 26
 - 4.7.4 Duties and Responsibilities 26
- 4.8 Pilot 27
 - 4.8.1 Purpose 27
 - 4.8.2 Scope 27
 - 4.8.3 Reports To 27
 - 4.8.4 Duties and Responsibilities 27
 - 4.8.5 Qualifications 28
- 4.9 Observer 29
 - 4.9.1 Purpose 29
 - 4.9.2 Scope 29



- 4.9.3 Reports To..... 29
- 4.9.4 Duties and Responsibilities 29
- 5 Management Procedures 30
 - 5.1 Expiry, Revocation or Suspension of Certificate 30
 - 5.1.1 Purpose 30
 - 5.1.2 Responsibility 30
 - 5.1.3 Procedure..... 30
 - 5.2 Changes to Operations..... 31
 - 5.2.1 Purpose 31
 - 5.2.2 Responsibility 31
 - 5.2.3 Procedure..... 31
 - 5.3 Manuals and Documentation 32
 - 5.3.1 Purpose 32
 - 5.3.2 Responsibility 32
 - 5.3.3 Procedure..... 32
 - 5.3.4 Document Control 32
 - 5.4 Control and Amendment of this Manual 33
 - 5.4.1 Purpose 33
 - 5.4.2 Scope..... 33
 - 5.4.3 Responsibilities 33
 - 5.4.4 Procedure..... 33
 - 5.5 Personnel Records 35
 - 5.5.1 Purpose 35
 - 5.5.2 Scope..... 35
 - 5.5.3 Responsibilities 35
 - 5.5.4 Procedure..... 35
- 6 Training and Competency..... 36
 - 6.1 Overview 36
 - 6.2 Model Flying New Zealand Wings Program 37
 - 6.2.1 Purpose 37
 - 6.2.2 Scope..... 37
 - 6.2.3 Responsibilities 37
 - 6.2.4 Definitions..... 37
 - 6.2.5 Endorsements 37
 - 6.2.6 Procedure..... 38
- 7 Risk & Hazard Management 39



- 7.1 Introduction to the Bow Tie Diagram 39
- 7.2 Bow Tie Diagram 40
- 8 Standard Operating Procedures 41
 - 8.1 Personal Pre-flight..... 42
 - 8.1.1 Purpose 42
 - 8.1.2 Responsibility 42
 - 8.1.3 Procedure..... 42
 - 8.2 Flight Planning..... 43
 - 8.2.1 Purpose 43
 - 8.2.2 Scope..... 43
 - 8.2.3 Responsibilities 43
 - 8.2.4 Aviation Planning 43
 - 8.2.5 Related Documents..... 43
 - 8.3 Issuing NOTAMs 44
 - 8.3.1 Purpose 44
 - 8.3.2 Scope..... 44
 - 8.3.3 Procedure..... 44
 - 8.4 Visual Line of Sight 45
 - 8.4.1 Purpose 45
 - 8.4.2 Scope..... 45
 - 8.4.3 Responsibility 45
 - 8.4.4 Visual Line of Sight 45
 - 8.4.5 Extended Visual Line of Sight..... 45
 - 8.5 Beyond Visual Line of Sight – Shielded Operations 46
 - 8.5.1 Purpose 46
 - 8.5.2 Scope..... 46
 - 8.5.3 Responsibility 46
 - 8.5.4 Procedure..... 46
 - 8.5.5 Caution notes:..... 46
 - 8.6 Night Operations..... 48
 - 8.6.1 Purpose 48
 - 8.6.2 Scope..... 48
 - 8.6.3 Responsibility 48
 - 8.6.4 Procedure..... 48
 - 8.6.5 Caution notes:..... 48
 - 8.7 Operating At and Within 4km of an Aerodrome 49



- 8.7.1 Purpose 49
- 8.7.2 Scope..... 49
- 8.7.3 Responsibility..... 49
- 8.7.4 Procedure..... 49
- 8.7.5 Uncontrolled Aerodrome..... 49
- 8.7.6 Controlled Aerodrome..... 49
- 8.8 Operations Above 400ft AGL 50
 - 8.8.1 Purpose 50
 - 8.8.2 Scope..... 50
 - 8.8.3 Responsibility..... 50
 - 8.8.4 Procedure..... 50
- 8.9 Events..... 51
 - 8.9.1 Purpose 51
 - 8.9.2 Scope..... 51
 - 8.9.3 Responsibility..... 51
 - 8.9.4 Procedure..... 51
- 9 Accident and Incident Reporting 52
 - 9.1 Definitions..... 52
 - 9.2 Responsibilities 52
 - 9.3 Investigation of Incidents..... 53
 - 9.3.1 Purpose 53
 - 9.3.2 Scope..... 53
 - 9.3.3 Responsibilities 53
 - 9.3.4 Procedure..... 53
 - 9.4 Reporting of Occurrence to CAA..... 54
 - 9.4.1 Purpose 54
 - 9.4.2 Scope..... 54
 - 9.4.3 Responsibilities 54
 - 9.4.4 What to Report 54
 - 9.4.5 Serious Accident Notification 54
 - 9.4.6 Incident Notification 54
- Appendices 56
 - Appendix A..... 56
 - Appendix B..... 56
 - Appendix C..... 56
 - Appendix D. 56



Appendix E..... 56

Definitions and Abbreviations

AGL	Above Ground Level
AIP	Aeronautical Information Publication
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CAR	Civil Aviation Rules
IAW	In Accordance With
LM	Large Model as defined in the LMCOP
LMANZ	Large Model Aircraft New Zealand
LMCOP	Large Model Code of Practice
MODEL AIRCRAFT	A UAS used for recreational purposes
MODEL FLYING WORLD	Model Flying New Zealand members magazine
MTOW	Maximum Take Off Weight
NOTAM	Notice To AirMen
NZAIP	New Zealand Aeronautical Information Publication
NZJMA	New Zealand Jet Modellers Association
NZMAA	New Zealand Model Aeronautical Association
OFFICERS	The President, Secretary, Treasurer and Competition Manager.
UA	Unmanned Aircraft
UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicle
VFR	Visual Flight Rules
VNC	Visual Navigation Chart
RPAS	CAA definition for a remotely piloted aerial system and includes remotely controlled model aircraft.
RULES	The Rules in the operative version of the Associations Constitution and the Bylaws of the Association.
SIG	Special Interest Group.

1 Introduction

1.1 About Model Flying New Zealand

Model Flying New Zealand (MFNZ) is a non-profit body dedicated to the promotion and protection of aeromodelling in New Zealand and is affiliated to the FAI. From its incorporation in 1948 the organisation was known as the New Zealand Model Aeronautical Association (NZMAA). A name and logo change were made in 2008.

Goals of Model Flying New Zealand

- Foster close association with the RNZAC, FAI and overseas modelling bodies
- Maintain liaison with Government departments and local authorities.
- Promote model flying as a recreational activity.
- Pursue an active public relation policy.
- Set a national safety code.
- Meet the needs of the membership.
- Address environmental issues, especially noise problems and the safe operation of models.
- Promote International, National and regional competitions.
- Foster relationships with National bodies of similar interest groups

The MFNZ is governed by a nationally elected Council of Management with a President, Secretary, Treasurer, Competition Manager, and Area Councillors and others who liaise with clubs in their area and represent their views at Council meetings.

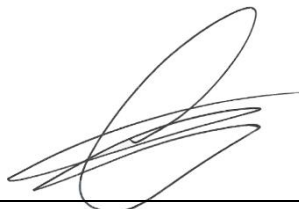
1.2 Organisational Statement

The purpose of this manual is to set out the policies and procedures governing the UAS operations of Model Flying New Zealand. This manual defines the procedures whereby Model Flying New Zealand will conduct its operations which meet required levels of safety, regulatory requirements, and high level of duty of care. All Model Flying New Zealand members are required to comply with the procedures in this manual at all times when conducting UAS operations.

All activities have inherent risks. These risks will be mitigated by stringent attention to all facets of the operation by all members and rigid application of the safety principles within this Manual. Members must comply with the policies and procedures in this manual at all times.

Model Flying New Zealand will operate an 'Open Door' policy and all personnel will have access to the President and Model Flying New Zealand Council in regard to safety concerns. Additionally, all members are encouraged to participate in the implementation and review of operational procedures and systems.

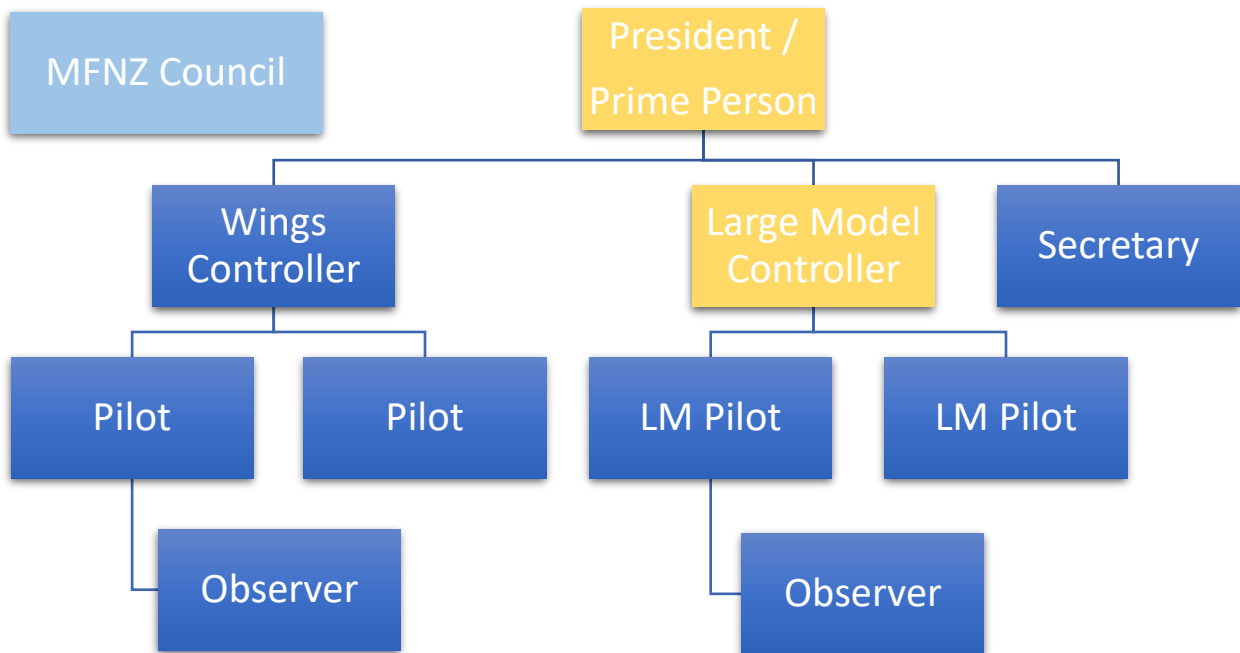
Authorised by:



Chris Jackson
President / Prime Person

Date: 26/8/2022

1.3 Model Flying New Zealand Organisation Structure



1.4 Senior Persons

1.4.1 Prime Person

The Prime Person has the overall responsibility for:

- a) The organisations' performance, rule compliance and safety management
- b) Being Primary Person for the organisation.
- c) Having overall responsibility for CAR Part 102 operations being conducted.
- d) Amending Model Flying New Zealand documentation to ensure it accurately reflects the operation of the organisation and that all changes are tracked and controlled.
- e) Additional responsibilities detailed in Section 4.3
 - i) The Prime Person will be appointed as defined by the Model Flying New Zealand Constitution; and
 - ii) Will have suitable experience and qualifications to discharge the role; and
 - iii) Will be acceptable to the CAA by way of Fit and Proper Person process.

The Prime Person role will normally be discharged by the Model Flying New Zealand President, however, may be discharged by the Immediate Past President during transitional phases, or by another member of Model Flying New Zealand council due to the workload sharing. Further information on how the role is assigned is available in the Model Flying New Zealand Constitution.

1.4.2 President

The President is responsible for:

- a) Providing the necessary resources so that all operations can be conducted to meet organisation obligations, goals and objectives whilst maintaining rule compliance and safe operations in accordance with this document.
- b) Additional responsibilities detailed in Section 4.5
 - i) The President will be appointed as defined by the Model Flying New Zealand Constitution; and
 - ii) Will have suitable experience and qualifications to discharge the role.



1.5 Administrative Details

1.5.1 Registered Name

New Zealand Model Aeronautical Association (NZMAA), trading as Model Flying New Zealand (MFNZ)

1.5.2 Address for Service

Model Flying New Zealand

24 Muri Road

Pukerua Bay 5026

Porirua

New Zealand

1.5.3 Email contacts

Additional contact details including phone numbers are available on the Model Flying New Zealand website.

President	president@mfnz.org
Prime Person	primeperson@mfnz.org
Large Model Controller	lmc@mfnz.org
Wings Controller	admin@mfnz.org
Secretary	secretary@mfnz.org

2 Scope of Operations

2.1 Introduction

Model Flying New Zealand's UAS operations must be conducted in accordance with Civil Aviation Rule Part 101, except as specifically identified in Section 2.4 below.

2.2 Limitations

The following restrictions apply to all MFNZ UAS operations [relevant rule(s) in brackets]:

- a) Pilots are only authorised to operate under the authority of the MFNZ CAR102 Unmanned Aircraft Operator Manual if they hold a current authorisation issued in accordance with the procedures dictated under the MFNZ Wings Qualification program.
- b) The UAV must not be operated in a restricted area or military operating area designated under Part 71 unless permission to do so has been obtained from the administering authority. [101.7]
- c) Flights will not be conducted in Low Flying Zones, unless the Low Flying Zone is closed to manned aircraft [101.9]
- d) All flights will be conducted in compliance with designated airspace requirements. [101.12(b)]
- e) Practicable steps must be taken to ensure that hazards to persons, property and other aircraft are minimised. Refer to Section 7.1. [101.13]
- f) All flights will be conducted within visual line-of-sight, unless operating in accordance with Section 8.5. At least one person must have the UAV in site at all times, maintaining observation of the surrounding airspace for other aircraft. [101.207(a), 101.209]
- g) A member of the flight team must have an unobstructed view of the airspace around the UAV, whether due to objects, buildings, or meteorological conditions. All flights must be conducted below the cloud base. [101.209(b)]
- h) No UAV shall be operated so close to manned aircraft as to create a collision hazard, and all manned aircraft have right-of-way in all situations. [101.213]
- i) If flights are to be conducted above 400 feet AGL then the procedure in Section 8.8 shall apply [101.207(c)]. Otherwise, flights will not be conducted above 400 feet AGL. [101.207(a)(3), 101.207(c)]
- j) If an operation is to be conducted within 4km of an uncontrolled aerodrome, then the procedure in Section 8.7.5 shall apply. [101.205(1)]
- k) If the operation is to be conducted within controlled airspace or within 4km of a controlled aerodrome then prior approval or a Memorandum of Understanding (MOU) must be obtained from the relevant Air Traffic Service (ATS) unit, and operations conducted in accordance with the conditions of the MOU. ATS approval of a flight plan lodged via the Airshare website is one means of "prior approval" [101.205(2)]
- l) Flights within 4km of any aerodrome must be conducted by the holder of a CAA-approved pilot qualification or certificate, or under the direct supervision of the holder of such a document or is the holder of a Pilot Licence or Certificate issued under Civil Aviation Rule Parts 61 or 149. Refer to Section 6
- m) All aircraft operated by MFNZ and exceeding 15kg or exceeding the limitations of MFNZ LMCOP CAT 3 will be operated IAW with the LMCOP and Section 3 [101.202, 101.215].

2.3 Areas of Operation

Model Flying New Zealand’s operations will be conducted anywhere in the New Zealand flight information region (NZ FIR).

The blue line surrounding New Zealand in the map below shows the boundary of the NZ FIR.

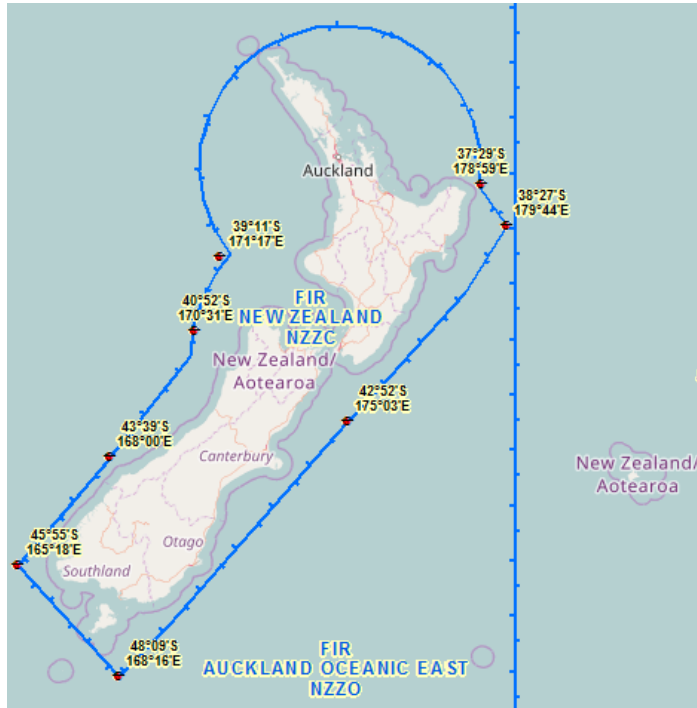


Figure 1: Boundary of NZ Flight Information Region

2.4 Authorised Departures from CAR Part 101 (“Privileges”)

The following departures from Civil Aviation Rule Part 101 are authorised:

- Operation above 400ft AGL in accordance with the procedure detailed in Section 8.8 [101.205(a)(1)(iii)(B), 101.207(c)].
- Flying Unshielded at Night in accordance with the procedure detailed in Section 8.6 [101.211]
- Operation of UAV weighing more the 15kg in accordance with the procedure detailed in Section 3.1 [101.202, 101.215]
- Operation of UAV weighing more than 25kg in accordance with the procedure detailed in Section 3.1 [101.202, 101.215]
- Operation Beyond Visual Line Of Sight in accordance with the procedure detailed in Section 8.5 [101.207(a)(2),101.209]

2.5 Operations Not Authorised

The following operations are not authorised and must not be conducted:

- Operations above people or property without consent, beyond the privileges existing in [101.207(a)(1), 101.207(b)]; and
- Application of agricultural chemicals.
- No items will be dropped that may cause hazard to people or property [101.15]
- Operations in Low Flying Zones [101.9]
- Any operation beyond CAR 101 use in Special Use or Designated airspace [101.7]
- Any operation beyond the recreational use of UAS.

3 Aircraft

3.1 Introduction and Large Model Code of Practice

Model Flying New Zealand is an approved organisation IAW [101.202 (1) through (6)]. This approval is documented in Appendix B

3.1.1 Initial Airworthiness Standards

Initial airworthiness standards will be set either by the Pilot or in the case of aircraft greater operating under the Model Flying New Zealand LMCOP under the standards set out by the Large Model Controller (Refer Section 3.2)

3.1.2 Maintenance

All maintenance will be carried out as dictated by the Pilot in an on-condition basis. Inspection will be carried out as dictated by relevant pre-flight and post-flight inspection documentation.

3.1.3 Large Model Categories

Model Flying New Zealand members operate a large fleet of aircraft, numbering in the 10s of thousands. These aircraft are divided into four main categories aligning with Model Flying New Zealand LMCOP procedures, and CAR 101.

Model Aircraft – Below 15kg and LMCOP power limits

- Category 1 – Between 15kg and 25kg, Section 3.2.3
- Category 2 – Between 25kg and 150kg, Section 3.2.4
 - Category 2A – Between 25kg and 75kg
 - Category 2B – Between 76kg and 150kg
- Category 3 – Below 15kg but exceeding LMCOP power limits, Section 3.2.2

The Large Model Code of Practice is available in Appendix B

Note - Category 2 aircraft are authorised as an aircraft and pilot combination.

3.1.4 Large Model Code Of Practice Power limits (Category 3)

MFNZ places the following power limits on aircraft, defining any aircraft exceeding them as Category 3 aircraft and mandating their operation under the LMCOP program.

- Internal combustion powered aircraft greater than 88cc capacity
- Turbine powered aircraft with greater than 142N thrust.
- Turboprop powered aircraft with greater than 5.2kW output
- Electric powered aircraft with greater than a sustained 5kW input

Whilst not a legal requirement, more than 20 years of experience operating this class of aircraft has shown it to be a prudent safety precaution.

3.1.5 Registration of Aircraft

Any aircraft operating under the LMCOP as a Category 1, 2, or 3 aircraft will be listed by the Large Model Controller on the Large Model Register. This document will be internal to Model Flying New Zealand but will be available to the Civil Aviation Authority upon request. Model aircraft operated by Model Flying New Zealand members, below this weight threshold, are not required to be registered.

3.2 Categories of Model Aircraft

3.2.1 Aircraft with a gross MTOW below 15kg and less than LMCOP power limits

MFNZ does not require record keeping of aircraft within this classification, as the risk to their operation is inherently low.

3.2.2 Aircraft with a gross MTOW below 15kg and above LMCOP power limits – LMCOP CAT 3

Aircraft exceeding the limitations of section 3.1.4 are classed as Category 3 and will be operated IAW with the LMCOP

- a) The aircraft will be inspected and certified IAW LMCOP;
- b) The aircraft will be listed in the Large Model Register by the Large Model Controller;
- c) The aircraft will not be operated by a pilot who does not hold an MFNZ Wings Qualification with LM endorsement;
- d) LM Permit to Fly remains valid only if the Owner maintains the aircraft in the state of airworthiness that existed at the time of the Permit being issued;
- e) The LM Permit to Fly will be valid for a period of no more than **five** years;
- f) All flights must be recorded in the Owners logbook.

3.2.3 Aircraft with a gross MTOW above 15kg and below 25kg – LMCOP CAT 1

Aircraft with a gross MTOW above 15kg and below 25kg will be classed as Category 1 and will be operated IAW with the LMCOP

- a) The aircraft will be inspected and certified IAW LMCOP;
- b) The aircraft will be listed in the Large Model Register by the Large Model Controller;
- c) The aircraft will not be operated by a pilot who does not hold an MFNZ Wings Qualification with LM endorsement;
- d) LM Permit to Fly remains valid only if the Owner maintains the aircraft in the state of airworthiness that existed at the time of the Permit being issued;
- e) The LM Permit to Fly will be valid for a period of no more than **five** years;
- f) All flights must be recorded in the Owners logbook.

3.2.4 Aircraft with a gross MTOW above 25kg and below 150kg – LMCOP CAT 2A & B

Aircraft with a gross MTOW above 25kg and below 76kg will be classed as Category 2A and will be operated IAW with the LMCOP

- a) The aircraft will be inspected and certified IAW LMCOP;
- b) The aircraft will be listed in the Large Model Register by the Large Model Controller;
- c) The aircraft will not be operated by a pilot who does not hold an MFNZ Wings Qualification with LM endorsement **and** Advanced Power (Refer Section 6.2);
- d) The aircraft will not be test flown without permission by the Large Model Controller;
- e) The aircraft will not be operated by a pilot that is not listed on the specific aircrafts Permit to Fly;
- f) LM Permit to Fly remains valid only if the Owner maintains the aircraft in the state of airworthiness that existed at the time of the Permit being issued;
- g) The LM Permit to Fly will be valid for a period of no more than **three** years;
- h) The Large Model Controller reserves the right to limit the operation to designated areas;
- i) All flights must be recorded in the owners logbook.

Aircraft with a gross MTOW above 76kg and below 150kg will be classed as Category 2B and will be operated IAW with the LMCOP

- a) The aircraft will be inspected and certified IAW LMCOP;
- b) The aircraft will be listed in the Large Model Register by the Large Model Controller;



- c) The aircraft will not be operated by a pilot who does not hold an MFNZ Wings Qualification with LM endorsement **and** Advanced Power AP (Refer Section 6.2);
- d) The aircraft will not be test flown without permission by the Large Model Controller;
- e) The aircraft will not be operated by a pilot that is not listed on the specific aircrafts Permit to Fly;
- f) LM Permit to Fly remains valid only if the Owner maintains the aircraft in the state of airworthiness that existed at the time of the Permit being issued;
- g) The LM Permit to Fly will be valid for a period of no more than **one** year;
- h) The Large Model Controller reserves the right to limit the operation to designated areas;
- i) All flights must be recorded in the owner's logbook.

4 Personnel

4.1 Overview

This section first describes general duties for all personnel. Position descriptions are then provided for the following roles:

- Section 4.2 - General Duties
- Section 4.3 – President / Prime Person;
- Section 4.5 - Large Model Controller;
- Section 4.6 - Wings Controller;
- Section 4.7 - Secretary;
- Section 4.8 - Pilot; and
- Section 4.9 - Observer.



4.2 General Duties

4.2.1 Purpose

Duties for specific positions are provided in this manual. This section provides guidance relevant to all.

4.2.2 Specific Requirements of Model Flying New Zealand

- a) Limitations specified in Section 2.2 must be complied with.
- b) All personnel must comply with the Personal Pre-flight Section 8.1 prior to conducting UAS Operations.
- c) All operations must comply with the Standard Operating Procedures in Section 8
- d) All accidents and incidents must be recorded and reported in accordance with the procedures in Section 9 of this manual. Minor incidents and accidents not requiring reporting to the regulatory authorities must be recorded in the register which is held by the Secretary.

4.3 Prime Person

4.3.1 Purpose

To define the duties and responsibilities of the Prime Person

4.3.2 Scope

The person with primary responsibility for Model Flying New Zealand's operations.

The Prime Person also has primary responsibility for UAS operations, including flight operations and any applicable ground support operations.

4.3.3 Duties and Responsibilities

The Prime Person is responsible for:

Regulatory

- a) Having overall responsibility for CAR Part 102 operations being conducted;
- b) Continued compliance with Civil Aviation Authority regulatory requirements;
- c) Ensuring regulatory approvals remain valid;
- d) Managing the process for amendment of the Model Flying New Zealand exposition, including applying to the CAA for approval of changes to this exposition which require prior CAA acceptance as per Section 5;
- e) Ensuring that this manual remains up to date, that a current copy is lodged with CAA, and that a current copy is held by the Secretary;
- f) Ensuring that in the event that the Unmanned Aircraft Operator Certificate held by Model Flying New Zealand expires or is revoked that the certificate is immediately surrendered to the Director of Civil Aviation as per Section 5.1;
- g) Ensuring that if the Unmanned Aircraft Operator Certificate held by Model Flying New Zealand is suspended that the certificate is immediately produced to the Director of Civil Aviation for appropriate endorsement as Section 5.1;

Operations

- a) Issuing NOTAMs, and delegating members to issue NOTAMs, in accordance with the procedure in Section 8.3;
- b) Implementing any corrective and preventative actions resulting from internal reviews of flight operations or ground support activities;
- c) Ensuring Pilots are aware of their responsibilities as per Section 4.8.4;
- d) Reporting accidents involving fatal or serious injuries as per Section 9.2
- e) Quarantining records relating to an accident or serious incident and notifying the CAA accordingly;
- f) In the event of an accident or serious incident, if the pilot is unable to perform their duties, controlling access to, and authorising movement of, the UAV involved in the accident or serious incident.

Health & Safety

- a) Demonstrating a positive commitment to the Model Flying New Zealand Health and Safety Policies.

4.3.4 Qualifications

The Prime Person must be acceptable to the Director of Civil Aviation. This will be established by way of a Fit and Proper Person application to the CAA.



4.4 President

4.4.1 Purpose

To define the duties and responsibilities of the President

4.4.2 Scope

The person with primary responsibility for Model Flying New Zealand's resourcing, in combination with the Model Flying New Zealand Council..

4.4.3 Duties and Responsibilities

The President is responsible for:

Regulatory

- a) Providing the necessary resources so that all operations can be conducted to meet organisation obligations, goals and objectives whilst maintaining rule compliance and safe operations in accordance with this document.

4.4.4 Qualifications

The Presidents role will established and filled in accordance with the Model Flying New Zealand Constitution.

4.5 Large Model Controller

4.5.1 Purpose

To define the duties and responsibilities of the Large Model Controller

4.5.2 Scope

The senior person designated as being responsible for aircraft operating under Large Model program.

4.5.3 Reports To

The Large Model Controller is responsible to the Prime Person for carrying out the duties and responsibilities detailed in this procedure.

4.5.4 Duties and Responsibilities

The Large Model Controller is responsible for:

Large Model Program

- a) Maintain and administer the Large Model Code of Practice, and associated documentation as per Section 3;
- b) Appoint and administer Large Model inspectors;
- c) Management and application of a tracking system to record and monitor the status of Large Models operated;
- d) Ensuring incidents are investigated and appropriate action is taken;
- e) Ensuring the standards and procedures contained in the Large Model program are adhered to.

Occurrence Investigation

- a) Investigating and Reporting occurrences involving Pilots and aircraft operating under the LMCOP IAW Section 9.2
- b) Ensuring Model Flying New Zealand reports accident and incident information to the CAA in accordance with CAR Part 12 as required;
- c) Conducting accident occurrence investigations in accordance with the procedures in Section 9.3 of this manual and CAR Part 12.

Health & Safety

- a) Demonstrating a positive commitment to the Model Flying New Zealand Health & Safety Policies.

4.6 Wings Controller

4.6.1 Purpose

To define the duties and responsibilities of the Wings Controller

4.6.2 Scope

The senior person designated as being responsible for aircraft operating under Model Flying New Zealand Wings program.

4.6.3 Reports To

The Wings Controller is responsible to the Prime Person for carrying out the duties and responsibilities detailed in this procedure.

4.6.4 Duties and Responsibilities

The Wings Controller is responsible for:

Wings Program

- a) Maintaining and Administering the Model Flying New Zealand Wings Program as per Section 6;
- b) Maintaining a list of Examiners;
- c) Maintaining a list of Instructors;
- d) Maintaining a list of Wings qualified members.

Occurrence Investigation

- a) Investigating and recording occurrences that **do not** involve Pilots and aircraft operating under the LMCOP IAW Section 9.2

Health & Safety

- a) Demonstrating a positive commitment to the Model Flying New Zealand Health & Safety Policies.



4.7 Secretary

4.7.1 Purpose

To define the duties and responsibilities of the Secretary

4.7.2 Scope

The person designated as being responsible for document keeping.

4.7.3 Reports To

The Secretary is responsible to the Prime Person for carrying out the duties and responsibilities detailed in this procedure.

4.7.4 Duties and Responsibilities

The Secretary is responsible for:

- a) Maintaining the inventory of controlled documents and managing the document control system as per Section 5.3;
- b) Approving controlled forms and completion of controlled records relating to flight operations;

4.7.4.1 Health & Safety

- a) Demonstrating a positive commitment to the Model Flying New Zealand Health & Safety Policies.



4.8 Pilot

4.8.1 Purpose

To define the duties and responsibilities of a Pilot.

4.8.2 Scope

All Pilots operating under the privileges of Model Flying New Zealand CAR102 certificate.

4.8.3 Reports To

The pilot is responsible to the Prime Person for carrying out the duties and responsibilities detailed in this procedure.

4.8.4 Duties and Responsibilities

Responsibilities in an Emergency

In any emergency, the pilot is responsible for taking any action considered necessary to preserve safety, including:

- a) Deviating from prescribed routes, methods, procedures or limitations to the extent required to deal with the emergency;
- b) If appropriate informing ATS regarding progress of the flight, actions and intentions;
- c) Following an emergency, the pilot is responsible for informing the President and/or Large Model Controller as soon as possible.

General Responsibilities

The pilot is responsible for:

- a) Operating in accordance with CAA Rules;
- b) Maintaining airspace knowledge in alignment to CAR [101.12]
- c) Compliance with the contents of this exposition;
- d) Taking all practicable steps of minimize hazards to persons, property and other aircraft [101.13];
- e) Ensuring that the Observers are briefed on all aspects of their duties during a flight;
- f) In the event of an accident or serious incident, controlling access to the aircraft and following the accident and incident notification procedure in Section 9;
- g) Complying with any instructions suspending or restricting flight operations including those specified in the Operations Specifications;
- h) Familiarity with any operating limitations prescribed by the Director of Civil Aviation;
- i) Employing adequate measures to ensure the safety of persons and property with regards to:
 - a. Crowd control at operating sites; and
 - b. Damage caused by the aircraft.
- j) Obtaining permission for operation from affected landowners, or operating IAW with any existing agreements with landowners.
- k) Demonstrating a positive commitment to the Model Flying New Zealand Health & Safety Policies

Specific Pre-Flight Responsibilities

The pilot is responsible for complying with the Operating Procedures specified in Section 8;

- a) Briefing observers on safety requirements and use of emergency equipment.

In-Flight Responsibilities

The pilot is responsible for ensuring:



- a) Safe operation of the UAV;
- b) Visual contact is made with the aircraft at all times during flight, unless operating under Section 8.5

Specific Post-Flight Responsibilities

The pilot is responsible for ensuring:

- a) Flight records are completed as soon as possible after the flight or series of flights as required;

4.8.5 Qualifications

Pilots must have the following qualifications:

- a) Hold a Model Flying New Zealand Wings Qualification, if appropriate for the class of aircraft flown;
- b) Hold a Wings program endorsement for the aircraft type being flown, if a Wings class exists for it;
- c) Operate in accordance with any LMCOP CAT 2 requirements made by the Large Model Controller as per Section 3.2.4.

4.9 Observer

4.9.1 Purpose

To define the duties and responsibilities of the Observer.

4.9.2 Scope

Ground Crew for Model Flying New Zealand operations.

4.9.3 Reports To

Each Observer is responsible to the Pilot and Prime Person for carrying out the duties and responsibilities detailed in this procedure.

4.9.4 Duties and Responsibilities

All Observers have the general responsibilities to:

- a) Monitor airspace and inform the pilot if any other aircraft are in the vicinity; and
- b) Monitor activities on the ground and take necessary actions to keep the pilot free from distraction.
- c) Maintain airspace knowledge in alignment to CAR [101.12]
- d) All Observers will be briefed prior to each flight by the Pilot as to their specific responsibilities for that operation.
- e) Observers will carry out all duties assigned to them in conformance with the procedures set out in the Model Flying New Zealand exposition.

Observers must:

- a) Adhere to all instructions given by the Pilot.
- b) Take full responsibility in the area designated to them by the Pilot.
- c) Demonstrate a positive commitment to the Model Flying New Zealand Health & Safety Policies.
- d) Complete Model Flying New Zealand Observer training as either-
 - [On-Site Training](#)
 - Model Flying New Zealand Wings qualified.

5 Management Procedures

5.1 Expiry, Revocation or Suspension of Certificate

5.1.1 Purpose

To specify the actions required in the event of expiry, revocation, or suspension of the Unmanned Aircraft Operator Certificate held by Model Flying New Zealand.

5.1.2 Responsibility

The Prime Person is responsible for compliance with this procedure.

5.1.3 Procedure

- a) The Unmanned Aircraft Operator Certificate held by Model Flying New Zealand will continue in force until the expiry date endorsed on that certificate or until it is suspended or revoked.
- b) If it is intended to continue operations beyond the expiry date of the certificate, then an application for renewal of the certificate shall be made to CAA at least 60 days prior to the expiry date. Application for renewal shall be made on CAA form 24102/01.
- c) If the Unmanned Aircraft Operator Certificate held by Model Flying New Zealand expires or is revoked, the Model Flying New Zealand must immediately surrender the certificate to the Director of Civil Aviation.
- d) If the Unmanned Aircraft Operator Certificate held by Model Flying New Zealand is suspended, the Prime Person must immediately produce the certificate to the Director of Civil Aviation for appropriate endorsement.

5.2 Changes to Operations

5.2.1 Purpose

To ensure that CAA is notified of any changes to Model Flying New Zealand's operations and that prior acceptance is obtained from the Director of Civil Aviation when appropriate.

5.2.2 Responsibility

The Prime Person is responsible for compliance with this procedure.

5.2.3 Procedure

Changes to Operation

The Prime Person must notify the Director in writing of any change that affects the currency of any information required by CAA form 24102/01:

- Legal name of organisation;
- Trading name (if any);
- Location of principal base of operation;
- Address for service;
- Postal address;
- Type of operation;
- Persons with control over the exercise of privileges;
- Contracted service providers.

Changes Requiring Prior Approval of CAA

Where it is proposed to change any of the following, the Prime Person shall apply in writing to the CAA for acceptance of the change prior to formally amending the Manual:

- The Prime Person;
- The scope of the approval; and
- A change in the location of the base of operations from that listed on the Operations Specifications.
- Notification to the CAA of proposed changes to senior persons shall be accompanied by a completed form CAA 24FPP, together with a CV detailing the training and experience for the proposed appointee.

5.3 Manuals and Documentation

5.3.1 Purpose

To specify the manuals and documentation that form part of the Model Flying New Zealand Unmanned Aircraft Operations exposition.

5.3.2 Responsibility

The Secretary is responsible for maintaining the manuals and documentation described in this procedure and will discharge the role of Document Controller.

5.3.3 Procedure

The system of documentation for Model Flying New Zealand is comprised of the following manuals and documents:

- CAR 102 Unmanned aircraft operations manual;
- Large Model Code of Practice;
- Wings Program;
- Members Manual;
- SIG Codes of Practice;
- Members database;
- Specific Flying Site Agreements;
- Model Flying Sites – Risk Assessment Procedures;
- Agreements with ATS;
- Agreements with any aerodromes;
- CAR 102 Certificate;
- CAR 102 Operations Specifications;
- CAR101.202 Certificate;
- Any exemptions issued by CAA.

5.3.4 Document Control

- The Director will hold a copy of this manual.
- Remaining copies of this manual will be digital only and available to all MFNZ Membership
 - a. Document Control will be administered digitally through the Model Flying New Zealand Google Drive account, which has limited write access rights to the Secretary.
 - b. Any printed version of this manual will be marked ***Uncontrolled and for Reference Only***

5.4 Control and Amendment of this Manual

5.4.1 Purpose

To ensure all copies of the CAR 102 Unmanned aircraft operations manual remain current and all changes are correctly authorised.

5.4.2 Scope

This procedure applies to amendments and reissues of this CAR 102 Unmanned aircraft operations manual.

5.4.3 Responsibilities

The Prime Person is responsible for:

- a) Authorising amendments to the CAR 102 Unmanned aircraft operations manual;
- b) Ensuring the Manual is kept up-to-date and continues to reflect company operation;
- c) Ensuring the technical accuracy of amendments;
- d) Ensuring that amendments meet the requirements of any applicable Civil Aviation Rule Part or Advisory Circular; and
- e) Determining the distribution of the Manual.

The Prime Person shall comply with any direction given by the CAA to amend the Manual in the interests of safety.

5.4.4 Procedure

Changes Requiring Prior Approval of CAA

Where it is proposed to change any of the following, the Prime Person shall apply in writing to the CAA for acceptance of the change prior to formally amending the Manual:

- a) The Prime Person;
- b) The location of the primary base of operation;
- c) The scope of the approval.

Notification to the CAA of proposed changes to senior persons shall be accompanied by a completed form CAA 24FPP, together with a CV detailing the training and experience for the proposed appointee.

Amendment Process

The Prime Person or authorised delegate will make the required changes to the relevant manual(s). Amended text or page content, including deletions, will be indicated by a solid vertical bar in the right-hand margin of the page.

Distribution

This manual will be available on the Model Flying New Zealand website - <https://www.mfnz.org/members-pilots/documentation/> with the document being held on a controlled Google Drive account.

A current electronic copy of this manual will be emailed to the Civil Aviation Authority as soon as possible after the amendment is made.

- a. For changes that require the approval of CAA Section 5.2.3, email a copy of the amended manual and a completed CAA amendment application form (24102-02) to: certification@caa.govt.nz
- b. For other changes:
- c. Complete the CAA exposition amendment summary form (24102-12);
- d. If the 24102-12 form requires an amendment application, then email the following documents to certification@caa.govt.nz:



- Amended exposition;
- Completed CAA amendment application form (24102-02); and
- Completed CAA exposition amendment summary form (24102-12).
 - e. If the 24102-12 form does not require an amendment application, then send the amended manual and the 24102-12 form to library@caa.govt.nz.

Manual Version Status

The CAR 102 Unmanned aircraft operations manual will have the version number and effective date at the bottom of each page.

5.5 Personnel Records

5.5.1 Purpose

To ensure an accurate record is maintained of all personnel.

5.5.2 Scope

All Model Flying New Zealand members.

5.5.3 Responsibilities

The Secretary is responsible for maintaining personnel records and ensuring the privacy of information held in those records.

5.5.4 Procedure

A personnel file is kept for each individual that exercises any responsibilities under this exposition. This record will be stored in the Model Flying New Zealand Members Database. The following information is lodged in each file:

- The individual's record of Wings Qualifications;
- The individual's record of Wings Endorsements
- The individuals MFNZ membership status;
- The Secretary shall ensure records relating to a member are retained for a minimum of 2 years from the date that member either ceases flying with Model Flying New Zealand or ceases to perform duties requiring the licence or authorisation.

6 Training and Competency

6.1 Overview

This section sets out the procedures governing training and competency for Model Flying New Zealand members. Procedures are provided for:

- Model Flying New Zealand Wings Program;
- Model Flying New Zealand Wings Endorsements.

Model Flying New Zealand is an approved organisation IAW [101.202(1)]. Model Flying New Zealand Wings program meets the requirements of [101.205(3)(i)(A)]

The Wings program is available in Appendix B.

6.2 Model Flying New Zealand Wings Program

6.2.1 Purpose

To ensure that the scope of a pilot’s authorisation to fly any Model Flying New Zealand aircraft is commensurate with their knowledge and demonstrated competence.

Model Flying New Zealand’s Wings program documentation and details are available online.

[Model Flying New Zealand Wings Program](#)

6.2.2 Scope

All Pilots of aircraft governed by the Wings program, excluding those flying Free Flight or Control Line aircraft.

6.2.3 Responsibilities

The Prime Person, Large Model Controller and Wings Controller are responsible for authorisation of pilots in accordance with this procedure.

Pilots are responsible for complying with the limitations of their authorisation.

6.2.4 Definitions

Training is the process of obtaining new knowledge or skills.

Model Flying New Zealand Wings is the process of assessing whether knowledge or skills meet a defined standard and is an assessment of the pilot’s ability to competently fly the UAV.

Model Flying New Zealand Wings Endorsement assesses the pilot’s ability to operate a specific class of model aircraft.

6.2.5 Endorsements

There are 11 disciplines of qualification. Members are encouraged to progress from Basic to Advanced qualifications.

Class	Aircraft Specifics
BP	Basic Powered Fixed Wing
AP	Advanced Powered Fixed Wing
BG	Glider
AG	Advanced Glider
BH	Helicopter
AH	Advanced Helicopter
MR	Multicopter
AM	Advanced Multicopter
BT	Basic Turbine
AT	Advanced Turbine
DS	Dynamic Soaring

There are additional specialist qualifications for the following categories.

Endorsement	Aircraft Specifics
LM	Large Model
FP	First Person View
HS	High Speed
NR	Night

Note: certain aircraft types may require multiple endorsements to operate. e.g., Large Turbine FPV Multicopter would require MFNZ Wings with MR(AM)/BT(AT)/LM/FP endorsements.

6.2.6 Procedure

Pilots must hold a valid Wings qualification and appropriate endorsement/s from the Secretary before flying any applicable unmanned aircraft.

A Pilot will be authorised in accordance with the following table:

Training & Competency	Scope of Authorisation
MFNZ Wings, with endorsement(s) for aircraft being operated, endorsement by Large Model Controller for specific CAT 2 aircraft	Full privileges under MFNZ Part 102 Certificate. Ability to operate specified CAT 2 aircraft (25-150kg)
MFNZ Wings, with endorsement(s) for aircraft/operation being conducted	Full privileges under MFNZ Part 102 Certificate. Nil operations above 25kg.
MFNZ Wings	Ability to operate within 4km of an aerodrome unshielded IAW CAR101.205 (a)(3)(i)(A)

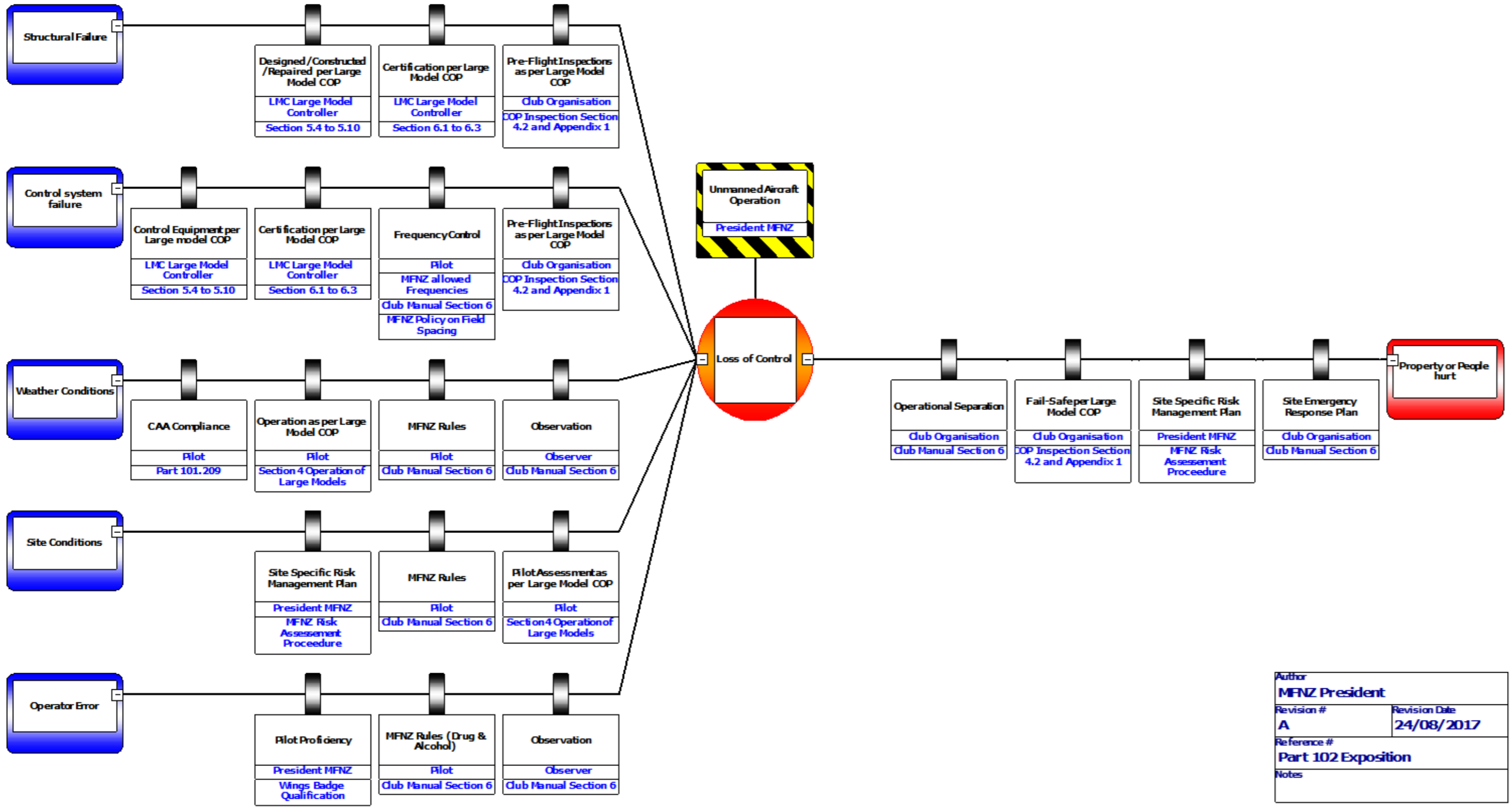
7 Risk & Hazard Management

7.1 Introduction to the Bow Tie Diagram

The Bow Tie diagram is developed by looking at the top event that poses the hazard from the activity being undertaken, listing the threats that could initiate the top event on the left and the potential consequences if the top event were to occur on the right. The various controls/barriers that prevent the threats leading to the top event as well as the controls/barriers that act to mitigate the consequences of the top event occurring are also detailed.

- a) The hazard is the operation of unmanned aircraft.
- b) The point at which control is lost the potential exists for undesired outcomes. This point is called the top event and the undesired outcomes are consequences, in this case damage to people or property. Anything that can lead to the top event is a threat to the hazard.
- c) Eliminating/minimising the threats and/or mitigating the consequences is achieved by implementing and maintaining controls/barriers.
- d) The overall likelihood of the consequences materialising is risk.
- e) The management of the risks associated with this hazard, operation of unmanned aircraft, is documented on the bowtie diagram below – Section 7.2. This also details the barriers incorporated in MFNZ's operating procedures designed to prevent the top event occurring as well as those barriers designed to mitigate the consequences should the top event occur.
- f) The roles and responsibilities around the maintenance of those barriers are also detailed and references are made to the specific MFNZ policies, procedures, codes of practice, etc. that apply.

Hazard Assessment for Large Unmanned Aircraft Operations



8 Standard Operating Procedures

Standard Operating Procedures are provided for:

- Section 8.1 - Personal Pre-Flight;
- Section 8.2 - Flight Planning;
- Section 8.3 - Issuing NOTAMs;
- Section 8.4 - Visual Line of Sight;
- Section 8.5 - Beyond Visual Line of Sight – Shielded Operations;
- Section 8.6 – Night Operations;
- Section 8.7- Operations At and In the Vicinity of an Aerodrome;
- Section 8.8 - Operations Above 400ft AGL;
- Section 8.9 - Events

8.1 Personal Pre-flight

8.1.1 Purpose

To ensure that personnel are fit to safely conduct their roles.

8.1.2 Responsibility

All personnel are responsible for assessing their fitness to operate in accordance with this procedure.

8.1.3 Procedure

All Personnel involved with the use and operation of UAS will use the **IMSAFE** protocol.

Before commencement of any operation, all personnel should ask themselves “Am I fit to fly?”

I = Illness	Am I suffering from any illness which could reduce my ability to safely conduct the operation?
M = Medications	Am I taking any medications – whether prescription, over-the-counter, or alternative remedies?
S = Stress	Am I suffering from stress which could affect my ability to safely conduct the flight?
A = Alcohol	Am I suffering from the effects of the consumption of alcohol or prescription drugs?
F = Fatigue	Am I suffering from fatigue which could affect my ability to safely conduct the flight?
E = Eating	Have I eaten sufficient food?

If any person has reason to doubt their fitness for operating the UAV, then that person should not use the equipment or perform their duties.



Remember to give yourself the **'I'M SAFE'** check before you take to the sky!



8.2 Flight Planning

8.2.1 Purpose

To ensure that all required planning has been conducted prior to a UAV operation, and to ensure that all required equipment is available for safe operation.

8.2.2 Scope

All MFNZ operations.

8.2.3 Responsibilities

The Pilot is responsible for compliance with this procedure.

8.2.4 Aviation Planning

Review online weather forecasts for intended area of operation to confirm that conditions are likely to be suitable:

- a) Cloud layer above 400ft (120m) AGL;
- b) Check visibility; and
- c) Check Sunrise, Sunset (www.aip.net.nz/assets/AIP/General-GEN/2-TABLES-AND-CODES/GEN_2.7.pdf)

8.2.4.1 Airspace and Aerodromes

- a) Check intended area of operation against a Visual Navigation Chart (VNC). Note the designation and classification of airspace and ensure that all airspace requirements will be complied with during the planned operation. Airshare (www.airshare.co.nz) can also be used for this purpose but does not include any temporary airspace restrictions notified via AIP Supplements (SUPPs) or Notices to Airmen (NOTAMs).
- b) Review the AIP Supplements (www.aip.net.nz) to identify any changes to airspace or aerodromes that may be relevant.
- c) Obtain and review any NOTAMs for the area of operation from the Airways Internet Flight Information Service (IFIS) website (www.ifis.airways.co.nz) or using the IFIS Mobile app.
- d) If the area of operation is within 4km of an uncontrolled aerodrome and the operation will not be shielded with a barrier, then a Memorandum of Understanding (MOU) or Agreement with the aerodrome operator of the intended operation must be established.
- e) If the area of operation is within 4km of a controlled aerodrome or within controlled airspace, authorisation must be obtained from the relevant ATC unit. If another party (such as an MFNZ Club) has established a Memorandum of Understanding (MOU) with that ATC unit then follow the requirements of the MOU. If no MOU exists, then the flight will need to be filed in Airshare (www.airshare.co.nz).
- f) If the area of operation is within 4km of any aerodrome:
 - a) Review the aerodrome plate from the NZAIP (available at www.aip.net.nz) for relevant information such as whether the aerodrome is located within a mandatory broadcast zone (MBZ).
 - b) Ensure that Wings qualifications requirements are met.
 - c) Refer to 8.7

8.2.5 Related Documents

- a) VNC
- b) AIP Supplements
- c) NOTAMS
- d) MOU with any ATS unit

8.3 Issuing NOTAMs

8.3.1 Purpose

To specify the procedure for issuing NOTAMs.

NOTAMs may be requested by any member authorised by the Prime Person

8.3.2 Scope

All operations for which a NOTAM is required, including:

- Operations above 400ft AGL in uncontrolled airspace as per the procedure in Section 8.8; and
- Any operation that is deemed a NOTAM should be desirable for aviation safety.

8.3.3 Procedure

A NOTAM should be issued at least 24 hours prior to any operation for which it has been assessed that a NOTAM is desirable for aviation safety.

Obtain the latitude and longitude of the location of operation, and distance from nearest aerodrome. This is available in the correct format from resources such as Google Maps.

Prepare a NOTAM, using the following structure and format, changing the wording in **BOLD** as required. Edit the radius of the operation and the latitude and longitude. Add in the brackets the approximate distance and direction to the nearest airfield. IFIS's RPAS NOTAM feature is available to automate some of the following process.

REMOTELY PILOTED ACFT ACTIVITY WILL TAKE PLACE WI 1NM RADIUS OF S **36 52 08.4** E **174 45 07.0** (**KINGSLAND** APRX **5.3NM SE NZWP**)

- Enter the NOTAM via the IFIS website (<https://ifis.airways.co.nz/>):
- Include the operator's name (Model Flying New Zealand), authorising person name, your name as the contact person, and your contact telephone number.
- Enter the start and end time of the operation.
- Enter the lower limit as "SFC" (surface) and the upper limit above sea level to the nearest 100 feet.
- Registration will be required on first use of IFIS, which will include provision of the operator's address.

Alternatively, an email may be prepared and emailed to the NOTAM office: nof@airways.co.nz (NOTAM Office, Airways New Zealand, P O Box 14 131, Christchurch). If sending by this format, ensure to include:

- Operator name (Model Flying New Zealand), address, and CAA Participant ID,
- Authorising person's name and CAA Participant ID.
- Contact name and telephone number.
- The time of the operation. Times are in 24hr time in the format YYMMDDHHMM and may be either in Local Time or UTC time (UTC is 12hr behind NZ Standard Time 13hr behind NZ Daylight Time). An example is (change **BOLD** as required):
- FROM: 1706070000 UTC TO: 1706070300 UTC
- The NOTAM text as above.
- The height of the operation in the format below. Edit the upper height above sea level for the flight to the nearest 100 feet.
- LOWER: SFC UPPER: **1000FT** AMSL

Follow up an email request with a phone call to the NOTAM office (Tel: 03 358 1688) about 30mins after the email if no email response has been received.



8.4 Visual Line of Sight

8.4.1 Purpose

To specify the acceptable means of maintaining visual line of sight

8.4.2 Scope

All MFNZ operations not operating IAW the procedure in Section 8.5.

8.4.3 Responsibility

The Pilot is responsible for compliance with this procedure.

8.4.4 Visual Line of Sight

The UAV must be maintained in visual line of sight at all times. Visual line of sight means a straight line along which an observer has a clear view, and which may be achieved with the use of spectacles, contact lenses, or a similar device used to correct subnormal vision of the user to no better than normal vision but not the use of an electronic, mechanical, electromagnetic, optical, or electro-optical instrument.

The pilot or an observer must have sight of the UAV and the surrounding airspace in which the UAV is operating.

8.4.5 Extended Visual Line of Sight

The pilot need not have visual line of sight if a trained and competent observer maintains visual line of sight of the UAV and sight of the surrounding airspace in which the UAV is operating and is in direct communication with the pilot.

Before electing to utilise an observer, careful consideration should be given to the means and likelihood of being able to maintain direct communication between the observer and the pilot in the intended area of operation.

8.5 Beyond Visual Line of Sight – Shielded Operations

8.5.1 Purpose

To specify acceptable means of operating UAS Beyond Visual Line of Sight (BVLOS) when shielded at low level.

8.5.2 Scope

All flights conducted Beyond Visual Line of Sight

8.5.3 Responsibility

The Pilot is responsible for compliance with this procedure.

8.5.4 Procedure

UAS may be operated Beyond Visual Line of Sight provided.

- a) UAS operated have a MTOW less than 15kg and below LMCOP CAT3 limitations (Section 3.2.1); and
- b) The Pilot holds Wings qualification with FPV endorsement (Section 6.2.5); and
- c) The Pilot must ensure that the UAV is operated to avoid a collision with any manned aircraft; and
- d) The UAS is flown a Shielded environment, remaining below the height of, and within 100m of the Shield/s. Shields are defined as per CAR [101.3]; and
- e) The UAS is not operated more than 100ft AGL, irrespective of Shield height; and
- f) The UAS is not flown more than 1000m from the Pilot; and
- g) The operating radius remains within Class G uncontrolled airspace, or within a Danger Area designated for the purpose of UAS operations;
- h) Property permissions must be obtained as per [101.207(a)(1)]; and
- i) Access to the property from parties not involved in the operation is controlled, resulting in a sterile environment; and
- j) Return to Home (RTH) functionality, if used, must not cause a breach of the Shield; and
- k) The site has been approved by the Prime Person and has not changed since previous approval; and [MFNZ BVLOS Site Approval Form](#)
- l) MFNZ BVLOS Form must be completed. [MFNZ BVLOS Operations Form](#)

8.5.5 Caution notes:

Pilots exercising this privilege must ensure as far as practicable that RF propagation from the FPV and C2 system remains adequate. Obstacles such as trees will attenuate signals and will reduce operational range, as will operating multiple aircraft in the same area, such as during a FPV race. Due to the wide range of systems in circulation, and widely varying operational environment, it is impossible to dictate a safe RF range that is suitable for all and will require the Pilot to assess the operation beforehand.

Methods of controlling access to the operational area by parties not involved in the operation may include mitigations such as;

- Closing gates
- Signage
- Fencing
- Observers, particularly for third parties entering the operational area.

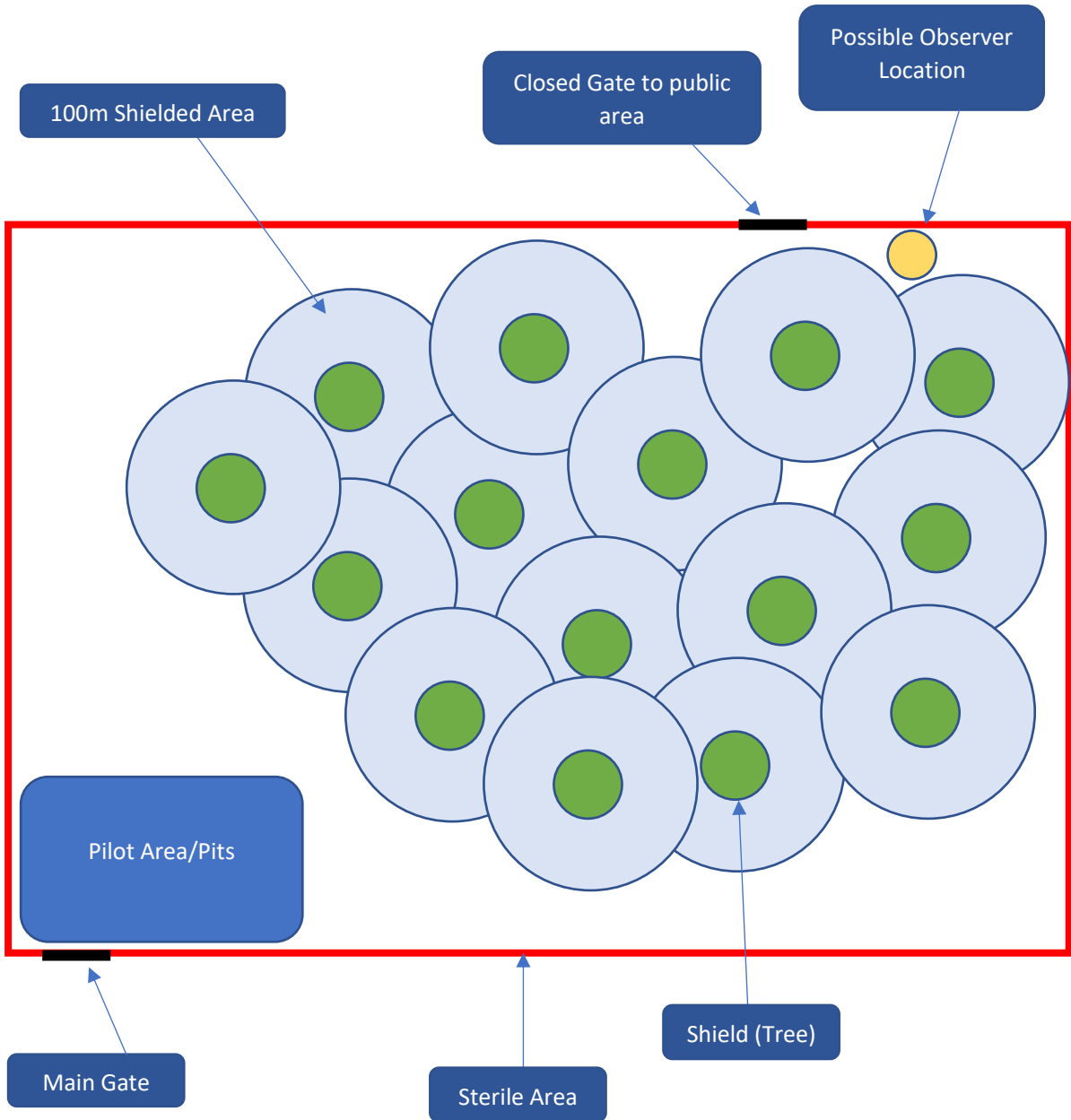


Figure 1 – Possible Shielded BVLOS area layout

Figure 1 describes a possible layout meeting the requirements for shielded BVLOS. A sterile area is established using a fenced off area with two gates. One gate can be monitored by pilots/observers, whilst the other is monitored by an observer, ensuring that the area remains sterile. UAS may be operated anywhere depicted as light blue, remaining shielded.

BVLOS operations will not take place if the ground area covered by the UAS does not remain sterile of third parties.

It is the Pilots responsibility to ensure that the operation is safe, primarily that the aircraft remains shielded and that access to the operating area is controlled.

8.6 Night Operations

8.6.1 Purpose

To specify the process for Night Operations.

Part 101 allows Night Operations if they are indoors or a shielded operation. [101.211]

Night is defined as the time between Evening Civil Twilight (ECT) and Morning Civil Twilight (MCT). These times can be found in the AIP under GEN 2.7 (www.aip.net.nz/assets/AIP/General-GEN/2-TABLES-AND-CODES/GEN_2.7.pdf)

8.6.2 Scope

All operations conducted at night outside of a Shielded Operation.

8.6.3 Responsibility

The Pilot is responsible for complying with this procedure.

8.6.4 Procedure

All night operations shall be flown in visual meteorological conditions.

- Minimum ceiling of 1500 feet AGL
- Minimum visibility of 5km

In all night flying operations:

- a) The aircraft is fitted with suitable illumination; and
- b) An Observer is present and in direct communication with the Pilot;
- c) The Pilot holds Model Flying New Zealand Wings, with endorsement for the aircraft being flown; and
- d) The Pilot holds Model Flying New Zealand Night Endorsement.

If night flying is being carried out as part of an event, involving multiple unmanned aircraft operating at night:

- a) A flight line director is to be appointed to oversee the conduct of night operations;
- b) A NOTAM is issued at least 24 hours before the operation in accordance with the procedures in Section 8.3
- c) The Flight line director shall comply with Section 8.9

The Pilot is responsible for ensuring that any operation or procedure is safely conducted.

8.6.5 Caution notes:

There must be adequate lighting for the pilot to maintain situational awareness of the location and orientation of the UAV. This may require consideration of both lighting on the UAV and lighted reference points in the flying environment. The precise requirements for a particular operation will depend on the lighting on the UAV, ambient lighting, background lighting, and existence of reference points.

Due to reduced depth perception in low-light conditions, and hence increased difficulty in maintaining full situational awareness, it should generally be expected that the UAV cannot be flown as far from the pilot at night as can be achieved during the day.

In order to preserve the dark adaptation of the pilot's vision, ground crew should perform those tasks requiring additional lighting or close proximity to the UAV's lighting, such as turning the UAV on.

Even though LED lighting is more visible at night, this does not necessarily mean that the pilot of a manned aircraft has any better visibility of a UAV at night. The pilot of the manned aircraft will be looking down at a large number of light sources and is unlikely to notice the UAV against such a background.

A suitable reference for the hazards of operating at night is the Good Aviation Practice Night VFR guide.

www.aviation.govt.nz/assets/publications/gaps/night-vfr.pdf

8.7 Operating At and Within 4km of an Aerodrome

8.7.1 Purpose

To specify safe operating procedures when operating at or within 4km of an aerodrome.

8.7.2 Scope

All flights conducted within 4km of an aerodrome.

8.7.3 Responsibility

The Pilot is responsible for compliance with this procedure.

8.7.4 Procedure

- a) The Pilot must ensure that the UAV is operated to avoid a collision with any other aircraft.
- b) All UAV flights must avoid the aerodrome traffic circuit unless operating at a controlled aerodrome and otherwise instructed by ATC.
- c) All UAV flights must avoid any active movement area of an aerodrome and any active runway strip.
Note - Active is defined as being used, or imminently being used, by manned aircraft.
- d) Communications must be maintained as agreed in the Memorandum of Understanding or Agreement with the aerodrome operator or otherwise as required in an approval granted via Airshare.
- e) Within 4km of any aerodrome the Pilot must hold, or be under the supervision of the holder of, Model Flying New Zealand Wings qualification [101.205(a)(3)(i)(A)&(B)].

8.7.5 Uncontrolled Aerodrome

Unless conducting a Shielded Operation AND there is a physical barrier that prevents the flight of the UAV to the aerodrome:

- A Memorandum of Understanding (MOU) or Agreement with the aerodrome operator of the intended operation must be established; and
- An observer must be present while the UAV is in flight.

8.7.6 Controlled Aerodrome

Unless conducting a Shielded Operation AND there is a barrier that prevents the flight of the UAV to the aerodrome:

- An authorisation must be obtained from the relevant ATC unit. If another party (such as an MFNZ Club) has established a Memorandum of Understanding (MOU) with that ATC unit then follow the requirements of the MOU. If no MOU exists, then the flight will need to be filed in Airshare (www.airshare.co.nz).

8.8 Operations Above 400ft AGL

8.8.1 Purpose

To allow for operations above 400 feet AGL.

8.8.2 Scope

All operations.

8.8.3 Responsibility

The Prime Person and Pilot are responsible for compliance with this procedure.

8.8.4 Procedure

Part 101 allows for operations above 400 feet AGL in the following situations:

- Within 4km of an uncontrolled aerodrome if the operator is approved by the Director of Civil Aviation; [101.205(b)(1)] and
- Outside of 4km from an aerodrome boundary and where operations remain in Class G airspace and a NOTAM is issued at least 24 hours prior to the operation [101.207(c)].

This procedure confers the privilege to engage in operations above 400ft AGL in any location.

8.8.4.1 Controlled Airspace

Flight above 400 feet AGL is permitted in controlled airspace if authorised by the relevant Air Traffic Control unit. This is obtained by filing an Airshare request (www.airshare.co.nz).

Some controlled airspace will be **transponder mandatory**. UAVs may operate in this airspace without a transponder at the discretion of ATC.

8.8.4.2 Uncontrolled Airspace

In accordance with Part 101, the following procedure will be followed for uncontrolled airspace:

- Operate in a Danger Area designated for that purpose under Part 71; or
- Ensure that at least 24 hours before the operation, the Prime Person, or a person authorised by the Prime Person, notifies the aeronautical information service provider for the issue of a NOTAM.

If operating above 400ft AGL within 4km of an uncontrolled aerodrome, then:

- a) Obtain an agreement with the aerodrome operator (refer procedure in Section 8.7);
- b) Issue a NOTAM at least 24 hours prior to the operation (refer Section 8.3);
- c) A trained and competent observer must be present; and
- d) Maintain a listening watch on the aerodrome frequency.

8.9 Events

8.9.1 Purpose

To ensure greater Prime Person oversight of Events

8.9.2 Scope

Events shall be defined as –

- Any operation that is intended, or probable, to include the general public in close proximity to any Model Flying New Zealand activity; or
- Any operation that has higher than usual risk of lack of separation between people and Model Flying activity; or
- Any operation that the Pilot or Flight line director determines to have a higher level of risk to those not directly involved in the activity.

8.9.3 Responsibility

The Prime Person/Pilot/Organiser/Flight Line Director are responsible for compliance with this procedure.

8.9.4 Procedure

The Pilot/Organiser/Flight Line Director as applicable shall contact the Prime Person via email or by phone and gain prior authorisation for the Event to take place.

The Prime Person shall assess any applicable –

- Job Hazard Assessment
- Event safety plans
- Organiser requirements
- Site Plan
- Hazard Register
- Operational requirements
- Airspace requirements
- Observer requirements
- Member qualifications
- MFNZ documentation

The Prime Person shall issue approval in writing to the applicant if satisfied that the operation meets regulatory and safety requirements.

9 Accident and Incident Reporting

9.1 Definitions

Occurrence	Definition
Incident	Any occurrence, other than an Accident, which is associated with the operation of an aircraft and affects or could affect the safety of operation.
Accident	An occurrence that is associated with the operation of an aircraft, being an occurrence in which a person is fatally or seriously injured;

9.2 Responsibilities

Model Flying New Zealand will report accidents and incidents as per the following.

- Incidents that occur whilst Pilots are conducting operations under CAR101 will be reported internally and as dictated by the practice of good airmanship and the safety of aviation system participants reported IAW Section 9.4.6 as deemed necessary.
- Incidents that occur whilst Pilots are conducting operations under MFNZ CAR102 Unmanned Aircraft Operations Manual will be reported internally and;
 - Aircraft operating under the LMCOP (Section 9.4.6) will be reported to CAA and investigated by the Large Model Controller IAW Section 9.4.6
 - Aircraft operating under this manual outside of the LMCOP will be reported to CAA as deemed necessary by the practice of good airmanship and investigated by the Wings Controller IAW Section 9.4.6
- Accidents where a person is fatally or seriously injured will be investigated and reported by the Prime Person IAW Section 9.4.5

Note – Any Accident resulting in a person or persons being seriously, or fatally, injured will be reported by calling 0508 ACCIDENT as soon as practicable, this will be followed by reporting the Accident to the Prime Person.

In deciding whether an incident is sufficiently serious enough to warrant notification to the CAA, the pilot and/or the Occurrence Investigator shall be guided by Appendix A to Advisory Circular AC12-1. A current copy of AC12-1 should be filed in the Administration Folder, or otherwise can be downloaded from the Civil Aviation Authority website.

9.3 Investigation of Incidents

9.3.1 Purpose

To detail how Model Flying New Zealand establishes the facts relating to its involvement in an incident and as far as those facts permit, the root cause of the incident.

9.3.2 Scope

The following occurrences must be investigated in accordance with this procedure:

- All incidents notified to CAA; and
- All accidents and incidents recorded in the Model Flying New Zealand accident register.

9.3.3 Responsibilities

Responsibilities for investigation and reporting of occurrences are detailed in Section 9.2

9.3.4 Procedure

9.3.4.1 Investigation Procedure

The objective of an investigation is to identify the root cause of the occurrence and to determine what actions need to be taken to prevent recurrence.

- a) Investigations shall be conducted on the Accident Report Form.
- b) The investigation shall include as applicable:
 - a. An interview with all people involved;
 - b. A review of all relevant documentation;
 - c. The recording of a sequence of events; and
 - d. Analysis of cause and effect.
 - e. A copy of the investigation report shall be filed with the corresponding Accident Report.

All persons involved in the occurrence shall be notified of the outcome of the investigation (and, if relevant, the details reported to the CAA), including the actions taken to prevent recurrence of a similar incident.

9.3.4.2 Post-Investigation Reporting to CAA

The provisions below apply only to occurrences that have been notified to CAA.

The results of the investigation, including any preventative action, shall be submitted by the Responsible Person (Section 9.2) to the Safety Investigation and Analysis Unit of the CAA within 90 days of the occurrence.

Notification should be provided on CAA forms:

- f. CA005RPAS Occurrence report - Remotely piloted aircraft systems (RPAS/UAVs).
- g. www.aviation.govt.nz/assets/forms/CA005RPAS.pdf

The completed form should be emailed to the Civil Aviation Authority at ca005@caa.govt.nz.

If any individual is a person having a duty to report to the Authority under Rule Part 12, e.g., a pilot, and that person disagrees with the results of the organisations investigation, that person may exercise the right to submit their view of the causal factors directly to the CAA.

9.4 Reporting of Occurrence to CAA

9.4.1 Purpose

To detail procedures for reporting accident and incident information to CAA.

9.4.2 Scope

Accidents and incidents under CAA jurisdiction

9.4.3 Responsibilities

The Person Responsible, defined in Section 9.2, is responsible for ensuring Model Flying New Zealand reports accident and incident information to the CAA in accordance with CAR Part 12.

The Pilot is responsible for completing a report in the prescribed manner for any accident or incident in which he/she is involved.

9.4.4 What to Report

All the following events should be reported to CAA:

- a. Injury to persons;
- b. Incidents involving manned aircraft;
- c. Incursion into airspace where not authorised;

9.4.5 Serious Accident Notification

The Pilot of a UAV that is involved in a serious accident shall, unless fatally or seriously injured, immediately advise the occurrence to the Prime Person.

The Pilot, or if that person is fatally or seriously injured, the Prime Person, shall as soon as practicable, notify the Civil Aviation Authority on Freephone 0508 ACCIDENT (0508 222 433) and give the following data:

- a) Date and time of the accident;
- b) Nature of the accident;
- c) Type of UAV;
- d) Advise Model Flying New Zealand as the operator;
- e) Position, or the last known position of the UAV with reference to an easily defined geographical point;
- f) The name of the pilot;
- g) Type of operation;
- h) Weather conditions;
- i) Number of persons killed or seriously injured as a result of the accident; and
- j) Details of damage to the UAV.

The pilot, or if that person has been fatally or seriously injured, the Prime Person, shall complete Civil Aviation form CAA005 Occurrence Report and email it to the Civil Aviation Authority at ca005@caa.govt.nz as soon as possible after the telephone notification has been given but in any event no later than 10 days after the occurrence.

After an accident, the Pilot, shall prepare a statement detailing the facts, conditions and circumstances relating to the accident and provide this statement to the Prime Person to accompany submission of the Occurrence Report to the CAA.

9.4.6 Incident Notification

The pilot of a UAV involved in an aircraft incident or airspace incident shall as soon as practicable thereafter, advise the occurrence to the responsible person as per Section 9.2

A pilot of a UAV that is involved in an airspace incident must notify the CAA of the incident as soon as practicable if the incident is a serious incident or an immediate hazard to the safety of an aircraft operation.



Within 14 days of any incident the following people must provide the Civil Aviation Authority with the applicable details of the incident:

- a. The Pilot; and
- b. The Responsible Person on behalf of Model Flying New Zealand.
- c. Notification should be provided on Civil Aviation form:
- d. CA005RPAS Occurrence report - Remotely piloted aircraft systems (RPAS/UAVs).
- e. www.aviation.govt.nz/assets/forms/CA005RPAS.pdf

The completed form should be emailed to the Civil Aviation Authority at ca005@caa.govt.nz.

Appendices

Appendix A.

Model Flying New Zealand Governing Documents

Document (Hyperlinked)
Constitution
Bylaws

Appendix B.

Model Flying New Zealand Reference Documents (Available at <https://www.mfnz.org/members-pilots/documentation/>)

Document (Hyperlinked)
Members Manual
Large Model Code Of Practice
Wings Program
Turbine Code of Practice
Club Sites Risk Assessment
Risk Assessment Template
Club Sites Map
Insurance

Appendix C.

Model Flying New Zealand Forms and Certificates

Document (Hyperlinked)
Large Model Form A
Large Model Form B
Large Model Form C
MFNZ BVLOS Form
MFNZ BVLOS Site Approval Form
Observer On-Site Training Form

Appendix D.

Occurrence Reporting Forms

Document (Hyperlinked)
Accident
Incident / Insurance Claim
Large Model
CA005RPAS

Appendix E.

102 Rule Compliance Matrices (External)

Document (Hyperlinked)
CAR102 Matrices

