HIGHBROOK AERO MODELLERS INC

(Est. Sept. 1954)

PROCEDURES, RISKS AND RULES

FOR OPERATING REMOTELY PILOTED AIRCRAFT SYSTEMS

AT

HIGHBROOK MODEL AIRPARK

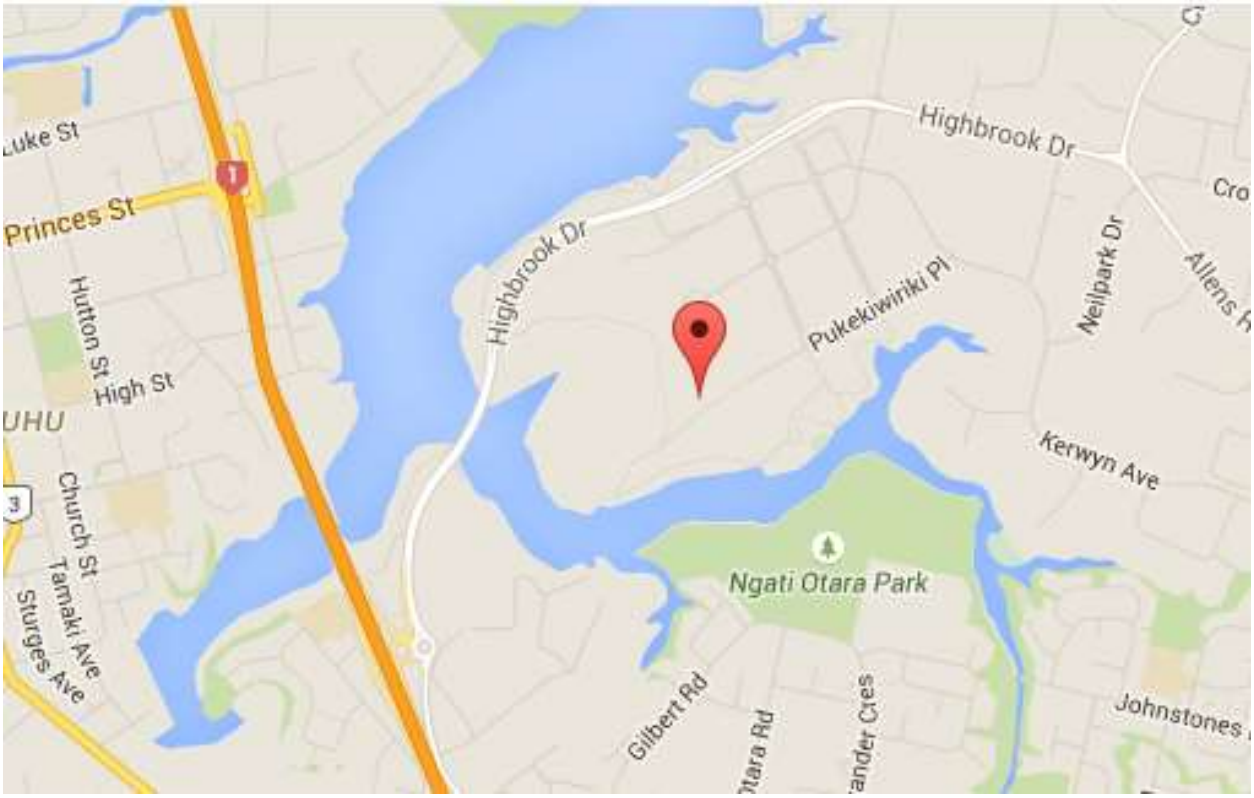
" Pukewairiki " off Pukekiwiriki Road

March 2022(Revision 8.7)

HAM (Inc) Committee
March 2022

Introduction

Highbrook Aero Modellers (Inc) conducts safe model aircraft (remotely piloted aircraft systems) flying activities at “Pukewairiki “ off Pukekiwiriki Road, Highbrook Park, for club members and invited members of other clubs affiliated to Model Flying New Zealand.



Whilst flying model aircraft at this location does not constitute a public event, spectators are welcome to attend and observe.

Safety is of paramount importance in all of the flying conducted at this airfield.

Rules and Procedures

Rules governing the safe operation of radio controlled model aircraft at this location are listed in the following publications:

1. CAA Regulations Part 101
2. Model Flying New Zealand Members Manual
3. NZJMA’s Jet Turbine Code of Practice – by approval of Club Captain

4. This Club's safety rules
5. Occupational Health and Safety Act

MFNZ and **NZJMA** have approved this site for the flying of all types of model aircraft including jet turbine models in terms of the above listed publications.

Hazards and Risks

A Risk Assessment has been undertaken and a Register of Hazards established. Both the severity of a risk and the frequency of the risk occurring are taken into account to give a final score by using the methodology recorded in MFNZ's "Risk Assessment Procedure".

Mitigation of identified risks is undertaken by a number of control methods to lower the final score to an acceptable level.

Should a serious accident occur, a post-accident audit will be conducted to capture any additional actions to make model flying at this site even safer.

Any queries regards this document should be directed to the Club's President.

Proximity to Personnel

The approach adopted to ensure the safety of members, observers and nearby residents is one of lateral separation and flight direction limitations. This is a similar approach to that taken when considering safety at aviation locations and events. The logic is based on accepting a low risk of an aircraft accident, and following this occurrence, trying to ensure the aircraft is as far away from any people as possible.

The layout of the airfield and establishing safety lines makes best use of this approach.

First Aid

Our committee members each carry First Aid kits and some members also carry their own first aid supplies. Closest Doctors are at:

Radius Medical Centre: **16 Ti Rakau Dr, Burswood, Auckland 09-273 8980.**

Major medical incidents. Call 111 for Fire Service or St. Johns Ambulance

Fire Hazard

Radio controlled model aircraft generally fall into three categories: -

Methanol and Petrol fueled Aircraft

These types of model aircraft have been flown internationally for several decades with a very low incidence of fire.

Electric Powered Aircraft

Lithium Polymer batteries that may combust in the event of a crash or use of incorrect charging procedures power electric aircraft. The fire is of a very short duration and risk of environmental damage is low.

Jet Turbine Aircraft

Jet turbines use Diesel, Kerosene or Jet A1 fuel for their operation. The small fuel loads carried and the temperature of exhaust gases pose a risk to the surrounding area.

Fire Mitigation

It is recommended that flyers have a domestic size fire extinguisher in their vehicles when at the flying field.

Attachments:

1. Club Safety Rules and Procedures
2. Risk Assessments and Control Measures
3 Topographical Photo
4. Hazards Register
5. Aircraft Inspection
6. Key Contacts List


Highbrook Model Airpark - Flight Envelope

Attachment 3 **Hazards Register**

Environmental		
Airspace		*CAA has a registered "Danger Zone" NZD 120 - with a radius of 0.5 km centred on the HAM(Inc) site with a flight ceiling of 900 ft AMSL to ground level.* *Full sized aircraft may only transit this airspace in the event of an emergency.*
Airfield	Runway	*55^0 N EAST / S West alignment, 150 m with unrestricted approach over Mangroves from the East and Mangrove estuary from the West.*
Flight Envelope		*North/South alignment* *North to 100m of thesouthern edge of the Highbrook Motorway* *South –southern boundary of flightline of airstrip* *East – Pedestrian walkway, West – middle of estuary,.* *East/West alignment – from the runway the flight envelope extends to the west/south and east.* *Aircraft to be within line of sight at all times.*
Surrounding Area	Public Road	• *Motorway to the North – 400m from pilots' box heading 0^0N* • *Roadway access to flying site directly adjacen to flying field's*

	Power Pylons Power Station Mangroves	*southern boundary.* • *80m south of pilot's box* • *1000m West of pilots' box* • *Field bounded by Mangrove swamp West, North and East.*
Grounds Layout	Airstrips Pilots' Box Area to the North, South and East Spectators	*Grassed area – fire hazard v.low* *Personnel close to runway* *Water and Mangrove Swamp* *Pits/spectator area 30 metres from runway*
Radio Spectrum		*Use of MFNZ approved frequencies only, with most pilots using 2.4 Ghz.*
Meteorology		*Visual contact with aircraft* *Wind affecting jet performance – crosswind*
Fire		*Spread of fire through undergrowth.*
Mechanical		
Aircraft		*Failure of aircraft*
RC system		*Failure of communications system*
Fuel		*Fire Hazard – covered above*
Accident/Failure		*On airstrip* *Off airstrip*
Collision		*On circuit*
Human		
Pilot Qualification		*MFNZ WINGS badge or under supervision of a club approved Instructor. Members Flying alone must be WINGS badged.*
Operational Limitations		*Operating within designated airspace and geographical limits.*
Pilot Awareness/Co-ordination		*Loss of awareness of operating environment*
Safety Management		*Co-ordination of safety response.*

Medical		*Unexpected medical event affecting ability to control aircraft.* *Sunburn* *Minor and / or major injuries*
Wildlife		
		Pukeko, most unlikelyto be harmed as they are neveraround once the strip is in use

Attachment 4

Risk Assessments and Control Measures

Highbrook Aero Modellers (Inc)

Risk Matrix – December 2020

Introduction to Risk Analysis

The concept of a formal risk analysis is to identify and rank risks such that appropriate treatments can be developed to minimise risk. Many of the risks, which an organisation faces, fall into the "we have no control over this" category, but in reality, while these events are of a random nature, steps can be taken to reduce both the likelihood and consequences of a risk event. These range from adoption of simple procedures, though to paying a third party to take the risk (e.g. insurance). Unfortunately insurance companies will not accept unconstrained risk, and generally insist on the organization taking prior steps to manage the risk.

This analysis is loosely based on the methodology of NZS 4360/ AS 31000.

Terminology

a. Consequences

Level	Description
Extreme	Severe effect on activities and/or major financial impact to HAM(Inc) and/or its elected Officers
Major	Severe effect on activities and/or major financial impact to HAM(Inc) or its Officers
Moderate	Activities affected , e.g. time delays on projects or cost overruns
Minor	Minimal effect on activities - - impact managed within existing schedules and or budget
Negligible	Deliverables not affected

b. Likelihood (within 10 year horizon)

Level	Description
Almost certain	Is expected to occur. 90% +
Likely	High probability of occurrence 60-90%
Possible	40 – 60-% that it may occur within the time horizon
Unlikely	Could occur at some time – 10-40% probability
Rare	May occur only in exceptional circumstances. Less than 10% probability

c. Overall Risk

Likelihood						
	Almost Certain	Moderate	Major	Major	Extreme	Extreme
	Likely	Moderate	Moderate	Major	Major	Extreme
	Possible	Minor	Moderate	Moderate	Major	Major
	Unlikely	Minor	Moderate	Moderate	Moderate	Major
	Rare	Minor	Minor	Minor	Moderate	Moderate
		Negligible	Minor	Moderate	Major	Extreme
		Impact				

Treatment of risks

The main approaches to risk management are:-

Avoid the risk by de-scoping the project or identify an alternative approach to the activity thus avoiding the risk.

Accept the risk occurrence with no management plan. This action should only be addressed for low impact and likelihood risks.

Treat (mitigate) the risk through a mitigation plan. Mitigation is a preventative action that reduces the risk. This can involve the transfer of the risk to another party, however, this action itself raises a risk due to the reliance on a third party, who may insist on a shared approach.

When applied to the overall risk chart, likely treatments are as follows.

Impact	Rare	Unlikely	Possible	Likely	Almost Certain
Extreme	Manage to reduct impact	Mitigate to reduce impact	Mitigate-reduce impact	Avoid / Mitigate to reduce impact	Avoid/ Transfer
Major	Manage to reduct impact	Manage to reduct impact	Mitigate to reduce impact	Manage to reduce likelihood	Mitigate to reduce likelihood
Moderate	Accept	Mitigate	Mitigate	Manage to reduce likelihood	Mitigate to reduce likelihood
Minor	Accept	Accept	Mitigate	Mitigate	Mitigate to reduce likelihood
Negligible	Accept	Accept	Mitigate	Mitigate	Mitigate to reduce likelihood

Likelihood

Identified risks

Issue	1. Failure to comply with MFNZ site requirements		
Possible Cause	The MFNZ rules appear to be mandatory, however various statements by MFNZ officials confirm that they are to be regarded as best practice guidelines, and that clubs are free to adopt their own risk analysis and mitigation processes. Known "non – compliance" include: • Requirement that planes do not overfly public within 200m of each end of the runway. We did comply but the Council has since put in a public walkway. The Council has, on our request, installed warning signage, and we have included observation of pedestrian traffic as a defined function of the observer • No pit screens at North end • Spectator safety distances		
Notes	References • The MFNZ website states *" It is the responsibility of " Clubs" to ensure that its members undertake flying activities within the rules and safety requirements of the Association and the Civil Aviation Authority."* ○ The Insurance Cover **does not** extend the members who fly outside these requirements. • NZMAA Club Manual section 6 safety *f) The flying field for all R/C flying (except Pylon and Soaring*)* ***will*** *conform to the following rules:*		
Consequences	• Insurance claim not accepted • Personal risk to officials if they knowingly operate a non-compliant activity		
Likelihood	Strong probability that our interpretation of the rules may be tested at some point.		
Risk Weighting before addressing	**Consequence** Extreme	**Likelihood** Possible	**Overall weighting** Major
Mitigation/ Treatment	• Clarification has been obtained from MFNZ that "rules" are best practice examples – not mandatory • Address all known risks with a "best practice" solution, tailored to our circumstances • Identify any other breaches of MFNZ rules. Develop management plans for each non-compliance • Obtain "Association Liability Insurance" to protect officials from personal legal attack for incidents which arise may arise regardless of best intentions of officials		
Risk weighting after addressing	**Consequence** Extreme	**Likelihood** Rare	**Overall Weighting** Moderate

Issue	2. Loss of access to airspace		
Possible Cause	• Closure of Contact Energy power station • Closure of Danger Area • "Near miss" flying incident • No long term agreement with CAA for Danger area • Complaints of models flying above allowed altitude		
Notes	This risk will not go away and can only get more acute over time.		
Consequences	Loss of flying site		
Likelihood	It only takes one idiot to create an incident, for this to become reality		
Risk Weighting before addressing	**Consequence** Extreme	**Likelihood** Possible	**Overall weighting** Major
Mitigation/ Treatment	• Maintain regular contact with CAA • Strict adherence to HAMI/NZMAA rules • Maintain cordial relationships with Contact Energy and businesses that surround Highbrook Park • Enforcement of use of observers • Act on any breaches of height limits • Continued briefing of club members through newsletters, website and meetings		
Risk weighting after addressing	**Consequence** Extreme	**Likelihood** Rare	**Overall Weighting** Moderate

Issue	3. Governance Errors		
Possible Cause	Club committee members are generally appointed for knowledge of club (aero modeling) activities – not a balanced board with commercial, legal, operational skills		
Notes	Crown review of Incorporated Societies Act underway – may introduce similar governance accountabilities on committee members as for directors under the Companies Act.		
Consequences	Personal liability for club officials Sub-optimal performance of club Legal exposure		
Likelihood	Low if we know our limits		
Risk Weighting before addressing	**Consequence** Major	**Likelihood** Possible	**Overall weighting** Major
Mitigation/ Treatment	• Secretary to provide Committee members with a summary of obligations and liabilities • Be cautious about making decisions with legal or commercial implications • Engage appropriate expertise as required • Seek the services of an honorary legal advisor, when appropriate • Be proactive about fixing issues • Maintain a list of action commitments		
Risk weighting after addressing	**Consequence** Minor	**Likelihood** Rare	**Overall Weighting** Minor

Issue	4. Environmental Hazards		
Possible Cause	Interference with wild life in the Park. The river bank and mangrove areas adjacent to the park are dangerous Sun strike at the North Eastern area of the field.		
Notes	The park is generally zoned for passive recreation and the river bank and mangrove zones are of high conservation significance as specified in the Unitary Plan The mud that is on the edge of the river and within the mangroves is deep and very sticky posing significant hazards when entered. The Mangroves are very dense and should a person who ventures into this area alone fall or become injured it may be difficult to locate them in a timely manner. The incoming tide could rapidly cause a very dangerous situation to develop. The position of the sun relative to the strip creates significant sun strike risk, which can lead to loss of sight and disorientation of the model.		
Consequences	Significant injury Uncontrolled models impacting people or assets		
Likelihood	Very likely if not mitigated		
Risk Weighting before addressing	**Consequence** Moderate	**Likelihood** Likely	**Overall weighting** Major
Mitigation/ Treatment	• Detailed rules of all activities at the field and adherence to the rules • Strong induction and refresher processes to alert all members to the risks		
Risk weighting after addressing	**Consequence** Minor	**Likelihood** **Likely**	**Overall Weighting** Moderate

Issue	5. Loss of member numbers		
Possible Cause	• Change in demographics –ageing membership • Younger generation have other interests • New areas of aeromodelling emerging which are currently not supported by the club		
Notes	Aero modelling is continuing to evolve, from a start in free flight and control line, we are now heavily into radio control, with emerging niches of e.g., indoor flying, large scale, gas turbines, park flyers. If the club does not evolve to address the changing interests, it will lose relevance.		
Consequences	Wind-down of club.		
Likelihood	Very likely unless we actively address this issue. We already have a membership heavily biased towards an older age group.		
Risk Weighting before addressing	**Consequence** **L**ikely	**Likelihood** Major	**Overall weighting** Major
Mitigation/ Treatment	• Actively support and reposition club activities to meet changing interests– e, Indoor, Park flyers • Promotion of open days to public • Actively encourage and support younger members		
Risk weighting after addressing	**Consequence** Unlikely	**Likelihood** Minor	**Overall Weighting** Moderate

Issue	6. Flying Safety Incident – personal injury		
Possible Cause	Unsafe operation of aircraft Unsafe aircraft Unconstrained aircraft in pits Lack of observers Flying by unskilled/unqualified pilots (no wings)		
Notes	We have had several significant safety issues since flying activities were established in 2008 at Highbrook, which have caused serious injury. Since 2016 and the safety practices have been rigorously enforced, the accident level has reduced to almost zero.		
Consequences	Personal liability to club member Personal liability to officials Closure of field Investigation by ACC and/or OSH.		
Likelihood	Always a potential hazard		
Risk Weighting before addressing	**Consequence** Extreme	**Likelihood** possible	**Overall weighting** Major
Mitigation/ Treatment	• Monitoring and advising members of unsafe practices • Peer checking of aircraft before flight • Enforcement of safety procedures and rules • Continuous review of safety systems and prompt adjustment where required. • Ensure safety kit is fully stocked and prominently placed, and that key club members are aware of location. All members should be encouraged to have a first aid kit available at all times when at the field • Establish “no blame” incident register where we can monitor types of incidents and trends, to identify any further changes in safety practice		
Risk weighting after addressing	**Consequence** Moderate	**Likelihood** Unlikely	**Overall Weighting** Moderate

Issue	7. Flying Safety Incident – damage to property		
Possible Cause	Unsafe operation of aircraft Unsafe aircraft Unconstrained aircraft in pits Lack of observers Flying by unskilled/unqualified pilots (no wings)		
Notes	This is a well-known and understood risk. Provided we obey the requirements of our insurance policy, the risk is minimised. If we are in breach of insurance requirements, the risk is substantial. However – it should be noted that the insurance provided by MFNZ protects the flyer only. The excess on each claim is $1000 of which the flyer pays $200 and MFNZ pays $800. There is an ongoing risk that either MFNZ or the insurer could subsequently seek to recover their losses from the club. This is particularly the case where the club is seen to fall short of its obligations to maintain safe flying standards		
Consequences	Personal liability, high financial and reputational cost to Office holders Closure of field Legal action		
Likelihood	Very likely – several previous examples		
Risk Weighting before addressing	**Consequence** Moderate	**Likelihood** Possible	**Overall weighting** Moderate
Mitigation/ Treatment	• Monitoring and advising members of unsafe practices • Peer checking of aircraft before flight • Enforcement of safety procedures, and flight line practices. • Ensure members without wings are in a program to obtain this as soon as possible, and any non wings qualified member must be fully supervised by a wings qualified member • Establish “no blame” incident register where we can monitor types of incidents and trends, to identify any further changes in safety practice		
Risk weighting after addressing	**Consequence** Minor	**Likelihood** Unlikely	**Overall Weighting** Moderate

Issue	8. Non Flying accident to person or property		
Possible Cause	This could arise from e.g. – An accident with the mower - An explosion of a BBQ cylinder - Pollution of stream from fuel or weed killer - Lipo catching fire		
Notes	• This is a potential area of exposure as appears to be outside the coverage of the MFNZ insurance • Accidents with the mower appear to be covered under the mower insurance policy (insured as a motor vehicle) • Under the Incorporated Societies Act, the Club's liability is limited to the value of the Club assets. Unless an insurance policy is in place, an extreme event could close the club		
Consequences	Potentially serious		
Likelihood	Further work required to evaluate this risk		
Risk Weighting before addressing	**Consequence** Extreme	**Likelihood** Unlikely	**Overall weighting** Major
Mitigation/ Treatment	• Awareness and management of safety risks • In an extreme event the club could fail and a new club established in its place.		
Risk weighting after addressing	**Consequence** Extreme	**Likelihood** Unlikely	**Overall Weighting** Major

Issue	**9. Other risks**		
Possible Cause	Financial risk – e.g. dishonesty of official - Failure of financial institution		
Notes	Not a current risk, but our Treasurer may feel more comfortable with some structure.		
Consequences			
Likelihood			
Risk Weighting before addressing	**Consequence** Extreme	**Likelihood** Unlikely	**Overall weighting** Major
Mitigation/ Treatment	Adopt rigid financial procedures such as: • Ensure funds only lodged with institutions holding high credit ratings • We have Ensured no one individual can control the following ○ Cheque signatories ○ Open new bank accounts ○ Issue funds transfer instructions The Association Liability Insurance cover provides up to $100,000 fidelity cover		
Risk weighting after addressing	**Consequence** Minor	**Likelihood** Unlikely	**Overall Weighting** Moderate

Attachment 5

Aircraft Inspection

R/C Power Models

Large R/C models must be built and operated to higher standards than small R/C models. In addition, models 15kg - 25kg, pilotless aircraft 25kg – 100kg and models under 15kg using motors of 75cc or larger require, a Permit to Fly achieved through an Approval Scheme operated by the Large Model SIG, and which requires specified inspection of models during construction and completion of observed test flight regimes.
Large models can only be flown by those current members holding a large model endorsement on their wings badge. Buddy Boxing on Large models can only be conducted by a club approved instructor.
Large model certificate must be carried the pilot and it must be in that pilots name. The certification number must be displayed on the aircraft.

For all R/C Models the following checks must be made in addition to those already covered in the ‘General’ and the ‘Radio Control’ sections, before every flying session:

AIRWORTHINESS INSPECTION: The ultimate responsibility for the safety and airworthiness of the aircraft rests solely with the owner and/or pilot.

Attachment 6 **Key Contacts List**

List of Contacts	(List name of contact)	(List phone numbers)
Club Committee and Office Holders	Please see web/blog site Highbrook Aero Modellers for up to date information	
Fire Service	Dial 111	
Order of St John Ambulance Station Radius Medical Centre	Dial 111 16 Ti Rakau Dr Burswood, Auckland	0800 ST JOHN (0800 785 646) 09-273 8980.
Model Flying New Zealand		https://www.modelflyingnz.org
Worksafe	Contact within seven days of accident	SeriousHarm.Notification @worksafe.govt.nz