PAN PAC
FOREST PRODUCTS LTD

Risk Register – UNMANNED AERIAL VEHICLE (UAV)

Vault ID #	Task/Area where hazards exists	Hazard – what can cause harm	Potential outcome – what can happen	Likelihood	Consequences	Risk Rating (Inherent)	Required Control Measures List the control measures required to eliminate or minimise the risk of illness or injury for each hazard identified	Frequency of Monitoring or Action Date	Personnel Responsible The person required to action the control measure	Eliminate	Type Minimisation Controls	Likelihood	Consequences	Risk Rating (Residual)
6387	UAV Operation	Buildings, high vegetation	Material damage to craft or assets. Fire caused by LiPO batteries. Lost craft due to "flyaway".	C	3	**H**	• Flight Planning. • Assess all hazards on site. • Conduct a safety flight or "CCC" flight prior to carrying o but the intended operation.	On site prior to flight and during planning.	Operator		A	D	3	**M**
	UAV Operation	Communication loss/interference with craft	Material damage to craft or assets. Fire caused by LiPO batteries. Lost craft due to "flyaway".	C	3	**H**	• Reduce or eliminate any other source of WIFI or radio signal in the operating area. • Move away from RT aerials on vehicles. • Be aware that a handheld radio used for communication with an observer may cause interference. • UAV Return to Home feature must be operational and set prior to conducting flight.	During operation	Operator		A, I	D	3	**M**
	UAV Operation	Bird contact/attack	Material damage to craft or assets. Fire caused by LiPO batteries.	C	3	**H**	• Monitor the flight area for bird activity. • Switch controller to "P" mode if flying in autopilot, fly above the bird/s and come directly home and land UAV.	During operation	Operator		A	D	3	**M**
	UAV Operation	LiPO batteries (Crashed UAV, whilst charging, damaged batteries or wear and tear)	Fire caused by LiPO batteries.	C	3	**H**	• UAV craft kit must contain fire blanket (1m x 1m minimum). • Only approved chargers to be used for batteries. • Charge batteries on a hard surface. • Store batteries in a secure place. • Discharge batteries prior to storage. • Monitor battery health and maintain as per Pan Pac UAV & Equipment Maintenance.	During operation	Operator, All staff		A, I	D	3	**M**
	UAV Operation	Sun Strike	Material damage to craft or assets. Fire caused by LiPO batteries.	C	3	**H**	• Check light conditions prior to flight. • Ensure positioning of operator is away from sun. • Have an observer on site.	During operation	Operator		I	D	3	**M**

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	UAV Operation	Dis-orientation with craft/loss of site with craft during flight	Material damage to craft or assets. Fire caused by LiPO batteries.	C	3	H	• Choose a suitable vantage point to conduct the operation from. • Monitor craft at all times – if no observer on site cease flight if line of sight is compromised. • Auto-return to home is visual of craft is lost • Have an observer on site.	During operation	Operator		I	D	3	M
	UAV Operation	Contact with powerlines	Material damage to craft or assets. Fire caused by LiPO batteries or downed powerlines.	C	4	H	• Reference Transpower powerlines card in Craft Kit. • Ensure visual of craft is maintained, and operator is aware of powerline corridor relative to their operation. • Must not operate closer than 12m to any powerlines.	During operation; planning	Operator		A, I	D	3	M
	UAV Operation	Operator distraction during flight	Operator loses visual of craft. Operator loses control of craft and/or crashes.	C	2	M	• If approached by anyone during an operation, ensure that they do not distract you. • Manage the use of the aircraft radio (Only in extreme circumstances or emergencies).	During operation	Operator, observer		A	E	2	L
	UAV Operation	Propellers striking a person	Injury to body	C	3	H	• Ensure propeller guards are fitted to the UAV • Do not fly closer than 10m to any person or group of people (does not include operator) • If propeller guards cannot be practically fitted to the UAV, double the operating distance from other persons to 20m.	During operation	Operator		A, I	D	3	M
	UAV Operation	Launching or catching UAV by hand	Injury to operator from propellers	C	3	H	• Only to be performed by competent operator unless an emergency situation/ landing. • Craft must be grabbed from below only. • This practice must only be used for the Phantom series UAVs.	During Operation	Operator, observer		A	D	3	M
	UAV Operation	Neck/shoulder pain	Holding UAV remote controller and iPad	C	1	L	• Ensure all controllers are fitted with a neck/shoulder strap to take the weight of the controller and iPad	During Operation	Operator			E	1	L

	UAV Operation	Low flying, manned aircraft	Material damage to manned aircraft causing death or major injury. Material damage to craft or assets. Fire caused by LiPO batteries.	C	5	**H**	• Complete full flight planning including all Pan Pac necessary steps and procedures prior to operation. • Check airspace, NOTAMs, AIPs, low level flight advice from NZRAF, ag strips. • Have the ability to perform a correctly formatted VHF radio call. • Do not fly in Low Flying Zones (LFZs). • Isolate UAV using CSC command to kill UAV motors and deliberately bring it to the ground.		Operator		A, I	D	5	**M**
	UAV Operation	UAV does not gain altitude to correct RTH (Return to home) height	Material damage to craft or assets. Fire caused by LiPO batteries.	C	3	**H**	• Ensure the operator always maintains line of sight with the UAV. • If RTH height has not been set correctly, manually override and increase the height of the UAV.		Operator		A	D	3	**M**
	UAV Operation	Flying craft in "Atti" mode	High risk of losing control or crashing	B	3	**H**	• Ensure flying in "Atti" mode is only done in calm conditions when practicing using this function. • Only use "Atti" mode as a last resort to reclaim the craft if a loss of GPS signal occurs • Only attempt if trained and hold Part 101		Operator		A	D	3	**M**
	UAV Operation	Loss of GPS signal	High risk of losing control or crashing Lost craft due to "flyaway"	B	3	**H**	• Operator must be competent or under direct supervision of a qualified pilot. • Switch the controller to "Atti" mode and manually fly the craft home.		Operator		A	D	3	**M**
	UAV Operation	Operating UAV over water	Material damage to craft from hitting water	C	2	**M**	• Turn craft Visual Positioning System OFF. This will avoid the camera becoming confused over the water (See user manual if necessary)		Operator		A, I	D	2	**L**
	UAV Operation	Critical battery warning forcing emergency landing.	Material damage to craft or assets. Fire caused by LiPO batteries.	C	2	**M**	• Always operate craft with a 30% low battery warning. • Ensure craft is landed or close to landing at 30%. • For mapping flights operate a battery timer appropriate for wind and temperature conditions. • Maintain critical battery warning at 10% (factory setting is 15%) to minimise the chance of the UAV initiating an emergency landing. • Manual controls can still be applied if necessary, during an emergency landing.		Operator		A	D	2	**L**

	UAV Operation	Low outside temperature	Battery Failure due to voltage drop or cell failure	C	2	**M**	• Ensure battery temperature is at least 15 degrees prior to any UAV operation. • Monitor outside temperatures • Avoid flying first thing on cold mornings if possible.		Operator		A	D	2	**L**
	UAV Operation	Contact of propellers with ground during take-off or landing	Injury from flying objects during shattering of propellers. Damage of UAV motors due to stress causing mid-air failure if not repaired, or damage goes unnoticed	C	2	**M**	• Select appropriate landing and take-off area. • Maintain setback distance from the craft. • Monitor wind conditions. • Always use the automated take-off and landing functions. • Always use propeller guards. • Replace propellers at regular intervals, and when damage is noticed.		Operator		A	D	2	**L**
	UAV Operation	Operating UAV over or near roads	UAV collision with traffic. Distraction for traffic.	C	2	**M**	• Permission must be granted from NZTA before flying adjacent to, or over their road network. • Ensure weather conditions will not impact an operation that is conducted close to a public highway. • Do not operate the UAV in a manner that will be distracting for road users. • If the craft crashes, isolate the UAV and place batteries in a LiPO bags.		Operator		A, I	D	2	**L**