



Model Rocketry Risk Register and Control Plan (all levels)

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Endorsed by:

Status: Under CASA review

Risk No.	Description of Hazard	Description of Risk	Worst credible outcome	Likelihood	Consequence	Risk Level	Risk Treatment Strategy	Operations Manual Reference/s	Residual Likelihood	Residual Consequence	Residual Risk
1	Public interaction	Miscellaneous accident with minor injury	Litigation, adverse publicity	2	2	4	<ul style="list-style-type: none"> Limited public access to launch events Supervision and control by participants Public liability insurance held 	Range Safety Officer (RSO) Guidelines document Range Safety Guidelines document	1	2	3
2	Public interaction	Miscellaneous accident with major injury	Litigation, adverse publicity	2	4	6	<ul style="list-style-type: none"> Limited public access to launch events Supervision and control by participants Public liability insurance held 	Range Safety Officer (RSO) Guidelines document Range Safety Guidelines document	1	4	5
3	Moving about, set up of equipment, general range activity, pack up of equipment	Slip, trip, fall, snake/spider bite, sunburn	Minor personal injury to participant	2	2	4	<ul style="list-style-type: none"> Defined exit and entry points to launch areas Policy requiring appropriate footwear & clothing. First-aid kit to be available. 	Range Safety Officer (RSO) Guidelines document Range Safety Guidelines document	1	2	3
4	Rocket set-up and motor installation	Premature ignition of motor with persons in proximity	Minor personal injury to participant	2	3	5	<ul style="list-style-type: none"> Mandatory adherence to Tripoli Safety Code/s Instruction from experienced participants First aid facilities available 	Tripoli High Power Safety Codes Safe Launch Practices document - sections I, J	1	2	3
5	Motor ignition and initial thrusting	Delayed ignition of motor where participants are in proximity	Minor personal injury to participant	2	3	5	<ul style="list-style-type: none"> Mandatory adherence to Tripoli Safety Code/s Instruction from experienced participants 	Tripoli High Power Safety Code Safe Launch Practices document - section K	1	2	3
6	Motor ignition and initial thrusting	Ground fire	Major property damage	3	4	7	<ul style="list-style-type: none"> No activity on fire-ban days. No activity if launch area grass is dry and excessive. Clear areas around launch site of flammable materials or use non-flammable ground sheet. Mandatory fire extinguisher/s at-hand. Discretionary use of sparky motors 	Tripoli High Power Safety Code Safe Launch Practices document - section K US National Fire Protection Association Code 1127	2	3	5
7	Motor ignition and initial thrusting	Catastrophic failure of motor casing	Minor personal injury to participant	1	3	4	<ul style="list-style-type: none"> Mandatory use of only commercially produced and certified rocket motors. Mandatory compliance with minimum safe distance chart for all launches. 	Tripoli High Power Safety Code Safe Launch Practices document - section V	1	2	3
8	Motor ignition and initial thrusting	Noise startling livestock or pets	Injury to animals	2	2	4	<ul style="list-style-type: none"> Flight only on suitably-sized areas and not in proximity to livestock or animals. Advise any neighbouring landowners of launch and discuss in advance, any potential animal responses to launch noise. 	Tripoli High Power Safety Code Tripoli Range Safety Officer (RSO) Guidelines	1	2	3
9.1	Low/Mid powered rocket flight	Unstable flight leading to powered impact with persons or property	Serious personal injury to participant or observer; minor property damage	3	4	7	<ul style="list-style-type: none"> Mandatory adherence to range clear distance requirements. Verification of design stability before flight. Instruction from experienced participants. 	Tripoli High Power Safety Code Tripoli Range Safety Guidelines - Flier, Flight Safety Review	1	4	5
9.2	High powered rocket flight	Unstable flight leading to powered impact with persons or property	Serious personal injury to participant or observer; major property damage	2	4	6	<ul style="list-style-type: none"> Mandatory adherence to range clear distance requirements. Verification of design stability before flight. Instruction from experienced participants. Range Safety Officer scrutineering of models prior to flight. 	Tripoli High Power Safety Code Tripoli Range Safety Guidelines - Flier, Flight Safety Review	1	4	5

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10	In-flight break-up of rocket	Descending debris striking persons or property	Minor personal injury to participant or observer; minor property damage	2	3	5	<ul style="list-style-type: none"> - Mandatory adherence to minimum safe distance chart for HPR launches. - Instruction from experienced participants - Heads-up during launches - No launch until previous flight has landed 	Tripoli High Power Safety Code Tripoli Range Safety Guidelines - Launch Control	1	3	4
11.1	Flight into proximity with light or microlight aircraft	Collision with aircraft or distraction to pilot	Major damage to aircraft, loss of control and crash causing fatality	2	4	6	<ul style="list-style-type: none"> - Mandatory adherence to requirements of CASR Part 101 and Tripoli Safety Codes - Visual and auditory verification of no aircraft in launch area prior to launch. - No flight in controlled airspace without appropriate approvals sought and confirmed before launch. - NOTAM lodgement & AirServices notification 	Tripoli High Power Safety Code Tripoli Range Safety Guidelines - Launch Control	1	4	5
11.2	Flight into proximity with heavy aircraft	Collision with aircraft or distraction to pilot	Minor damage to aircraft causing diversion or emergency landing	1	3	4	<ul style="list-style-type: none"> - Mandatory adherence to requirements of CASR Part 101 and Tripoli Safety Codes. - Visual and auditory verification of no aircraft in launch area prior to launch. - No flight in controlled airspace without appropriate approvals sought and confirmed before launch. - NOTAM lodgement & AirServices notification - Liaison and coordination with other airspace users and RPT operators - Have dedicated range contact phone number to allow advice and suspension of launches in the event of any unscheduled aircraft operation in launch area. - Monitoring airspace use with ADS-B technologies. 	Tripoli High Power Safety Code Tripoli Range Safety Guidelines - Launch Control Tripoli RSO Guidelines - Airspace	1	3	4
12.1	Ballistic descent of low power rocket	Descending rocket impacts on persons or property	Personal injury to participant or observer, minor property damage	2	4	6	<ul style="list-style-type: none"> - Mandatory adherence to Tripoli Safety Codes. - Instruction from experienced participants. - Mandatory adherence to minimum safe distance chart for HPR launches. - 'Heads-up' during all launches - Attention to LCO at all times - Controls on concurrent HPR flights 	Tripoli High Power Safety Code Tripoli Range Safety Officer Guidelines - Launch Control, Flight Safety Review, Flier Responsibilities	1	4	5
12.2	Ballistic descent of mid or high power rocket	Descending rocket impacts on persons or property	Serious personal injury or fatality to participant or observer; major property damage	2	5	7	<ul style="list-style-type: none"> As above, plus: - Positive control of trajectory for full flight through selection of launch rod/rail angles, determining and consideration of winds aloft. - No flight uprange of flight line 	Tripoli High Power Safety Code Tripoli Range Safety Officer Guidelines - Launch Control, Flight Safety Review, Flier Responsibilities	1	5	6
13	Uncontrolled descent from tangle, strip or failure of recovery systems	Descending rocket impacts on persons or property	Minor personal injury to participant or observer; minor property damage	3	2	5	<ul style="list-style-type: none"> - Mandatory adherence to Tripoli Safety Codes - Instruction from experienced participants. - Mandatory adherence to minimum safe distance chart for HPR launches. 	Tripoli High Power Safety Code Tripoli Range Safety Guidelines - Launch Control	1	2	3
14	Excessive drift during descent to outside of recovery area	Descending rocket impacts on persons or property	Minor injury; minor property damage	2	2	4	<ul style="list-style-type: none"> - Appropriate selection and size of launch site - Not launching near populous areas - No flight in excessive winds 	Tripoli High Power Safety Code Tripoli RSO Guidelines - Weather	1	2	3

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15	Rocket hangs-up in elevated location (powerlines, trees)	Attempted recovery from an elevated location	Participant attempting recovery falls and is fatally injured	2	4	6	=F222- Appropriate selection of launch site. - Recovery from elevated locations prohibited. - Mandatory compliance with Tripoli Safety Codes	Tripoli High Power Safety Code Tripoli Safe Launch Practices document	1	3	4
16	Rocket descends onto a roadway	Collision with a vehicle or distraction to drivers	Minor damage to vehicle; major damage if subsequent loss of control and crash	2	3	5	- Control of launch location so as to make descent onto public roadways unlikely. - No flight in elevated wind conditions. - Mandatory adherence to minimum safe distances chart for HPR launches. - Mandatory adherence to minimum clearances from operating roadways.	Tripoli High Power Safety Code Tripoli Safe Launch Practices document	1	3	4

		Consequence				
		1	2	3	4	5
		Negligible	Minor	Moderate	Major	Severe
Likelihood	5	Almost Certain	7	8	9	10
	4	Likely	5	6	7	8
	3	Possible	4	5	6	7
	2	Unlikely	3	4	5	6
	1	Rare	2	3	4	5

Value	Consequence	Meaning
5	Severe	Multiple fatalities, equipment destroyed
4	Major	Large reduction in safety margins, serious injury, major equipment damage
3	Moderate	Significant reduction in safety margins, serious incident, injury to persons
2	Minor	Nuisance, operating limitations, use of emergency procedures, minor incident
1	Negligible	Few consequences

Value	Likelihood	Meaning
5	Almost Certain	Imminent - expected to occur in most circumstances
4	Likely	Once in the next month - will occur in most circumstances
3	Possible	Once in the next 12 months
2	Unlikely	Once in the next 1-5 years - could occur at some time
1	Rare	Once in the next 10 years - only in exceptional circumstances

>8	Extreme Risk	Detailed treatment plan and constant monitoring required
6-7	High Risk	Requires high level treatment and monitoring
4-5	Medium Risk	Requires moderate planning and monitoring as appropriate
<4	Low Risk	Managed by normal operational procedures