



Snorkel New Zealand Ltd.

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Plant Risk Assessment

Self Propelled Vertical Mast type Elevating Work Platform
Snorkel TM12

This Hazard Identification and Risk Assessment document is *Model specific*. It is based on the knowledge that all new machines of this model were/are produced to the same specification and design. It assumes all examples of this exact model currently in service to be as per the original specification, and to have been and continue to be operated and maintained in accordance with the Manufacturers requirements, and with all applicable statutory and regulatory requirements

This Hazard Identification and Risk Assessment document has been prepared based on information available at the time of publication, and on the physical assessment of an original example of the Model for which it was prepared. This Assessment must be reviewed by all stakeholders as required:

- o Having regard to the manufacturers approved options
- o Having regard to the general arrangement of miscellaneous equipment or facilities that may be provided on the plant according to the end users requirements or specification
- o According to the particular circumstances under which the plant is used and maintained
- o As new Hazards are identified and/or as risks are reassessed
- o As existing risk control measures are revised or new risk control measures are introduced and implemented
- o As and when work procedures are altered or revised
- o Having regard to any unauthorised alterations or modifications made to the design or operation of the equipment

Snorkel New Zealand Ltd. have made every attempt to identify all reasonably foreseeable operating circumstances in preparing this Assessment, however no guarantee as to the completeness of this Assessment is provided or implied.

It is the responsibility of Owners, Employers and Operators to identify all hazards associated with the use of this equipment specifically applicable to the task to be carried out and to where the equipment is to be used or located. They must assess the risk potential for each of the identified hazards and ensure that all reasonably practicable steps are taken to ensure those risks are effectively controlled.

- *All operators must be trained and competent in the safe use of this particular piece of equipment, and hold appropriate qualifications as required by applicable regulatory requirements**
- *Operators of the equipment to which this Plant Risk Assessment refers must read and understand the Instructions for Use and Warnings contained within the Operators Manual prior to use**
- *All Daily Pre-Start Checks, Routine and Periodic Inspections, Maintenance and Repairs to this equipment must be carried out in accordance with the requirements of AS2550.10-2006**

	36 Bruce Road, Levin		Ph. +646 368 6918 Fax: +646 368 9164		
	Plant type: Self propelled vertical mast Elevating Work Platform		Person conducting Assessment: Bruce MacLean		
	Model: TM12	Serial No. TM12-01-060050	Date of Assessment: February 13th, 2015		

HAZARD DESCRIPTION	RISK ASSESSMENT	PRACTICABILITY Is it practicable to remove or mitigate the risk?	RISK CONTROL		CONFIRMATION Has the necessary action been completed?
			RISK CONTROL MEASURES ALREADY IMPLEMENTED (by Designer, Manufacturer, Importer, Distributor)	SUPPLEMENTARY RISK CONTROL (for action by Management - the person, company or entity legally responsible for the use of the equipment)	
Injury - due to use of machine not suitable for the task, and/or operating the equipment without sufficient instruction, training, information or supervision	High	Yes	Operators Manual provides detailed information on use of the machine, including all limitations and associated hazards and risks. Manual warns of use by inexperienced or untrained operators	Prepare a documented system of work ensuring all modes of operation of the machine are covered. Train and instruct the operator, and ensure the Operators Manual is with the machine at all times	
Injury as a result of site specific hazards	High	Yes	General requirements, warnings and list of site specific hazards is detailed in the Operators Manual	Ensure Operators are able to identify all site specific hazards they may encounter and implement actions to ensure they are addressed by appropriate means	
Injury due to inappropriate and/or unauthorised use	High	Yes	Warnings in Operators Manual of the dangers of 'horseplay' and to secure the machine against unauthorised use at the end of each shift. Unit is fitted with a keyswitch for security.	Ensure only trained Operators use the machine and ensure the machine is secured before leaving unattended - remove the key	
Persons injured due to missing, damaged or illegible safety decals and labels	High	Yes	Pre-operational Inspection includes check of decals and Operators Manual provides pictures of each decal for identification	Ensure Pre-operational Inspection is carried out as per manufacturers instructions and is recorded in the Logbook provided on the machine. Maintain/replace decals as req'd	
Persons injured due to unrecognised hazards	High	Yes	Preliminary hazard identification is provided in the Operators Manual	Ensure a specific hazard and risk assessment is carried out relevant to the task and environment, prior to operation of this piece of equipment. Ensure all appropriate risk control measures are implemented and adhered to	
Due to failure to observe or rectify safety upgrades from the manufacturer	Extreme	Yes		Ensure the owner of the machine is registered with the manufacturer. Periodically check with the manufacturer for the existence of any safety related bulletins or notifications or upgrades and ensure they are implemented. Ensure the manufacturer is notified when the machine is disposed of.	
Persons could be injured if the unit is operated by persons under the influence of drugs and/or alcohol.	High	Yes	AS2550.10 – 2006 clause 5.2 (p) states that personnel shall not be under the influence of drugs or alcohol.	Ensure that operators do not use the aerial device while under the influence of alcohol or drugs.	

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GENERAL HAZARDS (continued)			RISK CONTROL MEASURES ALREADY IMPLEMENTED (by Designer, Manufacturer, Importer, Distributor)	SUPPLEMENTARY RISK CONTROL (for action by Management - the person, company or entity legally responsible for the use of the equipment)	Has the necessary action been completed?
Persons could be injured if the operator's performance is inhibited by poor health or medication with side effects.	High	Yes		Instruct the operator that he/she must report to the supervisor if suffering poor health and safe operating performance could be affected.	
Persons could be injured if the operator's performance was inhibited by excessive fatigue.	High	Yes		Implement a system to ensure that operators do not work excessive or continuous shifts and manage peak demands.	
Persons could be injured if the operator's vision is impaired by sunlight or bright lights in close proximity.	Moderate	Yes		Instruct the operator in relation to the siting of lights.	
Persons could be injured if the unit is operated during storms.	High	Yes		Ensure that the unit is not operated during storms or if storms may arise when carrying out the required task	
Persons could be injured if the unit is operated indoors without adequate ventilation.	High	Yes	Operators Manual contains warning regarding charging the batteries in well ventilated area	Ensure the unit is operated only in well ventilated areas.	
Persons could be injured if equipment is operated while not wearing appropriate PPE.	High	Yes	Requirement specified in AS2550.10. Warning in Operators Manual regarding wearing PPE appropriate to the task and environment	Provide specification for appropriate PPE including gloves, safety glasses, hard hat and safety footwear etc as appropriate. Instruct operators on requirements for its use. Ensure PPE is inspected and certified on a routine basis.	
Persons could be injured due to exposure to UV.	Moderate	Yes		Develop and provide specification for appropriate UV protection and its use. Provide UV protective equipment and instruct operators on the requirements for its use.	

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HYDRAULIC SYSTEM			RISK CONTROL MEASURES ALREADY IMPLEMENTED <small>(by Designer, Manufacturer, Importer, Distributor)</small>	SUPPLEMENTARY RISK CONTROL <small>(for action by Management - the person, company or entity legally responsible for the use of the equipment)</small>	Has the necessary action been completed?
Failure of hydraulic cylinder or hose resulting in uncontrolled platform movement	High	Yes	Cylinder design is in accordance with AS1418.10-2011 requirements. Load holding valves are fitted to cylinders. Pre-operational and routine maintenance checks include load holding valve operation.	Ensure all pre-operational and routine maintenance checks are carried out. Withdraw machine from service if platform does not maintain selected height or if hydraulic leaks develop	
Injury as a result of high pressure oil jet from hydraulic leak	Moderate	Yes	Operators Manual contains warning to be aware of this	Ensure that personnel are properly trained and aware of the hazards	
Uncontrolled movement due to contamination of hydraulic system	Moderate	Yes	Hydraulic filters are fitted. Maintenance manuals detail service intervals for hydraulic filters and hydraulic oil replacement	Ensure Maintenance manual requirements are carried out	

ELECTRICAL HAZARDS	RISK ASSESSMENT	PRACTICABILITY Is it practicable to remove or mitigate the risk?	RISK CONTROL MEASURES ALREADY IMPLEMENTED <small>(by Designer, Manufacturer, Importer, Distributor)</small>	SUPPLEMENTARY RISK CONTROL <small>(for action by Management - the person, company or entity legally responsible for the use of the equipment)</small>	CONFIRMATION
Persons could be injured due to contact with or approach to live electrical apparatus	Extreme	Yes	Legislative requirements to maintain minimum approach distances. Decals fitted to platform advise minimum approach distances	Ensure all persons understand and observe the limits of approach. Use only trained and qualified operators	
Electric shock due to fault with AC power supply	High	Yes	All installations and certifications are performed by suitably qualified personnel	Ensure that AC power supplies are appropriately protected and checked in accordance with legislative requirements	

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Machine could collapse due to design or manufacturing fault	High	Yes	Machine is designed, manufactured and tested to comply with requirements of AS1418.10-2011. Design is registered with Workcover NSW and Worksafe Victoria	Carry out all Pre-operational safety checks. Routine and Periodic Maintenance as required by AS2550.10-2006 must be carried out by a competent person. Periodically check with the manufacturer and industry bodies for the existence of any Safety Alerts or Service Bulletins.	
Structural failure to overloading	High	Yes	Overload tested in accordance with AS1418.10-2011 Clause 2.3.1.6 for machines meeting enhanced overload criteria. Decals on platform show maximum capacity and acceptable load combinations	Ensure machine is only operated within the specification and operating parameters detailed in Operators Manual, and in accordance with industry standards and regulatory compliance with AS2550:10-2006. Ensure machine is only Operated by trained personnel	
Structural failure due to dynamic loading	High	Yes	AS1418.10-2011 compliance accounts for the effects of dynamic loads. Proportional controls provide for reduction of function speeds and all controls return to neutral when released. Emergency Stop switch provided	Ensure the machine is not operated near drop-offs or kerbs. Ensure function speeds do not exceed the specifications set out in the Operators Manual. Only trained and experienced operators are to use the machine	
Structural failure due to loose or missing pivot pins, retainers and fasteners	Extreme	Yes	Pre-Operational checks detailed in Operators Manual include inspection of these components	Ensure that Pre-operational checks are performed and documented	
Structural failure due to unauthorised modification, alteration, use or interference	High	Yes	Operators Manual includes warnings prohibiting unauthorised modification or alteration. Keyswitch is fitted to prevent unauthorised use	Ensure that no modifications or alterations are performed without written consent of the manufacturer. Ensure the machine is secured at the end of each shift and the key is removed	
Structural failure due to unit being in poor mechanical condition due to fatigue or wear	High	Yes	Pre-operational checks of all mechanical and structural components are included in Operators Manual	Ensure machine is checked, repaired & maintained by a competent person in accordance with manufacturers checklist provided in manuals and in compliance with AS2550.10-2006. Use only OEM parts to repair	

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Loss of stability/overturning hazards					
Injury as a result of instability or overturning due to use on excessive slope or on ground surface incapable of supporting machine weight and load	Extreme	Yes	Interlock and alarm preclude raising platform when machine is on excessive slope. Operators Manual warns of requirement for ground checks prior to use. Stability tested in accordance with AS1418.10-2011	Ensure that machine is operated within the rated slope guidelines specified on the data plate and in the Operators Manual. Ensure Tilt sensor interlock is maintained and tested as per manufacturers requirements	
Overturning due to overloaded platform	Extreme	Yes	Stability and overload tested in accordance with AS1418.10-2011 Clauses 2.3.1.5 & 2.3.1.6 for machines meeting enhanced stability and overload criteria. Maximum capacity decal fitted on platform	Ensure the platform is not overloaded and that operators understand and observe the allowable load limits and combinations	
Overturning due to use in high winds	High	Yes	Designed and tested for stability at maximum wind speed of 12.5 metres/sec for one operator. Maximum wind speed stated in Operators Manual and on decals fitted to machine. Operators Manual warns against use of bluff bodies on the platform which may increase loads due to exposure to wind	Ensure the machine is not used in winds exceeding the maximum rated speed. Ensure only one operator uses machine when exposed to wind. Ensure that bluff bodies are not carried in the platform that will increase the wind loads on the platform	
Overturning due to tyre failure or loss of wheel/s	High	Yes	Machine is fitted with solid tyres. Wheels are secured by castellated nut & split pin, and by a bolt. Pre-start checks in Operators Manual include these items	Ensure wheel/tyre condition and security are checked regularly according to manufacturers recommendations included in Operators Manual	
Overturning due to pushing or pulling objects with platform or by applying excessive manual force to adjacent surfaces	High	Yes	Warnings provided in Operators Manual not to use machine as a crane or jack or for any other purpose than to position personnel and their equipment. Warnings in manual and decals on machine indicate maximum allowable manual force	Ensure Operators do not exert manual forces greater than specified maximum. Ensure Operators do not use platform to push or pull objects or as an anchor point to tie off to	
Loss of stability due to machine movement caused by wheels sliding or slipping on slope or ramp	High	Yes	Operators Manual warns of requirement for ground checks prior to use	Ensure the support surface is level, is not slippery, and is capable of supporting the full weight of the machine and load	

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HAZARD DESCRIPTION CONTROL MALFUNCTION & UNCONTROLLED MOTIONS	RISK ASSESSMENT	PRACTICABILITY Is it practicable to remove or mitigate the risk?	RISK CONTROL		CONFIRMATION Has the necessary action been completed?
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Due to control malfunction	High	Yes	Emergency Stop switches fitted at both control stations. Pre-operational checks of controls and emergency stop switches are included in the Operators Manual	Ensure pre-operational checks are carried out as per the Operators Manual checklists. Implement regular maintenance in accordance with manufacturers instructions and AS2550.10-2006 requirements	
Due to accidental operation of controls by 'knocking', or inadvertent activation from engagement by tools, hoses, cables, loose clothing etc	High	Yes	Pre-enable switch and joystick trigger fitted that must be pressed first for function to occur. Emergency stop switch provided which disables all controls. Platform controls are protected by a guard. Lower controls are positioned to minimise risk of inadvertent operation	Ensure operators engage the Emergency Stop switch when the desired work location has been reached, as instructed in the Operators Manual. Implement safe working procedures to ensure the risk of inadvertent engagement by tools, hoses, cables and loose clothing etc, is minimised	
Due to safety switches being overridden	High	Yes	Warnings in Operators Manual and decals on machine prohibit alteration or disabling of safety switches or interlocks	Ensure safety devices and interlocks are not tampered with. Ensure only trained and qualified operators use the equipment.	
Control system conflict using emergency power system	Low	Yes	Emergency manual lowering does not rely on a power source	Ensure Operators are familiar with the emergency procedures prior to operating the equipment. Ensure ground personnel are always available to operate emergency controls	
As a result of hydraulic hose failure	High	Yes	All load holding cylinders are fitted with load holding counterbalance valves	Verify operation of all load holding valves during routine maintenance	
As a result of brake failure	High	Yes	Brakes are spring applied automatically when drive control is not in use	Ensure brake operation is checked during routine maintenance	

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CRUSHING, SHEARING & TRAPPING HAZARDS					
Crush injury as a result of operation - travelling or raising/lowering	High	Yes	Motion alarm and flashing beacon fitted provide audible and visual warnings	Ensure operators are aware of their surroundings and travel at appropriate speeds. Ensure ground personnel are always available to operate emergency controls if required and that they are familiar with them	
Due to inadvertent activation of controls	High	Yes	Pre-enable switch and joystick trigger fitted that must be pressed first for function to occur. Emergency stop switch provided which disables all controls. Platform controls are protected by a guard. Lower controls are positioned to minimise risk of inadvertent operation	Ensure operators engage the Emergency Stop switch when the desired work location has been reached, as instructed in the Operators Manual. Implement safe working procedures to ensure the risk of inadvertent engagement by tools, hoses, cables and loose clothing etc, is minimised	
Persons crushed whilst performing routine maintenance	High	Yes	Instructions included in Operators Manual regarding blocking mast. Warnings provided in manual	Train operators and maintenance personnel to be aware of these hazards and implement safe work procedures	
Persons injured due to exposure to pinch/crush/shear points	High	Yes	Warning decals fitted to all identified locations	Pre-operational checks includes warning decals. Ensure operators are properly trained and experienced	
Persons crushed by lowering platform and/or mast sections	High	Yes	Warning decals fitted. Alarm sounds during platform lowering. Platform lowering stops briefly and warning alarm sounds before lowering is complete	Train operators and maintenance personnel to be aware of these hazards and implement safe work procedures. Ensure all warning alarms and safety devices are checked during routine maintenance and daily inspections	

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SLIP, TRIP & FALL HAZARDS					
Falling from the platform	High	Yes	Handrails provided comply with AS1418.10-2011. Warnings provided in Operators manual regarding climbing on handrails. Non-slip flooring provided	Carry out pre-operational check of handrails for security of fitting. Ensure platform is free of debris that may cause floor to become slippery. Heed all warnings in manual not to climb on or over handrails	
Stepping out of elevated platform onto an adjacent structure	Extreme	Yes	Refer to requirements for elevated platform egress in AS2550.10-2006	Ensure operators do not egress from an elevated platform unless a risk assessment has been carried out and AS2550.10-2006 requirements are met	
Use of step ladders or stools in platform to increase access height or reach	Extreme	Yes	Operators Manual contains warning prohibiting this	Ensure that Operators do not use any means to gain additional height. Ensure selected machine provides sufficient height and reach for the required task	
Fall when accessing elevated platform	Extreme	Yes	Platform is able to accessed at ground level	Ensure that operators access the platform only when it is fully lowered. Use three points of contact when entering/exiting the platform	
Falling through platform gate	Extreme	Yes	Platform entry gate is self closing and self latching in accordance with AS1418.10-2011 requirements	Carry out pre-operational check of platform entry gate for proper functioning. Ensure objects in platform cannot interfere with correct gate function. Ensure operators do not deliberately cause gate to remain open	

FALLING OBJECTS					
Ground crew or passers by being struck by falling tools or objects	Moderate	Yes	100mm high toe guards provided and platform floor openings limited to 15mm in accordance with AS1418.10-2011 requirements	Barricade area from public access. Ensure materials are not supported on the handrails or exceed the confines of the platform	

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EMERGENCY PROCEDURES			RISK CONTROL MEASURES ALREADY IMPLEMENTED <small>(by Designer, Manufacturer, Importer, Distributor)</small>	SUPPLEMENTARY RISK CONTROL <small>(for action by Management - the person, company or entity legally responsible for the use of the equipment)</small>	Has the necessary action been completed?
Injuries sustained or exacerbated as a result of incorrect emergency retrieval procedures	High	Yes	Operators Manual contains detailed emergency retrieval procedures and instructions for per-operational checks of emergency controls	Ensure operators and all ground support personnel are familiar with correct emergency operating procedures.	
Injuries exacerbated as a result of working solo	Extreme	Yes		Ensure operators are provided with means of communication where necessary and establish protocols to ensure regular communication is maintained	

FIRE OR BURNS	RISK ASSESSMENT	PRACTICABILITY Is it practicable to remove or mitigate the risk?	RISK CONTROL		CONFIRMATION
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Work in an explosive or toxic atmosphere	High	Yes	Warning provided in Operators Manual regarding hazards associated with charging batteries	Ensure machine is not used in a hazardous environment. Ensure appropriate risk control measures are in place when carrying/using hazardous materials in platform	
During battery maintenance	High	Yes	Warning provided in Operators Manual regarding hazards associated with maintaining and testing batteries	Ensure battery maintenance is performed by a competent person and that appropriate risk control measures are implemented. Wear appropriate PPE	
Exposure to radiant heat or contact with hot objects or components during maintenance or checks	Moderate	Yes		Where possible, allow components to cool before performing maintenance or checks. Wear appropriate PPE and take care to avoid direct contact with hot objects or components	

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DRIVING, TRANSPORT & HANDLING			RISK CONTROL MEASURES ALREADY IMPLEMENTED <small>(by Designer, Manufacturer, Importer, Distributor)</small>	SUPPLEMENTARY RISK CONTROL <small>(for action by Management - the person, company or entity legally responsible for the use of the equipment)</small>	Has the necessary action been completed?
Injury as a result of accumulation of deterioration during long term storage	High	Yes		Ensure that an Annual Inspection is comprehensively performed by a competent person before returning the machine to service	
Injury from unsecured vehicle	High	Yes	Procedures are provided in Operators Manual. Tie down lugs are fitted to the machine and are identified by decals	Ensure the machine is secured in accordance with the requirements described in the manual and with relevant transport regulations	
Injury loading/unloading from transport vehicle	High	Yes	Procedures are provided in the Operators Manual	Ensure procedures in the manual are followed. Ensure loading ramps are adequate to support the machine weight and that the ramp gradient is less than the maximum machine gradeability. Ensure the transport and ramps are secured to prevent shifting during loading/unloading	
Injury releasing brakes	High	Yes	Operators Manual includes warnings related to release of brakes	Ensure the machine is secured to prevent it moving when brakes are released, prior to releasing them	
Injury sustained when lifting the machine	Moderate	Yes	Data plate on machine and specifications in Operators Manual show the machine gross weight	Ensure the lifting equipment and all rigging is appropriate for the task and is in good condition. Use only the designated lifting points identified on the machine and in the Operators Manual. Keep all personnel clear during lifting	

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MAINTENANCE					
Injury from pressurised sources during maintenance on hydraulic systems	High	Yes	Warnings provided in Operators Manual	Ensure maintenance personnel are adequately trained in maintenance of hydraulic systems and equipment and follow all precautions and instructions in manual	
Injury sustained when performing certain maintenance procedures	Moderate	Yes		Establish appropriate work procedures for all required and anticipated tasks. Ensure they are adhered to and review them periodically	
Injury as a result of poor maintenance procedures	Moderate	Yes		Ensure maintenance personnel are adequately trained in the maintenance of this piece of equipment. Always follows manufacturers instructions when performing maintenance and seek advice when necessary. Ensure the equipment is tested by a competent person prior to being returned to service after any maintenance and/or adjustment to systems and/or components has been carried out	
Injury due to handling heavy and/or unsupported components	High	Yes	Warning in manual states that heavy items should not be lifted without the aid of a mechanical device	Ensure personnel are provided with any necessary mechanical aids and instructions on their use, and ensure they are used and in accordance with those instructions	
Injury due to exposure to pinch points and/or shear points	High	Yes	Warning decals fitted to all identified points on machine	Ensure maintenance personnel are instructed to be aware of these hazards	
Crushed by falling boom/s or platform during maintenance	High	Yes		Ensure all maintenance personnel are trained in correct repair procedures	