



Snorkel New Zealand Ltd.

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Plant Risk Assessment

Diesel powered Rough Terrain Scissorlift type Elevating Work Platform

For the following Snorkel models built prior to January 2011:

SR2255, SR2755, SRT2670, SRT2770, SR2770, SR3370, SLH3284, SR3284, SLH4084, SR4084

This Hazard Identification & Risk Assessment has been prepared by Snorkel NZ and is based on several key assumptions:

1. That all examples of these models currently in service are as per their original specification
2. That all examples of these models have not been modified in any way without prior written consent of the manufacturer
3. That all examples of these models are operated and maintained in accordance with the Manufacturers Instructions and with all applicable statutory requirements

This Hazard Identification & Risk Assessment document has been prepared based on information available at the time of publication and 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**

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| 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) | |
| GENERAL HAZARDS | | | | | |
| 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. Do not leave platform elevated when unattended without considering potential wind forces | |
| Persons injured due to missing, damaged or illegible safety decals and labels | Moderate | 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 | Moderate | 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 | Low | 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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| 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 to in relation to the sighting 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 running the engine and/or charging 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. | Moderate | 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. | |

| HYDRAULIC SYSTEM | | | | | |
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| Failure of hydraulic cylinder or hose resulting in uncontrolled platform movement | Low | Yes | Cylinder design is in accordance with AS1418.10 requirements. Load holding valves are fitted to cylinders. 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 | Low | 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 | Low | 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 | | | | | |
|---------------------------------------------------------------------------------------|----------|-----|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--|
| Persons could be injured due to contact with or approach to live electrical apparatus | Moderate | 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 | Moderate | 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 | Low | Yes | Machine is designed, manufactured and tested to comply with requirements of AS1418.10. Design is registered with Workcover and Worksafe authorities | 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 due to overloading | High | Yes | Structure complies with AS1418.10. Hydraulic system relief valve prevents lift if platform is overloaded. Decals on platform show maximum capacity. Operators Manual contains warnings against overloading | 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, or accidental impact with adjacent structures | Moderate | Yes | AS1418.10 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 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 | High | 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 and Battery disconnect switch are 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 | High | 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 | 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. Where fitted, use stabilisers to level machine where necessary | |
| Overturning due to overloaded platform | High | Yes | Stability and overload tested in accordance with AS1418.10. Hydraulic system relief valve fitted prevents lift if platform is overloaded. Maximum capacity decal fitted on platform | Ensure the Operators do not attempt to lift loads in excess of the maximum capacity and that they do not place additional loads in the platform when elevated | |
| Overturning due to use in high winds | High | Yes | Designed and tested for stability at maximum wind speed of 12.5 metres/sec. Maximum wind speed and number of operators 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 no more than the specified number of operators use 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 | Moderate | Yes | Machine is fitted with solid filled tyres. Wheels are secured by nuts. 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 stabiliser footplates 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 on stabilisers | |

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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 | Low | 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 inadvertant activation from engagement by tools, hoses, cables, loose clothing etc | High | Yes | Joystick trigger must be pressed for function to occur. Emergency stop switch provided which disables all controls. Lower controls are positioned to minimise risk of inadvertant 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 inadvertant engagement by tools, hoses, cables and loose clothing etc, is minimised | |
| Due to safety switches being overridden | Low | 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 | Lower controls override upper controls. 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 | Low | 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 | Low | Yes | Brakes are spring applied automatically when machine is not in use | Ensure brake operation is checked during routine maintenance | |
| CRUSHING, SHEARING & TRAPPING HAZARDS | | | | | |
| Crush injury as a result of operation - travelling or raising/lowering | Moderate | 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 inadvertant activation of controls | High | Yes | Joystick trigger must be pressed for function to occur. Emergency stop switch provided which disables all controls. Lower controls are positioned to minimise risk of inadvertant 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 inadvertant engagement by tools, hoses, cables and loose clothing etc, is minimised | |
| Persons crushed whilst performing routine maintenance | High | Yes | Instructions included in Operators Manual and decal on scissor arms regarding use of Safety Prop. Warnings provided in manual | Train operators and maintenance personnel to be aware of these hazards and implement safe work procedures. Ensure Safety Prop is always used when performing maintenance. | |
| Persons injured due to exposure to pinch/crush/shear points | Low | 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 scissor arms | High | Yes | Warning decals fitted. Warning alarm sounds during lowering. | 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 | Full perimeter handrails provided comply with AS1418.10. 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, sit or stand on or over handrails. | |
| Operator ejected from platform | High | Yes | Handrails provided comply with AS1418.10. | Operators must ensure platform does not become entangled with adjacent structures. Heed all warnings not to climb on handrails | |
| Stepping out of elevated platform onto an adjacent structure | High | 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 | High | Yes | | 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 | High | Yes | Platform is able to accessed at ground level. Steps and | 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 | Moderate | Yes | Platform gate is self closing in accordance with AS1418.10 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 | 150mm high toe guards provided and platform floor openings limited to 15mm in accordance with AS1418.10 requirements | Barricade area from public access. Ensure materials are not supported on the handrails and do not exceed the confines of the platform | |

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| EMERGENCY PROCEDURES | | | | | |
| Injuries sustained or exacerbated as a result of incorrect emergency retrieval procedures | Moderate | Yes | Operators Manual contains detailed emergency retrieval procedures and instructions for pre-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 | Moderate | Yes | | Ensure operators are provided with means of communication where necessary and establish protocols to ensure regular communication is maintained | |

| FIRE OR BURNS | | | | | |
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| Work in an explosive atmosphere | Moderate | Yes | Warning provided in Operators Manual regarding hazards associated with charging batteries | Ensure machine is not used in a hazardous environment | |
| During battery maintenance | Low | 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 including the use of appropriate PPE | |
| During re-fuelling | Low | Yes | Warnings in Operators Manual to ensure adequate ventilation and no naked flames | Ensure all warnings in manual are heeded | |
| Exposure to radiant heat or contact with hot objects or components during maintenance or checks | Moderate | Yes | Engine is water cooled. Engine bay is ventilated. Exhaust is located away from operator during routine maintenance. | 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 | |

| DRIVING, TRANSPORT & HANDLING | | | | | |
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| Injury as a result of accumulation of deterioration during long term storage | Low | Yes | | Ensure that an Annual Inspection is comprehensively performed by a competent person before returning the machine to service | |
| Injury from unsecured vehicle | Moderate | 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 | Moderate | 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 | Moderate | 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 | Low | 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 | |