

Demag AC100

100T ALL-TERRAIN CRANE

Plant Risk Assessment



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Plant Risk Assessment

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INFORMATION

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METCALF
CRANE SERVICES



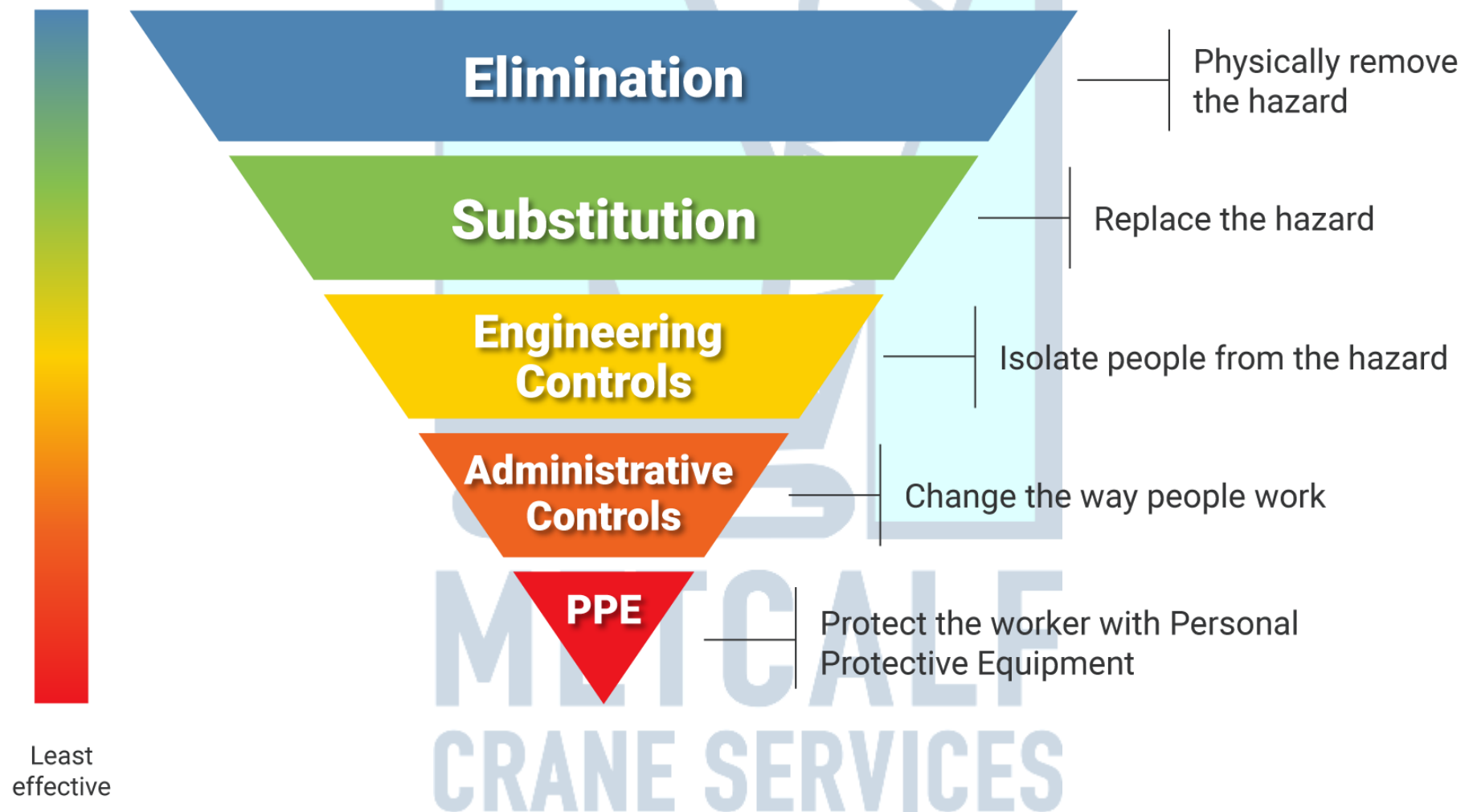
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Most
effective

HIERARCHY OF CONTROLS



Risk Matrix							
Consequence	Probability (Likelihood)						
	Severity		A	B	C	D	E
			<1% probability of occurring Never Heard of in Industry	>1% probability of occurring Heard of in Industry	>10% probability of occurring Happened in Company or More than Once per Year in Industry	>50% probability of occurring Happened at the Location Multiple Times	99% probability of occurring Occurs Frequently
			Remote	Highly Unlikely	Unlikely	Likely	Almost Certain
	1	Zero	Low	Low	Low	Low	Low
	2	Insignificant	Low	Low	Low	Low	Medium
	3	Minor	Low	Low	Low	Medium	Medium
	4	Serious	Low	Low	Medium	Medium	High
	5	Critical	Medium	Medium	Medium	High	High
	6	Catastrophic	Medium	Medium	High	High	High

Consequence Categories							
		Health and Safety of People	Damage to Assets (financial impact)	Damage to Environment	Damage to Metcalf Reputation	Law (Compliance with regulations)	Community and Social Damage and Impact
1	Zero	No injury or health effect	Zero	Zero effect	Zero impact	Zero Legal impact	Zero community/social impact Nil damage to
2	Insignificant	Slight injury (First Aid) or health effect or the potential for either	Slight damage or potential to cause slight damage up to \$5000	Slight effect or potential to have a slight effect Contained by Engineered means	Slight impact or potential to have a slight impact Public concern restricted to local complaints	Local investigation, minor breach of regulation or technical non-compliance – Prosecution not likely	Inconsequential short-term impact. Public concern restricted to local complaints Negative local media reports
3	Minor	Minor injury (recordable) or health effect or the potential for either	Minor damage or potential to cause minor damage \$5,000 up to \$50,000	Minor effect or potential to have a minor effect Short term effect on location	Limited impact or potential to have a limited impact Negative local media	Breach of law/regulation or non-compliance. Minor legal issues, minor litigation possible	Repairable damage to objects of cultural/heritage
4	Serious	Severe Injury (lost time) or multiple minor injuries or potential for either	Local damage or potential to cause local damage From \$50,000 up to \$500,000	Local effect off location or potential to have a local off location effect Moderate-term effect off location	Considerable impact or potential to have a considerable impact Negative state media	Major breach of regulation and significant prosecution Performance Infringement Notice (PIN)	Permanent damage to objects of cultural/heritage significance Major disruption to community wellbeing and social networks for a period of months
5	Critical	Permanent Disability, Fatality or Severe Injury or potential for any	Major damage or potential to cause major damage From \$500,000 up to \$5m	Major effect or potential to have a major effect Widespread impacts to sensitive public or private areas ground water or water bodies	Major national impact or potential to have a major national impact Negative National Media	Very significant fines and prosecutions, Multiple prosecution and fines	Reduced quality of life within community Significant loss or damage to objects of cultural/heritage significance Severe disruption to community wellbeing and social networks for up to two years
6	Catastrophic	Multiple Fatalities or Multiple Permanent Disabilities or potential for either	Extensive damage or potential to cause extensive damage More than \$5m	Massive effect or potential to have a massive effect Widespread impact to sensitive public or private areas, ground water or water bodies	Major international impact or potential to have a major national impact Negative International Media	Potential jail terms and/or very high fines for company and individuals. Prolonged multiple litigations	Community ability to support itself severely impaired Widespread loss of objects of cultural/heritage significance Severe disruption to community wellbeing and social networks for a period of many years



Set Up

Superstructure Boom

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
1	Crushing, falling, slipping and tripping on or from the superstructure.	D	4	M	Only trained and licensed personnel should be involved in the assembly / disassembly of the superstructure boom. Establish a clear working zone and obstruction free area using barricades and safety tape. Keep clear and away from all matching surfaces. All matching surfaces must be free of contaminates. Check all locating pins and pinholes to ensure that they are free of contaminates. Lift only from designated lifting points provided. Ensure suitable ground conditions are provided for the assembly/disassembly. Correct positioning and blocking and ground bearing pressure of the outriggers must be observed. Only use designated access and egress points. When connecting/disconnecting hydraulic quick couplers, the engine must be shut down, and the hydraulic system de-pressurised. Ensure quick couplers are contaminate free. Ensure hydraulic hoses are matched. Align and match all other connections.	C	4	M	Prior to use by the hirer. Prior to supply.



Demag AC100

100T ALL-TERRAIN

SET UP: WINCH, HOIST I, HOIST II

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	

Winch, Hoist I, Hoist II

1	Entanglement, crushing, slipping and injury.	D	4	M	Ensure that the wire rope is secured and avoid slack rope. Ensure all access and egress points are free of contaminants such as oil, grease, water etc. When connecting/disconnecting hydraulic quick couplers the engine must be shut down, and hydraulic system de-pressurised. Remove dust caps before assembly and re-fit after disassembly. Ensure quick couplers are contaminate free. Ensure hydraulic hoses are matched. Align and match all other connections. Only lift winches from the designated lifting points. As required, personal protection equipment is to be worn, such as helmet, protective glasses, safety boots, gloves and any other protective equipment required by site regulations.	C	4	M	Prior to use by the hirer. Prior to supply.
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Counterweight Mounted to the Superstructure

1	Collision, crushing and falling.	D	4	M	Only trained and licenced personnel should be involved in the assembly/disassembly of the superstructure counterweight. Establish a clear obstruction free working zone using barricades and safety tape. Lift counterweight only from designated lifting points provided.	C	4	M	Prior to use by the hirer. Prior to supply.
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Demag AC100

100T ALL-TERRAIN

SET UP: MAIN BOOM

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					A licensed dogman/rigger must be in a position to observe the mounting of the counterweight with clear communication to the plant operators. Ensure suitable personal safety equipment is worn when carrying out this operation using a full safety harness and inertia reel where practicable, with helmet, protective glasses, safety boots and gloves as required.				

Main boom

1	Tipping, collision resulting in damage or injury.	E	6	H	Only trained and licensed personnel should be involved in the assembly / disassembly of the main boom. A clear understanding of the procedures as per the operation manual. Check for any other obstructions when telescoping the boom. Ensure the correct code is entered for the configuration of the crane.	B	6	M	Prior to supply. Prior to use.
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Main Boom Extension

1	Crushing and collision resulting in damage to the plant or injury to personnel.	E	6	H	Only trained and licensed personnel should be involved in the assembly / disassembly of the main boom. Establish a clear obstruction free working zone using barricades and safety tape. Ensure all hydraulic hoses are free of contaminants. Ensure all electrical connections are matched and safety systems checked and operational.	B	6	M	Prior to use.
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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	

Main Boom Extension and Runner

1	Crushing, falling, slipping, tripping and collision.	E	6	H	Establish a clear obstruction free working zone using barricades and safety tape. <i>Sections are only to be lifted from the approved lifting points and handled with soft slings.</i> Check tools used for safe usage when carrying out assembly / disassembly. Failure to observe correct assembly procedures could lead to serious damage or injury. Ensure suitable personal safety equipment is worn when carrying out this operation such as helmet, protective glasses, safety boots, gloves and any other protective equipment required by site regulations. Consult the operation manual for the exact procedures for assembly and erection. All connecting pins for the mounting of the main boom extension, and runner must be driven from the outside in during assembly. Observe the site and government regulations when carrying out this procedure. Use approved safety harness and inertia reel lanyard where practicable Clear communication channels must be maintained between the licensed dogman/rigger and the operator. In the event of the communication equipment failure, all operations should cease immediately until communication can be re-established	B	6	M	Prior to supply
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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
Reeving of Ropes									
1	Crushing, falling, slipping, snagging, tripping and entanglement.	E	6	H	Only trained and licensed personnel should be involved in the reeving of the ropes. Establish a clear obstruction free working zone using barricades and safety tape. Clear communication channels must be maintained between the licensed dogman/rigger and the licensed operator. In the event of the communication equipment failure, all operations should cease immediately until communication can be re-established The licensed dogman/rigger must have adequate safety protection against falling with suitable equipment and safety harnesses. Consult the Operation Manual for complete procedure on reeving of ropes. Keep hands, arms and loose clothing well clear of sheaves to avoid the risk of entanglement and crushing when reeving. Maintain tension on all ropes when reeving to avoid the possibility of entanglement or slack ropes. Observe all warning signs. Only a licensed operator is to use the reeving winch. Use only manufacturers recommended hook blocks at all times. The reeving procedure must be followed at all times as per the manual.	B	6	M	Prior to supply. Prior to use.



General Operations

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
1	Insufficient knowledge of the plant could lead to damage or serious injury.	E	6	H	Read and understand the Operating Manual of the plant prior to commencement of operation. Incorrect operation, servicing or inspection of the plant can lead to potential accidents or injury. Only a licensed person should operate the plant. Ensure boom / jib clearance from overhead obstructions.	B	6	M	Prior to supply. Prior to use.
2	Wearing of unsuitable clothing, which may cause entanglement.	D	5	H	At all times the appropriate personal protective clothing must be worn when driving or operating the plant, or as in accordance with the site requirements or regulations. Wear a helmet, protective glasses, safety boots, gloves and other protective equipment required by site regulations.	B	5	M	Prior to use.
3	Incorrect operation of controls could lead to damage or serious injury.	D	5	H	Follow all instructions and warnings noted in the Operation Manual, which you will also find clearly marked on areas of the plant. These contain instructions and warnings, which are necessary for the complete safe operation of the plant. Failure to observe the instructions could lead to possible incidents or injury. Incorrect operation of controls could seriously damage plant equipment. Do not attempt to operate the plant without fully understanding the operation manuals. If unclear of any instruction in the manuals, refer to the manufacturer.	B	5	M	Prior to use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
4	Damaged or defaced signage can lead to the non-observance of warning signs	E	6	H	Ensure regular inspections and when damaged or defaced signs are identified they must be repaired / replaced immediately. Be fully conversant with all the warning and safety signs on the plant and in the operation manual.	B	6	M	Prior to supply. Prior to use
5	Impact with other plant or personnel within the operational area could lead to collision or injury.	D	6	H	A clear working zone must be defined using barricades and safety tape and clear of any obstructions. The operator must always be aware and observe these areas. Only authorised personnel, equipment and plant are permitted within the working zone. A designated person must direct any other equipment or personnel in the area. If working in a public area, a traffic controller must be present. No personnel other than the licensed operator are to be on the plant during operation.	B	6	M	Prior to use
6	Impact with other plant or personnel due to poor visibility or adverse weather conditions	D	4	M	Clear communication channels must be maintained between the dogman/rigger and the operator. Any communication equipment failure should result in the immediate ceasing of operation until communication is re-established. Where provided, audio/visual equipment must be operational. Adequate lighting must be provided during times of poor visibility During poor visibility use additional personnel to direct operations. In very poor visibility, plant must be shut down.	B	4	L	Prior to use
7	Electrocution and fire from live overhead conductors.	E	6	H	Extreme caution is to be used when operating the plant near these devices. Consult the local electricity supply company responsible for the safe operating distances.	B	6	M	Prior to use.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					If the regulated distance cannot be achieved, power authorities must be notified, and power disconnected. If operation is required in the proximity of live wire/cable, shielding must be in place. Ensure appropriate fire-fighting equipment is available and know its location. A trained first aid officer must be available.				
8	Poor communication could result in damage or serious injury to personnel or plant.	D	4	M	Clear and concise directions are to be given by the designated dogman/rigger. Failure to do so could result in accident or injury to personnel or plant. Any communication equipment failure should result in the immediate ceasing of operation until communication is re-established. If communication fails, the licensed operator must be directed to stop operations. Operation of plant must not commence until full communications are restored.	B	4	L	Prior to use
9	Fire from oil, electrical, material and overheating.	D	4	M	Observe the location and availability of the fire equipment, and its status and understand its instructions. All operators of the plant should be trained in the use of First Aid Fire Fighting Appliances provided. Ensure correct extinguishers are available. There should be a caution relating to the repair of load bearing members without prior approval of the manufacturer.	B	4	L	Prior to supply. Prior to use.
10	Accident resulting in shock or injury.	E	6	H	Ensure there is an appropriate first aid kit on the plant, and that it is always fully maintained.	B	6	M	Prior to supply.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					Ensure that the appropriate emergency services are contacted. All operators should be trained in basic first aid. All personnel must be aware of emergency numbers.				
11	Spillages	D	4	M	Any spillage of fuels or lubricants must be handled in accordance with the appropriate regulations. Appropriate personal protective clothing is to be worn, such as helmet, protective glasses, safety boots, gloves and any other protective equipment required by site regulations. An approved spillage kit is to be readily available	B	4	L	Prior to supply. Prior to use.
12	Obstruction of access and egress could lead to injury.	D	4	M	All access and egress on and off the plant must always be clearly marked and kept clear of obstructions. Repair or replace any damaged walkways or ladders. Ensure all surfaces are free of contaminants e.g.: all grease, water etc.	B	4	L	Prior to use.
13	Jumping from plant.	E	6	H	Use only ladders, handrails and walkways provided. DO NOT jump from plant at any time. DO NOT jump from plant when it is in motion.	B	6	M	Prior to use.
14	Replacing fuel and Lubricants on plant	E	6	H	The load must be lowered to the ground, the plant secured, and the engine shut down. Activate the battery isolator were fitted and tag the plant with the appropriated signage. Observe the location and availability of the fire-fighting equipment and its status.	B	6	M	Prior to supply



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					Appropriate personal protective clothing is to be worn, such as helmet, protective glasses, safety boots, gloves and any other protective equipment required by site regulations. Re-fuelling and servicing must be carried out in accordance with the manufacturer's instructions and guidelines. Excess fuel and lubrication must not be stored on the plant at any time. Any spillages must be cleaned up. Re-fuelling and lubrication points must be free of any contaminants.				
15	Ill Health	D	4	M	At no time should any personnel operate, work or carry out maintenance on the plant whilst under the influence of alcohol, illicit drugs, or prescription drugs that may cause drowsiness. Do not attempt to operate this plant when you are excessively fatigued or feeling unwell.	B	4	L	Prior to use.
16	Exposure to excessive noise levels.	D	4	M	All noise protection equipment must remain in place on the plant. Earmuffs / earplugs must be worn if excessive noise levels have been measured.	B	4	L	Prior to use.
17	Unplanned operation of the plant leading to damage of plant or serious injury to personnel.	D	4	M	Do not attempt to operate the plant unless a full understanding of the plant and its operation has been carried out. All plant systems must be operational prior to commencement of work Check all limit switches, proximity switches. Complete a visual inspection of the plant. Refer to the Operation Manual for a complete listing of pre-operational checks and procedures. Only trained and licensed personnel are to operate the plant.	B	4	L	Prior to use.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
18	Miss-operation of the safe load indicator, leading to damage or injury.	D	4	M	Only trained and licensed personnel are to program or operate the Safe Load Indicator. Carry out pre-operational functions and check all plant safety systems. Ensure correct program is accessed for the boom/jib/counterweight combination. Refer to operation manual outlining the correct operation of the Safe Load Indicator. If any function is unclear before commencing operation, contact the manufacturer. DO NOT operate the plant if the Safe Load Indicator is not functioning.	B	4	L	Prior to use by the hirer.
19	Collision, damage or injury due to unclear working zone.	D	4	M	Physical and visual checks of the working zone and plant must be carried out prior to commencement of work. Ensure barricades and safety tape is erected. No unauthorised personnel are to be in the working zone. No entry signs are to be placed. A licensed dogman/rigger should be used to control the working zone.	B	4	L	Prior to use by the hirer.
20	Accidental operation of the plant leading to collision, damage or injury.	D	4	M	Before operation of the plant, if unsure of any procedure, refer to the Operation Manual as required or contact the supplier. All plant systems must be operational and functional prior to commencement of work. Refer to the Operation Manual for a complete listing of operational checks and procedures. Strict observance of any warning tags attached to the plant must be adhered to. Untrained personnel are not permitted to operate the plant.	B	4	L	Prior to use.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
21	Excessive wind	D	4	M	If the wind exceeds the manufacturers specification, then the plant must not be operated. Also check with the local meteorological authority. Refer to the Operation Manual for operational parameters in high wind. In the event of working in a cyclonic high wind area, ensure that a procedure and safe work practice is followed and implemented to fully secure the plant. Ensure the anemometer is fitted and operational. Tag lines are to be used on load where possible. In extreme circumstances a boom combination may have to be lowered to the ground.	B	4	L	Prior to use by hirer.
22	Poor ventilation resulting in carbon monoxide poisoning.	E	6	H	Plant must always be operated in well ventilated areas and following the instructions applicable to the operating site.	B	6	M	Prior to use.
23	Slipping, tripping and falling from the plant.	D	4	M	Remove additional rigging equipment used and ensure clear walkways are maintained. At no time must personnel jump or exit the plant other than the designated ladders and walkways. Ensure all access points are free from contaminants such as oil, water, and grease. Clear or remove all foreign objects such as rags, tools, cleaning equipment, drums, etc from the plant. Check that all handrails and guards are correctly installed. A fully body harness and inertia reel lanyard to be used where practicable when rigging or repairs are carried out on the crane.	B	4	L	Prior to supply. Prior to use.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
24	Boom deflections, which increase the radius and can lead to overload or tipping resulting in damage or injury.	D	4	M	A licensed dogman/rigger must be responsible for the direction and operation of the plant. A licensed operator must understand the configuration and load chart of the plant.	B	4	L	Prior to use.
25	Fatigue or injury resulting from poor ergonomics.	D	4	M	Ensure seating is adjusted to enable comfortable operation of all controls. Refer to the operation manual for further clarification. Clear visibility and adjustment of all visual aids, cameras and mirrors must always be maintained. Maintain a clean working environment in and around operator's cabin, ladders and walkways.	B	4	L	Prior to supply. Prior to use.
26	Collision or damage resulting from a swinging load.	D	4	M	Smooth operation of the plant is essential to avoid dynamic loading and centrifugal force, resulting in possible overloading, collision or damage. Sudden or violent movement of the controls is to be avoided, as dynamic loading greatly reduces the safety margins of the plant. Tag lines must be in place on load where possible.	B	4	L	Prior to use
27	Injury or damage resulting from exceeding the safe working parameters.	D	4	M	Do not operate the plant outside of its rated lifting capacity for its configuration. Always take care to work within the recommended lifting charts. Ensure the correct falls of line are reeved for the load being handled. It is prohibited to use a plant to pull loads at an angle or to drag loads. The plant should not be operated if the anti-two block system is not functioning. Failure of this device would result in damage to the sheaves and rope.	B	4	L	Prior to supply. Prior to use.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					Confirm that hook block and rigging equipment is included in the weight to be lifted. Certification of the load to be lifted. Ensure the plant is level before commencing operations. Smooth operation of the plant is essential.				
28	Disablement of safety devices or excessive load on the configuration being used could result in injury, tipping or rolling.	D	4	M	Under no circumstances should over-riding of the safety devices be undertaken Refer to the Operation Manual for assembly / disassembly programs. Ensure the correct counterweight is fitted for the boom/jib combination being used. Do not park the plant on an embankment and maintain a safe distance from open trenches. Disablement of the safety device could result in over loading resulting in structural damage and tipping. Do not attempt to lift any load above the rated capacity for the combination being used.	B	4	L	Prior to supply. Prior to use.
29	Damage or injury resulting from dropping the load, unstable load or overloading the plant.	D	4	M	No personnel should be under the load at any time, or in an area between a load and an obstruction. Ensure all safety devices are operational and functional e.g.: anti two block, boom angle indicator. The Safe Load Indicator is an aid only. The load charts take precedence, and the operator should fully understand all load charts. Loads should be kept close to the ground where possible. Ensure the safety catch on the hook is in working order. If the above risk occurs the operator should carry out full operational and functional check of the crane.	B	4	L	Prior to use.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
30	Collisions and crushing with people under the load whilst winching or slewing.	D	4	M	No personnel are permitted within the slewing range of the plant or under the path of the load. The licensed operator should be aware of boom deflection when winching and no personnel should stand between a load and obstruction. Work should be stopped if unauthorised persons refuse to leave the working zones. Avoid sudden starting and stopping of loads as violent movement reduces the stability of the plant.	B	4	L	Prior to use.
31	Unintentional damage or injury from overloads.	C	4	M	If this situation occurs the operator must immediately take action to bring the plant back into a safe operating condition. If there is any damage to load bearing members, other plant or equipment or injury due to overloading, there may be a requirement for the incident to be reported to the Regulatory Authority in the State of operation. In these cases, the operator (after making the plant safe) should shut the plant down until the accident has been reported and the regulator given the opportunity to investigate the incident.	A	4	L	During operation.
32	Damage or entanglement of rope during operations.	C	4	M	Always avoid the situation of slack rope. Disentanglement in some cases can be achieved by unwinding the rope and rewinding. If entanglement occurs, shut down the plant and have a competent person carry out immediate inspection of drums and rope. Avoid contact with other objects when hoisting or slewing.	A	4	L	During operation
33	Hazards to air traffic due to boom / jib combinations.	C	4	M	Operation of the plant can be carried out at heights, which may create hazards to air traffic.	A	4	L	Prior to supply. Prior to use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					Ensure that all relevant authorities are notified, such as the Federal Airport Corporation and the Police. Aircraft warning lights must be fitted and operational where required by regulations.				
34	Collisions or damage due to more than one plant operating in unison.	D	6	H	If the operating ranges of different plants overlap, a safe working procedure must be in place. The supervisor, licensed operator and licensed dogman/rigger must have a safe operating procedure in place and communicated to others if using more than one crane. Ensure that the crane operator can communicate with others clearly, by visual, audio aids and signals, and as per site conditions, regulations or standards. Failure to adhere to the safe operating procedure could result in tipping or damage to the plant. During tailing operations, a clear safe working procedure is to be established before commencing operation.	B	6	M	Prior to supply. Prior to use
35	Power failure of plant could result in damage or injury.	D	6	H	In case of power failure all functions and movements of the plant are stopped completely. Secure a safe working position around the plant and load area. All operational mechanisms are locked hydraulically and mechanically, preventing any movement of the crane. As the case described is extremely rare, contact the supplier immediately.	B	6	M	Prior to supply. Prior to use. During operation.
36	Shock or injury from high power electromagnetic transmitters.	D	6	H	When operating in the vicinity of high-power transmitters or radar stations, contact the relevant authority before commencement of work.	B	6	M	Prior to supply. Prior to use.

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
37	Electrocution from lightning strikes.	C	4	M	Timber mats or earth straps are to be used when the boom / jib is erected.	A	4	L	Prior to use.
38	Danger of crushing or collision when travelling.	C	4	M	Tiger striping is in place on the counterweight of the crane. Audible alarms have been fitted to indicate when the plant is propelled.	A	4	L	Prior to use.
39	Tipping or sinking of the plant during operation	D	6	H	Correct ground preparation by use of ballast bog mats to accommodate the ground pressure generated during lifting or travelling.	B	6	M	Prior to use.
40	Falling from height.	C	4	M	Access to the boom / jib when erected can be by an elevated work platform, scissor lift or approved man box. Approval from the local authorities must be obtained prior to usage of a man box.	B	4	L	Prior to use by the hirer.
41	Unintentional movement of the plant.	C	4	M	A licensed operator must remain in the cabin whilst there is a load on the hook.	B	4	L	During operation.
42	Damage to public utilities.	C	4	M	Obtain permits from relevant bodies i.e.: local council, phone, gas, water, electric etc. prior to commencing work.	B	4	L	Prior to use.
43	Damage or injury resulting from incorrect programming of IC1 system.	C	4	M	Only licensed and trained personnel should carry out any adjustments or modifications to this system.	B	4	L	Prior to supply.
44	Damage or serious injury resulting in over riding of the dead-man switch.	C	4	M	As this is a main safety feature, at no time should this control be overridden.	B	4	L	Prior to supply



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
45	Damage or injury to personnel, plant or other equipment.	C	4	M	Only licensed and trained personnel are to drive the crane. Before driving the plant, ensure all components and accessories are stowed and locked in place. Check all wheel nuts for correct tension. Ensure all tyres are correctly inflated and in good condition. Function test all lights and accessories. Confirm appropriate signage is in place and visible. Check all fluid levels on the plant.	B	4	L	Prior to supply.
46	Damage to plant and drive train	C	4	M	Before driving crane, the suspension system must be levelled as per the Operation Instructions. Whilst driving, monitor all warning systems and gauges. E.g.: air pressure, suspension system, steering.	B	4	L	Prior to supply. Prior to use.
47	Collision or damage with other objects.	D	6	H	Ensure permits are current and observe all load regulations. Continuously monitor clearance of the crane whilst driving.	B	6	M	Prior to use by the hirer. During operation.
48	<i>Warning and control devices:</i> Damage or injury to plant or personnel.	D	6	H	All warning and control cables and connectors must be checked before operation and function. Any damaged items must be repaired or replaced prior to commencing operation.	B	6	M	Prior to use by the hirer.

Maintenance

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
1	Injury to operational and maintenance personnel.	D	6	H	Inform the area supervisor and operating personnel of intended maintenance / repair. When required place appropriate lockout tags and safety warning signs. Ensure suitable personal protection equipment is worn when carrying out this operation such as helmet, protective glasses, safety boots, gloves and any other protective equipment required by site regulations. Use only designated access and egress points ladders and walkways. Only licensed personnel are to carry out maintenance. Use only recommended oils and fluids as per the operation manual.	B	6	M	Prior to supply. Prior to use by the hirer.
2	Burning and scalding.	D	6	H	Wait for all oils and lubricants to cool sufficiently prior to commencing maintenance or repairs.	B	6	M	Prior to use.
3	Fire.	D	6	H	Ensure the proximity of the appropriate fire-fighting equipment when carrying out any work on the plant. Keep the plant clean of any combustible material. Remove all residual traces of oil, fuel, cleaning agents and components and dispose of appropriately.	B	6	M	Prior to supply. Prior to use by the hirer.
4	Burning from battery fluids.	D	6	H	Appropriate safety protection equipment such as long sleeve shirt, gloves and protective glasses must be used when handling the batteries, as battery fluid is diluted sulfuric acid.	B	6	M	Prior to use by the hirer. Prior to supply.
5	Fire, fumes and burns from welding.	D	6	H	Obtain the appropriate permits prior to carrying out welding procedures. Ensure the proximity of the appropriate firefighting equipment.	B	6	M	Prior to supply. Prior to use by the hirer.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					Do not weld or use naked flame near electrical lines or hydraulic hoses. Protect the plant using fire blankets where required. Keep the plant clean of any combustible material. Before carrying out any welding remove the battery leads. Ensure a clean weld area by the removal of paint and contaminates. Attach the welding earth connection as close as possible to the work area. Ensure enough ventilation in the work area. Any repairs or modifications must be approved and clarified by the supplier. Ensure appropriate screens are in place prior to commencement or welding. Appropriate protection equipment must be used when using these processes.				
6	Fire and explosion from using oxy acetylene process.	D	6	H	Obtain the appropriate permits prior to operating a naked flame. Ensure the proximity of the appropriate fire-fighting equipment. Do not weld or use naked flame near electrical lines or hydraulic hoses. Protect the plant using fire blankets where required. Keep the plant clean of any combustible material. Ensure a clean area by the removal of paint and contaminates, prior to using this process. Ensure enough ventilation in the work area. Any repairs or modifications must be approved and clarified by the supplier. Appropriate protection equipment must be used when carrying out these processes such as helmet, gloves, safety glasses, boots and any other protective equipment required by site regulations.	B	6	M	Prior to use by the hirer

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
7	Vapour and explosion generated by the batteries.	D	6	H	If welding, or a naked flame is to be used in the vicinity of the battery's, the battery's must be removed prior to the commencement of work. Appropriate safety protection equipment must be used such as long sleeve shirt, gloves, protective glasses when handling the batteries, as battery fluid is diluted sulfuric acid.	B	6	M	Prior to use by the hirer. Prior to supply.
8	Injury from high-pressure hydraulic oil.	D	6	H	Only trained and licensed personnel must undertake repairs and maintenance on the hydraulic system of the plant. Before commencement, the hydraulic system must be cooled. Before commencement of work the engine must be shut down and hydraulic system de-pressurised. Any spills must be cleaned prior to commencement of work. Ensure suitable personal protective equipment is worn when carrying out this operation such as helmet, protective glasses, safety boots, gloves and any other protective equipment required by site regulations.	B	6	M	Prior to supply. Prior to use by the hirer.
9	Environmental damage from spillage or leakage.	D	6	H	Use only approved containers to collect all contaminates. During maintenance a suitable absorbent agent must be on hand. In the unlikely event of a major spill the Environmental Protection Authority and local authorities must be contacted. Site safety conditions must be adhered to. Approved containers must be used to collect oils during routine service.	B	6	M	Prior to use by the hirer.
10	Electrical malfunctioning resulting in damage or injury.	D	6	H	Only licensed and trained personnel should carry out any adjustments or modifications to the electrical system.	B	6	M	Prior to supply.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
11	Damage or injury from failure to carry out routine inspections as per the lubrication and maintenance manual.	D	6	H	Refer to the lubrication and maintenance schedule for items such as ropes, hook blocks, sheaves, bars, rods, main cords and lacings for inspection intervals. Failure to observe the instructions of the maintenance schedule could lead to damage or injury.	B	6	M	Prior to supply
12	Damage or injury from corrosion or cracking.	D	6	H	If corrosion or cracking on the plant is detected refer to the supplier for repair procedures.	B	6	M	Prior to supply
13	Injury due to poor visibility during maintenance.	D	6	H	The work area should be adequately illuminated when carrying out maintenance / repairs.	B	6	M	Prior to supply
14	Changing Tyres: Crushing or injury.	D	6	H	It is recommended that mechanical aids be used during this procedure. Establish a clear obstruction free working zone using barricades and safety tape. Establish clear communications with all parties when carrying out this procedure. Ensure correct tyre inflation as per manufacturers specifications.	B	6	M	Prior to use by the hirer.

METCALF
CRANE SERVICES



We the undersigned, confirm that the PRA nominated above has been explained and its contents are clearly understood and accepted. We also confirm that our required qualifications to undertake this activity are current. We also clearly understand the controls in this PRA must be applied as documented; otherwise, work is to cease immediately.

[illegible]



Name	Qualification Required for this Activity	Signature	Date

