

Humma UV35-25

35T MOBILE CRANE

Plant Risk Assessment



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INFORMATION

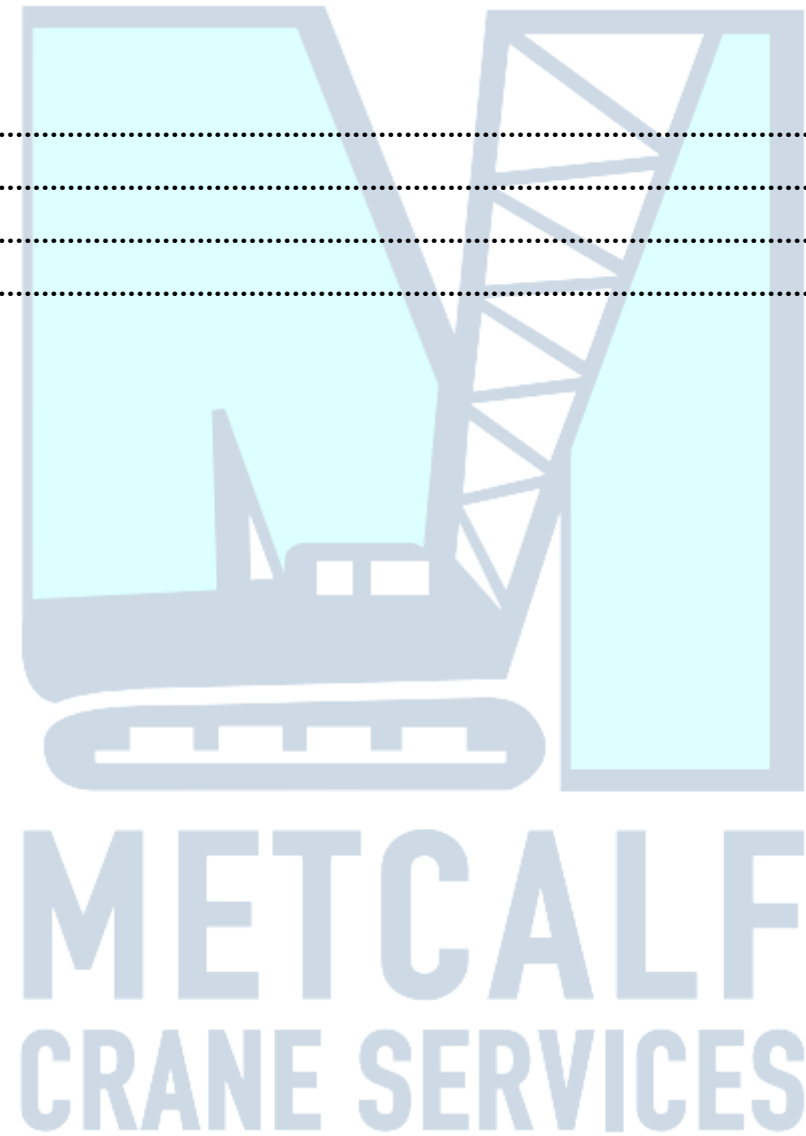
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METCALF
CRANE SERVICES



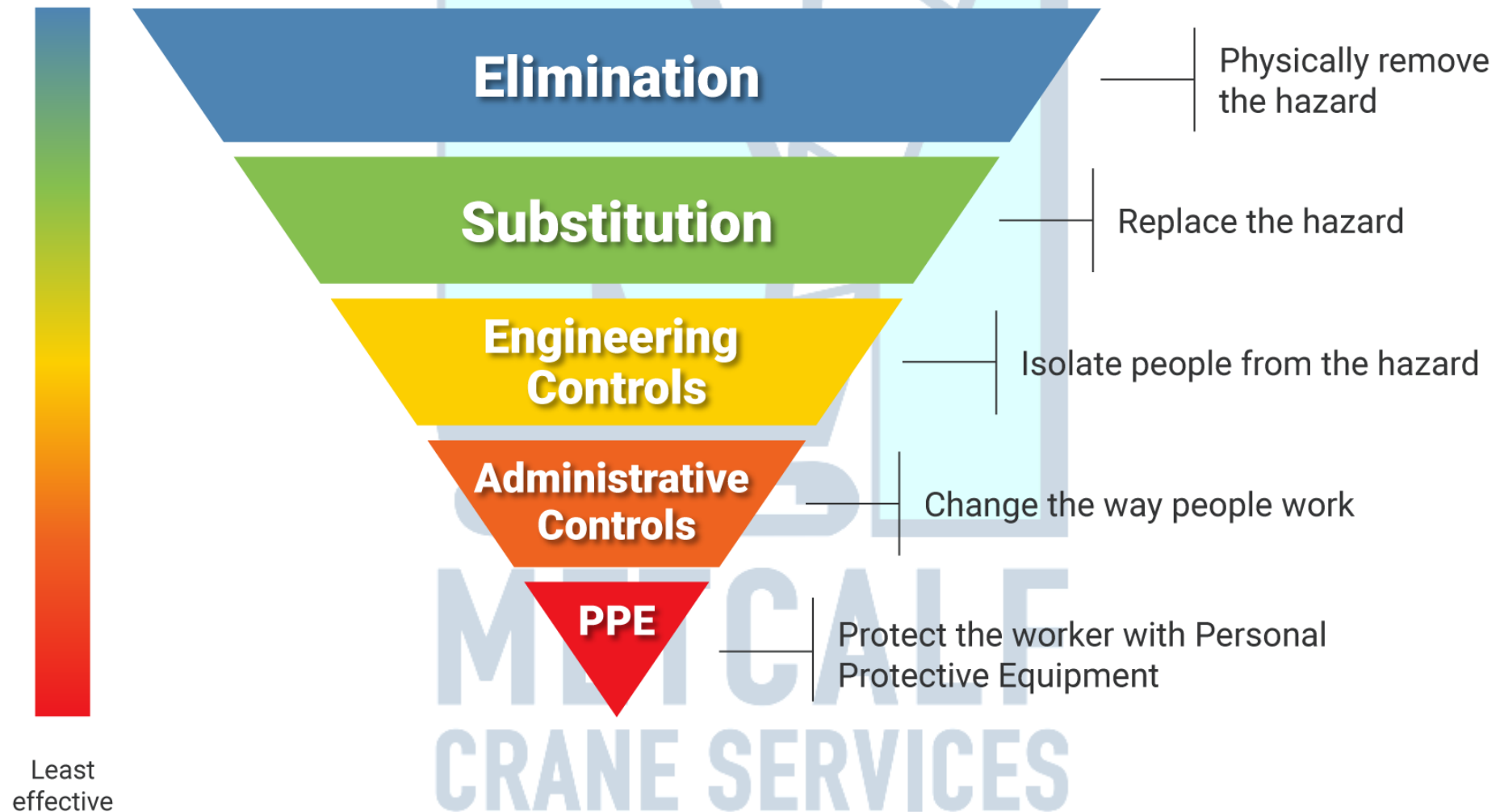
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Most
effective

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

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
1	Inadvertent operation of plant due to poor housekeeping	C	4	M	Keep area of the operator's cabin and seat clean and tidy. Do not leave parts, tools or other objects in the area of the operator's seat. These can cause unexpected accidents while you are working.	B	4	L	Prior to use by the hirer. Prior to supply.
2	Stress and tiredness from poor sitting position and posture	D	4	M	Adjust the operator's seat so that you can sit comfortably with good posture, and all control levers are within easy reach without having to lean or strain your body. Check that you can reach the foot pedals comfortably with your back resting against the back of the seat.	B	4	L	Prior to use by the hirer. Prior to supply.
3	Accidental operation of plant if operated by more than one operator. Passengers may collide with obstructions or be thrown off the machine, or they may cause a hazard by obstructing the operator's field of view	C	4	M	Before and during work, nobody other than the operator should sit in the operator's seat or climb onto the crane	B	4	L	Prior to use by the hirer. Prior to supply.
4	Slips, trips and falls when getting on or off the plant	D	4	M	Take the following precautions when you get in and off the crane. Check that all guards and covers on the machine are fastened correctly. Tighten any loose bolts or repair any damage Wipe off any mud, oil or snow on the steps before you start work Do not jump onto or off the machine	C	3	L	Prior to supply



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					Do not hold onto the seat, control box, control levers or anything other than the handgrips provided when you get on or off the machine Maintain 3 points of contact at all times when entering/exiting Do not get on and off the machine while it is moving				
5	Dropping of load	E	6	H	Check safety devices. Pick & Carry cranes are fitted with various safety devices which should be checked before starting work Carry out regular servicing of the crane in accordance with the recommendations in the operator's and maintenance manual	B	6	M	Prior to supply. Prior to use.
6	Crane overload or tip over in adverse working configuration	E	6	H	Check the operation of the crane computer / Load Moment Indicator ("LMI") according to the pre-operational check procedure described in the Operators Manual (this manual should be kept in the crane cabin).	C	6	H	Prior to use.
7	Failure of controls and/or mechanical parts of plant	E	6	H	Before operating the crane check the machine according to the pre-operational checking procedure detailed in this manual. Check the operation of the control levers while the crane is not carrying any load. Allow the crane to warm up before carrying full load. Ensure that the crane is serviced regularly in accordance with this manual.	B	6	M	Prior to supply. Prior to use.
8	Falling objects (during erecting and dismantling activities) could damage property and present a risk of injury to workers and members of the public.	E	6	H	Erect and maintain effective barricades around the mobile crane. Only allow persons who are directly involved Pick & Carry crane operations inside the area. Schedule the erecting and dismantling of the crane to occur when the movement of other persons and mobile plant at the workplace is at a minimum	B	6	M	Prior to use by hirer.

General Operations

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
1	Unintended movement of plant due to clothing getting caught or tangled in control levers and mechanical parts	C	4	M	When driving or operating the machine, do not wear clothing with dangling parts, which might catch on control levers or mechanical parts. Wear appropriate personal protective equipment as necessary	B	4	L	Prior to supply. Prior to use.
2	Unintended movement of plant from operating wrong controls or errors in judgement	C	6	H	Do not operate the crane when you are excessively fatigued or unwell Read the Operators Manual & Risk Assessment ("this manual") thoroughly, familiarizing yourself with all controls before you start operating the crane. Follow instructions and warnings in this manual and on plates and stickers mounted on the machine. If there is something you do not understand, have it explained to you. If the manual is lost, or a warning label is illegible, replace it.	A	6	M	Prior to use.
3	Fire and emergency response	B	5	M	Carry a fire extinguisher and first aid kit in the crane. Learn how to use the fire extinguisher before an actual emergency situation arises.	B	4	L	Prior to use
4	Fire from handling chemicals	B	5	M	Do not smoke or use fire near fuel, oil, antifreeze, batteries or other chemicals, which could ignite. Extinguish all fires and potential source of ignition when handling these flammable materials Before refuelling the crane, switch off the engine and check that there are no fires or potential sources of ignition nearby. After refuelling securely fasten all fuel and oil caps and wipe off any spillage. Refuel and change oil in a well-ventilated work area.	B	4	L	Prior to supply. Prior to use



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		P	C	R		P	C	R	
5	Unfamiliarity with site conditions or scope of work	C	4	M	Plan for Pick & Carry crane operations as early as possible. Planning should involve inspection of the site, consultation with all persons involved in the work such as the principal contractor, crane hirer, energy supplier, employer, dogman, spotter, site foreman and crane operator.	B	4	L	Prior to use
6	Not observing instructions on warning labels could cause operation beyond limitation of plant	D	4	M	Observe all instructions on the warning labels. Ensure that all warning labels are clean and legible. If the warning labels are damaged or illegible replace them.	C	4	M	Prior to use
7	Collision with people or objects in work area	E	5	H	Before starting work, check the work area for the presence of roads, overhead powerlines, nearby structures, other cranes, aerial hazards and other obstructions. Isolate the work area by using witches hats, temporary barriers or fencing. People, vehicles, etc. should be prohibited from entering the isolated area. Consult the principal contractor, site supervisor, the other crane operators and everyone involved with the work and prepare a safety plan for the job. Always be aware of your surroundings and the hazards while you work.	B	5	M	Prior to use.
8	Collision with other plant and structures: During articulating or reversing From dirty windows and mirrors From poor lighting From adverse weather conditions	E	5	H	When operating a Pick & Carry crane, consider hazards such as overhead powerlines, nearby structures, other cranes, high obstructions and other mobile equipment within the crane working area. When you need to articulate or reverse in areas of restricted visibility, place a guide or use a spotter and follow their instructions. Keep the cab windows, mirrors, wipers and working lamps clean. When working in areas with poor lighting switch on the lights. If required use additional illumination (mobile lighting can be hired from equipment hire places)	B	5	M	Prior to use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					When visibility is bad due to fog, snow, rain, or other adverse weather conditions stop work and do not start again until conditions have improved.				
9	Collision with people or other vehicles when working on public roads	E	5	H	When working on public roads, position a guide and erect fences, witches hats, etc. Observe all the traffic rules and safety regulations and laws of the Country or State where the crane is being used.	B	5	M	Prior to supply. Prior to use.
10	Collision with objects and people working in the work area	E	5	H	Discuss your requirements with the site supervisor. If you consider that the people and equipment in the area has to be removed before you operate the crane, discuss it with the site supervisor so the necessary arrangements can be made.	B	5	M	Prior to supply.
11	Electrocution from live overhead conductors. If you are working close to power cables you can also receive a shock even if the crane does not physically contact the cables	E	6	H	Take the following precautions when working near power cables. Contact the managing company in advance and arrange for electricity to be switched off (if possible), or arrange for cables to be fitted with protective devices. Keep a safe distance between the machine and the power cables. Consult the electricity authorities on the location and voltage of cables on the site and the minimum isolation distance. Use a spotter and follow their instructions.	B	6	M	Prior to supply. Prior to use
12	Electromagnetic radiation from high-power electromagnetic emitters (used for radio, television, radar and mobile phones transmission) could be painful and have dangerous consequences.	E	6	H	Take the following precautions when operating the crane near high-power electromagnetic wave emitters Contact the relevant authorities before starting work. Discuss the safety requirements and precautions to be taken with the authorities. Ensure that all the safety precautions are observed.	B	6	M	Prior to use.



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		P	C	R		P	C	R	
13	Electrocution from lightning strikes. A crane with a long boom is prone to lightning strikes	B	6	M	If thunderstorms are approaching, lower the boom, turn off the crane and get out of the crane. Resume work when the thunderstorm ceases.	A	6	M	Prior to use.
14	Inadvertent movement from poor signalling. If the signaller does not signal appropriately with the sling handler and other workers there could be an accident	D	5	H	Work according to signals. Choose one person to be the signaller. Before starting the job the controller, the signaller, the sling handler and other workers should confer on signal procedures in order to work safely under the direction of the signaller. Signallers must hold relevant licenses and tickets to ensure adequate training and knowledge.	B	5	M	Prior to supply
15	Collision between two cranes working together	E	5	H	Determine signals for joint operations in advance. If two or more cranes are working together on a site ensure that all parties involved discuss the work plan and clearly define the lines of communication.	B	5	M	Prior to use.
16	The crane could tip over due to: Strong windy conditions. Loads with large volumes of surface areas have larger wind forces and the loads from the suspended objects act on the crane and could cause the crane to tip over. Poor ground conditions Rapid articulation	D	4	M	Stop work in strong windy conditions. If the wind had a gust speed of 10m/s or more, retract the boom, turn off the crane and get out of the machine. Resume work when the gust speed it below 10m/s Check that the ground conditions are stable and level over the entire intended path of travel. Do not operate the crane on unstable ground. Articulate the crane slowly and smoothly	B	4	L	Prior to use.



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		P	C	R		P	C	R	
17	Carbon monoxide poisoning from the exhaust fumes when the engine is running indoors	C	4	M	If the engine must be started indoors, open all doors and windows to ensure good ventilation. If necessary, connect an additional pipe to the exhaust pipe and expel the exhaust gases to the outside.	A	4	L	Prior to use.
18	Fire from spills	C	4	M	Keep the engine and surroundings clean. Do not leave tools, rags, or anything else in the engine compartment. After inspection and maintenance wipe off any spilled oil or fuel. Check that flammable materials are not scattered about or piled up near the engine.	A	4	L	Prior to use by the hirer.
19	Accidental movement of the crane	C	5	M	Only start the engine when seated in the operator's seat	B	5	M	Prior to use by the hirer.
20	Operating the crane when it is being serviced or repaired	C	5	M	Always attach warning tags on control levers of the machine when it is being serviced or repaired. Isolate the machine where possible.	A	5	M	Prior to use.
21	Collision with people and objects	D	5	H	Check for people and objects near the crane before you start the engine. Concentrate on the job and always be aware of people and equipment approaching the crane. Erect temporary barriers around the crane.	B	5	M	Prior to use by hirer.
22	Unintended movement of the crane on start up	D	6	H	Before starting the engine check that all levers, pedals and switches are in their neutral or OFF positions	B	6	M	Prior to use.
23	Structural failure or tip over of the crane during operation	C	6	H	Do not exceed the lifting capacity of the crane. If unsure of the lifting capacity, always check the rated lifting capacity chart. Lifting capacity varies with the boom length and working radius.	A	6	M	Prior to supply. Prior to use.



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		P	C	R		P	C	R	
					Always check that all safety devices and warning systems are functioning properly. Do not operate a crane if any of the safety devices or warning systems are faulty.				
24	Collision from swinging load or reduced stability of the crane	C	6	H	Avoid sudden movement or violent operation of the crane. Operate the levers and pedals smoothly. Start, accelerate, decelerate, articulate and stop the crane smoothly and securely. When lifting long loads tie a guide rope to each end of the load. This will prevent the load from swinging whilst it is being lifted. Compound operations, such as combining winch hoisting or lowering, articulating huffing and telescoping will be slower than the individual operations. When switching from compound to single operation, work the controls slowly with no sudden change in speed or direction.	A	6	M	Prior to use.
25	Crane damage and tip over from using counterweights that are not specified	D	6	H	Only use counterweights supplied by the manufacturer. Incorrect counterweights may subject the crane to unreasonable strain and damage it, or decrease the stability of the crane. For machines with variable counterweight (MAC25 all models, MAC25SL all models, some AT15 & AT-20 machines delivered to New Zealand), ensure the selection on the crane computer is correct before commencing lifting operations. Always refer to the correct load chart. Follow any warning provided in this manual or by the crane computer.	B	6	M	Prior to supply. Prior to use.
26	Collision if operator is not concentrating on the job	D	5	H	Do not operate the crane if you are tired or cannot concentrate on the job. Always be alert and watch that the boom or the suspended load does not collide with people or buildings and the load does not collide with the boom.	C	5	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	
27	Operating the crane by reaching in through the door or window. (The operator is not in full control of the crane and could cause the crane to collide with people, buildings, and other objects.)	E	6	H	Only operate the crane while seated in the operator's seat.	B	4	L	Prior to supply. Prior to use.
28	Dropping the load from an unattended crane	D	6	H	Never leave a suspended load on an unattended crane. When leaving the crane, always lower the load to the ground, switch off the engine, lock the crane and take the keys with you.	A	2	L	Prior to supply. Prior to use.
29	Dropping of load, damage or tip over of the crane due to overloading or unstable load	D	6	H	Carry out the following checks before lifting a load. a) Check that the total weight of the load (including the weight of slings, hook and attachments) is below the rated capacity of the crane. b) Check that the number of parts of line on the winch rope is a standard number according to the rated lifting capacity c) Check that the slings are properly positioned to lift the load above its centre of gravity d) Check that the winch rope is hanging vertically When the load just leaves the ground pause until it stops swinging. Confirm that the load is stable before continuing to hoist.	A	2	L	Prior to use
30	Dropping the load from insecure slings or hook	D	6	H	To prevent the load from falling off or slipping out of the slings, pay attention to the following points when arranging the sling.	A	4	L	Prior to use

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					a) The slings or chains should be of the right capacity and in good condition b) Arrange the slings so that they do not get tangled with each other c) The hook is fitted with a retainer to prevent the slings from slipping out. Check that the hook is in good condition and the retainer is operating correctly d) Place a protector (some soft material) to prevent the rope from damage where it comes into contact with the corner of the load, and elsewhere where the sling is prone to damage e) Slings and hooks to be inspected annually by a competent person				
31	Damage to the crane or reduced stability when working with a heavy load and long boom	D	5	M	When lifting a load, the boom flexes and increases the working radius. This is more noticeable with a very heavy load or long boom. Allow an extra margin below the rated lifting capacity to compensate for the increased working radius.	B	5	M	During operation
32	Overload due to the increased flexure of the boom when the load is lifted suddenly	D	5	M	Lift the load off the ground carefully. Hoist the load vertically and pause briefly when the load is just off the ground to confirm the sling and that there is no overload. Then resume hoisting.	B	5	M	During operation
33	Damage to crane or reduced stability if the load is lifted off the ground by luffing or extending the boom	D	5	M	Never lift the load off the ground by luffing or extending the boom. Wait until the load is just off the ground before luffing or extending the boom	B	5	M	Prior to supply. Prior to use
34	Damage or injury caused by personnel under the load when articulating	D	6	H	Before moving the load sideways check that it is safe to do so. The path of the load or crane should be clear of people or obstructions.	B	6	M	Prior to supply. 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	
35	Collision or dropping of load on people	D	6	H	Do not move the suspended load above people's head	B	6	M	Prior to supply. Prior to use. During operation.
36	Damage or injury caused by loss of stability due to operation on sloping ground	D	6	H	Read and understand the Operators manual regarding operation on sloping ground. The rated capacity of the machine should be <u>reduced</u> when lifting on or traversing sloping/uneven/out of level terrain. Do not operate the machine on sloping ground outside the limits described in this manual and the machine load chart. Plan lifts carefully when operating on uneven terrain. Operators must be able to perform a manual calculation to reduce the safe working load of the machine if a lift plan is unavailable. Some Pick & Carry cranes may be fitted with crane computers which can perform a reduction in rated capacity. Refer to the operator's manual to check if this function is available on the machine in use.	B	6	M	Prior to supply. Prior to use.
37	Collision with obstacles from entanglement of wire rope during hoisting or articulating	C	4	M	If the wire rope becomes entangled with an obstacle, carefully disentangle it without further hoisting or slewing. Place the load back on the ground and check that the wire rope is not damaged before resuming.	B	4	L	Prior to use.
38	Overload and tip over of the crane by sudden raising or lowering of the boom	D	4	M	Lower the load to the ground using the winch. Avoid sudden raising and lowering of the boom as it makes the crane prone to tipping over.	B	4	L	Prior to use.
39	People falling from height	D	5	H	Only lift people using a Terex approved man basket. A safety harness must be worn. Different states and countries have different safety regulations and laws. Always observe the laws of the state of or country you are in.	B	5	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	
40	Damage to the boom or tip over of the crane if the load is not lifted from a position above its centre of gravity	E	4	H	Never drag a load sideways, hoist it diagonally or drag it towards the crane. Luffing or hoisting to drag the load sideways or lift it diagonally subjects the crane to forces it was not designed for. These additional forces will damage the boom or cause the crane to tip over. Follow the signaller and list the load vertically.	C	4	M	Prior to use by the hirer.
41	Impact from falling objects during an earthquake	C	4	M	If there is an earthquake when the crane is operating, the vibrations feel greater and more alarming from the elevated position of the operator's seat. Stop work immediately and respond to ground deformation or falling objects as follows: a) Lower the load to a safe place b) Articulate away from the damager of falling or toppling objects and then lower the boom c) Stop the engine d) To avoid being thrown out of the cab (by the vibrations caused by the earthquake) fix yourself in position with your hands and feet until the earthquake stops. If the door is open close it and secure it. To resume work after the earthquake has ceased and there is no likelihood of further tremors, thoroughly check the ground conditions. Look for damage to any part of the crane, check the operation of the crane computer and check hooks and slings for any abnormalities. Inspect the load for signs of movement of damage.	C	3	M	During operation.
42	Cabin noise when operating the crane.	C	4	M	Refer to the Db ratings on the noise certificate in the Operator's Manual, and Occupational Health and Safety guidelines (for noise levels and the time an operator can be safely subjected to these noise levels without adversely affecting his or her health) in your state or country. If the noise levels and period of exposure are high, use appropriate hearing protection.	B	4	L	Prior to use.



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		P	C	R		P	C	R	
	(An operator subjected to high noise levels over a prolonged period of time can become temporarily or permanently deaf)								
43	Reduced stability and possible tip over during luffing the boom. (When luffing the boom, the working radius increases as the angle of the boom decreases thus increasing the risk of tip over)	D	5	H	When luffing the boom, ensure that the load will not cause the crane to tip over at the largest radius. Refer to the load chart in this manual.	C	5	M	Prior to supply.
44	Damage to hook from over-hoisting	D	4	M	Terex Pick & Carry cranes compensate for the hook height below the boom head whilst telescoping in or out on boom 1 & 2. It is safe to two-block the hook block against the boom head with no load on hook for road travel. When lifting a load, care should be taken to prevent a load or hook block contacting the boom as damage may occur. The size of the lifting load must also be taken into account. All MAC25 and MAC25SL models only compensate hook height on boom 1 & 2, but not for boom 3. The over-hoisting protection device (anti two-block switch) is functions to stop boom 3 extending if contacted by the hook block. It is safe to override the anti-two block for road travel only. When lifting a load, care should be taken to prevent a load or hook block contacting the boom as damage may occur. The size of the lifting load must also be taken into account. Do not operate the crane if the over-hoisting protection device is malfunctioning.	B	4	L	Prior to supply



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		P	C	R		P	C	R	
45	Dropping of excessive load	E	5	H	Choose a hook and winch rope parts of line suitable for the mass of the load from the rated lifting capacity table.	B	5	M	Prior to supply.
46	Dropping of excessive load or reduced stability	E	5	H	When lifting a load, pause briefly after the load has just left the ground to check whether it is safe to continue.	B	5	M	Prior to supply. Prior to use.
47	Entanglement of wire rope on the winch drum	E	3	M	When unwinding, do not allow the hook to touch the ground. If the hook touches the ground, the wire rope on the winch drum can become tangled	B	3	L	Prior to use by the hirer. During operation.
48	Collision with rotating load due to twisted wire rope	D	3	M	If the wire rope gets twisted and causes the hook to rotate, untwist the rope before starting work.	B	3	L	Prior to use by the hirer
49	Abrupt stop from over-hoisting condition	D	4	M	Lower the hook sufficiently before extending the boom. Monitor the position of the hook block relative to the head of the boom. Care should be taken to prevent a load or hook block contacting the boom.	B	4	L	Prior to use by the hirer. During operation.
50	Damage to the boom if used to push or pull objects (not applicable to DM type crane)	D	4	M	Do not use the boom to push or pull objects as the crane is not designed for this. Loads must be freely suspended to move them.	B	4	L	During operation.
51	Collision with people or objects when articulating	E	6	H	Check that the area is clear of obstructions before articulating. Ensure that work area is barricaded to ensure that unauthorised personnel do not enter the area.	B	6	M	Prior to use by the hirer. During operation.

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
52	Damage to the boom and tip over of the crane from centrifugal forces caused by rapid articulation and stopping with a suspended load	E	5	H	Always be aware of the centrifugal forces when articulating. Articulating rapidly with a suspended load increases the working radius and could cause an overload that could tip over the crane. If the articulation is stopped abruptly, the inertia of the suspended load will cause it to swing uncontrollably and impose higher loads on the boom. Do not articulate rapidly or stop abruptly as this could lead to tip over and/or damage to the boom. This problem will get worse with longer boom lengths and higher boom angles.	C	5	M	Prior to use by the hirer. During operation.
53	Jib breaking and falling off from overload	C	5	M	When lifting an object, ensure that the load lifted is within the lifting capacity of the boom at the maximum working radius.	A	5	M	Prior to use by the hirer. During operation.
54	Injury due to manual handling while attaching jib	C	4	M	Follow instructions given in this manual for jib installation. Exercise caution while commanding crane movements.	B	4	L	Prior to use by the hirer. During operation.
55	Collision or dropping of the load when working with two cranes (tandem lifting)	D	4	M	When tandem lifting: a) Work with two cranes of the same type b) Select cranes with ample capacity for the job c) Create a lift plan prior to commencing work d) Do not exceed 75% of the rated capacity on either of the cranes at any time during the lift e) Reduce the rated capacity for articulation and sloping ground accordingly f) Appoint one signaller for the entire operation g) Ensure clear line of communication to all personnel	B	4	L	During operation.



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					h) Control cranes by single lever operations. Avoid compound lever operations i) Avoid rapid movements				
56	Collision, entanglement and falling crane/load when operating on sites with reduced load visibility	D	4	M	When operating a crane on sites with reduced load visibility: a) Choose a number of parts of line with ample capacity for the job b) Be particularly thorough in all aspects of signalling c) Proceed with extra caution in all crane operations d) If the number of parts of line on a wire rope is unsuitable for the boom length, the hook will not reach the ground level and the wire rope will wind backwards onto the drum and get damaged	B	4	L	During operation.

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Maintenance

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
1	Inadvertent or unauthorised operation of crane can cause accidents	D	5	H	Take the following precautions: a) After finishing work, stow the crane and lock it b) Do not leave the crane in its working position – this can cause accidents c) Remove keys and store in a locked location	B	5	M	Prior to supply Prior to use by the hirer.
2	Collision from crane rolling down a slope	D	5	H	Take the following precautions: a) Park the crane in a safe and level location. If there is no level location to park on, and the crane has to be parked on an incline, place chocks under the wheels to prevent the crane from moving b) Ensure that the parking brakes are engaged	B	5	M	Prior to use by the hirer.
3	Collision of parked crane with passing vehicles	D	4	M	Take the following precautions: a) If possible, park the crane off the road b) If the crane had to be parked on a road, park it in a safe and level location. Avoid parking around bends, just after the crest of a hill and where an approaching driver's vision is obstructed c) Observe the safety regulations and laws of the state or country where the crane is being used	C	4	M	Prior to supply. Prior to use by the hirer.
4	Mechanical failure of the crane	D	5	H	Ensure that the crane is maintained in accordance with the manufacturer's requirements. After operating the crane, check the crane for damage or signs of failure. Repair or replace damaged or worn parts. Replenish greases and oils as required.	B	5	M	Prior to supply. Prior to use by the hirer



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
5	Damage from unauthorised use of the crane	D	5	H	When the machine is not being used, lock the doors and take the keys away	B	5	M	Prior to use.
6	Failure of controls or mechanical parts of the crane	D	6	H	If there is a breakdown or malfunction of a control or crane component or part, repair or replace it immediately. Do not, under any circumstances, start a crane, which requires repairs	B	6	M	Prior to supply. Prior to use by the hirer.
7	Equipment malfunctions from incorrect tuning	D	6	H	Always keep the crane in good state of repair and serviced regularly. Use authorised Terex dealers or service agents to keep the crane in top operating condition. Terex authorised dealers are service agents thoroughly understand the Terex cranes, and are trained and equipped to ensure that you get the best possible returns from your investment	B	6	M	Prior to use by the hirer. Prior to supply.
8	Collision from a run-away crane if not parked on level ground	D	5	H	When inspecting and maintaining the crane, park on level ground and always engage the parking brakes. Also place chocks under the wheels for additional safety	B	5	M	Prior to supply. Prior to use by the hirer.
9	Inadvertent operation of the crane during inspection and maintenance	C	6	H	Always place warning signs on the crane when it is being serviced or repaired. Whenever possible, stop the engine and remove the keys. Isolate the crane where possible.	B	6	M	Prior to use by the hirer
10	Mechanical failure of the boom and/or jib after they have been repaired	D	5	H	Use only authorized repairers to repair the boom or jib. Repairs of the boom or jib require specialized techniques and training. Authorised Terex repairers are trained in these techniques.	B	5	M	Prior to use by the hirer. Prior to supply.
11	Burns from a hot radiator	D	4	M	Observe caution when opening a radiator cap – the hot radiator coolant could spray out dangerously when the cap is removed from a hot radiator. If you have to take the radiator cap off, wait until the coolant has had time to cool. After the coolant temperature has reduced sufficiently, loosen the cap slowly and allow the pressure to dissipate before completely removing it.	B	4	L	Prior to supply. Prior to use by the hirer.



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
12	Mechanical failure through corrosion from oils contaminated with water	D	5	H	When topping up or replacing fuel or hydraulic oil, take care to avoid the entry of water or other contaminants Ensure that the oils are changed regularly according to the instructions in the crane service schedule	B	5	M	Prior to use by the hirer.
13	Mechanical failure due to the use of incorrect oils, greases and filters	D	5	H	Use only genuine Terex approved oils, greases and filters. The use of products not approved by Terex could void warranty. Terex will not in any way, accept responsibility for resultant accidents or breakdowns caused by the use of unapproved parts and/or products	B	5	M	Prior to supply
14	Environmental hazards from waste oil	D	6	H	Drain waste oil from the crane into a proper container designed for the purpose. Dispose the waste oil in accordance with the regulations of the state or country. Never allow waste oil or other contaminants to get into the storm water system, streams, rivers or wetlands	A	4	L	Prior to supply
15	Injury or damage during cleaning	C	4	M	When washing the crane take the following precautions: a) To prevent slipping wear slip-resistant boots b) High-pressure steam can cut skin, and splash dirt into the eyes. Wear suitable personal protective equipment (such as goggles) when using high-pressure steam c) Water sprayed on electrical equipment during washing can cause electrical shock or cause the equipment to fail. Ensure that all electrical equipment is protected from water over-spray and the electricity supply is fitted with a Residual Current Device (RCD) to protect the operator from electrical shock	B	4	L	Prior to supply
16	Falling from height	D	5	H	When working at height take the following precautions: a) Keep working area neat and tidy (no tools scattered around) b) Wipe off any spilled oil or grease and walk carefully	B	5	M	Prior to supply



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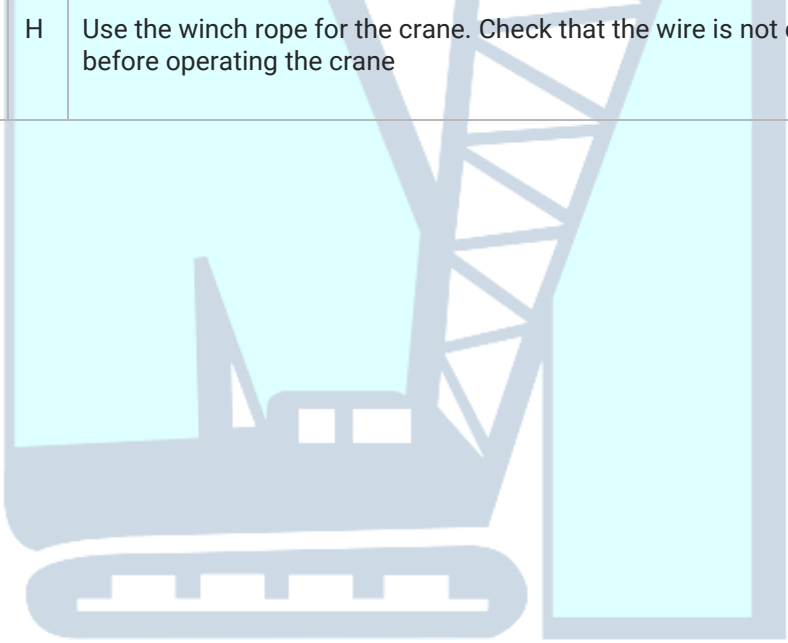
Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
					c) When climbing and descending, use the handgrips and platforms provided. Always support yourself on at least three (3) points at all times d) Use additional safety devices such as fall arrest systems, harnesses, lanyards, platform ladders, etc				
17	Carrying out inspection and maintenance with the crane running	C	4	M	Unless the task you are to perform requires the engine to be running, stop the engine before inspection and maintenance. If the task you are to perform requires the engine to be running, take care to prevent your body or clothes from getting caught in moving parts	A	4	L	Prior to supply
18	Explosion of the gas released by the battery, or skin burns from contact with the battery fluid	C	5	M	When servicing any part of the electrical systems or when welding, remove the battery.	B	5	M	Prior to supply
19	Burns from contact with hot engine parts	C	4	M	Wait for the hot parts (engine, radiator, hydraulic equipment, pipes, exhaust system, etc) to cool before commencing work on or near the hot parts	B	4	L	Prior to supply
20	Fire and explosion if naked flame is used for lighting or illumination	D	5	H	Use and LED type lamp when inspecting the battery or fuel components. Do not use a lighter or other naked flame to light up the work area	A	5	M	Prior to supply
21	Fire from flammable vapours generated by heating the hydraulics	D	5	H	Do not weld, solder or heat with a torch on or near hydraulic equipment or pipes. Heat applied on pressurized pipes or rubber hoses could cause them to rupture. Cover the pipes and hoses with fire-resistant materials before applying heat near or on them	A	5	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	
22	Crushing from dropping load or parts of plant due to broken wire ropes	D	5	H	Use the winch rope for the crane. Check that the wire is not damaged before operating the crane	B	5	M	Prior to supply



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Sign Off

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.

Name	Qualification Required for this Activity	Signature	Date



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Name	Qualification Required for this Activity	Signature	Date

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