



Revision Summary

Version	Author	Reasons for Change	Approver	Date Approved
1.0	M Imamura	New document	M Guantero	21 Aug 2018



1: Purpose and scope

This document sets the requirements for lifting operations for and on behalf of Z Energy Limited (Z). This includes any crane work (including hiabs and excluding standard stock deliveries) and general movement of construction materials and equipment.

Applicability

This document applies to all persons working for and on behalf of Z or its subsidiaries, i.e. employees, contractors, sub-contractors, franchisees, and retail site staff, as well as visitors and other third parties on premises operated by Z or its subsidiaries.

Compliance shall be the responsibility of all employees, contractors, retailers and retail site staff or 3rd parties working for or on a Z area of business. This is a Z document and adherence is not required in any area controlled exclusively by another third party.

The requirements of this document shall apply in addition to any applicable laws and regulatory requirements, including the latest Approved Code of Practice for Cranes issued by the NZ Department of Labour. This document takes precedence only where its requirements exceed those of applicable laws and regulatory requirements.

All applicable laws and regulations shall be complied with when performing any work, either within or beyond the scope of this document.

Definitions

Crane

Any appliance equipped with a mechanical, hydraulic, pneumatic, or electrical means for raising and lowering a load by ropes or chains and for transporting a load while suspended, and includes a Hiab attached to a vehicle. It includes all chains, slings, ropes, shackles, swivels, rings, hooks, or any other tackle used in the operation of a crane. For the purpose of this document, this SWP does not include use of Forklifts.

Excavators being used in place of a crane for lifting should follow same procedures as a crane. They must have load charts installed in cab and have a proper certified lift attachment or bucket removed and chains or hook fitted to main bucket pin. Using excavators as cranes is a high-risk activity because lifting is not the primary design function of these machines.

Critical Lift

A complex or critical lift requiring two or more cranes where engineering planning and procedures are essential. A non-routine crane lift requiring detailed planning and additional safety precautions.

Critical lifts include any of the following;

- Lifts made when the load weight is 75% or more of the rated capacity of the crane; lifts that require the load to be lifted, swung or place out of the operators view; or lifts made with more than one crane. For the purposes of this document we – will NEVER exceed 80%.
- Lifts on uneven, or unstable ground
- Lifts using more than one crane
- Lifts involving non-routine or technically difficult rigging arrangements
- Hoisting personnel with a crane or derrick
- Lifts involving hazardous materials (e.g. explosives, highly volatile substances)
- Lifts involving sub-merged loads
- Lifts without the use of outriggers
- Lifts where the centre of gravity could change,
- Lifts involving mancages
- Or, any lift that the crane operator believes should be critical, including within an area with Restricted Space.

Hiab

A hydraulic truck mounted crane

Sling/Strop

Rated / certified strap used for connecting the load to the crane hook.

Simple Lift

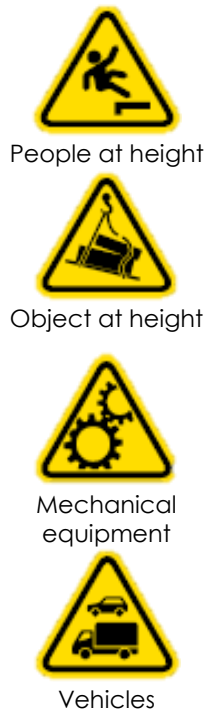
A relatively simple basic lift requiring one crane, where the lift is NOT over critical or vulnerable fuel containing equipment, pipework or electrical cabling. Crane is set-up on stable / firm ground, with a load less than 75% capacity of crane.

Taglines

Used to guide the load during the lift, these are light non-load bearing ropes.



2: Hazards



Applicable LifeSavers



3: References

External References

- Health and Safety at Work Act 2015
- Approved Code of Practice for Cranes (<https://worksafe.govt.nz/dmsdocument/410-approved-code-of-practice-for-cranes>)
- Approved Code of Practice for Load-lifting Rigging (<https://worksafe.govt.nz/dmsdocument/401-acop-load-lifting-rigging>)
- Lift Planning Guide from Crane Association of New Zealand (http://www.safecrane.nz/uploads/2/0/5/7/20572552/crane_association_lift_planning.pdf)
- New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001) <https://worksafe.govt.nz/dmsdocument/1565-new-zealand-electrical-code-of-practice-for-electrical-safe-distances-nzecz-34-2001>

ZORM Documents

- Z's Approach to managing operational risks
- Z's Approach to managing operational integrity
- Z's Permit to Work Manual
- Z's Drug and Alcohol Policy
- Managing fatigue at Z - QRG
- PPE Matrix - QRG
- PPE Specifications - QRG



4: Roles and responsibilities

General Manager-BU	<ul style="list-style-type: none"> Ensure business unit compliance to this procedure
HSSE Operations Manager	<ul style="list-style-type: none"> Responsible for maintaining and confirming the implementation of this procedure
Senior Permit Issuer	<ul style="list-style-type: none"> Ensure any tasks that involves working at heights is managed under the Z Permit to Work System (PTW)
Permit Issuer	<ul style="list-style-type: none"> Confirm that the hazards associated with the lifting operation have been identified and assessed and that the identified controls are adequate to perform the work in a safe and environmentally-sound manner prior to authorising and issuing the Permit to Work
Permit Holder	<ul style="list-style-type: none"> Completes a Safe Work Method Statement (SWMS)/Hazard Identification and Task Risk Assessment (HITRA) that reflects the Hierarchy of Control before lifting commences Ensure only a competent person performs the lifting Ensure all equipment used comply with relevant code of practice or regulation, be fit for purpose, well maintained and certified where required
Crane operator	<ul style="list-style-type: none"> Responsible for the overall lifting operation. Takes direction from Dogman during lifting operations. Stop the lift at any-time should an un-safe situation arise
Lift Supervisor	<ul style="list-style-type: none"> Coordinate and control all aspects of the lifting operation, including the pre-lift job safety meeting Ensure that personnel are aware of their specific responsibilities regarding each lift
Dogman	<ul style="list-style-type: none"> Responsible for directing the crane operator during lifting operations. Use clear and concise communication, with the use of hand-held radio, hand signal, or another form agreed between the Crane Operator and Dogman. Stop the lift at any-time should an un-safe situation arise.
Rigger	<ul style="list-style-type: none"> Part of the Lifting Operations team, responsible for "slinging" the load – i.e. set-up of lift equipment on the load to ensure safe execution of the lift.
Spotter	<ul style="list-style-type: none"> Oversee the lift, and associated work area, checking for approaching hazards and ensuring they are identified and communicated

5: Requirements

Any crane work (including hiabs and excluding standard stock deliveries) shall be managed under the **Z Permit to Work System** (PTW). Persons responsible for the particular work shall have in place a HITRA that reflects the Hierarchy of Control before Work at Height commences.

Work permit is required for any crane work, including hiabs and excavators, and excluding standard stock deliveries

A **Lifting Certificate** must be used in conjunction with the permit to provide a higher level of detail on the controls to be put in place to manage the activity.

Where a manacge and fall arrest system is to be used, a **Rescue Plan** is mandatory to rescue people who have fallen, are suspended in a harness, and could develop suspension trauma.

Lift plan

All lifts require a lift plan of some description, the detail of which will depend on whether the lift is a Simple Lift or Critical Lift. The plan must be agreed by the PI and lifting contractor.

The lift plan shall consider the following;

- What is the weight of the load, need to include the lifting equipment – i.e. the chains, and shackles
- Does the crane have sufficient capacity over the distance of the lift?
- What is the travel path of the load, are there any obstructions?
- Is one or more dogman and or spotter required for lifts where the operator view is obstructed
- What mean of communication will be used; hand signals, hand-held radios,
- Ground loadings including if required, confirmation by an engineer.

Additional documentation for the lift plan could include;

- Copy of underground services where the lifting equipment is to be sited
- The crane/ excavator load chart to show the capacity at the intended lifting radius



- The weight of the load to be lifted (including rigging)
- A plan to show the directions of the lifting slew, and the area to be taped off and controlled
- Whether the Lift team requires a Rigger, Dogman or Spotter.
- Use of taglines - where practical tag lines shall be used on all loads to ensure that the load is under control at all times to prevent spinning etc.

This information should be sourced from the Crane operator, with recommendation to use the Lift Plan pro-forma available from Crane Association of New Zealand.

5.1 Hierarchy of controls

At all times, when carrying out lifting operations make a risk assessment and apply the "Hierarchy of Controls", in descending order. Refer to NZ Department of Labour's ACOP for Cranes, Appendix G for common hazards and controls to eliminate, isolate and minimise risks associated with crane operation.

Hazard	1. Eliminate	2. Isolate	3. Minimise
Hit by falling object(s)	<ul style="list-style-type: none"> • Tools are to be attached to tool belts worn by the individual where practicable and safe to do so 	<ul style="list-style-type: none"> • Tape off underside of work area and erect warning signs. 	<ul style="list-style-type: none"> • Safety helmets to be worn at all times other than when no danger above, or inside vehicles or other shelter
Electrocution (from crane power supply)		<ul style="list-style-type: none"> • Ensure crane is properly earthed. • Lockout devices should be used wherever practicable. 	<ul style="list-style-type: none"> • Only qualified and certified electricians to perform electrical work on tower cranes
Electrocution (from external supply)	<ul style="list-style-type: none"> • Turn off power 	<ul style="list-style-type: none"> • Limit crane operations. 	Ensure crane is properly earthed. <ul style="list-style-type: none"> • All personnel to be made aware of hazard. • No part of crane or load to come within 4 metres of a 1Kv power source. If lifting over or near power lines work should be authorised by power authority
Load falling on, striking, or pushing personnel		<ul style="list-style-type: none"> • Z LifeSaver: Stay clear of elevated loads • All personnel not involved with the lifting operation to be kept clear of the area. • The area should be taped off and warning signs erected. • 	<ul style="list-style-type: none"> • Only appropriately trained, experienced and authorised personnel to operate and rig cranes. • Radios to be used when lifting out of sight of operator.
Injury from exposure to crane machinery		<ul style="list-style-type: none"> • All protection guards are to be in place at all times except when being worked upon or when necessarily removed for erection procedures. • Lockout devices should be used wherever practicable 	<ul style="list-style-type: none"> • Lanyards to be secured when not in use and not able to snag upon moving machinery etc
Crane tip over		<ul style="list-style-type: none"> • The area should be taped off and warning signs erected. • Lifting loads over personnel, accommodation or traffic 	<ul style="list-style-type: none"> • Mobile crane operators should be holders of the National Certificate in Crane Operation (Mobile) or studying for this qualification, or under the direct supervision of such a qualified person. • Detailed copies of the crane's capacity charts are to be available on site and in the operator's cab
Personnel struck by vehicles			<ul style="list-style-type: none"> • A temporary traffic safety management plan should be in place. • Approved high-viz clothing to be worn by personnel working in same areas as any vehicles.



Use of mancage	Use other means such as EWP or scaffold.	<ul style="list-style-type: none"> The use of mancages should be avoided where ever possible. 	<ul style="list-style-type: none"> A trial lift over planned working at height area must be undertaken with 150% of total load in man-cage prior to anyone being lifted. Man-cage should be certified and have SWL plate fitted to cage. All personnel must be harnessed to and lanyard anchor point must be above hook swivel
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5.2 Equipment inspection/certification

- All lifting devices and equipment need to be verified as fit for use within the last 12 months.
- All safety devices installed on the lifting equipment are to be working properly.
- All lifting devices and equipment are visually examined by a competent person before each lifting operation. (Z Life Savers).
- Two-way radios that will be used for communication are checked to ensure they are performing satisfactorily and the battery is charged. A spare battery should be available.

5.3 Worksite

5.3.1 Siting the crane/hiab/ excavator

Consider the following when locating a Crane, Hiab or excavator;

- Is the ground solid enough to support the weight – remember the total weight includes the crane, slings/chains, and the load.
- Are there underground services
- Is the area above clear of overhead obstacles i.e. power lines, pipework. Unless the electrical supply authority has been advised in writing then no crane activity will be carried out within 4 metres of any 1Kv overhead power line (consult lines company if in any doubt).
- Is the swing area, and path of load clear
- Weather conditions - Strong wind, rain, lightning, poor visibility and other weather or environmental conditions that could compromise safety, shall be considered before any lifts will be undertaken. **Maximum wind criteria should be set before lift commences.**
- Excavators should be set up a **minimum of 1 metre** away from any trench or pit with tracks parallel to excavation. A ground assessment may be required by an engineer prior to lifting. No one should be in excavation during lift and a spotter should be watching for signs of soil disturbance when lifting operation is underway

Secure the area to ensure anyone not essential to the task has been removed from the area where they might be injured by a falling or shifting load. (Z Life Savers)

5.3.2 Use of man-cages

- Platform is to be well maintained and certified and have SWL plate fitted to cage.
- Platform shall be inspected daily prior to use by the crane operator.
- Cranes used for work platforms shall meet the requirements of the Approved Code of Practice for Cranes.
- Workers in the platform must have a means of communication with the crane operator, and shall wear a safety harness with a lanyard that includes a short shock-absorber, must be attached to a certified attachment point at all times. Lanyard long enough to provide free movement within the confines of the basket. When the cage is suspended on the hook, a lanyard shall be independently attached above the hook. A trial lift over planned working at height area must be undertaken with 150% of total load in man-cage prior to anyone being lifted.

5.3.3 Radio communication

Radios must be rated for the work area it is being used.

Radios are normally used in one or more of the following situations:

- where the load being lifted is not visible to the crane operator and/or dogman
- where hand signals may not be clearly seen because of:
 - the height of load
 - the height of lift
 - distance
 - obstructions and site conditions
 - weather conditions
 - multiple lift operations



Dogman and Crane Operator should be familiar with the radio manufacturer's operating instructions.

- Prior to commencement of any task on site the radios to be used MUST have an operating safety check to ensure they are performing satisfactorily and the battery is charged. A spare battery should be available.
- A dedicated channel should be used for each lifting operation. Check for other radios in use on the site.
- Operators should familiarise themselves with any particular worksite procedures regarding the use of radio communication on that site.
- A "constant talk" method should be adopted requiring the radio users to talk in such a manner that the progress of the task is continuously made known to people involved at all times.
- To eliminate any misunderstanding, crane operators should take radio instructions from one competent person only. Special circumstances may require specific arrangements to be put in place when using more than two radios.
- To ensure reliable and prolonged service, all radios MUST be kept fully charged, dry and handled with care.

5.3.4 Safe distance between crane and live electrical line

New Zealand Electrical Code of Practice (NZECP 34:2001) requires that the distance between any live overhead electric line and any part of any mobile plant or load carried shall be "AT LEAST 4.0 METRES", unless the operator has received written consent from the overhead electric line owner allowing a reduced distance.

Where any mobile plant is likely to be used at any time in the proximity of overhead electric lines, the owner or operator of such device shall affix an approved warning notice in a conspicuous place as near as practicable to the operator's position. The notice shall be maintained in a legible condition and shall state: "WARNING, KEEP CLEAR OF POWER LINES".

5.3.4 Lifting operations

The Qualified Crane Operator and the assigned Dogman shall ensure the following are carried out:

1. The dogman/ rigger should be in high-visibility wear so all personnel involved in the lifting activity can see the person assigned to give hands signals to the crane operator.
2. Ensure the lifting equipment is certified for current use and rated appropriately for the activity.
3. Confirm that the appropriate rigging for the lift is correctly installed, and the lifting sets are not twisted or snagged.
4. Ensure load is balanced and stable.
5. Ensure shackle bolts are tight and adequately secured and locked.
6. Confirm the weight of any particular load or bundle.
7. Ensure the hook is positioned above the load's center of gravity (if known).
8. Ensure that a clear and effective communication system is employed and understood by personnel involved with the lifting operation.
9. Ensure there is adequate lighting in the pick-up and lay-down areas and unobstructed access ways and escape routes exist.
10. Ensure that the pick-up and lay-down areas are within the crane radius for the load being lifted.
11. Ensure that the load does not pass over personnel.
12. Ensure that any restraints to the lift are removed (e.g., hold-down bolts, sea fastenings, etc.).
13. Prior to the use of a mobile crane, the ground condition must be known and suitable for the intended lifting operation. The location of underground services must also be verified.

5.4 Competency

Specialised training and competencies are required before an individual is to be assigned a specific PTWS operational responsibility. Table 1 specifies training requirements for personnel involved in performing lifting activities.

Table 1. Training and competency requirements for lifting

Role	Training	Description
Dogman	NZQA US 3789	Sling varied regular loads and safely direct a crane during crane operations
Rigger	NZQA US 3789	Sling varied regular loads and safely direct a crane during crane operations
Person working on man cages	NZQA US 17600	Explain safe work practices for working at heights
	NZQA US 23229	Use of a safety harness for personal fall prevention when working at height



Role	Training	Description
Spotter	NZQA US 17600	Explain safe work practices for working at heights
Crane operator	Refer to Table 2.	

- Workers must not be permitted to use or operate any lifting equipment unless they are instructed, trained and qualified by a competent person in the use and operation of the equipment. Documentation of contractor qualified crane operator qualifications must be provided upon request.
- All persons operating or working with a crane must hold the following applicable Unit Standards as a minimum qualification and preferably hold the relevant National Certificate in Crane Operation. See Table 2.

Table 2. Minimum Unit Standard Requirement (from WorkSafe ACOP for Cranes)

Type of Crane	3789	3790	3794	3795	3800	3818	15757	16617	20208	20209	20526	23351	24511
Mobile crane operation	✓			✓									
Tower crane operation	✓		✓										
Crawler crane operation	✓										✓		
Self-erecting tower crane operation	✓								✓				
Cab controlled overhead travelling crane operation		✓											
Pendant or remote-controlled overhead travelling crane operation					✓								
Truck loader crane operation				✓*				✓*					
Erection of a self-erecting tower crane										✓			
Erection, climbing or dismantling of other tower cranes						✓	✓*					✓*	
Slings of regular loads	✓												
Non-slewing articulated crane e.g. tractor crane	✓												✓

*One or more of these unit standards must be held

Unit Standards

- 3789 – Sling varied regular loads and safely direct a crane during crane operations
- 3790 – Use a cab controlled gantry crane to lift and place regular loads
- 3794 – Lift and place regular and irregular loads using a tower crane
- 3795 – Configure and position a mobile crane, and lift and place regular and irregular loads
- 3800 – Use a radio remote or pendant controlled gantry crane to lift and place regular loads
- 3818 – Erect, climb and dismantle a tower crane
- 15757 – Use, install and disestablish temporary proprietary height safety systems when working at height
- 16617 – Use a truck loader crane to lift and place regular loads
- 20208 – Use a self-erecting tower crane to lift and place regular loads
- 20209 – Erect, dismantle and reconfigure a self erecting tower crane
- 20526 – Configure a track crawler crane and lift and place loads
- 23351 – Describe, set up, and use fall arrest and rescue system in a tower crane environment.
- 24511 – Configure a non-slewing articulated crane, and lift and place regular and irregular loads.

5.5 Fitness for work

- A competent person must be physically fit for the task, must have the ability to identify hazardous conditions, and must take action to maintain a safe workplace.
- If workers are exposed to extreme temperatures or physical demands, refer to **Managing Fatigue at Z guidelines** to address the risks of fatigue (HS-HAW-H-GUI-001).
- Workers must comply with **Z's Drug and Alcohol policy**. Z requires the performance of its staff, contractors and others on Z premises or operating equipment on Z's behalf to be unimpaired by alcohol or drugs.

5.6 WorkSafe notifiable work (related to lifting)

The Health and Safety in Employment Regulations 1995 require employers as well as the person who controls a place of work to provide at least 24 hours notice to WorkSafe of particularly hazardous work as defined below:

- Construction work with a risk of falling 5 Metres or more. Excludes:
 - work in connection with a residential building up to and including 2 full storeys,
 - work on overhead telecommunications lines and overhead electric power lines,
 - work carried out from a ladder only, or
 - maintenance and repair work of a minor or routine nature.



- Use of a lifting appliance where the appliance has to lift a mass of 500 kilograms or more a vertical distance of 5 metres or more. Excludes:
 - work using an excavator,
 - work using a fork-lift, or
 - work using a self-propelled mobile crane

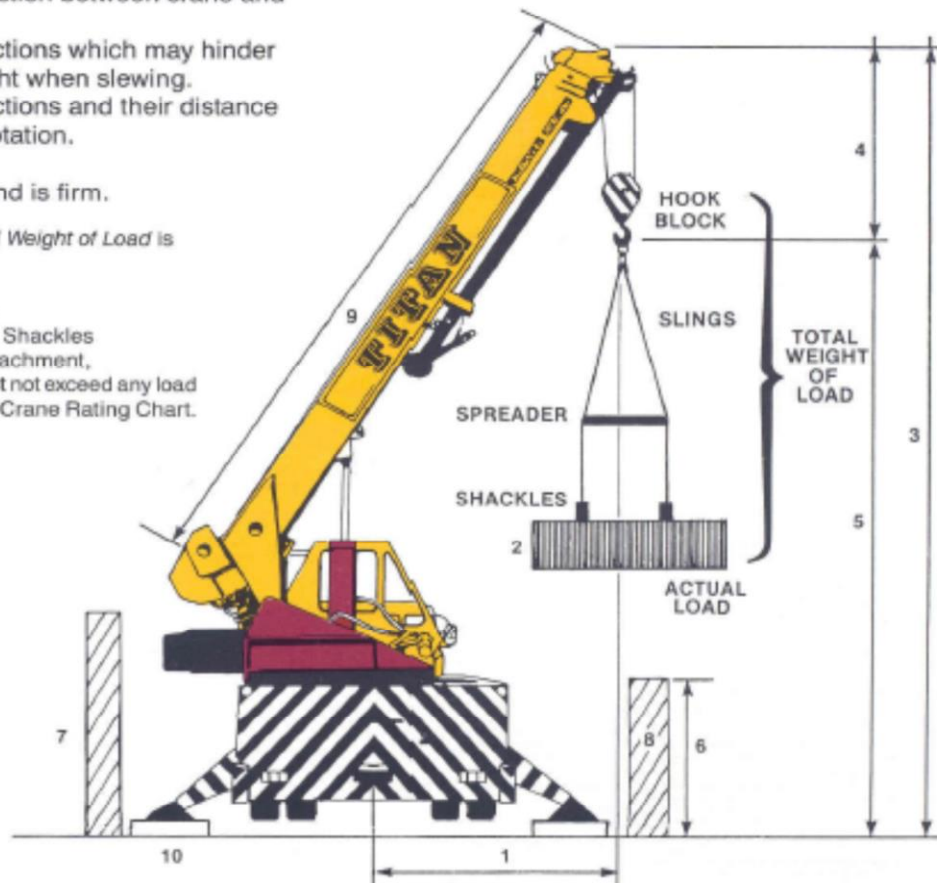


6: Crane terminology

- 1 Maximum radius.
- 2 Total weight of load*
- 3 Clearance height under ceiling (if any).
- 4 Allow distance from jib head to hook.
- 5 Height of hook from ground.
- 6 Height of obstruction between crane and load.
- 7 Allow for obstructions which may hinder the counterweight when slewing.
- 8 Allow for obstructions and their distance from centre of rotation.
- 9 Boom length.
- 10 Make sure ground is firm.










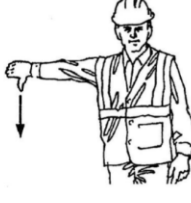








* Please note that *Total Weight of Load* is obtained by adding:
 Actual Load Weight
 + Crane Hook Block
 + Slings, Spreaders, Shackles
 + any other lifting attachment.
 The total of which must not exceed any load capacity listed in any Crane Rating Chart.

NOTE: Check for Power and Telephone wires in vicinity of lift area.



7: Crane hand signals

Source: Approved Code of Practice for Cranes, Appendix B.

				
<p>STOP Extend one arm and hold palm of hand vertical. Note: EMERGENCY STOP is indicated by holding both arms up.</p>	<p>STOP (B) Arm extended, palm down, move hand right and left. Usually for different level operations.</p>	<p>HOLD EVERYTHING Clasp hands in front of body.</p>	<p>MOVE SLOWLY Place one arm motionless across chest in conjunction with or before giving any other directional signal ("Hoist slowly" shown as example.)</p>	<p>HOIST With forearm vertical, forefinger pointing up, move hand in horizontal circles.</p>
				
<p>LOWER With arm extended downward, forefinger pointing down, move arm in horizontal circles.</p>	<p>USE MAIN HOIST Tap fist on head, then use regular signals.</p>	<p>USE FLYLINE (AUXILIARY HOIST) Tap elbow with one hand, then use regular signals.</p>	<p>RAISE BOOM (LUFF UP) Arm extended, fingers closed, thumb pointing upward.</p>	<p>LOWER BOOM (LUFF DOWN) Arm extended, fingers closed, thumb pointing downward.</p>
				
<p>SLEW Arm extended, point with finger in direction of swing of boom.</p> <p>OVERHEAD GANTRY CRANE – Arm extended, point with finger in the long-travel or cross-travel direction.</p>	<p>RAISE THE BOOM AND LOWER THE LOAD One arm extended, fingers closed, thumb pointing upward. Other arm extended downward with forefinger pointing down, move arm in horizontal circles.</p>	<p>LOWER THE BOOM AND RAISE THE LOAD One arm extended, fingers closed, thumb pointing downward. Other arm vertical with forefinger pointing up, move arm in horizontal circles.</p>	<p>EXTEND HYDRAULIC BOOM OR TROLLEY OUT (TOWER CRANE) Both fists in front of body with thumbs pointing outward.</p>	<p>RETRACT HYDRAULIC BOOM OR TROLLEY IN (TOWER CRANE) Both fists in front of body with thumbs pointing towards each other.</p>
				
<p>TRAVEL Arms bent at the elbows, fists clenched, rotate both forearms around each other, then point in the direction of travel.</p>	<p>TRAVEL (ONE TRACK – CRAWLER CRANES ONLY) Lock the track on the side indicated by the closed fist. Travel opposite track in the direction indicated by the circular motion of other fist rotated vertically in front of body.</p>	<p>FINISHED WITH CRANE Place arms above head and cross hands.</p>		

