Lifting and Rigging

Couple of takeaways

- Lifting and rigging activities are generally considered a high-risk task and often require specific training and licensing. Workers are to ensure they are trained and competent for the tasks they are performing.
- Lifting equipment is to be checked to ensure it has been inspected and is tagged and in date before use.
- Operational lifting equipment is tested and tagged annually.
- Lifting equipment used for construction activities is tested and tagged quarterly.

What is this procedure for?

The purpose of this procedure is to ensure that risks associated with rigging, lifting and slinging are reduced to as far as reasonably practicable and are consistent with the Hierarchy of Controls where Hydro Tasmania group has a prevailing influence over the performance of the works. This procedure applies to all lifting, rigging and slinging activities performed on all Hydro Tasmania group owned and operated sites and activities.

What are the roles and responsibilities?

Hydro Tasmania group management shall

- Allocate funding / resources to ensure hazards are managed
- Ensure a risk register is in place for their business area
- Support implementation and compliance with the WHS management system
- Ensure risks are controlled to ALARP
- Ensure that adequate information, instruction, training, supervision is always provided to workers and visitors

Line/ project managers shall

- Ensure full compliance with the requirements of this procedure
- Verify the implementation of this procedure by all Hydro Tasmania group workers and contractors
- Report all lifting and rigging incidents in accordance with Incident Management and Investigation Procedure requirements
- Monitor compliance with this procedure
- Identify remedial corrective actions required to meet this procedure
- Ensure that Hydro Tasmania group and contractors maintain all documentation relating to the inspection, test certificates, maintenance and repair of rigging and lifting equipment in a location readily accessible for audit and review by Hydro Tasmania group
- Ensure that copies of all high-risk work licenses, verifications of competency for all riggers and doggers are maintained and made available to Hydro Tasmania group upon request.
- Provide competent persons to inspect, tag and verify the integrity of all rigging and lifting equipment and an up-to-date register that records this inspection / verification
- Report all crane and lifting incidents and rigging, lifting and slinging damage reports immediately to the WHS Team

- Verify that Safe Work Method Statements (SWMS) have been developed for rigging, lifting and slinging operations and these have been maintained for currency and are provided to Task Supervisors for planning and developing task specific risk assessments with their workgroups.

Task Supervisors shall

- Have demonstrated experience appropriate for the works being supervised
- Conduct documented workplace inspections
- Immediately report all incidents involving rigging, lifting, and slinging operations to their Line Manager
- Provide and make available risk assessments to the workgroup to assist in the development of the task specific risk assessments
- Review risk assessments with the workgroup to verify accuracy and currency prior to work
- Monitor compliance with this procedure
- Identify remedial corrective actions required to meet this procedure.

Riggers/ Doggers/ Dogmen shall

- Ensure the safe execution of all slinging and lifting activities to which they are assigned
- Ensure the appropriate relevant lift evaluation as outlined in Table 1 is completed prior to the lift
- Conduct inspections of lifting and rigging equipment prior to and after use
- Take out of service any lifting or rigging equipment that is damaged or does not operate or conform to Hydro Tasmania group procedures or manufacturers specifications
- Ensure they do not undertake activities or use equipment without the appropriate training, instruction, or authority
- Wear the appropriate PPE, including safety harness and lanyard where required
- Fulfil the duties of the high-risk work license (HRWL) in a manner that is consistent with the terms and conditions of that license.

Crane Operator shall

- Be responsible for crane set-up and maintenance
- Use crane instruments to ensure crane is used within its specified safe tolerances (e.g. SWL)
- Obey reasonable signals and / or instructions of the rigger and / or dogger directing the crane
- Set up the crane in compliance with and manufacturer's requirements
- Comply with the requirements of this procedure and the manufacturers operator's manual
- Only operate cranes for which they have been familiarised with and within scope of their high-risk work licence
- Complete lift requirements as detailed by this procedure and supporting site documentation
- Report all damage or non-operational equipment immediately to their supervisor
- Complete the manufacturer's daily pre-start inspection and maintains the operator's logbook

- Fulfil the duties of the HRWL in a manner that is consistent with the terms and conditions of that license

NOTE: A worker engaged to maintain a crane and its associated parts does not require a HRWL to operate that crane.

Contractors shall

- Audit and monitor compliance with this procedure
- Identify remedial corrective actions required to meet this procedure
- Report all crane, rigging, lifting, and slinging incidents to Hydro Tasmania group representative immediately
- Maintain and verify currency of crane, lifting and rigging registers, where applicable
- Investigate all incidents and provides detailed reports to Hydro Tasmania group.

Rigging and lifting inspector shall

- Inspect, tag, and verify the integrity of rigging and lifting equipment in accordance with this procedure
- Maintain an up to date register that records inspection / verification

Forklift operator shall

- Be responsible for forklift set-up
- Use forklift within the specified safe tolerances (e.g. SWL)
- Comply with the requirements of this procedure and the manufacturers operator's manual
- Only operate forklifts for which they have been familiarised with and within scope of their high-risk work licence
- Report all damage or non-operational equipment immediately to their supervisor
- Complete the manufacturer's daily pre-start inspection and maintains the operator's logbook
- Fulfil the duties of the HRWL in a manner that is consistent with the terms and conditions of that license.

Workgroup members shall

- Ensure they follow reasonable instruction to ensure the safety and wellbeing of all workers while at work.

WHS team shall

- Facilitate and / or assist business units to conduct risk reviews
- Inspect / audit documentation and practices against this procedure
- Communicate and provide training in the application of WHS processes.

What are the details of the process?

Planning

Hydro Tasmania group and associated contractors conducting high risk activities shall plan and include WHS requirements into their construction maintenance and outage planning and scheduling activities. "Table 1 - forms to use for lifting activities" provides guidance on which WHS form is used for the type of lifting activities. In general, the greater the risk and

complexity of the lift, the greater planning is required to be undertaken as detailed within each form. Where it is unclear which form is to be used, a worker should consult their immediate supervisor. For dual lifts the default position is that a critical lift plan is required unless determined otherwise by the immediate supervisor and documented accordingly. The following definitions are provided to assist in a person deciding which form to be used.

Single crane lift

A single crane lift will be defined as a lifting operation that requires the use of one hook on one crane to perform a specific task.

Routine lift

A routine lift is defined as a lift that has all the following attributes.

- Load does not exceed 50% of the crane WLL/SWL.
- Load is less than 75% of the rigging WLL/SWL.
- Load has designated lifting point/points that are evenly spread over the centre of gravity, or requires simple slinging techniques for low risk, non-critical items.
- Load does not involve the use of mobile lifting equipment.
- Load does not involve lifting people.
- Load is not considered to be a critical component (Hydro Tasmania group supervisor to advise).
- Load is secure and not more than 1 item (e.g., bundles of pipes), or a load that has moving parts has been secured.
- Load does not require rolling over or tilting.
- Load does not require the use of specially designed lifting attachments or adaptors.
- Load is not required to be worked on while suspended.

To avoid unnecessarily restricting safe lifting and rigging practices and / or innovative solutions, variation on what defines a routine lift is acceptable on the basis that the decision is supported by a risk assessment that has been approved by the immediate manager.

Dual crane lift

A dual crane lift will be defined as a lifting operation requiring the use of more than one crane to perform a specific task.

Different forms need to be used for different lifting activities

Crane is used to lift a load	Forms
Simple single crane lift	Daily lift log standard lift
Routine lift Performed	Daily lift log standard lift
Routine lift not performed	Mobile crane lift evaluation Gantry crane lift evaluation
Multiple crane lift, consulted with supervisor and critical lift plan NOT required	Simple dual mobile crane lift evaluation Simple dual gantry crane lift evaluation

Multiple crane lift, consulted with supervisor and critical lift plan REQUIRED	Critical lift plan
Complex manoeuvring or rigging arrangement of load within area	Critical lift plan
Complex manoeuvring or rigging arrangement of load not within area and supervisor consulted	Crane needs to be used to lift a load

Table 1: Forms to use for lifting activities

Inspection and labelling

All rigging and lifting equipment shall be marked with the safe working load (SWL) as determined from the design with an individual identification code as follows:

Location / item abbreviation / sequentially numbered

Example: The first eye bolt at Poatina power station will be PO-EB-001

When a unique number is placed on an item abbreviation (e.g. EB, RS, CB etc) does not need to be placed on the item, providing the remainder of the number is in place i.e. Location and sequential number. Batched items must be numbered separately, not together i.e. Not 04A, 04B should be 04, 05 etc.

The unique number used must be recorded in the lifting and rigging register where details from the inspection are recorded. A unique number can be used once only to ensure the history of the item is recorded within the register.

Each piece of lifting and rigging equipment (except shackles) shall have the current inspection tag attached and be colour coded to readily identify testing requirements have been carried out, for the current period.

Labelling using a punch should not be used, light engraving is acceptable for equipment such as a shackle, chain block, sheave, etc, is permissible. Where engraving is adopted, visible coloured tags should still be used as a visual guide that items have been registered and certified.

Due to the age of some equipment and the unique nature of bespoke designs for specific tasks, there will not be design certificates available for all items. Where possible, such items shall be replaced over time or shall be re-certified by a registered professional engineer. Where this is not possible, a note will be placed in the register to indicate that the equipment must only be used after being inspected by a Hydro Tasmania group Lifting and Rigging Inspector and the associated risk assessment specifically addresses the use of the equipment as a potential hazard and provide detailed and adequate controls to minimise the associated risks. The non-standard lifting gear return to service form shall be used to document this.

Inspection guiding principles

An approved Hydro Tasmania group Lifting and Rigging Inspector shall perform lifting and rigging equipment inspections at pre-determined intervals as outlined within this procedure.

Inspections shall be:

- Completed within the 14 days prior to the 1st day of the next inspection period

- If required inspection has not been conducted within 14 days of the expiry date of the previous inspection

equipment must not be used and shall be removed from service until appropriate inspection has been completed

A tamper proof tag can be used as an indicator to signify if equipment has been used between inspection intervals. If the tamper proof tag is found to be intact, an inspector can replace the coloured tag without inspecting the item. The temper proof tag must be placed in a location that prevents a worker using the equipment unless the tag is broken.

Where rigging equipment is used intermittently or once every several years, the equipment does not need to be subject to routine inspection as outlined in this procedure subject to the following conditions being met:

- This equipment shall be quarantined and clearly labelled and identified not for use unless inspected
- The equipment shall be allocated a unique identification number and recorded in the rigging register
- The equipment shall be secured and stored in a way that reduces the likelihood of mechanical or chemical damage and deterioration from being exposed to environmental elements.

Equipment consisting of separate lifting and rigging gear can be group, inspected and recorded in the register as one item.

Inspection calendar periods and colour coding

All lifting equipment shall be inspected by an approved Hydro Tasmania group Lifting and Rigging Inspector. Lifting equipment shall be inspected annually in operational environments and quarterly on construction sites.

Where conditions are severe, shorter intervals may be applied. If it is suspected of being defective, it shall be tagged with a "Hazardous or Unusual Condition" tag and removed from service for inspection, repair, or disposal.

Inspections for lifting equipment in use for operational purposes are performed in august of each year. The colour used to indicate that an inspection has been completed must be rotated annually and meet the requirements outlined in operations inspection schedule & colours table and appendix A.

Operations (12 Monthly Inspections)	White Aug 26 – Aug 27 Aug 28 – Aug 29 Aug 30 – Aug 31 Aug 32 – Aug 33	Orange Aug 25 – Aug 26 Aug 27 – Aug 28 Aug 29 – Aug 30 Aug 31 – Aug 32

Table: Operations inspection schedule and colours

Lifting equipment used within construction works are to be inspected quarterly and tagged according to the requirements outlined in quarterly inspection requirements table and appendix A. Appendix A should be available where lifting equipment is stored and used.

Dec – Feb	March – May	June – August	Sep – Nov
Red	Green	Blue	Yellow

Equipment under suspension

Rigging equipment designed and used for suspension of equipment must not be used for lifting purposes unless the equipment is subject the inspection and certification requirements of this procedure. The rigging equipment designed and used for the suspension of equipment must be labelled at the point of attachment to inform workers of this restriction. Examples of equipment under suspension include stop logs, dewatering pit pumps etc.

Process flow

1. Work order is assigned to **lifting inspector** by **Area Coordinator**
2. **Lifting inspector** obtains current tags and lifting register from stores
3. **Lifting inspector** initiates inspections
4. If defective rigging equipment is identified, then **inspector** removes defective equipment from service and returns to store
5. **Inspector** then determines if replacement is needed purchase as per pre- purchase evaluation procedure and scans certificates & updates register
6. If defective ringing equipment is not identified then **lifting inspector** updates lifting register, updates hard copy power station lifting register and closes work order.

What are the general requirements?

Selection and procurement

Procurement of lifting and rigging equipment shall be conducted in accordance with pre-purchase evaluation standard.

Test certificates for the lifting and rigging equipment shall be confirmed upon receipt and stored within a central location (hard and soft copy) and referenced within the rigging register.

NOTE: Eyebolts and shackles do not come with individual test certificates, however when they are manufactured there is a "batch certificate" produced and it is a Hydro Tasmania group requirement that the "batch certificate" is provided with the purchase and delivery of the items.

Pre – deployment

Before being issued from a storage location or when first used, all lifting equipment shall be given a visual inspection to determine if any signs of damage. If it is suspected of being defective, it shall be tagged with an 'out of service' tag and removed from service for inspection, repair, or disposal. All lifting equipment used for the first time shall be checked against the lifting and rigging equipment register.

Pre & after use

Before and after each lift, rigging and lifting equipment shall be given a visual inspection to determine if any signs of damage. If it is suspected of being defective, it shall be tagged with a "Hazardous or Unusual condition" tag and be removed from service for inspection, repair, or disposal.

Manufacturers' user instructions and associated load rating charts should be reviewed prior to use.

Rigging and lifting equipment usage

As part of the conditions of a high-risk work license, a worker shall not attempt lifting operations unless competent, trained and experienced in the use of the lifting and rigging equipment. Always use as per the manufacturer's specifications.

Chains used for lifting – Grade T (80)

NOTE: All chains used for lifting within Hydro Tasmania group will be Grade T(80), however should other grades be required (e.g. Grade 100) they can be used by exception and authorisation is to be gained using the change/variance request form

The following conditions are to be met at all times:

- All chain slings shall comply with the requirements of AS 3775.1: chain slings for lifting purposes Grade T (80) - product specification
- All chains shall have an ID tag with their safe working load WLL/SWL
- The tag is to state the manufacturers name, grade of steel used for the chain
- Chains used for lifting must be alloyed steel chain Grade T (80)
- No stretched links of more than 10%
- No gouges or worn links, of more than 10% of diameter
- No nicked or corroded links
- Chain is supple
- No damaged or worn eyes, hooks, hammerlocks, or rings.

Superflex wire rope slings

NOTE: Superflex wire rope slings are to be used for lifting within Hydro Tasmania group, however, should wire slings be required they can be used by exception and authorisation is to be gained using the change/variance request form

The following conditions are to be met at all times:

- All steel wire rope slings shall comply with the requirements of AS 1666.1: Wire rope slings – product specification
- All slings shall have the ID stamp or tag and ensure the WLL of the sling is clearly legible
- All load bearing points shall be checked prior to each use for excessive wear, kinking, broken wires, and corrosion
- Check each strand along its length, opening the rope as much as practicable to enable examination
- Check end fittings and attachments for excessive wear or corrosion
- Check for heat damage, which is usually obvious through discolouration of the wires

- Slings and wire ropes subject to dynamic loading shall be fitted with approved end fittings complying with AS 2759-2004: Steel Wire Rope – use, operation, and maintenance
- If damage is noted, the wire rope sling shall not be used and a "Hazardous or Unusual Condition" tag shall be placed on the wire rope sling and be removed to a designated quarantine area to be inspected by an approved worker for a condition assessment. The outcome of the inspection (acceptable, repairable, or destroyed) shall be recorded in the Lifting and Rigging equipment register.

Wire rope (to be used by exception)

- The following conditions are to be met at all times
- It has no broken strands
- It is not badly corroded (any visible corrosion needs investigation to verify internal integrity of the wire rope)
- It has no flattened or kinked sections
- It has no damaged or worn eyes, hooks, or rings
- It is stored clear of the ground in a clean, dry place, making sure that it is not in contact with corrosive substances when it is stored
- A copy of the wire rope certification must be maintained in the lifting and rigging equipment register.

Round endless soft slings

The following conditions are to be met at all times:

- Periodic inspections have been completed at intervals in accordance with Hydro Tasmania group inspection and tagging requirements and written records are kept of periodic inspections in lifting and rigging equipment register.
- A permanent marker should be used to label the sling under the sheath.
- The use of synthetic slings shall be limited to materials that will not cut or damage the slings
- Synthetic slings may be used provided any square edges that may cut or damage the sling are padded with a rated material of sufficient strength to prevent damage to or failure of the sling
- Synthetic slings shall not be used as head slings to support pipes, beams, steel or lifting and rigging gear in racks or structures without the written approval of the Line Manager
- Round slings shall not be used around tasks involving hot works.

NOTE: It is Hydro Tasmania group's preference that soft slings are gradually withdrawn from use and replaced by Superflex wire rope. Where-ever possible and available Superflex wire rope slings should be used due to their better service life. Superflex wire rope slings give the user all the flexibility that round endless slings do, because they are further resistant to mechanical damage, cannot become kinked, flexible, long slings can be safely stored on a cable drum etc.

RUD equipment

NOTE: This equipment is unlikely to come with individual test certificates, however when they are manufactured there is a "batch certificate" produced and it is a Hydro Tasmania group requirement that the "batch certificate" is provided with the purchase and delivery of the items.

IMPORTANT: Nuts are only to be used with bolts or threaded studs with a minimum quality class. Non-certified bolts or threaded studs must not be used. Before installation and at every use, visually inspect RUD lifting points, with particular attention to any evidence of corrosion, wear, weld cracks and deformations. Confirm compatibility of bolt thread and tapped hole.

Additional information on the use and application can be located by referencing manufacturers' user instructions and associated load rating charts.

Eye bolts

NOTE: Eyebolts do not come with individual test certificates, however when they are manufactured there is a "batch certificate" produced and it is a Hydro Tasmania group requirement that the "batch certificate" is provided with the purchase and delivery of the items.

The following conditions are to be met at all times:

- Eyebolts must be inspected before each lift by checking for wear or damage, cracks, bending, elongation or other deformities, and damage or dirty threads
- In addition, eyebolts should also be checked for receiving holes and evidence of grinding, cutting, machining, or other alterations
- Eyebolts which exhibit any of these conditions must be removed from service, have a "Hazardous or Unusual Condition" tag fitted and be disposed of as soon as possible from site.

The following information shall be marked on collared eyebolts:

- Manufacturer's identification
- 'M' to denote ISO metric thread, coarse series; 'B' for BSW; or 'U' for UNC
- Nominal size e.g. M42.Padeyes

The following conditions are to be met at all times:

- All Padeyes will be of an engineered design to ensure their suitability for intended load and service and have certification including non-destructive testing
- The certification and associated documentation shall be maintained by the contractor onsite and made available to Hydro Tasmania group upon request

Padeyes should be visually inspected before making a lift. They are to be checked for

- Bent, crushed, bulged, or otherwise deformed material
- In addition, they must also be inspected for cracks, excessive rust, wrinkled paint, and indications that the Padeye has been modified
- To prevent point load stress failures during lift operations, all Padeyes must be smooth in the direction of the lift
- If any of the above conditions are exhibited, careful consideration should be given to replacement of the Padeye.

Shackles

NOTE: Shackles do not come with individual test certificates, however when they are manufactured there is a "batch certificate" produced and it is a Hydro Tasmania group requirement that the "batch certificate" is provided with the purchase and delivery of the items.

The following conditions are to be met at all times:

- Only stainless and forged alloy shackles will be used. All shackles must have their rated capacity clearly embossed
- Before making a lift, the shackles used in lifting must be visually inspected by:
  - Checking the pin for straightness and complete seating
  - Looking for cracks, deformities, and evidence of heat damage or alterations
  - Checking the distance between eyes for signs of opening up
  - Checking the eyes for roundness and twisting
  - Ensuring that the safety pin is in place, or the shackle pin can be secured by another suitable means.

Shackle bodies shall be permanently and legibly marked with the information required below:

- Manufacturer's identification
- Quality Grade, as M or 4, or S or 6
- WLL
- Identification marking to correlate the shackle to the test certificate.

Beam clamps (Girder)

The following conditions are to be met at all times:

- Never lift loads in excess of the WLL
- Ensure the beam, monorail, or structure that the clamp is attaching to is sufficient WLL or strength to handle the intended loading
- Ensure the flange width of the beam that the clamp will be attaching to is within the stipulated grip range of the clamp
- Ensure that the clamp is seated correctly
- Never lift off two clamps without using a spreader bar to ensure equalization of the load (unless specific manufacturers specifications say otherwise)
- Ensure that the WLL and ID plate are in place and are clearly legible
- Inspect the clamp for any signs of distortion, cracking, and excessive wear and corrosion
- Check the hinge points for free movement
- Check the suspension shackle for any signs of distortion or excessive wear – the shackle should swivel freely

Never stand underneath a suspended load or lift a load over people.

Drum Lifters

Certified drum lifters are to be used for drum handling. Drums with lids cut off shall not be lifted due to potential for structural collapse. Note: Drum Lifters that are not installed with a positive lock device shall not be used.

Lifting Cages

- Lifting cages shall be constructed as per the requirements of AS 4991: lifting devices
- Lifting cages shall have slinging arrangement provided through a hammerlock assembly prior to mobilisation to site. These slings must have certification

- Lifting cages shall be maintained and inspected and listed in lifting and rigging equipment register.

Spreader bars

Spreader bars have many advantages for safe lifting. Spreader bars distribute the weight of a load between two lifting points, to eliminate stress on a single lifting point. The two or more attachment points on a spreader bar allow for a direct upward hoist, and stop the load being damaged by angled slings wearing against it. For these reasons, spreader bars should be used for lifting wide or heavy duty loads such as general-purpose containers, portable toilets etc.

Winches

Where winches are required, the following must be considered prior to use:

- Method of securing the winch to prevent displacement
- The routing of the winch wire and methods to control access into proximity of the winch wire
- Methods of attachment and calculations on head sheaves, diverting sheaves and head slings
- Calculations and non-destructive test (NDT) results on any Padeye or lug used in the winch set up configuration
- Engineering calculations to verify that no component in the winch set up shall be overloaded or stressed above design tolerances.

Chain blocks

The following conditions are to be met at all times:

- Chain blocks shall comply with the requirements of AS 1418.2 - Cranes (including hoists and winches) serial hoists and winches
- Chain blocks shall only be used as per the relevant manufacturer's specifications
- No back hooking or reeving of chain-on-chain blocks and independent slings must be used to attach to chain block
- Raise the load just clear, then halt the lift to check the integrity of the chain block, slinging method etc
- Check chains are not twisted and do not use the load chain as a sling
- If damage is noted the chain block shall not be used and a "Hazardous or Unusual Condition" tag shall be placed on the chain block and be removed to a designated quarantine area to be inspected by an Approved Worker for a condition assessment. The outcome of the inspection (acceptable, repairable or destroyed) shall be recorded in lifting and rigging equipment register.

Lever hoists

The following conditions are to be met at all times:

- Lever hoists shall comply with the requirements of AS 1418.2 - Cranes (including hoists and winches) serial hoists and winches
- Lever hoists shall only be used as per the relevant manufacturer's specifications
- Ensure any support fits freely into the seat of the hook and does not exert a side thrust on the point
- Check the operation of the brake
- Adopt safe slinging practices and follow the instructions for the safe use of the equipment used

- Do not extend the operating lever (e.g. with a tube) to force the hoist to operate
- Check the slinging arrangement ensuring that the lever hoist is chains are not twisted and do not use the load chain as a sling
- Lever hoists should not be used in a vertical position unless manufacturer has specified otherwise
- If damage is noted, the lever hoist shall not be used and a "Hazardous or Unusual Condition" tag shall be placed on the lever hoist and be removed to a designated quarantine area to be inspected by an approved worker for a condition assessment. The outcome of the inspection (acceptable, repairable, or destroyed) shall be recorded in Lifting and Rigging Equipment Register.

Lifting devices

The following conditions are to be met at all times:

- All Lifting accessories and lifted equipment must be designed, manufactured, inspected, tested, marked and certified according to Lifting Devices and all other applicable National Australian Standards and Codes of Practice
- All load bearing equipment must be certified by a competent person and SWL/WLL marked.

Workbox

The use of the workbox shall be limited to those situations where it is necessary to elevate workers to carry out work where it is not reasonably practicable to use scaffolding or purpose built in situ platforms for work to be completed in an elevated position.

Management / supervisors shall ensure that workboxes comply with the relevant WHS Regulatory requirements as well as this procedure. A SWMS shall also be in place prior to use of a workbox. The SWMS shall include an emergency rescue plan that considers the possible need and availability of emergency response resources such as the location of first aid, firefighting and rescue equipment required for emergency access of the workbox.

Requirements for a forklift workbox

Forklifts may be used to provide a safe work platform if they are designed to lift people. Workboxes should only be used to raise workers performing occasional tasks and must be securely attached to the forklift.

In addition to the normal operational use and inspections, the forklift operator should:

- Check that the forklift is suitable, can carry the expected load and has the correct workbox attachments
- Check the workbox is attached securely in accordance with the manufacturer's instructions
- Check that workers can safely exit from the workbox and the forklift in the event of a failure in its normal operation
- Make sure the park brake is on, the controls are in neutral and the mast vertical
- Perform a test lift with the workbox attached before a worker enters the workbox
- Always remain at the controls while workers are in the workbox.

Requirements for the crane used with a workbox

A crane used with a workbox shall:

- Be fitted with a safety hook or moused accessory
- Be equipped with controls that return to the neutral position when released and this action causes the motion to stop
- Be equipped with power lowering
- Be equipped with a positive free fall lockout control so that inadvertent disengagement of the lockout is not possible
- Be fitted with an upper limit motion limiting device
- Be fitted with a down-limit motion limiting device, if the workbox is to be lowered below the crane supporting surface
- Have a minimum rated capacity of at least twice the total load of the workbox and its contents at the maximum radius for the task to be performed and not less than 1000 kg operation of the crane with suspended workers.

To help make sure people in a crane-lifted work box are safe:

- The work box must be securely attached to the crane
- Full body fall-arrest harnesses complying with AS/NZS 1891.1 - Industrial fall-arrest systems and devices – harnesses and ancillary equipment shall be worn at all times
- Harnesses should be attached to fall-arrest anchorage points in the work box or to the main sling ring above the heads of the workers
- Directions to the crane operator should only be provided from the workbox by a person holding a digging or rigging licence
- Mobile cranes must not travel while suspending work box
- Workers remain substantially inside the workbox while it is lifted or suspended
- Emergency retrieval arrangements are put in place before the lift so workers can safely exit the work box in the event of crane failure.
- Workers shall not enter or leave the workbox when elevated (except in an Emergency), unless all the following conditions are met:
- A risk assessment has been completed that identifies that access and egress from the workbox in this manner is safe and that this means of access is safer than all other alternative means
- The structural adequacy of the landing area has been established and the landing area is clear
- Where the landing is at the edge of a structure, the maximum gap between the workbox and landing does not exceed 100mm, the workbox is secured to a suitable point on the landing and access and egress does not take place unless a fall-arrest harness is properly worn and attached to a suitable anchorage on the structure.

Note: Workboxes shall not be used in winds in excess of 7 m/s (25 km/h), within 10km of electrical storm activity, snow, ice, sleet or other adverse weather conditions that could affect the safety of worker.

Barricading and signage

The following conditions are to be met at all times: Barricading and signage is required, (but not limited to) where workers are:

- Working overhead
- Installing or moving plant or equipment
- Erecting structures
- Carrying out lifting operation
- Where there is a potential for other workers to sustain injury from them

- Other activities being undertaken by the Rigger (or Dogger).

Cranes lifting loads

Working at height to rig and/or attach or remove lifting equipment should be actively discouraged. (e.g. provider rigging equipment that allows attachments to be made at the ground level on a shipping container). The following conditions are to be met at all times:

- Only approved workers that hold a Dogman's high risk work license (as a minimum) are to direct loads suspended by cranes
- A relevant lift evaluation as outlined in table 1 is to be completed as outlined in planning of this procedure.
- Effective communication between the Crane operator and the Rigger / Dogger directing the load shall be established
- Approved signals are to be used are as per AS2550.1- Cranes, hoists and winches – safe use – general requirements which outlines the recognised signals as defined in the National Competency Standards.

Use of crane pendant controls

A number of cranes in use in Hydro Tasmania group are fitted with either hard wired or wireless pendant controls. The following conditions are to be met when using pendant controls:

- A high-risk work license endorsed for bridge and gantry crane operation is required for all operators of station cranes fitted with pendants
- Controllers should be designed in such a way to reduce the risk of accidental operation (guarding, barriers, etc.)
- Crane operators must take steps to control inadvertent operation when carrying out ancillary tasks (e.g., use of E-stops, put down controller in a safe location, etc.).
- The use of a second person/Rigger must be considered when planning lifting operations using a pendant control. Restrictions to line of sight, load control hazards and proximity load adjustments must be assessed.

Control of Loads

- Tag lines shall be at least 16mm in diameter and be made of non-conductive material (high dielectric constant material)
- Tag lines shall be maintained clean and dry and shall be assessed before use
- Lifting gear should not be used as tag lines
- Tag lines shall not be attached to the lifting gear unless no other practicable means of attachment are identified for large loads, two tag lines are recommended with one being placed at each end of the load
- Tag lines shall be made from a continuous single length and must be free of any knots, splices, or loops
- Tag lines must be of sufficient length to allow workers handling cargo to work in a safe position well clear of the immediate vicinity of the load
- Tag lines shall be used to position the load when landing while keeping workers out of the line of fire should there be a failure of the lifting equipment

- In cases where a tag line may not be considered a safe option, the situation shall be reviewed, and an alternate method applied if required.

Note: Placing hands on a suspended loads should be avoided. Where hands are placed on loads for finite control of the load, the activity should be risk assessed.

Working with tag lines

The following conditions are to be met at all times:

- At all times, the Riggers handling tag lines must always consider 'line of fire' and try and maintain a minimum angle of 45 degrees between themselves and the load
- Hold the tag line in such a manner that it can be quickly and totally released
- Ensure that the tag line does not become entangled with the glove
- The tag line is not to be secured to adjacent structures or equipment and this includes the practice of making a "round turn" on stanchions or similar structures and surging the line to control the load.

Appendix A: Lifting equipment inspection tag colours

Lifting equipment inspection tag colours

NOTE: All lifting equipment shall be inspected by an approved Hydro Tasmania group Lifting and Rigging Inspector. Any equipment suspected of being defective or does not have the appropriate coloured inspection tag applied, shall be tagged with a "Hazardous or Unusual Condition" tag and removed from service for inspection, repair, or disposal. Equipment identified as requiring disposal shall be destroyed.

Construction Sites (3 monthly Inspections)	Operations (12 Monthly Inspections)
RED - DEC TO FEB	WHITE Aug 26 -Aug 27 Aug 28 - Aug 29 Aug 30- Aug 31 Aug 32- Aug 33
GREEN - MARCH TO MAY	
BLUE - JUNE TO AUG	ORANGE Aug 25 - Aug 26 Aug 27 - Aug 28 Aug 29 - Aug 30 Aug 31- Aug 32
YELLOW - SEPT TO NOV	