DEVELOPING WORKPLACE HEALTH & SAFETY GUIDANCE

for the

RECREATIONAL & LIGHT COMMERCIAL BOATING INDUSTRIES

WHS GUIDANCE MATERIAL

SECTION 5

MOVING BOATS

Prepared between January 2010 & October 2011 with the generous support & assistance of individuals and businesses within the membership of the Boating Industry Association of NSW (BIA).

The Boating Industry Association of NSW.
53 Hume St
Crows Nest 2065.
Phone (02) 9438 2077
Fax (02) 9439 3983
Email: info@bia.org.au
www.bia.org.au

WorkCover NSW
92-100 Donnison Street
GOSFORD 2250
Phone (02) 4321 5000
Fax (02) 4325 4145
www.workcover.nsw.gov.au

DISCLAIMER: This research was funded under the WorkCover Assist Program. The research conclusions are those of the authors and any views expressed are not necessarily those of WorkCover NSW or the Boating Industry Association of NSW.

Note: This material provides a brief overview of some of the key issues and readers are directed to the further guidance material provided and to seek expert advice as required. Each business should utilise risk management principles, including consulting relevant workers, to ensure any control measures implemented are properly tailored to the site, workers and tasks.

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Introduction

Achieving a safe site with safe work practices requires a business's ongoing commitment and action. It is process of continual improvement to adapt to changes in technologies, changes in plant and equipment, taking on new personnel, as well as to meet requirements under various health and safety regulations, codes of practice and Australian Standards.

Australia is moving towards a national model of managing health and safety at workplaces, and from 2012 it is planned that all states and territories will be adopting the new:

- Work Health and Safety Act
- Work Health and Safety Regulations and
- Codes of Practice.

These laws will replace the NSW Occupational Health and Safety Act (2000) and the NSW Occupational Health and Safety Regulation (2001)

The following guidance material has been prepared for BIA members to provide information on managing selected 'hazardous' issues in the industry:

- height safety
- undertaking hazardous manual tasks
- working in confined or enclosed spaces and
- moving boats.

In each section there is:

- an overview of the hazard
- an outline of the legal requirements for addressing each of the hazard areas
- case studies from BIA members illustrating how different businesses have tackled the hazards
- lists of other potential options that could also be considered for controlling risks
- references for where to look for further guidance and more technical information

This guidance is not 'prescriptive' but rather provides BIA members with suggestions and options from businesses that face similar health and safety challenges. It encourages the user to follow the risk management approach to identify hazards, assess the risks and to eliminate or otherwise control the risks so far as reasonably practicable. Under the WHS Act this means "*that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety of workers, taking into account and weighing up all relevant matters including:*

(a) the likelihood of the hazard or the risk concerned occurring; and
(b) the degree of harm that might result from the hazard or the risk; and
(c) what the person concerned knows, or ought reasonably to know, about:
(i) the hazard or the risk; and
(ii) ways of eliminating or minimising the risk; and
(d) the availability and suitability of ways to eliminate or minimise the risk; and
(e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk"

When undertaking risk assessments in the workplace it is a legislative requirement that consultation with workers is carried out as part of the process. By drawing on the experience, knowledge and ideas of the workers a business is more likely to identify all hazards in the workplace and choose effective control measures.

When implementing control measures within a workplace the Hierarchy of Control should be utilised. The Hierarchy of Control ranks the levels of control from the highest level of protection and reliability to the lowest level of protection and reliability.

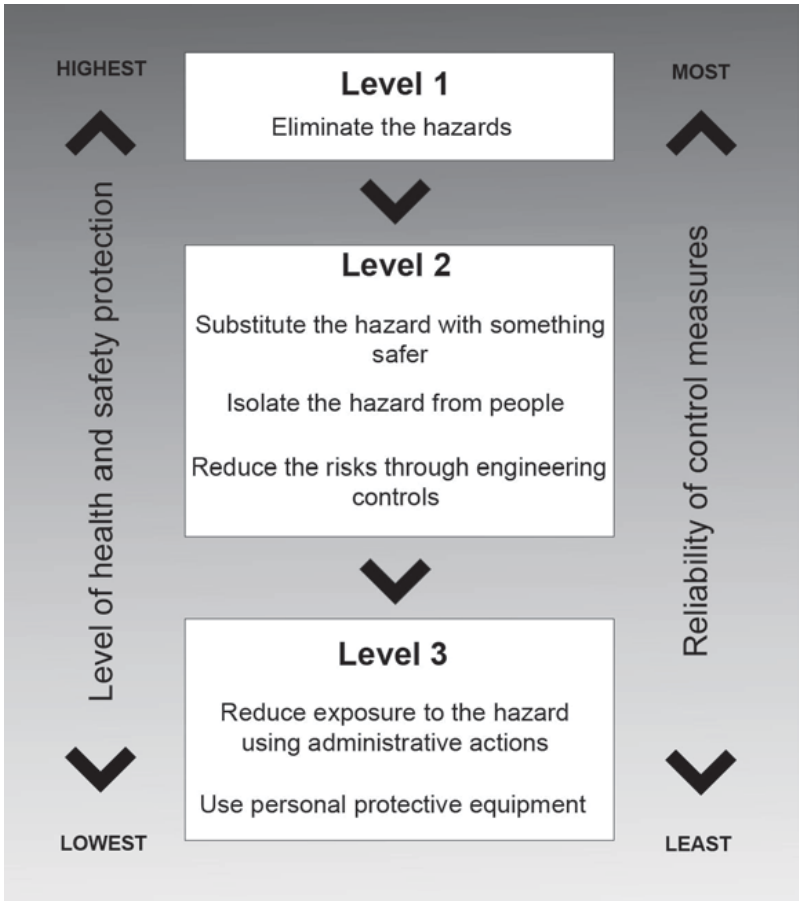

Diagram 1 - Hierarchy of Control (Model Code of Practice – How to Manage Work Health and Safety Risks)

Methods used by other businesses to eliminate or control risks may be easy to copy, or may need to be adapted to suit, or may not suit the conditions and personnel at other businesses. Regardless of which option is the best fit for individual businesses it is hoped that this guidance will assist BIA's members to review and upgrade their existing health and safety management and generate new ideas for managing hazards at work.

Further Guidance

Work Health and Safety Act 2011
Work Health and Safety Regulation, Safe Work Australia
Model Code of Practice – How to Manage Work Health and Safety Risks, Safe Work Australia

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WORK HEALTH AND SAFETY ISSUE – MOVING BOATS

The Risk

The movement of boats has been identified in the marine industry as an area where operators find it difficult to achieve compliance with OHS legislation and there is a potential risk to workers safety.

The key risks when moving boats in the marine industry are when a person is required to:

- Move trailer boats around yards and workshops.
- Move trailer boats around showrooms
- Operate straddle carriers
- Operate winches and cradles on slipways

The task of moving boats is made more complicated by the different sizes, weights, configurations and surfaces on which they are moved and different types of equipment involved.

Due to the nature of the boating industry eliminating or substituting the risk of moving boats is usually not reasonably practicable. The most common form of control is engineering controls such as the use of straddle carriers and slipways for moored boats and forklift attachments and dollys for trailer boats. These controls would be supported by administrative measures such as procedures and training to ensure equipment is maintained, operators are competent and can operate equipment safely.

The consequence

The consequences of not controlling the risks when moving boats include muscle strain and back injuries, crush injuries, damage to property and potentially a fatality.

Examples of incidents involving moving boats include:-

- A NSW company was convicted and fined when a motor cruiser slipped sideways off a cradle, injuring two workers. The court found there was no safe system and there was a lack of a risk assessment (Industrial Court of NSW 2005).
- A similar incident occurred in the USA in 2001 when a worker was placing wooden blocks under a 33 foot boat and the boat fell on him, causing death (NIOSH 2003).
- Another case recorded in NSW related to a yard hand having his hand crushed while operating a boat winch (Industrial Court of NSW 1999).
- In the United Kingdom a worker was crushed to death after being struck by a moving load which was being lifted by a crane (The Safety & Health Practitioner 2009). A lack of adequate assessment and planning was blamed for the accident.

The law

There is no specific legislation or codes of practice in relation to slipways and travel lifts. Under WHS legislation they would be covered by the WHS Plant requirements. Under these requirements employers must ensure that:

- the plant is not operated by a person unless they have received adequate information and training and are supervised to the extent necessary to minimise the risks to health and safety
- plant is used only for the purpose for which it was designed unless a competent person has made an assessment that the change in use does not present an increased risk to health or safety
- if safety features or warning devices are incorporated into plant, the features or devices are used as intended
- plant is subject to appropriate checks, tests and inspections necessary to minimise risks to health and safety

Plant needs to be maintained in accordance with the requirements of the designer or manufacturer of the plant and there are systems in place to minimise the risks to health and safety of people maintaining, inspecting, altering, repairing or cleaning the plant.

All safety features and warning devices associated with the plant need to be maintained and tested.

Any plant designed to lift or move equipment or materials must have a clearly legible notice affixed, in a conspicuous place specifying the rated capacity of the plant in appropriate metric units.

Whilst using plant designed to lift or move equipment or materials:
- as far as practicable, no loads are suspended or travel over a person
- plant that is not specifically designed for lifting or suspending loads is not used for those tasks unless the plant provides at least an equal level of safety to that of plant that is specifically designed for those tasks, and
- all lifting or suspending is done within the rated capacity of the plant.

In relation to industrial lift trucks (Forklifts) employers must ensure that:
- they are equipped with appropriate lifting attachments specifically designed for the load to be lifted or moved, and
- they are used in a way that minimises exposure of the operator to risks arising from work practices or systems and the particular environment in which the industrial lift truck is used.

When using attachments on a forklift the attachments must have a rated capacity displayed on the attachment. The attachment must be:

- designed by a competent engineer
- manufactured by competent people
- safely used on the forklift.

The attached guidance notes provide information that may help operators in the recreational and light commercial boating industry reduce injuries and increase compliance with WHS requirements. They also provide real examples of how members of the NSW BIA have eliminated or controlled the risk of moving boats.

Does your business comply?

Check how well YOUR business is currently managing the risk of moving boats by completing the attached *Moving Boats - Self Assessment Tool*. Identify areas of non-compliance (those in the red) and areas that need improvement (those in the orange). This tool also outlines the elements of a good safety management system.

Use your first assessment as a baseline, and once you have looked over the guidance notes and the case studies you will see where your systems can be improved. By following the guidance you will achieve better safety for all people on your site, and better compliance with the work, health and safety laws.

References

- Work Health and Safety Act 2011
- Work Health and Safety Regulation
- Work Health and Safety Plant regulations
- Plant Guide – WorkCover NSW
- Recording plant maintenance – WorkCover NSW
- Forklift safety: Reducing The Risks – NSW WorkCover
- Making your forklift work for you – 10 minute checklist for managers and supervisors – NSW WorkCover
- Australian Standard 2359.1-1995, Powered Industrial Trucks – General Requirements
- Australian Standard 2359.2-1995, SAA Industrial Truck Code Part 2 Operation
- Australian Standard 2359.6-1995, Powered Industrial Trucks Part 6: Safety Code
- Australian Standard 2359.15-1995, Powered Industrial Trucks Part 15: Fork-arm extensions and telescopic fork arms – Technical characteristics and strength requirements
- Australian Standard 1418.1 Cranes, Hoists and winches Part 1: General requirements
- Australian Standard 1418.3 Cranes, hoists and winches—Bridge, gantry, portal (including container cranes) and jib cranes
- Australian and New Zealand Standard 2550.1 Cranes, hoists and winches - Safe use - General requirements
- Australian Standard 2550.3 Cranes, hoists and winches - Safe use - Bridge, gantry, portal (including container cranes), jib and monorail cranes
- Australian Standard 2759 Steel wire rope - Use, operation and maintenance
- Australian Standard 2089 Sheave blocks for lifting purposes
- Australian Standard 1353.1 Flat synthetic-webbing slings Part 1: Product specification
- Australian Standard 1353.2 Flat synthetic-webbing slings Part 2: Care and use

Moving Boats
Self Assessment Tool

Key steps to a safe system:	Hazard Identification	Risk Assessment	Risk Control	Consultation	Documentation	Instruction & Training	Supervision
NON-COMPLIANCE	No intentional identification of hazards of moving boats	No risk assessments on moving boats have been done	No attempt has been made to eliminate or reduce risks from moving boats	No evidence of management consulting with workers	No documents outlining any of the steps taken towards identifying, assessing and managing the risk of moving boats	No evidence of workers having received training and instruction in the processes of moving boats or in using the required plant	Workers are left unsupervised with no agreed or stated safe work methods for tasks requiring mthe movement of boats
WORKING TOWARDS COMPLIANCE	Some hazards have been identified with or without incidents or injuries occurring	Assessments have been done on an ad hoc basis and/or are incomplete	Some controls have been put in place, but these do not follow the 'hierarchy of control', adhoc and/or are incomplete	Consultation is on an ad hoc basis, and/or workers' feedback and views are not taken into account	Some documentation of some steps in the risk management of this hazard	Some training has been provided in some aspects on an adhoc basis. No assessment of competency	Safe Work Methods have been developed and/or provided but no effort to ensure workers' compliance
COMPLIANCE	Proactive hazard identification is done regularly and documented	Assessments been done on all tasks relating to moving boats in accordance with regulatory requirements and show consideration of risk factors	Plant safety requirements have been followed, all plant and equipment certified to appropriate standard, all risk controls implemented and reviewed	Workers are consulted on a routine basis regarding safety and methods used to move boats	Documents outlining the decisions and their rationale for managing the movement of boats at the business, with Safe Work Method Statement and/or safe operating procedures provided	Workers are trained and assessed as competent in the safe use of equipment used to move boats, hold appropriate high risk work licenses and, and are trained and competent in safe work procedures	Supervision ensures the Safe Work Methods are followed and any problems are acted on

WORK HEALTH AND SAFETY INDUSTRY GUIDANCE

Moving Boats – Trailer Boats

HAZARDOUS TASKS identified

Moving trailer boats around yards, workshops and show rooms is a common task carried out by businesses in the recreational and light commercial sector. From construction to delivery, selling and maintenance there is a requirement to move boats on trailers.

Common methods used include employees pushing boats, use of manual trolleys, forklifts with attachments and motor vehicles. The trailers need to be moved on a variety of surfaces and sometimes in areas with restricted room to manoeuvre the trailer.

Any reduction in the need for and/or the force used by workers to manually push boats on trailers will have an impact on reducing risk.

Consultation is a legal requirement and an essential part of managing health and safety risks.

A safe workplace is more easily achieved when everyone involved in the work communicates with each other to identify hazards and risks, talks about any health and safety concerns and works together to find solutions. This includes cooperation between the people who manage or control the work and those who carry out the work or who are affected by the work. By drawing on the knowledge and experience of your workers, more informed decisions can be made about how the work should be carried out safely.

RISKS to assess

Check the following to see what the risks are of moving trailer boats at your business:

- What is the weight of the boat you are moving?
- How many axles does the trailer have?
- What surfaces do you need to move the boat on? Are there any gradients, bumps or holes in the surface?
- What obstructions or restrictions are present?
- Is other traffic or people around that could be struck by the boat?
- What aids do I have available to eliminate or reduce the need for people to push the boat?

RISK CONTROL options

Mechanical Means of Moving Boats on Trailers

Use of Forklift

Operators of forklifts must hold a High Risk Work License.

Use of an attachment on a forklift is the most common method of moving trailers.

WHS Legislation requires any attachment on a forklift to be:
- designed by a competent engineer
- manufactured by competent people
- safely used on the forklift.

All attachments must have a rated capacity affixed to the attachment and must be secured correctly and safely on the forklift. You should only use attachments designed for the forklift they are used on. Ask the manufacturer of your attachment whether it is suitable for the forklift it will be used on.

When moving trailers with a forklift attachment the tow ball mass weight must not exceed the rated capacity of the attachment.

Specific skills require specific additional training and supervision. Employers must ensure that where attachments are used, further training is given to forklift operators and adequate supervision is provided.

Case study
At various trailer boat retailers and repairers they have sourced towing forklift attachments that have a compliance plate attached. These are secured to the forklift securely via chain.

Compliance plate affixed to attachment indicating rated capacity

In utilising these certified attachments they have also worked to meet the requirements of OHS legislation

Other mechanical methods

Other mechanical for moving boat trailers are available. These range from purpose built towing tugs to hand operated tugs.

When assessing the risks of using these mechanical devices things to take into consideration include:-

- Weight of the trailer
- Tow ball mass weight
- Area in which it is going to be used e.g. avoid using internal combustion engines indoors or in poorly ventilated areas
- The type of tyres/wheels on the equipment

An example of a commercially available electric powered tow tug with non marking tyres suitable for use indoors. The type of tyres would make it unsuitable for use over rough or broken ground. This particular tow tug is able to move loads up to 6500kgs

Manual Means of Moving Boats on Trailers

Whilst not eliminating the need to push boats on trailers around, manual dollies can reduce the risk of injury. Manual dollies may be used in areas where there is restricted space to manoeuvre, where the use of internal combustion engines is not permitted or in moving lighter boats.

When assessing the risk of utilising manual dollies things to take into consideration include:-

- Weight of boat and trailer
- Surfaces and gradients
- Distance the boat needs to move
- Amount of boats to be moved

Case study

At various trailer boat retailers and repairers they have manufactured trailer dollies that allow them to move trailer boats around their yards.

The use of large pneumatic wheels assists in manoeuvring the dolly and trailer around.

Examples of an industry built trailer dolly and a commercially available trailer dolly. Note both have large pneumatic tyres.

Ratchet Jockey wheel

The use of a ratchet jockey wheel to move boats around reduces the force required to manoeuvrer boats.

Boat Handling Jacks and Dolly systems

Removing the trailer and moving boats around on dolly system may be useful in showrooms and at boat shows.

The use of commercially available boat handling jacks and dollies remove the need to manipulate a trailer. The unidirectional wheels on a dolly may make it easier to fit boats into tight areas. Utilising boat handling jacks can assist in changing or customising trailers for boats.

Further guidance

- Work Health and Safety Act 2011
- Work Health and Safety Regulation
- Forklift safety: Reducing The Risks – NSW WorkCover
- Making your forklift work for you – 10 minute checklist for managers and supervisors – NSW WorkCover
- Australian Standard 2359.1-1995, Powered Industrial Trucks – General Requirements
- Australian Standard 2359.2-1995, SAA Industrial Truck Code Part 2 Operation
- Australian Standard 2359.6-1995, Powered Industrial Trucks Part 6: Safety Code
- Australian Standard 2359.15-1995, Powered Industrial Trucks Part 15: Fork-arm extensions and telescopic fork arms – Technical characteristics and strength requirements

Attachment 1 – Overseas models of certified forklift towing attachments

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WORK HEALTH AND SAFETY INDUSTRY GUIDANCE

Moving Boats – Slipways and Straddle Carriers

HAZARDOUS TASKS Identified

The movement of larger boats in and out of the water for maintenance tasks usually involves a piece of load shifting plant such as a slipway or straddle carrier. The operation of lifting and shifting large boats usually involves the use of winches, cables and/or slings.

Previous incidents have shown that when the risks of moving larger boats are not properly controlled injuries can occur to people and damage to boats can occur.

Although there is no specific legislation covering the use of the boat shifting equipment there is a need to ensure the plant is fit for purpose and compliant with general plant requirements and Australian Standards.

Consultation is a legal requirement and an essential part of managing health and safety risks.

A safe workplace is more easily achieved when everyone involved in the work communicates with each other to identify hazards and risks, talks about any health and safety concerns and works together to find solutions. This includes cooperation between the people who manage or control the work and those who carry out the work or who are affected by the work.By drawing on the knowledge and experience of your workers, more informed decisions can be made about how the work should be carried out safely.

RISKS to assess

With the operation of plant on marinas it is important that the equipment is fit for purpose, safe to use and operators are trained in using the equipment. When assessing the risks of using boat shifting plant and equipment it is important to take into consideration:-

- The load being shifted
- The inherent risks of the plant/equipment
- The environment it is working in
- The skills and competencies required to operate the plant/equipment
- The daily, periodic and annual checks required
- The maintenance requirements
- Compliance with Codes of Practice and Australian Standards

RISK CONTROL options

All equipment used to lift and shift boats should have safe operating procedures. These may be the equipment manufacturer's instruction, instructions written by the marina operator or a combination of both. Australian Standards for the safe use of cranes, hoists and winches requires the detailing of processes to be followed for safe operation and the identification of any risks in operating the crane. This must be available to the operator.

All equipment should be operated by a competent person who through training, qualification, experience or a combination has acquired the knowledge and skill to enable them to correctly and safely perform the task.

Case study – Training of straddle carrier operators

There is no High Risk Licence for operating a straddle lift in NSW, however many of the principles involved in using a straddle lift are similar to using a gantry crane. Marina operators need to ensure that people using straddle lifts are competent to do so with the necessary training and knowledge to ensure the safe operation of the straddle lift. Incorrect operation of a straddle lift can cause serious injury to personnel and significant damage to boats being lifted.

The Marina Industries Association of Australia has devised a competency based course for operators of straddle lifts. The course is based on nationally endorsed competencies and on completion of a log book and practical assessment a Statement of Attainment is obtained. The course also allows for recognition of prior knowledge.

By having straddle lifts operators undertake competency based training you can demonstrate that the operators are competent to carry out the tasks of lifting and shifting boats using the marinas straddle lifter.

Controls on any lifting equipment must be labelled in accordance with Australian Standards. Labelling should indicate the function and/or operation of each control. Appropriate emergency stops should be located in within easy reach of the operator. If the operators view can be obstructed by the load then suitable audible and/or visual warnings should be on the equipment and should be activated automatically when the machinery is in motion.

Case study – Controls and emergency stops

Ensuring all controls on plant used to move boats are labelled correctly showing the operation of that control. Emergency stops should be readily available. Plant should also be able to be isolated or locked so as to prevent unauthorised use. Keys should always be removed when plant is not in use.

There may be circumstances where the operator of boat lifting and shifting equipment cannot physically see what is happening around the area due to the load blocking their view. The use of a spotter to assist in guiding the operator and warning of any pedestrians or obstacles in the way can reduce the likelihood of an incident. The spotter should be competent to undertake the tasks involved in guiding the operator, always remain in communication with the operator or be in a position where they are visible to the operator

The inspection and maintenance of plant/equipment used to lift and shift boats is required to ensure that it is fit for purpose and safe to use. Documenting the inspection and maintenance requirements, in accordance with suppliers specifications and regulatory requirements, and the recording of when those inspections or maintenance were carried out not only allows those persons controlling a site to be sure that inspections and maintenance are carried out correctly but aids in demonstrating compliance

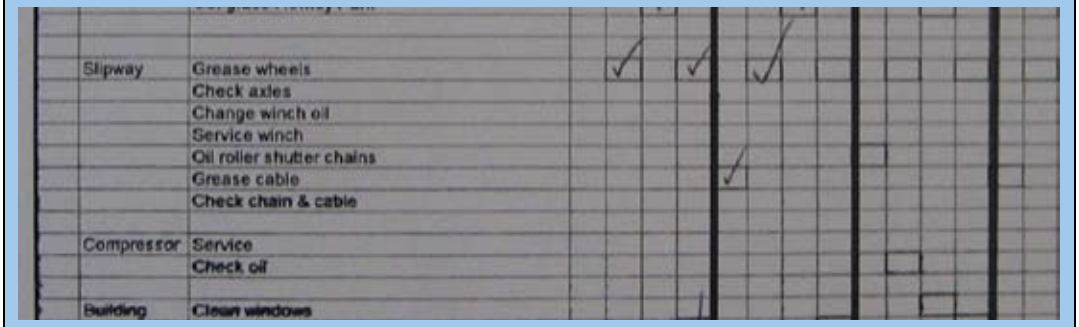
Scheduling of inspections and maintenance may include:

- Daily checks e.g prestart checks
- Periodic checks e.g. weekly, monthly or quarterly
- Annual checks e.g. Major Servicing or third party inspections

Case study – Scheduling and documenting inspections and maintenance

Regular inspections and maintenance of straddle carriers and slipways is required to ensure that they are safe to operate. In order to ensure that key components are inspected and maintained a documented inspection and maintenance regime should be established.

A number of marinas have adopted a spreadsheet that visually indicates when the inspection/maintenance needs to be carried out and by whom it was carried out



Documenting inspection and maintenance allows an organisation to show compliance with WHS legislation

Most boat lifting and shifting equipment utilised by marinas (straddle carriers and slipways) consist of a winch/hoist and cable. To ensure that the cables are capable of lifting the loads required some marina operators have gone through the process of quantifying the loads pulled up on by their equipment. Some slipway operators have hired cable strain gauges to measure the strain put on their winch cable. This has allows them to purchase the right cable for that particular slipway. Not only does this show compliance but potentially saves the operators money as they are not buying a heavier rated cable that they don't need.

Cables need to be inspected regularly and replaced if necessary. The inspection needs to be undertaken by a competent person. There is no set time frame for the replacement of a cable. It was found that replacement of cables by marinas ranged from annually to ten years plus. Due to the environment that most cables are exposed to there is a need to ensure proper lubrication of the cable to limit corrosion

Essential points to be taken into consideration when inspecting cables include:-

- State of internal lubrication
- Degree of corrosion
- Indentation of wires caused by pressure or wear
- Presences of wire breaks (these are not necessarily visible).

Examples of cable corrosion

Minor rust of surface of cable. Lubrication required

Rust on surface of cable. Lubrication required and internal inspection should be carried out before using again

Rusted cable. Pitting has started to occur. Cable ready to be discarded

Major rust, cable should be discarded imediately

When externally inspecting cables things to look for

- ☑ Inspect termination of rope at the drum and other points.
- ☑ Inspect for broken wires.
- ☑ Inspect for corrosion.
- ☑ Inspect for deformation.
- ☑ Inspect for surface wear.
- ☑ Inspect for defective coiling.
- ☑ Inspect for deterioration due to snatch loading.
- ☑ Inspect lengths that run through blocks, particularly those which lie on the sheaves when the appliance is in the loaded condition.

Documentation of wire rope inspections is required under Australian Standards and can help show compliance with WHS legislation.

Many slipways utilise snatch blocks or sheave blocks. The blocks need to be rated to carry the loads required and have a compliance plate attached. The blocks should also conform to the requirements of Australian Standards.

Case study – Utilising rate sheave/snatch blocks

Whilst pulling boats up on slipways some marinas utilise blocks as part of their winching systems or to double up the cable to achieve a greater winching capacity.

Any blocks used in the winching system should be rated with the capacity of the block clearly stated on a compliance plate (Note – Compliance plates were present on blocks pictured below but are difficult to view). The blocks should also be compliant to Australian Standards. Australian Standard 2089 – Sheave Blocks for lifting purpose provides guidance on the requirements for the blocks

Having rated blocks as part of your winching system allows an organisation to show compliance with WHS legislation

When lifting boats with a straddle carrier the direct contact point between the load and the lifting device is the slings. Slings need to be compliant with Australian Standards. The slings need to be inspected and maintained on a regular basis and discarded if necessary.

Things to look for when inspecting slings include:-

- External Wear
- Local Abrasion
- Cuts and Contusions
- Internal Wear
- Damage to any protective coating or sleave
- Sunlight degradation
- Chemical Attack
- Label Damage
- Deterioration of stitching
- Damage to any eyes
- Damage at the connection to any terminal attachment
- Damage to any end fittings

Australian Standards require slings be inspected, as a minimum, every 3 months. However, with the conditions in which the slings are utilised in the marine environment, shorter intervals for inspection may be required. Some marinas require slings to be inspected before every lift. Inspections of slings should be documented.

Further guidance

Work Health and Safety Plant regulations
Plant Guide – WorkCover NSW
Recording plant maintenance – WorkCover NSW
Australian Standard 1418.1 Cranes, Hoists and winches Part 1: General requirements
Australian Standard 1418.3 Cranes, hoists and winches—Bridge, gantry, portal (including container cranes) and jib cranes
Australian Standard 2550.1 Cranes, hoists and winches - Safe use - General requirements
Australian Standard 2550.3 Cranes, hoists and winches - Safe use - Bridge, gantry, portal (including container cranes), jib and monorail cranes
Australian Standard 2759 Steel wire rope - Use, operation and maintenance
Australian Standard 2089 Sheave blocks for lifting purposes
Australian Standard 1353.1 Flat synthetic-webbing slings Part 1: Product specification
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