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**CENTRAL ASIAN AND CAUCASUS REGIONAL FISHERIES AND AQUACULTURE COMMISSION**

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| **TECHNICAL ADVISORY COMMITTEE (TAC)** |
| **SIXTH MEETING** |
| **ASTANA, KAZAKHSTAN**<br>**31 MAY-1 JUNE 2023** |
| **REGIONAL SAFETY CODE OF PRACTICE FOR AQUACULTURE AND FISHERY** |

**Executive Summary:**

This document presents a framework for a Regional Safety Code of Practice for Aquaculture and Fishery applicable to the CACFish area of competence.

The safety of those who work in the fishery and aquaculture sector globally continues to be of concern. Despite the best efforts from administrations and others, the fatality numbers in fisheries and aquaculture remain high across the world. This Code of Practice has been developed in an effort to increase safety standards in this sector, by promoting safe working practices for the most common activities encountered in aquaculture and inland fisheries operations.

Following the review, and approval of the Code to by the Commission, it is suggested that a full training package be developed, based on FAO safety manuals and the contents of this Code, and regional trainers identified and trained up. This will help to shape future interventions and improvements in safety in the sector.

**Suggested action by the Committee:**

a) Review the draft Regional Safety Code of Practice for Aquaculture and Fishery (Code) and approval for the Secretariat to proceed,

b) provide any further advice and/or guidance for the Code, and

c) identify the likely technical/scientific and management actions that might be taken to address the implications of the Code at national and regional levels.

## INTRODUCTION

1. The aim of this document is to present a framework for a Regional Safety Code of Practice for Aquaculture and Fishery (hereafter referred to as the 'Code) with a set of internationally recognized standards and norms. The Code of Practice should be read in conjunction with the applicable national legislation.

2. Safety has been recognized as a priority issue in several international instruments. [1] The FAO Code of Conduct for Responsible Fisheries is explicit in relation to the principle of "safety" in Article 6.17, where it is emphasized that "States should ensure that fishing facilities and equipment as well as all fisheries activities allow for safe, healthy and fair working and living conditions and meet internationally agreed standards adopted by relevant international organizations". Article 8.1.5 expands on the principle of safety, requesting States "to ensure that health and safety standards are adopted for everyone in fishing operations and that such standards should not be less than the minimum requirements of relevant international agreements on conditions of work and service". Moreover, Article 8.4.1 requests that "States should ensure that fishing is conducted with due regard to the safety of human life".

3. At its 110th Session in June 2022, the International Labour Conference decided to amend the International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work to include a safe and healthy working environment as a fundamental principle and right at work.2 With this decision, all ILO Member States commit to respect and promote the right to a safe and healthy working environment.

4. The fishery and aquaculture sector globally continues to have unacceptably high accident rates. FAO has amended its global estimate of the number of fatalities in fisheries in 2019 to 32 000 casualties per year. The 1999 ILO' established rate of 80 fatalities annually per 100 000 active fishers was maintained for this new estimate. It should be noted that the amended FAO global estimate is likely an underestimation. New research by the PEW Charitable Trust, Lloyds Register Foundation, the International Maritime Organization (IMO), FISH Safety Foundation (FSF) and FAO, with contributions from many FAO Members suggests that more than 100 000 fishers die each year in this sector. 3 Despite mandatory safety schemes and top-down approaches, safety practitioners propose that a more holistic approach to safety and health culture in the aquaculture and inland fishery sectors should be engendered. This Code of Practice promotes safe working practices for the most common activities encountered in aquaculture and inland fisheries operations. Developing safety and health awareness programs is also advocated in conjunction with the safe working practices outlined here.

5. Aquatic foods are increasingly recognized for their key role in food security and nutrition, not just as a source of protein, but also as a unique and extremely diverse provider of essential omega-3 fatty acids and bioavailable micronutrients. The State of World Fisheries and Aquaculture 2022 reports that an estimated 58.5 million people were engaged in the primary sector of fisheries and aquaculture in 2020, with many more people employed along the supply chain. Some 35 percent were employed in aquaculture. Overall women accounted for 21 percent of those engaged in the primary sector (28 percent in aquaculture and 18 percent in fisheries).

6. The Code, provided in Annex 1, deals with the fundamentals of safety for both aquaculture and inland fisheries workers and presents safety principles which are expected to become common knowledge and practice in the aquaculture and fishery sectors within the competence area of the Commission.

[1] Such as in the 2021 COFI Declaration for Sustainable Fisheries and Aquaculture is available at: https://doi.org/10.4060/cb3767en

[2] Resolution on the inclusion of a safe and healthy working environment in the ILO's framework of fundamental principles and rights at work https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_848632.pdf

[3] Scientific research findings are under review.

**OBJECTIVES**

7. The overall objective of this Code is to help promote more of a preventive occupational safety framework in the aquaculture and inland fisheries sector. In particular, it should help to:

d) prevent occupational accidents and improve the working environment in practice in aquaculture and inland fisheries operations; and

e) raise awareness of the hazards and safety risks associated with aquaculture and inland fishery and how they can be effectively managed and controlled and accidents prevented;

f) promote more positive attitudes and behavior towards safety in aquaculture and inland fisheries operations.

**SCOPE**

8. Fisheries is still one of the sectors with the highest risk of accidents. This Code has been developed to provide practical guidance to improve safety in this industry, and reduce the accident rate.

9. Aquaculture is defined as 'the farming of aquatic organisms in inland and coastal areas, involving intervention in the rearing process to enhance production and the individual or corporate ownership of the stock being cultivated'[4], and is an important source of food. Another important source of food and employment is inland fisheries. Inland fisheries are "any activity conducted to extract fish and other aquatic organisms from inland waters". It includes any fishing activity that takes place on inter alia lakes, dams, rivers and waterways.

10. While acknowledging the importance of aquaculture and inland fisheries though, there is also the recognition that it can be a dangerous profession. Aquaculture and inland fisheries activities are often linked, and to some extent face similar dangers – therefore these two complementary issues are addressed together in this Code, which is intended to be widely applicable and to be relevant to all aquacultural and inland fishery enterprises, irrespective of size, and for the protection of all employers and workers, irrespective of their employment status.

11. The Code provides guidance on safe working practices for many situations that commonly arise in aquaculture and inland fisheries operations, and the basic principles can be applied to many other work situations that are not specifically covered. However, it should not be considered a comprehensive guide to safety: the advice it contains should always be considered in conjunction with the findings of the employer's risk assessment, and any information, procedures or working instructions provided by the manufacturer, supplier or any other source should be followed.

12. Workers in the aquaculture and inland fisheries sector should be provided with the information necessary to ensure their health and safety. It is a requirement then that all those with specific responsibilities for safety should have immediate access to this Code, and that it should be readily available to all workers so far as is practicable. The Code should be supplemented by safety manuals[5], work instructions and other guidance issued by the appropriate bodies.

[4] FAO Fisheries Department (2003) World Fisheries and Aquaculture Atlas. CD-ROM. Rome, FAO. 2nd ed.; FAO, Fisheries Department (1997) Aquaculture development. FAO Tech. Guidelines for Responsible Fisheries (5):40p. Rome, FAO. (ftp://ftp.fao.org/docrep/fao/003/W4493e/W4493e00.pdf); Haylor, G. & Bland, S. (2001) Integrating aquaculture into rural development in coastal and inland areas.p. 73-81. In: Subasinghe, R.P.,p.B. Bueno, M.J. Phillips, C. Hough, S.E. McGladdery and J.R. Arthur (eds.). Aquaculture in the third millennium. Bangkok, FAO. Technical Proceedings; FAO/FIDI (1989) Aquaculture production (1984-1986). FAO Fisheries Circular, 817. Rome, FAO, 106p.

[5] Such a safety at sea for small scale fisheries manual available in all UN languages, including Russian: FAO.2020. Техника безопасности на море для маломерных рыболовных судов. Рим. https://doi.org/10.4060/ca5772ru

13. This Code should be interpreted and applied in accordance with national legal systems and their institutions. Many national regulations lay down specific requirements for standards of safety, equipment or operations, which must be satisfied to comply with the law. Where there are no specific requirements, it is envisaged that the Competent Authority will generally consider compliance with the Code of Practice as demonstrating that the employer, and others involved in the work (employees, contractors, etc) did what was reasonable to comply with the Regulations.

**A RISK-BASED APPROACH**

14. The Code examines basic safe working practices for a number of workplace issues, and operational processes and activities in the industry, and provides a starting point for controlling hazards in the workplace. Each individual organization should use the information in this Code as the basis of their workplace safety management program. This Code is presented as part of a safety awareness plan, rather than as a definitive document of aquaculture and inland fisheries safe work practices. Clearly not all situations and processes can be covered in such a Code of Practice. A suggested approach should include:

a) A method of identifying hazards and risks

b) Safe work procedures to manage those risks

c) A program for training workers in safe work procedures (based on this Code)

d) A method of monitoring workers for safe work procedures

e) A progressive disciplinary policy to ensure compliance with safety policies

f) Documentation of the steps of the health and safety plan as proof of due diligence

15. When developing a health and safety plan, one place to begin is to assess the safety issues of the workplace. Basic ways to assess safety are by:

a) Conducting informal inspections of the various work areas and tasks, considering issues like:

- Heavy lifting
- Slippery surfaces, trip/fall (e.g debris on floor)
- Working on boats / on the water
- Working with knives
- Unguarded and/or lack of training in the use of machinery and equipment
- Chemical usage
- Low / high temperatures
- Cut or puncture wounds from fish handling
- Bacterial and parasitic infections
- Night working
- etc

b) Discussing safety concerns with workers and others who may frequent the workplace,
c) Consulting information on safe industry standards – such as this Code.

16. In order to develop an effective safety plan for the Organization, this Code approaches safety issues from a risk-based perspective, noting that the process of risk management follows a very simple 4-step process. The SAFE methodology is outlined in more detail in the Code, but generally follows this approach:

**S**EE the Hazard – identifying the things that can cause harm in the workplace.
**A**SSESS the Risk – determining how dangerous those hazards are.
**F**IX the Problem – implementing control measures to make the operation safer, and
**E**VALUATE the Fix – checking that the implemented controls are actually working.

17. This risk management approach is a continuous process. As circumstances change, the risk will vary, requiring continuous evaluation and application of the appropriate controls. It is good practice to involve workers at all stages of this process – after all, they face the dangers of the workplace on a continuous basis and have the knowledge of actual operational risks.

**CONTENTS OF THE CODE**

18. While it should be noted that a Code such as this cannot cover every possible activity in the regional aquaculture/inland fisheries sector, the following chapters have been included. Each specific workplace will need to add additional activities as / if necessary.

d) Workplace housekeeping
e) New and young workers
f) First aid and emergencies
g) Personal protective equipment (PPE)
h) Slip, trip and fall prevention
i) Fire safety
j) Transportation safety
k) Boats and boating safety
l) Diving safety
m) Safe working with finfish
n) Weather hazards
o) Equipment / Machinery safety
p) Chemicals, fuels and lubricants safety
q) Electrical Safety
r) Hand and power tools
s) Hoisting and conveyor systems
t) Hydraulic safety
u) Sharps safety
v) Hot Work: Welding, cutting and soldering safety

**NEXT STEPS**

19. The proposed next steps are as follows:

- Following the approval of the Code by the Commission, it is suggested that a full training package be developed, based on existing safety manuals, such as the FAO Manual on Safety at sea for small-scale fisheries and the contents of this Code.
- Trainers will need to be identified and trained up. These trainers can then use the resources in their individual countries, tailoring the material to meet the specific requirements of the sectors they work in.

**SUGGESTED ACTION FOR THE COMMITTEE**

20. In view of all of the above, the Committee is invited to: (i) review the draft Regional Safety Code of Practice for Aquaculture and Fishery (Code) and approval for the Secretariat to proceed; (ii) provide any further advice and/or guidance for the Code; and (iii) identify the likely technical/scientific and management actions that might be taken to address the implications of the Code at national and regional levels.

**ANNEX 1**

# REGIONAL SAFETY CODE OF PRACTICE FOR AQUACULTURE AND FISHERY

## INDEX

# OBJECTIVES AND SCOPE

## Objective

The overall objective of this *Regional Safety Code of Practice for Aquaculture and Fishery* (Code of Safe Working Practice / or 'Code' in short) is to help promote more of a preventive safety culture in the Aquaculture / Inland Fisheries Sectors. In particular, it should help to:

(a) raise awareness of the risks associated with aquaculture/inland fisheries and how they can be effectively managed and controlled and accidents and diseases prevented;

(b) prevent occupational accidents and diseases and improve the working environment in practice in aquaculture/inland fisheries operations; and

(c) promote more positive attitudes and behaviour towards Occupational Safety and Health in aquaculture/inland fisheries operations.

## Scope

Aquaculture is defined as *'the cultivation of aquatic organisms in controlled aquatic environments involving interventions in the rearing process to enhance production.*'[1]

The ILO 'Future of work in Aquaculture in the context of the rural economy' report states that:

> *aquaculture is an important source of income and livelihoods for many rural communities, both coastal and inland. The sector has grown dramatically over the past five decades and now accounts for half of the world's fish food supply. It provides direct employment to more than 20 million people, with many more people employed along the supply chain. With the growing world population and environmental pressures, aquaculture is increasingly recognized as holding potential for sustainably addressing the challenges of food and nutrition security.*

Another important source of food and employment is inland fisheries. Inland fisheries include any fishing activity that takes place on lakes, dams, rivers and waterways. Aquaculture and inland fisheries activities are often linked, and face similar dangers – therefore these two complementary issues are addressed together in this document. While acknowledging the importance of aquaculture/inland fisheries though, there is also the recognition that it can be a dangerous profession. This Code is intended to be widely applicable and to be relevant to all aquacultural and inland fisheries enterprises, irrespective of size, and for the protection of all employers and workers, irrespective of their employment status.

This Code of Safe Working Practices examines basic safe working practices for a number of workplace issues, and operational processes and activities in the industry, and provides a starting point for controlling hazards in the workplace. Each individual organization should use the information in this Code as the basis of their workplace safety management program.

[1] The future of work in aquaculture in the context of the rural economy (ILO, 2021) https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/meetingdocument/wcms_818149.pdf

# MANAGING HEALTH AND SAFETY IN AQUACULTURE/INLAND FISHERIES: A RISK-BASED APPROACH

## *Introduction*


This Code of Safe Working Practice / Code approaches health and safety in the aquaculture/inland fisheries sector from a risk-based perspective, noting that the process of risk management follows a very simple 4-step process:

**SAFE** (**S**EE, **A**SSESS, **F**IX, and **E**VALUATE)

## *Steps in the 'SAFE' Risk Management Process*

Step 1: SEE the Hazard (Identify the Hazard)

**A hazard is any situation, activity, procedure, piece of equipment/machinery or fish that may cause harm or injury to a person**.

Common hazards in aquaculture/inland fisheries include:

- The work environment (inclement weather, heat, cold, sun)
- Machinery and equipment (hydraulics, boat stability)
- Boat / working on the water safety
- Diving
- Fish handling (needle-stick injuries, cuts)
- Electricity
- Workplace layout (ladders, decks)
- Combustible materials (gas, diesel)
- Working alone

All tasks, equipment and substances should be examined. When listing hazards use:

- Information from past incidents and workplace injuries
- Information from your families, workers, etc
- Product literature and information from suppliers
- Best industry practices
- Sight, smell, touch and hearing senses
- Close examination of areas or activities where children or visitors may be present

Hazards can also be categorized as follows:

| Hazard category | Causative agents /processes |
|---|---|
| **Safety** | Slips and trips, falls, needle-sticks, unprotected machinery, electricity, diving, underwater entrapment, explosions, firearms, tractor power take-offs, confined spaces |
| **Physical** | Heat and cold, vibration, solar radiation, noise |
| **Chemical** | Sensitisers, irritants, antibiotics, toxic gases |
| **Biological** | Sharp teeth, spines, poisonous insects, snakes, allergens, microbes, fish feed, endotoxins |
| **Ergonomic** | Heavy lifting, prolonged standing, awkward postures, repetitive motion, overexertion, lack of visibility |
| **Psychosocial** | High demand-low control situations, shiftwork, remote locations and lone work, abusive social environment |

**Step 2: ASSESS the Risk**

**Risk is the likelihood that an existing hazard may actually cause harm or injury, as well as the expected severity of that harm**.

Every aquaculture/inland fisheries operation has an element of risk – there will be hazards that could potentially impact the health and safety of all workers. Operators need to make sure that workers can enjoy a safe workplace by adhering to health and safety regulations, providing appropriate and adequate supervision and ensuring that all workers have the necessary training and equipment to do their jobs safely.

If a hazard has been identified, assess the risk by examining;

- The ***likelihood*** of the hazard resulting in injury to the crew or other persons - is it likely or unlikely to occur? Also, the ***likelihood*** of the hazard resulting in damage to the farm, boat or equipment, and
- The ***severity*** of the incident - could it cause death, serious injury, or minor injury?

To assess the risk of a hazard hurting someone, ask questions like:

- How many people come in contact with the hazard?
- How often?
- How seriously could someone be harmed?
- How quickly could a dangerous situation come up if something goes wrong?

**Step 3: FIX the Problem** (Eliminate or Control the Hazard)

There are several ways to control a hazard. Pick the way(s) that is reasonable and practical for the circumstances.

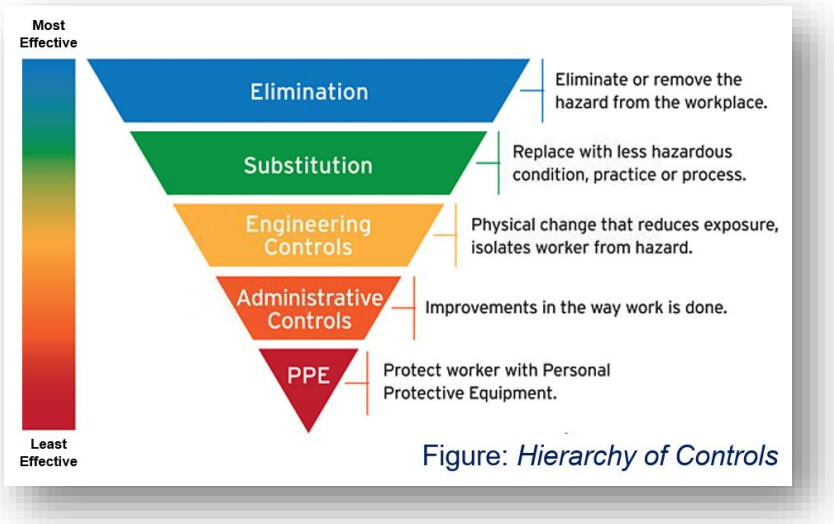

Figure: *Hierarchy of Controls*

1. **Eliminate** hazards posed by equipment, existing processes, and the environment if at all possible – this is the most desirable step! For example, get rid of a faulty machine.
2. **Substitute** something safer by using a different machine, material or work practice that poses less risk to perform the same task. For example, use a safer chemical instead of a more dangerous chemical.
3. **Use engineering/design controls** when it's not possible to eliminate hazards. Engineered controls include machinery guards and PTO shields. Design controls, such as locked fences, and isolate the worker from the hazard.
4. **Protect workers** if other controls are inadequate. Protect workers through training, supervision, and personal protective equipment (PPE). For example, supervise new workers until they are competent to deal with hazardous situations. Use and provide proper clothes and respirator protection for handling dangerous chemicals or biohazards. Remember though, that 'human' controls are often the most reliable, so try and implement the controls suggested earlier in this list.

**Step 4: Evaluate The Fix (**Check that the control is working**)**

The final step in the process is to check whether the controls are actually working / whether workers are following them?

Ask:

- Have the chosen control measures been implemented as planned?
- Are the chosen control measures working?
- Are there any new problems (unintended consequences)?

## SAFE WORKING PRACTICES: COMMON RISKS

### *Workplace Housekeeping*

Effective workplace housekeeping – on land or on the water – is in many ways the most important safety task that can be undertaken. Housekeeping includes keeping the work area neat and tidy, reducing slip and trip hazards in the work area, removing fire hazards from the work area and general maintenance.

Good housekeeping practice will include proper inspection, maintenance, upkeep and repair of tools, equipment, machines and processes.

**Common Hazards**

Poor housekeeping contributes to workplace injuries from:

- Being hit by falling objects
- Tripping over objects on the floor, stairs and platforms
- Slipping on wet, greasy, dirty or icy surfaces
- Walking into projecting items and stacked materials
- Cutting, puncturing or tearing the skin on projecting nails, wire, etc.

**Safety Procedures**

The general rule can be summarized**: "A place for everything, and everything in its place"**

- There must be proper storage facilities for all flammable, combustible, toxic and other hazardous materials.
- Materials must be stored in a safe and orderly manner. Make sure that that all stacking is stable.
- Collect waste regularly, and dispose appropriately.
- Clean spills immediately.
- Replace or fix broken or damaged items as soon as possible.
- Make sure that work / storage areas are well lit. Replace lights when needed.
- Tools should all have a designated storage area. Store after use. Don't place any tool or object where it may pose a hazard.
- Where possible, use mechanical aides for carrying materials and supplies.

## *New and Young Workers*

New and/or young workers often lack knowledge about the workplace. These workers particularly, should be given hands-on instruction, be supervised, and then be monitored periodically to ensure that they are doing the job properly and following all safety procedures and protocols.

**General Precautions**

- Ensure that new and young workers are told of all hazards in the workplace.
- Use past incidents or "close calls" to illustrate the hazards.
- Emphasise that only trained workers are allowed to carry out certain tasks.
- Review safe working practices with new and young workers.
- Make sure that all new and young workers are properly trained.
- Make sure that new and young workers use the required personal protective equipment (PPE) required for each task.
- Encourage reporting of hazardous situations or equipment to their supervisor immediately.

**Safety Procedures**

- Supervisors of new and young workers are to:
    - make sure that they have written work procedures where necessary
    - point out and explain any hazard, safe work procedure and PPE requirements

- provide a copy of safe work procedures for the task
- make sure that the worker has enough time to get familiar with the workplace / task to be completed
- demonstrate each step of the job procedure and detail all safety precautions, and have the worker perform the task under the supervision of a trained person before allowing them to attempt the work alone
- keep written records of the training workers, noting:
  - who provided the training,
  - who received training,
  - when the training occurred,
  - what training occurred.
- make sure that workers are aware of his/her legal rights and responsibilities
- correct any worker unsafe work habits and reward correct behaviour

### *First Aid and Emergencies*

Workers in the aquaculture/inland fisheries sector spend a lot of their time on the water and away from immediate professional medical attention, so it is critically important that they know basic first aid measures and be ready for any emergency situation.

**General Precautions**:

- Make sure that enough workers are trained in First Aid.
- Record all injuries, even minor ones. Note any First Aid treatment given.
- First Aid services must be accessible at all times.
- There should be plans in place to transport an injured worker to hospital if needed.
- The First Aid kit must be adequate for the number of workers and located in the current work area.

**Safety Procedure**:

- Every worker must know where the First Aid kit is.
- Every worker must know what to do if injured.
- There must be an adequate number of the required First Aid kits available.
- The First Aid kits must be clearly marked and stored in an accessible area.
- Check that the First Aid kit(s) are current – make sure that the contents have not passed their expiry date and that all items used are replaced immediately.
- Make sure that adequate means of communication are available for workers working in isolated locations (i.e., on the water or ice).
- Distress, boat safety and emergency equipment must be kept in a dry, easily accessible area.

**Emergency Planning:**

Nothing beats being prepared for an emergency situation. The employer is responsible for:

- Making sure that emergency procedures (e.g., fire, swamping, person overboard, etc) are developed and that the appropriate training is given to all.
- Ensuring that all workers are aware of the emergency plan developed, and are capable of responding to an emergency competently.

### *Personal Protective Equipment (PPE)*

Personal protective equipment (PPE) is an important part of the safety program. It is essentially any clothing or equipment that helps to protect a worker from injury. Workers should wear protective equipment based on the hazards they are exposed to, while employers should ensure that workers are trained in the proper use/care of the personal protective equipment.

Personal protective equipment needs to fit and be worn properly if it's going to work!

**Common Hazards**

Examples of common hazards in the aquaculture/inland fisheries industry requiring personal protective equipment include:

- When there is a danger to the head, eyes or face
- Where hands and arms require protection
- Where protection for the lungs is required
- When feet and legs require protection

**Safety Procedure**

- A complete risk assessment and review of the operation will show where PPE is required.
- Workers must be told to wear the correct PPE, either provided by the employer, or by the worker as a condition of employment.
- Workers should be trained in the proper use and maintenance of their PPE.
- All PPE must fit properly and be properly maintained. Any faulty or worn equipment must be replaced.
- Wear the following when:
    - eye or face protection is required – protective glasses, goggles or a face shield.
    - using loud equipment or machinery – hearing protection (i.e., if the noise level exceeds 85 decibels).
    - there is a risk of punctures, abrasions or irritations to the hands and arms – work gloves.
    - needing good traction – safety boots or footwear.
    - working outdoors – hat that will keep sunlight off the face, and sunglasses to protect eyes from harmful glare.
    - working on the water – the appropriate personal flotation device for each worker.
- Wearing wear jewelry or loose-fitting clothing should not be permitted – it can get caught in gears and machinery.

### *Slip, Trip and Fall Prevention*

Slips, trips and falls are amongst the most common aquaculture/inland fisheries injuries. These can result in muscle strain, broken limbs and contusions and death in the worst cases.

**Safety Procedures:**

- Where possible, make sure that floor areas are non-slippery.
- Oil, ice or debris must be removed from walking surfaces immediately.
- Likewise for equipment, tools, obstacles and debris – remove from the immediate working area. Keep walkways clear at all times.
- If there are lines, cables or ropes that cross the walkway area, cover them where possible.
- Make sure that walkways and working areas are well lit. Measure light intensities if needed. Replace broken light bulbs and faulty light switches.
- Workers should wear the appropriate anti-slip footwear for the task and working conditions.
- If walking surfaces are bad, slow down.
- It is important that things being carried or pushed do not obstruct the view of any hazards in the walking path.
- Construct, and maintain all runways, ramps and platforms so that they safely support all normal loads.
- There should at least be a guardrail on one side of all runways, ramps or platforms to give workers something to hold on to.

**Ladder Safety:**

- Workers should only use a sturdy, secure ladder to access elevated or sub-level areas.
- All ladders must be kept in good working condition. If there are loose, broken or missing rungs, split side rails or other hazardous defects, remove the ladder from service.
- The top of the ladder should always be secured at the top to prevent it from moving.
- Maintain 3 points of contact (e.g., two feet and one hand always on rungs or alternatively two feet plus a safety harness attached to a secured point).
- Always face the ladder when climbing. Don't overreach, and don't jump off ladders.
- It is recommended that the "four-to-one-rule" is used for straight ladders – the ladder base is set one foot from a wall or building for every four feet in height.
- Place the ladder on a sturdy flat surface if the ground is soft or uneven.
- Stay away from power lines, and don't work in high places in adverse weather conditions or when ill, tired or taking strong medications.

## *Fire Safety*

Fires and explosions can be devastating! There are several possible causes for fire in aquaculture/inland fisheries operations and vessels, including improper storage of fuels and / or refueling activities, faulty wiring and overloaded outlets, leaking propane tanks, overheating equipment, smoking, and welding operations. Even the improper storage of oily rags can start a fire. Fires can cause damage to buildings, equipment and machinery and serious injury or death.

**Safety Procedures**

- All workers should know what to do in a fire emergency.
- Electrical systems should be inspected regularly – especially if you experience problems with flickering lights, disruptions of power, etc.). Circuits must not be overloaded.

- Make sure that all extension cords are kept in a good condition.
- Use wire cages to protect light bulbs and heat lamps in hazardous situations.

**Storage of Flammables/Combustibles:**

- Flammable and combustible materials must be stored away from oxygen tanks and sources of heat (e.g., open flames, engines, equipment, daylight).
- Fuel and flammable material must be stored in good condition, labeled containers.
- Don't let flammable/combustible materials block/obstruct exits.
- Only keep the necessary amounts of flammable or combustible materials on board the boat – just enough for daily maintenance and operational needs.
- All work requiring the use of flammable materials must be undertaken in a well-ventilated area. Keep area clear of anything that could produce a spark.
- Never refuel a running or hot pump/motor.
- Have a "no smoking" policy in place in hazardous areas.

**Fire Prevention on Boats:**

- Ensure that each vessel has the right fire extinguisher(s) on board.
- Place fire extinguishers at the right place appropriate to the fire hazard.
- Keep fire extinguishers fully charged and in good condition.
- Propane appliances and cylinders must be properly secured, protected and be stored in well-ventilated areas. All valves must be work properly, and all connections tight.
- Bilges must be kept clean and free from oil and fuel. Bilge pump must work well.
- Enclosed engine spaces must have proper ventilation.
- Batteries must be stored correctly, and maintained properly.
- Electrical systems on the boat must be correctly, and safely installed and maintained.
- Adjust and lubricate machinery to minimize friction.

### *Transportation Safety*

Aquaculture/inland fisheries workers use many modes of transportation to carry out their daily tasks. Each of these has specific health and safety requirements. A good place to start is to review the operating manual and manufacturer's information before any vehicle is used.

**Safety Procedures**

- All operators of work vehicles must be properly trained.
- Vehicle operators and/or passengers must wear the appropriate personal protective equipment.
- Ensure that all vehicles are in proper working order before being used, and are all regularly inspected and maintained.
- Always perform pre-ride inspections and periodic maintenance of the vehicles (as outlined in the owner's manual).

**Vehicles:**

- Travel speed must be adjusted to the road conditions and activities being undertaken.
- Make sure that all vehicles have the proper lights need for working in dark or inclement weather conditions
- Passengers should not be transported, nor stand on tractors, equipment or trailer while underway.
- All guards must be kept in place on all equipment.
- Implements must be attached to the appropriate hitch provided by the manufacturer.
- PTO's must be switched off before hitching implements.

**Trailers and Wagons:**

- The hitch and safety chains must be properly connected when a trailer is being towed.
- The trailer load must be firmly secured, and properly loaded for stability.
- Make sure that items like tyres, brakes, etc on both the towing vehicle and trailer are in good condition and that brakes are always sufficiently strong for the load.
- Drivers must be experienced and properly trained in operating the towing vehicle and attached implements.

**ATVs:**

- When using an ATV, wear the appropriate PPE (helmet, eye protection, boots, long sleeved shirt or jacket, long pants, gloves).
- Always operate the ATV at a speed appropriate for the conditions.

### *Boats and Boating Safety*

Boats are often used in aquaculture/inland fisheries farms, but they can pose considerable hazards to those that work on them. The size and type of boat will vary according to circumstances and needs, but regardless of the size of the boat or operation, the hazards that workers are exposed to, often remain the same.

**Common Boating Hazards are:**

- Navigation, collision, and grounding
- Fire or explosion
- Engine or other mechanical difficulties
- Flooding and capsizing (especially with loads shifting)
- Persons falling overboard and drowning
- Weather related injuries such as sunburn, sunstroke, hypothermia or lightning
- Entanglement in gear or hauling equipment
- Cuts from knives, lines, tongs etc.
- Hearing damage due to loud noises

**General Safety Precautions**

Basic components for vessel and crew safety are:

- **Vessel**: stable, fit-for-purpose, and seaworthy:
    - Boats must be safe and suitable for the operation for which they are to be used.
    - Regular maintenance necessary – daily pre-trip inspection of the fuel, oil and/or other fluid levels.
    - Machinery/equipment must be maintained in a safe condition.
    - Maintain stability – keep weight down low.
    - Carry a tool kit, spare parts (e.g., fuses, impellers, bulbs, duct tape, spark plugs)
    - Have the necessary means to stop small leaks so that repairs carried be carried out in the event of an emergency.
    - Fuel containers and compressed gas tanks stored properly.
    - Equipment and gear stored neatly properly. Working area clean.
    - Slippery areas cleaned immediately.
    - Working areas kept clear and uncluttered.
    - Heavy equipment or gear must be secured to avoid it shifting.
    - Keep a first aid kit stored in a dry place. Replace used and outdated contents.
    - Keep accessways and ladders in good condition.
- **Crew**: properly trained, rested and competent:
    - Never stand on any lines, wires, cables or ropes that are under tension.
    - Each crewmember must know how to use the appropriate personal flotation devices. When the water is extremely cold and the risk of falling in is high, a floater suit or other survival gear is to be worn.
    - Appropriate clothing for the season and task must be worn at all times – no loose-fitting clothing or jewelry around moving equipment, lines, etc.
    - Gloves are to be worn where needed for hand protection.
    - Boots/shoes must have good traction.
    - Wear safety glasses or goggles when the activity requires eye protection (e.g., cleaning with chemicals, hauling lines, etc).
    - When reaching over the side/stern, always have one hand holding a railing or another piece of the boat.
    - Only use the provided means of boarding/exiting the boat (e.g., ladder).
    - Don’t get jammed between the boat and the dock or wharf when boarding or exiting the boat or when tying off.
    - Always keep a sharp knife available to cut jammed lines. Store the knife safely.
- **Lifesaving/rescuing equipment**: in place and ready for use:
    - Each vessel must be outfitted with the appropriate safety equipment.
- **Equipment and operating procedures**: must be fit for purpose
- **Fire protection**: equipment, training, awareness and practice

- **Maintenance**: standards and practice
- **Communications system**: in place, understood and used
- **Loading/Unloading the Vessel**: Safe work practice at all times:
    - Ensure the safety of persons loading or unloading the vessel.
    - Ensure safe and even loading of equipment and product.
    - Always consider weather conditions to prevent overloading or capsizing.
    - Keep load and equipment as low as possible and keep it secured to prevent cargo shifting or affecting the boat's stability and buoyancy.
- **Hauling Equipment:** Keep in good working order:
    - Inspect equipment and gear often, and replace anything that is worn, broken, has excessive wear and tear, or is otherwise unsuitable/unsafe.
    - Stand clear of the hauler where possible.
    - Hands must be kept clear of the line at all times.
    - Stay clear of the moving gear (e.g., line, cages, buoys).
- Never stand under a load or in areas where overhead equipment may swing or drop and cause serious injury.
- **Safe navigation practices**: understood by crew and followed
    - Avoid high-speed operation near shorelines, other boats or structures.
        - A safe boating speed will depend on the visibility conditions, wind/water conditions and currents, maneuverability of the boat, boat traffic in the area, and the proximity of any navigational hazards.
    - Make sure someone has knowledge of shipping routes, markers and hazards as well as the prevailing tides, currents, weather patterns to ensure the safe operation of the boat.
    - Make sure someone knows the rules of navigation.
    - Ensure that all navigational safety equipment (sound-signaling devices, radar reflectors, navigation lights, etc.) are in good working condition and appropriately located onboard.
- **Weather Conditions**: need to be considered:
    - Where appropriate, only undertake operations when the long range forecast is suitable to ensure the safe completion of the task.
    - Always watch out for signs of approaching bad weather (e.g., choppier seas, cloud bank in the distance, a rise in the humidity, and any sudden changes in the atmospheric pressure). Monitor weather updates until returning to port.
    - If the weather turns, know what to do in order to protect the crew (e.g., nearest shelter, return to port procedures).
    - In an electrical storm, lower the hauler/boom. Avoid contact with metal surfaces and electrical equipment. Take shelter in the cabin (if available).

**Rescue procedures for man-overboard situations**

Falling overboard can result in death very quickly – from drowning or cold-water exposure. Make sure there are procedures in place for recovering an overboard crew member.

**Safety Procedures**

- Immediately throw a life jacket, life ring, or a bright colored floating object into the water to help the person, and to guide the vessel back to the overboard spot.
- Inform the skipper immediately. Verbally direct the vessel operator to the overboard crew member.
- ALWAYS keep the overboard person in sight.
- The vessel must carefully maneuver alongside the overboard person so as not to cause further injury. Rescuers must be careful not to end up in the water themselves.
- Immediately apply first aid / resuscitation as required. Carefully watch the recued person in case there are complications.

### *Diving Safety*

Diving is often an important part of aquaculture/inland fisheries operations. Divers are required to inspect lines, anchors and general condition of the shellfish operations, as well as assisting with other plant operations. Divers are required to be knowledgeable about the type of diving they are about to carry out, the conditions at the dive site and the tasks they are about to perform. All diving operations must be well planned and be carried out by experienced divers with the proper knowledge, training and experience to carry out their assigned work.

**Safety Procedures**

- All divers should be First Aid qualified.
- They should be instructed in the work procedures they will be required to carry out.
- All divers must be able to swim well, and where possible, always dive with a 'buddy'.
- Divers must only dive if they are fit to do so (e.g., not ill, fatigued, impaired, injured).
- Divers must always consider weather and water conditions in the dive area – and suspend if hazardous or likely to become hazardous.
- All diving operations must follow the applicable health and safety regulations.
- Divers must stay within the posted dive site.
- Where necessary, divers must be provided with a lamp or other means of illumination during periods of darkness.
- Snorkel divers: always use a buddy system, and must be equipped with a whistle, weight belts (if required) with quick release closures, and thermal protection.
- Vessel propellors should be caged – or props on dive boats must be disengaged and locked out while being used as a dive base.
- Divers must carry an audio or visual signaling device when conducting a dive in open water without a lifeline.
- Divers must be protected from all hazards at or near the dive sight.

A written dive plan, specific to the particular dive site, must be prepared before a dive is conducted. This dive plan must include, a description of the tasks to be performed at the site, including work procedures for each type of dive and the diving equipment to be used, how long the dive will be, and the decompression tables and procedures to be used. In addition, the procedures to identify and address health or safety hazards at the dive site must be clear, with a list of all hazards in the immediate area of the dive site, and instructions for getting medical assistance and the possible evacuating of an ill or injured diver from the dive site, plus any other emergency responses procedures needed. This could include loss of

communication, diving equipment malfunction, hazardous weather or water conditions, aborting a dive or responding to any difficulties in keeping the dive base stationary.

## *Safe Working with Finfish*

### Common Hazards

There are numerous hazards when working with finfish, including:

- Limbs, clothing, hair or jewelry can get caught in machinery / equipment
- Trips and falls when walking over rough terrain or climbing ladders while carrying heavy loads
- Transporting, loading and handling fish in large tanks
- Crushed injuries when caught between the tank and another structure
- Compressed gasses (like oxygen) in the transport tank
- Falling from heights like off platforms while working with fish
- Possibility of injury when handling large, powerful fish (i.e., salmon)

### Safety Procedures

- Workers must be trained on the proper techniques and precautions for performing tasks associated with fish.
- There must be clean walkways so that workers will have good footing when treating fish.
- There should be minimal lifting required to get the fish into anesthetic baths, etc.
- Fish should be fully anaesthetized before taking it out of the anesthetic bath.
- Consider ergonomic principles for worker comfort and safety for those working with the fish or any work requiring heavy lifting or prolonged repetitive motion.
- Ensure good footing at all times when walking in tanks - especially if work involving fish is being completed before, or without, completely draining the tank.
- Don’t jump over the top edge of the tank, or drop into the tank – use a ladder that hooks over the tank edge.
- Always make sure that there are railings surrounding ground level tanks, as well as appropriate handrails along all walkways, around the edge of cages or over tanks.
- Walkways must be kept clear and free of debris (including ice and snow).
- Always wash hands regularly – especially after cleaning tanks and handling fish.
- After working on any fish or after using chemicals (e.g., inoculants), make sure that work surfaces are cleaned and disinfected at the end of the day.

## *Weather Hazards*

The weather can pose many hazards, especially in occupations like aquaculture/inland fisheries, where much of the work is done outside. This ranges from exposure to the heat and sun during the hot summer months, and to the cold and wind during the winter months. Stormy or inclement weather on the water can also put workers and property at risk. Working in icy, very cold weather is particularly hazardous, and care must be taken to ensure the safety of workers.

Common hazards include working in the heat and sun where workers can suffer from dehydration, fainting, and end up with sunburn, heat exhaustion and heatstroke. On the other end of the temperature scale, prolonged exposure to cold weather, particularly in water-soaked clothing or from direct

immersion after falling overboard, can result in dangerous overcooling of the body. Here hypothermia will affect a person's mental and muscle functions and can ultimately result in death. Note that victims of heat stroke and hypothermia are often unable to notice the symptoms of the illness. So, it is important that their co-workers' identify the symptoms, provide emergency assistance and seek medical help.

**Safety Procedures**

**Working in Hot Weather Conditions**:

- When working in hot weather conditions, workers must be provided with ample drinking water, and short rest breaks in a cool area.
- Workers should be wearing the appropriate protection (i.e., sunscreen, hat, sunglasses/goggles). Wearing sunscreen and a hat that keeps the direct sunlight off of the head and face area, protects from the hazards of heat and direct sunlight.
- Workers should wear sunglasses to protect eyes from direct sunlight or the glare off the water.
- Always drink lots of fluids, especially water. The amount of diuretics (coffee, cooldrinks, tea) consumed should be reduced as they increase fluid loss.

**Working in Cold Weather Conditions:**

- Wear possible, restrict the time that workers are required to work in extreme temperatures (e.g., take frequent short breaks instead of infrequent long breaks).
- The chance of hypothermia can be reduced by wearing warm, protective clothing and keeping the head and extremities (hands, feet, arms, legs) covered.
- Remember that heat is lost most rapidly through the head and neck, sides of the chest (including the armpits) and the groin area. Learn the appropriate methods to stay warm, especially if someone falls into the water.

### *Equipment / Machinery Safety*

**All machinery and equipment has the potential to cause harm. Common hazards associated with machinery/equipment which can potentially cause injury include:**

- Gearing, cables, sprockets, chains, clutches, cams or fan blades
- Machine components that cut or grind, or have shear points or crushing points
- Hot surfaces that can cause injury, fire or explosion
- Rotating PTO drive lines and other shafts, and all projections on rotating parts
- Fluids / gasses under pressure.

**Safety Procedures**

- Only use machinery/equipment as intended by the manufacturer.
- Inspect power-operated machinery/equipment every day before being used.
- Always ensure safety before starting any machinery/equipment.
- Operators of machine/equipment must have unimpeded access to the shut off.
- Only competent persons are to operate the machine/equipment.
- Wait until machinery/equipment has stopped before climbing on / cleaning.
- Don't ride on the load bed / bucket of a vehicle while it is being used.

- Secure all tools and other potentially harmful equipment on vehicles – especially when workers are being transported.
- Wear close fitting clothing, confine head or facial hair and avoid wearing dangling jewelry or rings when working around moving parts of machinery.
- Protect against burns caused by hot parts.
- There must be ample working space, ventilation and lighting when operating, adjusting or repairing machinery/equipment.
- Maintain powered mobile equipment, and keep the operation of them down to a minimum, especially when operated in closed areas for prolonged periods of time as fumes can kill.
- Back up alarms on mobile equipment must be properly functioning.
- All guarding must be left in place and properly maintained.
- All moving parts of machinery should be guarded.
- Maintain all air and hydraulic lines, hoses and components in safe working condition.
- Replace or repair all defective parts prior to use.
- Only lubricate machinery when it is at rest (or as directed by the manufacturer).
- Do not repair pressurized steam, air or hydraulic lines while machinery is in use.
- Keep children and bystanders away from those areas where tools, equipment or machinery are being operated or maintained.

### *Chemicals, Fuels and Lubricant Safety*

Proper handling, transport and storage are critical for maintaining the health and safety of anyone coming into contact with these substances. Chemicals, fuels and lubricants can pose a hazard to both the environment and the persons using them. The majority of chemicals, fuels and lubricants used on aquaculture/inland fisheries operations are associated with the routine use of vehicles, vessels and equipment. There are additional risks from materials used for cleaning fouling from gear (e.g., hydrated lime). For all these exposures, similar hazards exist. Note also that long term exposure to some substances can cause chronic health problems while other chemicals can cause immediate and acute symptoms.

**Safety Procedures**

**Chemical Storage:**

- Chemicals must be properly stored in a well lit and well ventilated area. This should be separate from other chemicals (there is always the risk of reaction between chemicals).
- Keep chemicals stored in the original containers with the labels intact.
- Don’t put chemicals into food or beverage containers.
- Warning signs and emergency numbers must be posted at all storage areas.
- Material Safety Data Sheets (MSDS) must be kept on file for all chemicals used.
- Absorbent materials must be available close by to clean up spills.
- Only keep reasonable quantities of fuel, oil and chemicals stored on site.

**Use of Chemicals:**

- Only use for intended purposes, and under the appropriate conditions.

- Use the appropriate personal protective equipment (PPE) at all times.
- Workers must be trained in the safe handling of the chemicals they use.

**Disposal of Chemical Containers:**

- Clean containers thoroughly empty containers to remove all traces of the chemical.
- Dispose safely, return all empties to point of sale if possible (see MSDS for details).

**Transporting of Chemicals:**

- Make sure hazardous substances/chemicals are secured during transport. Don't leave chemicals unattended unless in a locked container.
- Store separately from workers if all transported together on a truck.
- Keep proper records of all chemicals transported.

### *Electrical Safety*

Electricity, while essential to most operations, has the potential to cause serious damage and harm. Proper care and attention should be given to the maintenance and use of electrical units.

**Safety Procedures**

- The electrical safety rules must always be followed.
- During repair or maintenance, main switches must be locked out, locks and tags placed in them before working on power circuits. Make absolutely sure that no one else can use them while you are working.
- Make sure periodic electrical inspections are made by qualified persons.
- Only qualified individuals should be allowed to work on electrical repairs.
- Make sure that all wiring, equipment, leads and plugs are kept in good repair.
- Wiring installation must not be overloaded.
- Always consider every circuit to be live – and test appropriately before repairs/maintenance.
- Make sure that extension cords and devices are properly grounded.
- Only use the correctly rated fuse or circuit breaker when replacing.
- All power tools (portable or bench-mounted should be properly grounded.
- Try and avoid using electrical equipment in wet weather and working conditions where possible. And then, only properly ground electrical equipment must be used in wet areas (use a ground-fault circuit interruption outlet).
- Always use weather-proof outlets and fittings, especially in areas exposed to the elements, or where the presence of moisture could routinely pose a hazard.

**Overhead Power Lines**

When operating equipment in any location where overhead lines are present, the following points are important:

- Always be aware of overhead power lines - maintain minimum approach distances.
- Be aware of the operating height of equipment. Note extensions that add overall height.

- Lower the equipment prior to moving under power lines.
- Remember that factors like snow build up on the ground, snow and ice loading on overhead lines, warm, humid weather or other activities may cause a reduction in the distance between the lines and the top of any equipment operating below.
- If equipment comes into contact with electrical lines, remain calm and have someone call the local electric utility. Warn others to remain clear. Don't step off the equipment while it is energized – wait for everything to be switched off first.

### *Hand and Power Tools*

Workers need to understand the hazards associated with the equipment and tools found on the worksite. Incidents are often directly linked to:

- tools being used for the wrong task
- cluttered, poorly lit and unventilated areas
- faulty electrical cords
- tools and equipment without the required guards

Identify potential hazards in all workspaces. Then develop safe working procedures for your work area and tasks. All workers must be informed of these procedures, and be able to carry out the tasks safely.

**Safety Procedures:**

- Make sure workers have been properly trained in the safe use of all tools.
- Tools must be kept in good condition. Replace or repair defective tools before using.
- If the casing on tools is broken or damaged, don't use!
- Make sure all damaged cords or plugs on power tools are properly repaired or replaced.
- Power tools must be shut off, and the plug removed from the outlet before making adjustments.
- Don't use makeshift extension lights.
- Make sure that all extension lights have a guard around the globe and an insulated handle.
- All cutting tools must be kept sharp, and sharp edges covered when not in use.
- Make sure that sharp tools (e.g., saws, knives) used on work benches are pointed away from the work area. Don't allow handles to hang over the edge of the bench top.
- Always wear safety glasses or goggles and well-fitting gloves if the task requires it.
- Tools must only be used for the purpose they were intended. Don't apply excessive force or pressure on tools.
- Cut away from yourself when using cutting tools.
- When climbing a ladder, be careful that the tools you're carrying don't interfere with using both hands on a ladder.
- Be careful with sharp tools. Don't throw, or carry them in your pocket.
- Tools must be looked after at all times. Maintain them, and keep them clean and dry.
- After using, store tools properly.
- Remember housekeeping! Always keep your work area clean and tidy.

### *Hoisting and Conveyor Systems*

Hoisting systems or conveyors are often used in aquaculture/inland fisheries operations. Common hazards associated with these items include:

- No lock-out procedures
- Untrained operators
- Machine guarding missing on moving parts (e.g., pinch points, wrap points)
- Workers riding on the load or the equipment
- Lack of personal protective equipment (PPE)
- Poorly maintained, or damaged equipment

**Operators and Crew:**

- Workers must be trained before operating equipment or mechanical systems.
- Stand clear of the load being lifted. If the load is heavy, rather push than pull the load by hand. Don't try and help by lifting the load.
- Always lift from directly over the load.
- Never pass a load over the head of workers.
- Don't stand under the object being lifted.
- Only when everyone is clear of the load should you start moving the load – slowly and smoothly!
- No one should ride on the lifting system or the load that is being lifted.
- Don't raise the load any higher than necessary, and don't leave it suspended / unattended.
- All involved in the lift must know the communication signals for stop, go, lift the load, etc.
- Only those involved in the lifting operation should be near the lifting system (or conveyor) while it is in operation.
- Before working on a conveyor, the equipment must be stopped and locked out.
- Workers must not stand on the supporting frames of an open conveyor while loading, unloading or clearing blockages.
- Remember to wear gloves if needed, tie up long hair, and not wear loose clothing or jewellery when working near a hoist, boom or conveyor.

**Equipment:**

- Inspect lifting systems regularly. Worn or damaged components must be replaced before using.
- Make sure all moving parts (e.g., pinch points, rollers) are guarded.
- If used outside or in damp conditions, make sure all electrical components are waterproofed.
- Ensure that the safe load limit is posted in a prominent position. This limit is not to be exceeded.
- Always position lifting devices like hooks, rope loops correctly before lifting the load.
- Repair lifting systems according to the manufacturer's guidelines. Remember to switch off and lock out first!
- All workers MUST know the location of the emergency shutoff and how to use it.

**Rope Safety**:

- Ropes used must always be inspected first before use. Look for damage or chafing.
- Never exceed the safe working load of the rope.
- Make sure there are no sudden strains or jerks on the rope – it can snap.
- Keep the rope away from chemicals, direct sunlight or damp – these can weaken it.

**Blocks, Sheaves & Other Fittings:**

- These parts of the lifting gear should be regularly inspected, lubricated and maintained.
- Make sure that sheaves are properly guarded.
- Regular inspection is needed for all bushings, nuts, bolts, etc. Check for signs of wear and replace as necessary.

## *Hydraulic Safety*

Hydraulic systems are very useful, but if they are not properly maintained or adjusted they can cause serious injury or death. Even the hydraulic fluid contained within the system is toxic and can cause human flesh to deteriorate. Two of the main injuries are fluids getting into eyes or being injected into the skin.

Only experienced people should perform maintenance tasks.

**Safety Procedures**

- Always follow safety procedures in the manufacturer's manual.
- Only properly trained personnel are to operate equipment or mechanical systems.
- Be careful when working near raised hydraulic cylinders.
- Make sure defective parts on hydraulic systems are replaced immediately. A planned maintenance system can very useful.
- Remember: don't check for high pressure leaking hydraulic fluid with your hand – use a piece of cardboard or wood over the suspected area. If you do get a hydraulic skin puncture, get medical attention immediately.
- Always deactivate any hydraulic powered equipment before servicing or repairs:
    - lower it to the ground or block it mechanically,
    - shut off the engine that powers the hydraulic pump,
    - release hydraulic pressure (i.e., move the hydraulic lever back and forth several times),
    - let the system cool down and
    - follow the manufacturer's servicing procedure instructions.
- Make sure any spilled hydraulic fluid is cleaned up immediately.
- Always dispose of used hydraulic fluids in a safe and environmentally-friendly way.

## *Sharps Safety*

Workers in the aquaculture/inland fisheries industry are often exposed to the hazards from objects that can penetrate or puncture the skin (like knives, needles, etc). It is important that precautions are taken to reduce the risk of injury and health hazards posed by these tools.

**Common Hazards**

The types of hazards that are common when working with sharps include:

- The use of needles: accidental punctures when using these*
- The use of knives and screwdrivers: limb injuries caused by accidental stabbing or cutting
- The storage of these pieces of equipment: injuries caused by improper storage or disposal

*Note that not recapping needles is one of the most common causes of needle stick injuries.

**Safety Procedures**

- Always be very careful when handing all sharps (needles, knives, screwdrivers, box- knives, razors, etc.).
- Housekeeping, and organizing the work area will help – especially if sharps are located in a safe manner for the work to be done.
- All workers using needles should be properly trained to handle the needles and perform the required tasks (e.g., inoculate fish).
- It is important that needles are kept capped until ready for use.
- Don't ever put your hands into a sharps container unless you are absolutely sure it is empty.
- All sharps must be disposed of a rigid, wide-mouthed, leak-and-puncture-proof container. This container must have a lid that can be tightly closed. The container and it's contents must be clearly identified as holding sharps.
- The sharps disposal container must be placed in a convenient section of the work area – close to where needles are to be used.
- Make sure the location is clearly signposted.
- It is good practice to replace the sharps disposal container before it is full.
- Sharps disposal containers must be safely and properly disposed of.

## *Hot Work: Welding, Cutting and Soldering Safety*

The use of gas and arc welding are common practices on many aquaculture/inland fisheries operations, especially when building and repairing machinery. To reduce the dangers from these operations, the appropriate care and training should be given to workers to ensure the health and safety of the welder and any bystanders.

Typical hazards that welders face when welding include toxic fumes produced by the welding process; fire/explosion hazards from working with/around flammable liquids and compressed gases; ergonomic injuries as a result of performing repetitive motions, as well as working awkward positions; skin and eye damage (from the ultraviolet and infrared radiation); injuries to eyes and puncture/burn to the skin from flying hot metal bits; excessive noise levels, and electrical shock. Always wear the appropriate PPE, adequate eye protection and safety boots.

**Safety Procedures**

**Facilities:**

- There must be adequate ventilation to remove any toxic fumes.Remove combustible materials from the working area, and provide adequate fire extinguishing equipment where heat is used.

**Welding Equipment:**

- All welding / cutting equipment must be kept in good repair.
- Damaged equipment must be repaired to specifications by a competent person.
- Stop work immediately if a leak develops, and repair.
- Store, and use compressed gas cylinders in an upright position. Secure correctly and don't drop or allow them to be subjected to impact.
- Cylinders containing flammable compressed gas must separated by an approved fire- resistant partition from welding / cutting operations.
- Protective caps on gas cylinders must be used when they are being moved or not in use.
- Keep cylinders at a safe distance from all operations which produce flames, sparks, heat.
- Make sure all hose lines are properly marked, and fit reverse flow check valves as needed.
- Devices for holding the cylinders must allow for quick removal in case of fire.
- Only put down a welding or cutting torch when the gases have been completely shut off.
- Welding or cutting torches must not come into contact with the gas cylinder.
- Don't weld in wet conditions.