

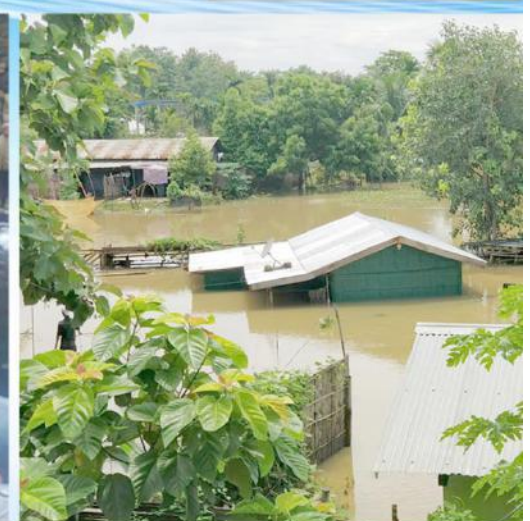


GOVERNMENT OF NAGALAND

NAGALAND STATE DISASTER MANAGEMENT AUTHORITY
HOME DEPARTMENT
NAGALAND : KOHIMA



AAPDA MITRA FLOOD DISASTER RESPONSE TRAINING OF COMMUNITY VOLUNTEERS IN DISASTER RESPONSE IN INDIA



NSDMA
NAGALAND STATE DISASTER MANAGEMENT AUTHORITY

ORGANISED BY
NAGALAND STATE DISASTER MANAGEMENT AUTHORITY
SUPPORTED BY
NATIONAL DISASTER MANAGEMENT AUTHORITY
AAPDA MITRA FLOOD DISASTER RESPONSE

FORWORD

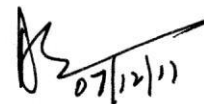
Nagaland State Disaster Management Authority (NSDMA) is tasked with the responsibility of ensuring preparedness of the State to face any natural calamities or disasters to prevent loss of life and properties. In today's world various kinds of natural or manmade disasters or calamities can cause extensive damage. The role of the Government agencies is always to ensure adequate preparedness to enable the community to join hands in mitigating these disasters. Towards these objectives NSDMA is publishing AAPDA MITRA Training Modules to help build capacity of the AAPDA MITRA. The AAPDA MITRA are able-bodied community volunteers trained to respond to disaster in case of floods with necessary skill to provide relief, rescue and basic first aid to the affected disaster victims.

Government of India through the National Disaster Management Authority (NDMA) has brought-out series of information and instructions primarily aiming towards saving lives in case of any natural or manmade disasters or calamities. The publication is a compilation to deal with floods for the State of Nagaland by the Nagaland State Disaster Management Authority (NSDMA).

Floods are one of the major natural disasters that have affected India in a large scale, and this has increased during the recent years due to unpredictable weather and climate change phenomena. With the recent cases of floods even in urban areas like the Chennai floods of 2015 and even parts of Dimapur in 2017 there is a larger need to strengthen the local community to be able to respond to these disasters more effectively. Accordingly, National Disaster Management Authority (NDMA) has introduced the AAPDA MITRA Training – a training for Community Volunteers to response to flood disasters.

Nagaland in recent years has also witnessed cases of inundated and flood especially in the plain area which has caused huge losses to properties, livelihood systems, infrastructure and public utilities. Therefore, in line with National Disaster Management Authority (NDMA), the Nagaland State Disaster Management Authority (NSDMA) has embarked upon training of 200 AAPDA MITRA selected from the vulnerable communities and regions.

I am sure this AAPDA MITRA Training Manual and the associated training of AAPDA MITRA will go a long way in helping the people of the State in mitigating these disasters.

A handwritten signature in black ink, appearing to be 'Abhishek Singh', with the date '07/12/11' written below it.

(ABHISHEK SINGH) IAS
Home Commissioner &
CEO, Nagaland State Disaster Management Authority.

AAPDAMITRA FLOOD DISASTER RESPONSE

OBJECTIVE : To train Community Volunteers at District level in Flood Rescue Operations in order to build capacities for organizing Aapdamitra (Flood Rescue Response Teams) during Flood Disasters.

ENABLING : On completion of the training program the participants will be able to:

OBJECTIVE

- ☐ Act as First Responder during Floods
- ☐ Operate Flood Rescue Equipment
- ☐ Organize immediate relief measures.

DURATION: 90 Periods (8 periods of 40 minutes each day) - 12 days

Sl.No.	CHAPTERS	Lectures(L) Demonstration(D) Practical(P)	No. Of Periods
1	FLOODS- Causes and Problems: How floods are caused, different causes of failures of embankments. Importance of vigilance and watch. Embankments and Emergency repairs, Problems created and role of local administration in relief work. Special rescue problems in dealing with secondary hazards i.e. landslides, etc	L	2
2	FLOOD FORECASTING AND WARNING SYSTEM IN INDIA: Warning against Flood Disasters – weather forecasting, IMD alerts, and warnings by district administration and importance of Community Risk Mapping.	L	2
3	SURFACE WATER RESCUE: Surface Water Rescue: safety considerations, methods PPE & training	L/D	2
4	FLOOD RESCUE EMERGENCY DRILLS: Flood Rescue Emergency Drill, Casualty Handling & Recovery	L	2
5	FLOOD WATER BEHAVIOR: Flood Rescue: Rules of river, Flood Water Behaviour	L	2
6	FLOOD RESCUE BOATS: Flood Rescue: Boats, types of boats, parts of a boat and safety equipments.	L/D	2

7	USE OF ROPES: Types & Use of ropes/SWR in rescue work. Knots and lashings etc.	D/P	4
8	FLOOD RESCUE: Words of Command for Rowing Boats	D/P	2
9	CORPSE DISPOSAL: Corpse disposal organization. Its necessity, equipments, manpower & procedure of disposal of dead.	L/D	2
10	USE OF LIFE JACKET AND LIFE LINES: Use of life jackets and life lines, throwing of Breast line & Life buoys	D/P	4
11	UNDERWATER SEARCH AND RECOVERY: Life Buoys & Hooks, Procedure of use & Safety lines. Underwater Search & Recovery: information on drowned bodies fixing, marking and assessments, recovery methods and tools	D/P	4
12	EMERGENCY METHOD OF RESCUE: Emergency methods of Rescue-Transportation and handling of casualties	D/P	4
13	IMPROVISED FLOATING AIDS: Preparation of improvised flood rescue and swimming aids-Types, their constructions & application in water body.	D/P	8
14	COMMOM IMPROVISED BRIDGES: Preparation of various types of rope bridges.	D/P	6
15	ELEMENTS OF BENDAGING: Use & practice of triangular & roller bandages-use of splints, etc	D/P	6
16	BASIC LIFE SUPPORT: CPR & FBAO Cardio Pulmonary resuscitation & Artificial Respiration	D/P	6

17	FLOOD PROTECTION & EMERGENCY REPAIRS: Flood Protection & Building Sand Bag Walls	D/P	6
18	Construction of DERRICK, SHEERS AND GYN	D/P	6
19	FLOOD RESCUE SURVIVAL: impact of heat, cold and moisture, heat escape lessening position and self rescue	D/P	2
20	OUTBOARD MOTORS: Out board motor, acquaintance with parts and its working. Using out board motor on boats	L/D	4
21	PICKETS AND HOLDFASTS: Hold fasts and Anchorages-Types and their uses	D/P	4
22	COMMUNICATIONS: Use of wireless sets and equipment, Radio telephony and use of Standard Phrases	D/P	2
23	PRACTICAL EXAMINATION		5
24	WRITTEN TEST		1
25	COURSE INAUGURATION & VALIDATION		2

FLOODS –Causes & Problems

A **flood** is an overflow of water that submerges land which is normally dry. In the sense of "flowing water", the word may also be applied to the inflow of the tide. Flooding may occur as an overflow of water from water bodies, such as a river or lake, in which the water spills over or breaks levees, resulting in some of that water escaping its usual boundaries, or it may occur due to an accumulation of rainwater on saturated ground. While the size of a lake or other body of water will vary with seasonal changes in precipitation and snow melt, these changes in size are unlikely to be considered significant unless they flood property or drown domestic animals.

Floods can also occur in rivers when the flow rate exceeds the capacity of the river channel, particularly at bends or meanders in the waterway. Floods often cause damage to homes and businesses if they are in the natural flood plains of rivers. While riverine flood damage can be eliminated by moving away from rivers and other bodies of water, people have traditionally lived and worked by rivers because the land is usually flat & fertile as well as provide easy travel and access to commerce and industry.

Some floods develop slowly, while others such as flash floods, can develop in just a few minutes due to cloudburst. Additionally, floods can be local, impacting a neighbourhood or community, or very large, affecting entire river basins.

Types

•■■■ Arial (rainfall related)

Floods can happen on flat or low-lying areas when the ground is saturated and water either cannot run off or cannot run off quickly enough to stop accumulating. This may be followed by a river flood as water moves away from the floodplain into local rivers and streams. Floods can also occur if water falls on an impermeable surface, such as concrete, paved or frozen ground, and cannot rapidly dissipate into the ground.

Localized heavy rain from a series of storms moving over the same area can cause Arial flash flooding when the rate of rainfall exceeds the drainage capacity of the area. When this occurs on tilled fields, it can result in a muddy flood where sediments are picked up by run off and carried as suspended matter or bed load.

•■■■ Riverine

River flows may rise to flood levels at different rates, from a few minutes to several weeks, depending on the type of river and the source of the increased flow. Slow rising floods most commonly occur in large rivers with large catchments area. The increase in flow may be the result of sustained rainfall, rapid snow melt, monsoons, or tropical cyclones. Localized flooding

may be caused or exacerbated by drainage obstructions such as landslides, ice, or debris.

Rapid flooding events, including flash floods, more often occur on smaller rivers, rivers with steep valleys or rivers that flow for much of their length over impermeable terrain. The cause may be localized intense thunderstorms or sudden release from an upstream impoundment created behind a dam, landslide, or glacier. Dam-building beavers can flood low-lying urban and rural areas, occasionally causing some damage.

- **Estuarine and coastal**

Flooding in estuaries is commonly caused by a combination of sea tidal surges caused by winds and low barometric pressure, and they may be enhanced by high upstream river flow. Coastal areas may be flooded by storm events at sea, resulting in waves over-topping defences or in severe cases by tsunami or tropical cyclones. A storm surge from a tropical cyclone falls within this category.

- **Catastrophic**

Catastrophic flooding is usually associated with major infrastructure failures such as the collapse of a dam, but they may also be caused by damage sustained in an earthquake or volcanic eruption.

Effects

- **Primary**

The primary effects of flooding include loss of life, damage to buildings and other structures, including bridges, sewerage systems, roadways, and canals. Infrastructure damage also frequently damages power transmission and sometimes power generation also leading to loss of drinking water treatment and water supply, which results in loss of drinking water or severe water contamination. It may also cause the loss of sewage disposal facilities. Lack of clean water combined with human sewage in the flood waters raises the risk of waterborne diseases.

Damage to roads and transport infrastructure may make it difficult to mobilize aid to those affected or to provide emergency health treatment. Floods inundate farm land, making the land unworkable and preventing crops from being planted or harvested, which can lead to shortages of food both for humans and farm animals. Entire harvests for a country can be lost in extreme flood circumstances. Some tree species may not survive prolonged flooding of their root systems

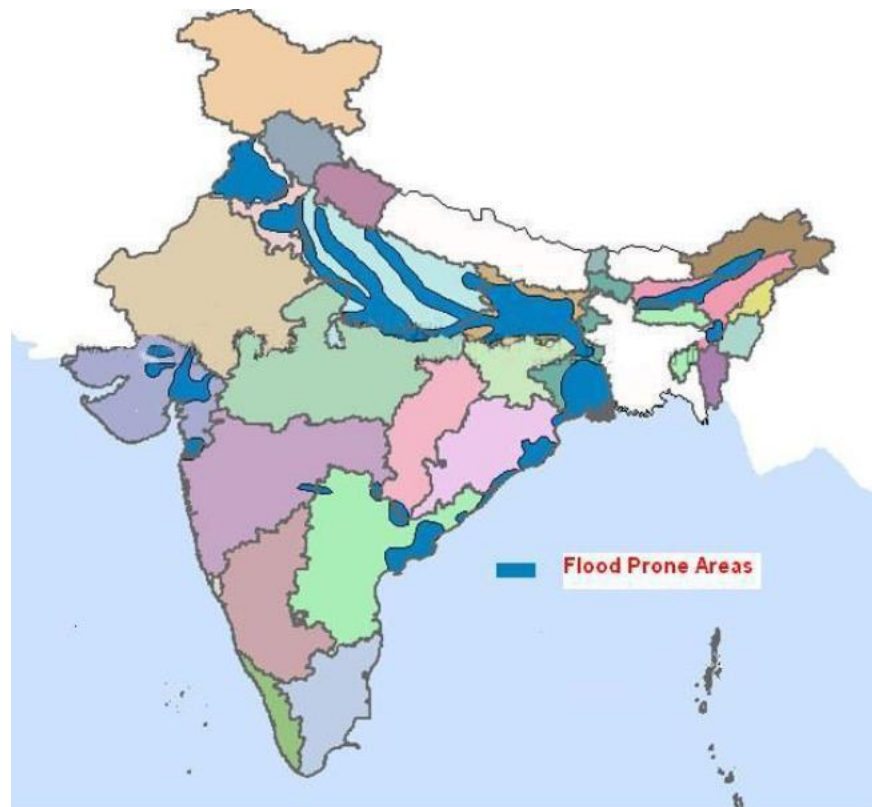
- **Secondary and long-term**

Economic hardship due to a temporary decline in tourism, rebuilding costs, or food shortages leading to price increases is a common after-effect of severe flooding. The impact on those affected may cause psychological damage to those affected, in particular where deaths, serious injuries and loss of property occur.

Damage risk levels for floods

The Govt of India instituted a technical group to study the material behaviour under submergence and formulate the below given damage risk from floods.

- a) **Very high damage risk (VH)** - Total collapse of buildings; roof and some walls collapse; floating away of sheets, thatch, etc.; erosion of foundation; severe damage to life line structures and systems;
- b) **High damage risk (H)** - Gaps in walls; punching of holes through wall by flowing water; parts of buildings may collapse; light roofs float away; erosion of foundation, sinking or tilting; undercutting of floors, partial roof collapse;
- c) **Moderate damage risk (M)** - Large and deep cracks in walls; bulging of walls; loss of belongings; damage to electric fittings;
- d) **Low damage risk (L)** - Small cracks in walls; fall of fairly large pieces of plaster;
- e) **Very low damage risk (VL)** - Fine cracks in plaster; fall of small pieces of plaster;



Causes of flooding in India

- Excessive rainfall in river catchments or concentration of runoff from the tributaries and river carrying flows in excess of their capacities.

- Backing of water in tributaries at their confluence with the main river.
- Intense rainfall when rivers are flowing full.
- Poor natural drainage.
- Landslides leading to obstruction of flow and change in the river course.
- Cyclones and very intense rainfall when the El Nino effect is on a decline.
- Imbalances in land use & Deforestation
- Earthquakes/ seaquakes that initiate tsunamis
- Failure of river embankments

Embankments failure and importance of close watch

It is necessary that a natural or artificial slope can be made out of earth, stones or bricks, or a combination of these in order to:

- Prevent or direct flooding by water
- To carry a road (railway, canal, etc.) over an area of low ground

An Embankment is an artificial bank raised above the immediately-surrounding land to redirect or prevent flooding by a river or lake. The main purpose of an artificial embankment is to prevent flooding of the adjoining areas; however, they also confine the flow of the river resulting in higher and faster water flow.

Types of Embankments -

- **Earthen Embankments** are simple compacted structures that rely on their mass to resist sliding and overturning and are the most common type of flood control measure found worldwide. Modern haulage methods and developments in soil mechanics since the end of the nineteenth century have greatly increased the safety and life of these structures.
- **Masonry Embankments** are constructed as wide walls of stones & cement that are built to stop water from flooding an area, or to support a road or railway specially near bridges.

Causes of Embankment Failure

- Shrinkage/Compaction of soil.
- Non-provision of adequate drainage
- Swell in the embankment
- Increase in pressure on the surface
- Rise in water levels beyond embankment
- Lack of maintenance
- Sedimentation
- Earthquakes

Protection & Emergency Repairs

• **Sand bag walling**

Although new styles of flood protection products have been developed in recent years, sandbags still provide valuable defence against flood water.

However, it is vital they are used correctly if they are to provide full benefit.. Local authorities must hold stores of sandbags at district level to use in the event of a flood.

Filling sandbags and building a wall can be strenuous so it is very important that all those involved are fit enough to help. The local flood plan should include a list of volunteers from the community who are willing and able to carry out the work.

Required equipment - Building a sandbag wall up to 600mm high requires approximately 80 filled (3/4 filled) sandbags per linear metre of wall to be built.

- To build a sandbag wall identify firm and level ground, free from obstructions.
- If the wall or dam is going to be in place for a long period of time PVC sheeting should be used to form a barrier on the wet side of the wall.
- If time and conditions permit sandbags should be compacted after being laid.

It is essential that everybody involved in building a sandbag wall is equipped with the appropriate personal protective equipment, including gloves, steel toecap footwear and hard hat.

Procedure for building sandbag walls -

- Lay alternate courses (Stretchers and Headers).
- Lay sandbags with seams and bag mouths facing inwards, as this is where moisture enters the bags.
- Shape the sandbags into rectangles before laying them.
- Use 3/4th filled sandbags to enable you to stagger joints.
- Have the neck of the sandbags facing the same direction.



-  **Wire crated stone walling** is a wire mesh cage or box filled with rocks for use in civil engineering for constructing embankments for protection of riverbanks or roadside ensuring erosion control.



Problems created by floods

Floods create damage from physical contact of goods, property, structures with floodwater, including damage from sediment, debris and other floating objects.

Major problem are –

-  Direct **Urban** Damages
 - Submergence of structures like residences & commercial enterprises
 - Collapsed Structures
 - Household durables, food, perishable items
 - Vehicles, equipments, public utilities
-  Direct **Rural** Damages
 - Loss of agricultural production
 - Loss of livestock, fodder
 - Loss of fences, levees, roadways, building
 - Homeless & marooned people
-  Indirect **Urban** Damages - All damages resulting indirectly from the flood, may occur during flood or afterwards
 - Loss of sales
 - Loss of wages
 - Disruption of transport, communication
 - Cost of removing goods, services
 - Monetary expenditure for cleaning up
 - Construction of temp facilities for homeless
-  Indirect **Rural** Damages
 - Cost of disrupted transport & communication
 - Moving of stock, equipment to higher grounds
 - Indebtedness
-  Social than economic damages which cannot be evaluated in financial terms
 - Disruption to personal activities
 - Cleaning up
 - Disruption to personal travel
 - Disruption to communication
 - Loss of health
 - Physical sickness
 - Psychological sickness
 - Risk of life

Role of District Administration

- Planning & developing an response system for flood emergency
- Putting the plans into action
 - Develop flood warning systems
 - Evacuation plans
 - Community Training programmes
 - Assistance for the victims
- Plan Recovery measures -

- **Short-term recovery**
 - Emergency shelter
 - Food
 - Medical care
 - Unemployment benefits
 - Restoration of essential services
- **Long-term recovery**
 - Loans for individuals, business
 - Reconstruction & rehabilitation

Flood Forecasting and Warning System in India

There are different Nodal Agencies providing Forecasts / Warnings relating to major Natural Disasters in India –

- India Meteorological Department (Cyclones, Floods, Drought, earthquakes)
- Central Water Commission of the Ministry of Water Resources (Floods)
- Geological Survey of India (Landslides)
- Department of Ocean Development (Tsunami)

Floods are recurrent disasters in India, which have led to approximately INR 1800 crores of losses annually. CWC's national flood forecasting and warning network comprises of 176 flood forecasting sites, which include 28 inflow forecasting sites and 148 water level forecasting sites. Through its 13 regional field offices, CWC issues forecasts by email, SMS, and through the CWC website to various user agencies, which include civil/engineering agencies of State/Central Governments, such as Irrigation, Revenue, Railways, public undertakings, Dam/ Barrage Authorities, and District Magistrates/ Sub Divisional Officers, apart from Defense Authorities involved in flood loss mitigation work.

Forecast formulation requires effective means of real-time data communication network from forecasting stations and base stations. Wireless communication system, installed in almost 550 stations, is the backbone of the communication system in support of flood forecasting activities. So far, 445 stations have been modernized with automatic data collection and transmission systems. Work is in progress to increase the total number of telemetered stations at the end of the XII Plan (2017) to 1,061.

Flood forecasting is mainly based on upstream water level observations. Mathematical models for Jhelum, Alaknanda, Bhagirathi, Ganga, Brahmaputra, Yamuna, Chambal, Baitarani, Vamsadhara, Subarnarekha, Mahanadi, Tapi, Godavari and Krishna rivers have been developed. Flood forecasting comprises of water level forecasting and inflow forecasting. Water level forecasts help user agencies to decide mitigating measures, such as evacuation of people, and shifting people and their movable properties to safer locations. Inflow forecast is used by various dam authorities in optimum operation of reservoirs, for safe passage of flood downstream, as well as to ensure adequate storage in reservoirs for meeting demand during non-monsoon period. India Meteorological Department (IMD) generates 3-day quantitative precipitation forecast (QPF) for several river basins. QPF-based flood forecasting system is developed and operational for Jhelum basin. Also, GLOF inventory has been prepared.

Priorities toward further development of the country's flood forecasting and warning system include:

- ☐ 2D inundation modelling for major flood-prone basins
- ☐ Updating of water level thresholds based on location, time, and season
- ☐ Real-time flood warning system o Flood plain zoning
- ☐ GLOF, LDOF, and cloud burst flood

- ☐ Inventory of all glacial lakes and water bodies
- ☐ Move from deterministic to probabilistic forecast
- ☐ International cooperation for access to upstream data
- ☐ Engagement with users, noting users' main focus on water level trend and flood onset, extent, and duration
- ☐ Improved coordination with user agencies

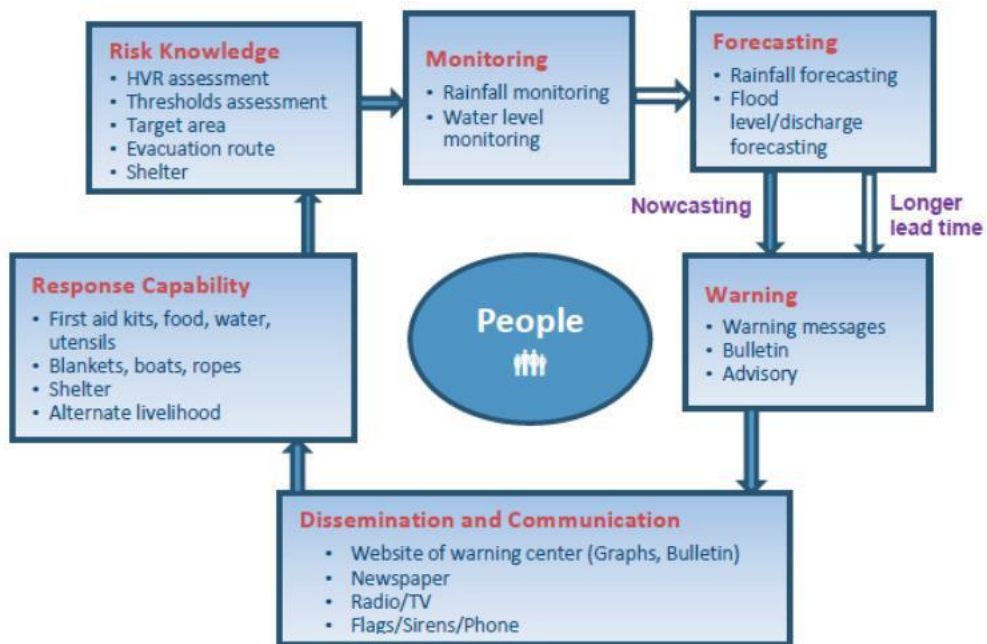
Flood Forecasting - Role of IMD

- ☐ Observation and Collection of Hydro-meteorological Data
- ☐ Transmission of data to forecast centers
- ☐ Analysis of data and formulation of forecast (Quantitative Precipitation Forecasts) & issue of heavy rainfall warnings
- ☐ Dissemination of forecasts/warnings to Flood Forecast Centres of CWC

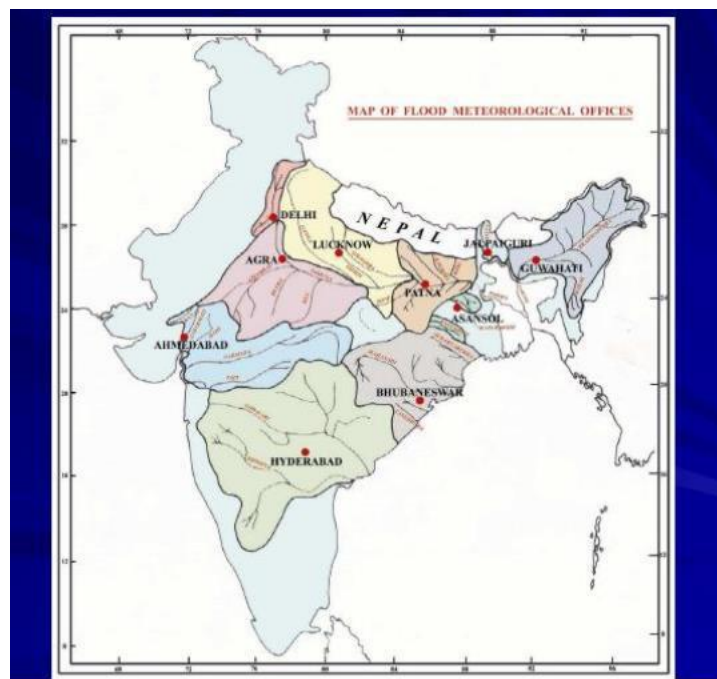
Flood forecasting and early warning is an efficient and cost effective method for minimizing the negative impacts of floods. Its purpose is to advise institutions and the general public on impending flooding, for taking mitigating actions. Flood warning should provide information on:

- ☐ Time of flood onset
- ☐ Magnitude of flood (water levels, discharges at key locations)
- ☐ Location and extent of flooding
- ☐ Duration of flooding
- ☐ Likely impacts

Flood early warning, to be effective, should provide adequate lead time for institutions and communities at risk to undertake preparatory and mitigating actions. The chain that starts with monitoring of extreme weather events, leading up to community level response can be functionally disintegrated into steps, wherein developmental interventions can contribute to preparedness and reduction in disaster risks at the community level. It is end-to-end when it involves a chain of activities that connects the technical and societal aspects of warning, from understanding and mapping of the hazard and monitoring and forecasting/predicting impending/ emerging harmful events, to processing and disseminating understandable warnings to authorities and the population and undertaking appropriate and timely actions in response to the warnings by involvement and participation of all stakeholders. Stakeholder feedback is a key feature, allowing post-event assessment for learning lessons, identifying good practices, and providing recommendations for improving the early warning system. These components of an end-to-end flood early warning system are illustrated below.



Early Warning System – Flood Warning Centers

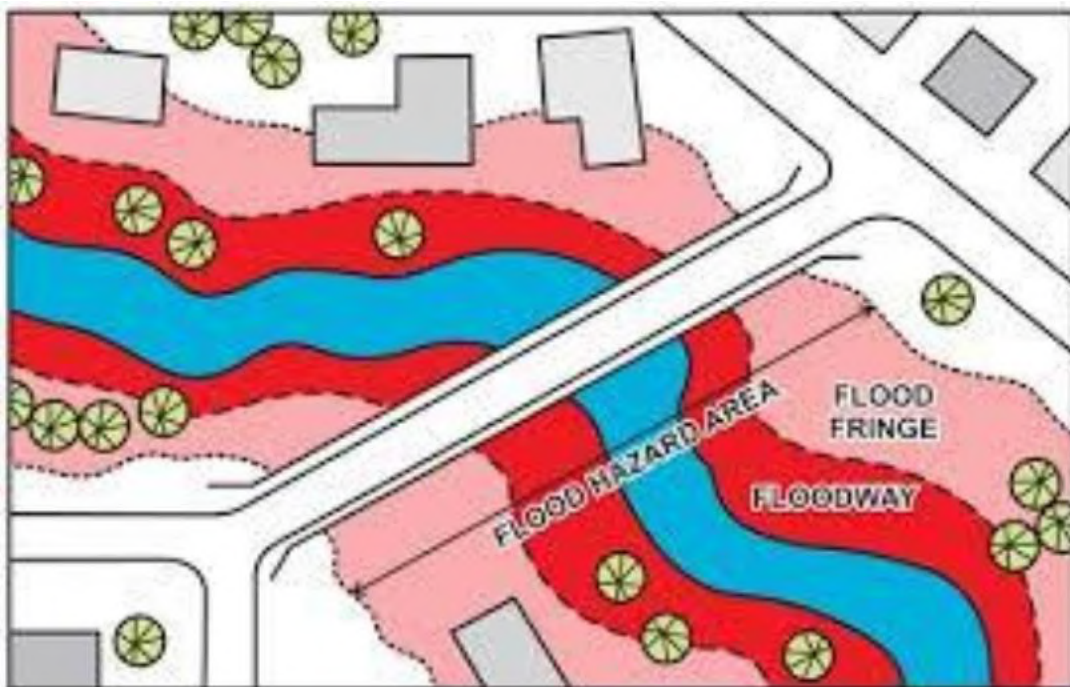


Community Risk Mapping

How can you reduce the vulnerability of your family, your friends and your belongings before a disaster happens? You can help your community to realize the risk of a disaster may happen and take preventive action. One of the best ways is to put up a hazard and risk map of your community.

A risk map is a big drawing or model of your community that you can draw or make with your friends' showing all the important buildings such as schools and hospitals, farm land, roads, and any other things that could be affected in the event of a disaster. It also shows potentially hazardous elements or places such as nearby areas that might get flooded, or very dry grasslands that can catch fire. It also shows all the resources, such as people and things that can help your community to get ready and protect itself, like the fire station, or a health care center. To show all these things you can draw symbols on the map. You can even invent your own symbols, as long as other people can understand them.

Risk maps help you to understand the hazards and risks in your community and encourage everyone in the community to take action to prevent a possible disaster or reduce its effects if it happens. For example, they show schools or other important buildings that are in high-risk area for floods or landslides. It also helps you be better prepared for a potential emergency. For example, they show you where the safest buildings are, or which are the best routes to follow if you are ordered to evacuate the area. This way, you and your community will know what to do in case of an emergency.



Surface Water Rescue

Pre-rescue Operations

It must be determined if this will be a RESCUE operation or a RECOVERY operation based on the survivability profile of the victim(s) which include factors such as the location and condition of the victim(s), and elapsed time since the accident occurred.

☐ MAKE THE GENERAL AREA SAFE

- Establish a hazard zone perimeter.
- Keep all non-essential rescue personnel out of the hazard zone
- Remove all non-essential civilian personnel at least 150 feet away from the hazard zone.

☐ MAKE THE RESCUE AREA SAFE

All personnel operating at or near the water shall be in proper personal protective equipment (PPE) which will include at a minimum: personal flotation device (PFD), approved water rescue helmet, and approved footwear.

1. Identify hazards that are present which include but are not limited to:
 - The volume of water.
 - The velocity of the water.
 - Debris in the water.
 - Hydraulics.
 - Depth of the water – rising / falling.
2. Assign personnel upstream.
 - Rescue personnel shall be assigned upstream to advise Rescue Sector of any upstream hazards that may affect the rescue operation.
3. Assign personnel downstream.
 - Rescue personnel shall be assigned downstream with throw bags to capture rescue personnel or victim(s) that may be washed downstream.
4. Assemble all necessary personnel, equipment, and patient packaging equipment that will be required for the rescue operation.

Rescue Operations

Technical rescue operations shall be conducted under the direction of Rescue Sector by trained Technical Rescue Technicians.

1. **RESCUE TEAM** - Rescue Team responsibilities shall include the following:
 - Ensure that all personnel operating in Rescue Sector are accounted for and wearing appropriate PPE.
 - Develop a rescue plan and a back-up plan.

- Ensure the plan and back-up plan, which include emergency procedures, are communicated to all personnel operating on the incident.

2. THE RESCUE PLAN

- Rescue operations should be conducted with as little risk to the rescuers as necessary to affect the rescue. Low-risk operations may not always be possible but should be considered first. The order of rescue from low-risk to high-risk are:
 - **TALK** – if water is calm or slow moving, try to talk the victim into self-rescue if possible.
 - **REACH** – extend an arm, pike pole, rescue hook, or any other such object to reach the victim and pull from the water.
 - **THROW** – attempt to throw the victim(s) a throw-bag rescue line or some other type of approved safety flotation device and “pendulum-belay” or “haul” the victim(s) to the bank.
 - **ROW** - If it is determined that a boat-based operation shall be utilized, Rescue Team shall assign a company on the opposite bank to assist in establishing an anchor for an approved rope system.
 - **GO** - If it is not possible to row to the victim, Rescue Team should consider putting a rescuer or rescuers in the water to reach the victim. This is a very high risk operation and shall be conducted exclusively by trained TRT personnel. Prior to entering the water, rescue personnel shall be briefed on the plan, the back-up plan and emergency procedures. Rescue personnel shall never be attached to a life line without the benefit of a quick-release mechanism approved for water rescue. Rescue personnel shall never do a “breath-hold” surface dive in an attempt to locate a victim beneath the surface of the water.
 - **HELI OPS** - Helicopter operations are considered high-risk and shall be decided upon through consultation with Rescue Team, Safety and Commander. Prior to considering the use of a helicopter for rescue operations, Commander must determine if a rescue-qualified pilot is available for the rescue operation. If so, the Pilot In Command (PIC) will have the final say on if and how the helicopter will be used in the rescue operation.

3. ASSESS THE VICTIM

When the rescuers reach the victim, a primary survey shall be completed. If the victim is conscious, rescuers should determine if the victim can assist in the rescue. If the victim is unconscious, the rescue must be completed as quickly as possible.

4. TREATMENT

- Initiate C-spine precautions as soon as possible.
- Conduct a secondary survey and correct any life threatening conditions.
- Provide for ALS level treatment and transportation to a hospital as indicated.

Termination

- Ensure personnel accountability.
- Consider decontamination of victim(s) and rescuer(s).
- Recover all tools and equipment used in the rescue/recovery. In cases of a fatality, consider leaving everything in place until the investigative process has been completed.
- Consider a Post Incident Critique (may be more appropriate at a later date).
- Return to service after returning all equipment to apparatus.

Recovering persons from water

The procedure for recovering a person or body from the water will be governed by a number of factors. These include:

- ☐ area of operations;
- ☐ resources available;
- ☐ current;
- ☐ weather, in particular, wind;
- ☐ calm or rough water;
- ☐ whether or not the victim is capable of assisting in the rescue; and
- ☐ hull type of the boat.

Whatever the situation, it is essential that the leader should carefully plan the operation. A hasty, unsuccessful reaction can cause loss of time, further endangering the life of the victim. The leader must exercise firm control during the operation, especially if there are persons other than crew members in the boat. It is essential that silence be maintained so that; the coxswains orders may be heard; and possible noises from a victim may be pinpointed.

Wherever possible, a person should be recovered from the water over the side or stern side of the boat. If the casualty must be taken aboard over the side of the boat, special care must be taken to maintain the balance of the boat. Never rock the boat to bring the casualty aboard due to the possibility of swamping or capsize. When recovery is over the stern, the motor must be stopped, not merely out of gear.

1. **Still Water:** The procedure for the recovery of a person from still water is:

- ☐ Attract attention of the coxswain or crew by shouting 'person in water'.
- ☐ If the person is capable of self-assistance, a buoy or a life jacket (at night a waterproof torch should be attached) should be attached to a line and thrown

near them. Do not throw items to the person unless it is certain that they can reach them.

- The crew must keep the person in sight. At night, a light is to be kept on the person.
- The coxswain must
 - slow down;
 - plan the pick-up;
 - stem the current and/or approach into wind; and
 - approach as slow as possible.
- If the pick-up is missed, the coxswain should go around in a large circle, rather than risk failing again with a short cut approach. It must be emphasised that the procedure outlined above is for still water and ideal conditions.

2. **Fast flowing water:** Help the person in the water to hold on to the side of the boat well away from the propeller. The boat should then be turned into the current and the person taken over the side of the boat. Some weight should be placed on the opposite side of the boat for balance to prevent capsize.
3. **Dangerous conditions:** A recovery in fast flowing, dangerous flood water requires an approach into the current with the coxswain stemming the current. Manoeuvre so that the person in the water drifts down the side of the boat. They must be grabbed before they get near the propeller and secured so that they are kept away from it.

The boat is then steered towards a safer area, at the same time sheltering and protecting the person in the water by keeping the hull between them and any debris is floating down.

Care must be taken not to broach the boat thereby increasing the risk. The coxswain must head the boat across the current.

No attempt should be made to take the person over the bow. Not only could they receive injury from floating debris if the boat is stemming the current, but the boat could pass over the top of them if an attempt was made to retrieve them while moving with the current.

Recovery of an Injured Person

The pick up operation is as previously described. However, if persons in the water are unable to help due to injuries, the crew must recover them having regard to their injuries. Basket stretchers can be safely used to recover people that cannot assist themselves from the water.

□ The procedure Basket Stretchers is –

- Attach life jackets to the foot end of the stretcher (if required).
- Position the boat alongside the person.
- Position the stretcher underneath the person.
- Then float the foot end of the stretcher until the stretcher is at right angles to the boat and the head end is closest to the boat.
- Grasp the head end of the stretcher and lift it on to the gunwale.
- Slide the stretcher over the gunwale and into the boat.

If suitable equipment is not available it may be necessary, depending on injuries, to tow the person to shore or shallow water to undertake recovery. If this is not possible then casualties must be recovered the best way possible with regard to injuries. In these situations the boat is trimmed so that the gunwale is closer to the water line so as to assist with the recovery of the casualty.

Recovery without equipment

Casualties can be brought into the boat without using equipment if necessary. The technique is to roll the casualty aboard over the gunwale, either from a position parallel with the boat's side or head-first into the boat especially in case of Inflatable Rescue Boats. FRBs with high freeboard (such as many of the large, flat-bottomed transport vessels) are generally not suitable for this type of recovery. Caution is needed when rolling a casualty in head-first, to avoid injury. Never attempt to lift a casualty into a boat on their back

Flood Rescue Emergency drills

Crew of FRB must be fully aware of the various emergencies they are going to encounter while operating in flood water and procedure to overcome those emergencies. Therefore this chapter deals with the various emergency drills to be performed by the FRB crew members.

Fire Drill

- ❑ All flood rescue boats must carry fire extinguishers. The extinguishers must be positioned where they can be easily stowed, seen, and picked up rapidly if necessary. They must never be stowed where stores or other equipment can be placed on them.
- ❑ The extinguisher must be placed away from fire sources e.g. fuel tanks or motors otherwise if these catch fire then it may not be possible to reach the extinguisher.
- ❑ In the event of fire, the following procedures must be carried out:
 - If possible steer the boat to keep the fire downwind. This may prevent the flames being fanned or the flames blowing back the boat.
 - Fight the fire.
 - If possible clear the area of gear, equipment or flammable equipment.
 - Cut off fuel and isolate tanks, if necessary and possible, throw tanks overboard.
 - If all else fails, capsize the boat.

Abandoning Ship

This is a last resort action. Ensure everyone is wearing a personal floatation device and check that they are being worn correctly:

- ❑ Send a radio signal or activate an emergency signal if possible. Give call sign, location, nature of problem, number of persons involved and what action you are taking.
- ❑ Do not jump into the water. You don't know what is below. Ease all persons into the water.

Capsize Drill

- ❑ If a boat has capsized, survivors should ensure no one is trapped inside the hull and all are accounted for. Recover all floating equipment and take action if possible to reduce equipment loss. The crew and passengers should stay with the boat as the boat will provide extra buoyancy; it is more easily spotted and will provide some protection from obstacles.
- ❑ All persons from a capsized or swamped boat must ensure they are positioned upstream of the hull to provide some protection from debris and to avoid bodies being crushed between the boat and fixed object eg trees, poles, rocks etc.

- When a boat capsizes:
 - Stay with the boat.
 - Use it to aid buoyancy and for protection.
 - If in flood water where there are trees, obstacles and fences, position the boat between you and the obstacle otherwise you may be trapped.
 - Right the boat if possible, and re-board. It will be full of water but will still float and provide some all round protection. Once inside, bail and splash the water out and try to paddle to a calm spot.
 - Remember that the safety of crew and passengers is more important than recovering the boat. If it is unsafe to remain with the boat the master should determine appropriate action.

Man Overboard Drill

If a person falls out of the boat the following procedure applies:

- Shout 'man overboard' and point to the person, attracting the coxswain's attention. Refrain from excessive movement. If possible throw the person a buoyancy aid.
- Note: The propeller presents a major hazard to a person in the water. If evasive action needs to be taken, the boat must be manoeuvred in such a way that the propeller does not come into contact with the person in the water.*
- The observer is to maintain a watch on the person in the water to direct the coxswain to them. At night a light should be kept on the person.
 - The crew carries out normal recovery drills of the person in the water.
 - When close to the person and if safety permits, the motor should be placed in neutral or stopped.
 - If unable to get downstream of the person, an approach may be made from upstream and reverse gear used to match the persons speed through the water while recovery is undertaken.
 - At all times during a recovery great care must be taken to avoid hitting the person and keeping the person away from the rotating propeller.

A person who has gone overboard and finds himself caught in a strong current should attempt to float on their back with their feet downstream as this will assist in avoiding injury.

Flood Rescue Boat Emergency Procedures

During flood rescue boat operations, emergencies of various kinds may arise; be the motor breakdown, loss of motor overboard, illness or injury to a crew member, or an accident of one kind or another. Experience has shown that set rules and procedures will reduce confusion in these circumstances.

Accident/Emergency

Should an accident or an emergency occur during operations involving flood rescue boats the following procedures are recommended:

- ☐ The flood rescue boat team makes an immediate radio call and informs headquarter of:
 - the problem (e.g. an accident);
 - seriousness of the problem (i.e. major or minor);
 - what the crew are doing about it;
 - the location of the incident; and
 - other boats in the vicinity.

Radio Failure

Should the flood rescue boat in distress lose radio contact as a result of the emergency, or have a radio failure, the nearest flood rescue boat to the boat in trouble will contact the headquarter. It will then become the communications link with the boat in distress and will stay until its services are no longer required.

Casualty Handling & Recovery

FRB Crews may encounter various types of casualties. If there are doubts as to the severity of injuries or illnesses or the treatment required, professional advice should be requested from a doctor or nurse. All Flood rescue boat crew should have current first aid knowledge and skills. When it is necessary for crews to go ashore to conduct rescue and transport of an injured, the following points must be observed:

- ☐ Secure the boat correctly.
- ☐ Once ashore remove life jackets to avoid snagging.
- ☐ First-aid equipment (kits, blankets, stretchers, lashings etc.) should be taken from the boat to save time.
- ☐ If on call-out, the operation is identified as a casualty evacuation, take an ambulance officer-in-charge, if possible.
- ☐ If a HF radio is to be used ashore and the terrain is bushy or rough, turn it off and remove the aerial to prevent damage whilst travelling.

2. Transport of an Injured

- ☐ Stretcher cases are to be blanketed and lashed to the stretcher, if necessary, and transported to the flood rescue boat. Before a stretcher is loaded into a flood rescue boat, the lashing should be removed from the patient and a life jacket fitted, having regard to injuries.
- ☐ Patients are not to be lashed to the stretcher again until they have been removed from the boat. The stretcher is lashed into the boat. A person qualified in first-aid is to attend to patients and reassure them during the trip.

Flood Water Behavior

It is important to know about a river and the habits of floodwater and moving water before attempting to put a FRB on it. There is enormous power in moving water and it must not be underestimated. The basic principle of operating a FRB in moving water is to avoid or minimize the power of the water or make it work to your advantage.

The force of water

As the speed of water increases, so does the force. Every time the water speed doubles, the force of the water multiplies by four.

How fast can water flow?

Experts have measured alpine river speeds, and the fastest water found, even on steep, runoff-swollen alpine rivers, was 17.5 km/h. Sections of the river where observers thought the river moved ‘very fast’ were actually measured at 12 km/h.

In constructed flood channels, where there is a smooth bottom and sides with no obstacles, water speed has been measured at over 48 km/h.

As water speed increases, so does its carrying capacity. Rivers in flood can carry very heavy objects like boulders and trucks, and can destroy buildings and bridges. When a river’s speed and volume decrease, heavier objects begin to settle, leaving the characteristic debris trail of a flood.

Important characteristics to note are that:

- ☐ **moving water doesn’t let up**—unlike ocean waves that break and then ebb, floodwater currents push against an object continuously. Once in the current, do not expect any relief from the water’s force.
- ☐ **moving water is predictable**—while fast-flowing water may look random and confused, it is not. Moving water is actually predictable and acts the same in a small creek as in a large river; it is just a matter of scale.

River variables

The nature of any river depends on three things:

- ☐ The amount of water
- ☐ How fast it moves
- ☐ What is in its bed and along the banks.

If any of these variables change, the river changes. This can happen very quickly. Rivers are gravity driven. The greater the fall between two points, the faster the water moves.

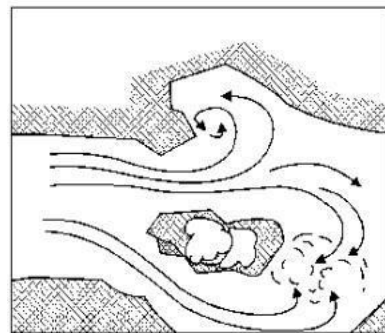
As a river rises in a flood, it picks up debris from the banks. If the river seems to have more debris than usual, it is a good indication that the water is rising. Generally speaking, as a river's gradient and volume increases, so does the size and number of rapids.

Rivers in flood

Most rivers have a range of normal levels where the river flows within its banks and is relatively predictable, such as low water during a drought and high water after a storm. Floods, however, are outside the usual range of river conditions and cause a river to overtop its banks and flow through the flood plain or the low areas along the river. In the process, it becomes less predictable and more dangerous.

Under flood conditions:

- ☐ The size and power of a river are greatly increased, as is the carrying capacity
- ☐ The river's swollen main current strikes the bank and ricochets off, instead of gently rounding, a bend
- ☐ Almost all river hazards become more dangerous and new dangers are created (e.g., there may not be enough clearance under a bridge or power lines for a boat to pass)
- ☐ Floodwaters are laden with debris, which can clog intakes and foul boat propellers
- ☐ Trees and other heavy objects join the river's flow, often collecting against bridges to form strainers or natural dams
- ☐ As the river flows through built-up areas and farms, the danger of contamination from pesticides, sewage, dead livestock and chemicals greatly increases
- ☐ Eddies, eddy lines, whirlpools, standing waves and rapids may form in rivers that are normally slow moving and tame.



Rules of the River

- ☐ The boat which is coming to the home bank will give way to the boat which is going to the far bank
- ☐ Rowing boat should give way to all other boats
- ☐ Steam boats and motor boats should give way to all sailing boats

- ☐ Small boats will give way to large boats
- ☐ In night time red lamp should be provided at the port side and a green light at the starboard side
- ☐ Overtaking is allowed through starboard side only
- ☐ All boats should give way to captive ferrying boat
- ☐ Nobody will go to the water without permission
- ☐ In case of use of flying ferry red flags and red light should be used in day and night respectively on both the road and the river
- ☐ Indication by whistles
 1. One whistle- movement towards star board side
 2. Two whistle-movement towards port side
 3. Three whistle-movement towards front

Safety precautions

- a. All should wear life jackets when working in water
- b. Reconnaissance boat should be in ready position
- c. All safety stores should be carried in boats
- d. Depth of water should be checked before loading
- e. Boat crew should know swimming well.

Personal Equipment and Hygiene

- ☐ **Clothing:** When operating during floods, weather conditions may change rapidly and crews should be prepared accordingly. Consideration should be given to protection from sunburn, cold and insects by selecting suitable clothing. Consideration must also be given to the effect clothing will have on freedom of movement and personal floatation. Wearing wetsuits is an option that may be appropriate.
- ☐ **Footwear:** Always use footwear while operating flood rescue boats. Bare feet are easily injured by objects in the boat and crew members will often have to wade in debris-strewn shallows. Footwear should provide protection, support and warmth for feet and ankles. Wearing woolen socks will help protect feet from sharp objects and cold. Gum boots or thongs must never be worn in flood rescue boats.
- ☐ **Hygiene Threats:** All floodwater should be treated as contaminated. It is advisable not to participate in flood operations with open wounds or cuts, or during a menstrual cycle. During flood operations it is advisable to cease shaving to avoid skin irritation or infection.

Flood Rescue Boats

Watermanship is the art of operating or riding in a boat. It covers many topics and would be defined in different ways by different people. For Flood Rescue Boat crews it is highly important to have knowledge of the flood rescue boat, its parts, rope work, anchors/anchoring boat-handling skills and rowing/paddling.

Knowing the Boat

Boat handling in adverse conditions is a flexible and individual matter, since no two boats are exactly the same in the same water conditions. Each hull design reacts differently, as do individual boats of the same type, because of factors such as trim, load etc. Team leaders and crew must know their boat. Training, of course, enhances the skills which are of great help but the real coxswain only emerges after being out in fast debris strewn flood waters.

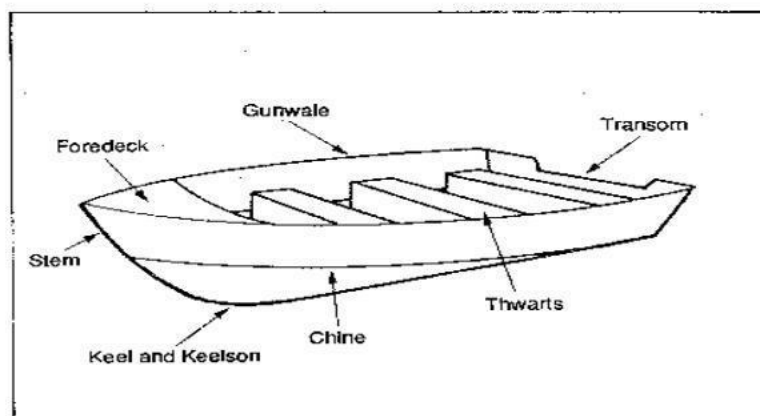
The flood rescue boats are vital and indispensable appliances in a flood affected zone. Without boats rescue operation in a flooded area is unthinkable. The boats will be useful for the following services in such calamity.

- ☐ Spot reconnaissance by emergency officials to ascertain the extent of damage.
- ☐ Rescuing marooned people from water logged area to a safe bank.
- ☐ Picking up floating living and dead bodies from water.
- ☐ Throwing of breast lines for help to a floating man in distress.
- ☐ Reaching the victims all other types of relief such as food, clothing, medicine, tents etc.

Tidiness and Safety

The Flood Rescue Boat must be maintained in first class working order. Ensure the decks are kept clean and free from obstacles, equipment is stowed in an appropriate stowage and fuel and oil spills are cleaned up promptly and properly. Tangled ropes and lines are a particular hazard therefore ropes should always be kept neatly coiled for instant use.

Parts of a Boat



- ☐ **Starboard:** The right hand side of a vessel looking towards the bow.
- ☐ **Stern:** The rear or back end of a vessel.
- ☐ **Port:** The left hand side of a vessel looking towards bow.
- ☐ **Bow:** The front of the vessel.
- ☐ **Hull:** The main body or shell of the boat.
- ☐ **Keel:** The member joining the two halves of the hull bottom usually along the hull centre line.
- ☐ **Keelson:** A reinforcing member to protect the keel and assist in directional stability.
- ☐ **Gunwale:** The continuous strip around the top of the hull.
- ☐ **Thwarts:** The seats built into the hull. Originally those that run across the hull. These often provide floatation and hull structural integrity.
- ☐ **Transom:** The flat back section of the boat joining the two hull sides to form the stern upon which an outboard motor may be mounted.
- ☐ **Chine:** The turn of the hull where the hull sides join the bottom of the hull.
- ☐ **Stem:** The rising or vertical section at the front of the boat where the hull sides meet to form the bow.
- ☐ **Rowlocks:** The brackets which are used as pivot points between the hull and the oars.

Boat equipment

The equipment mentioned hereunder will vary according to the types of boats. I.e. all boats will not have all the equipment mentioned below; but requirements of every type of boat will be fulfilled from the list

- ☐ Steering oars
- ☐ Paddles
- ☐ Emergency repair patch
- ☐ Breast line
- ☐ Park picket
- ☐ Anchor
- ☐ Mooring line with pin
- ☐ Foot pump or rescue boat mark II
- ☐ Oars (knife or spoon type wooden item)
- ☐ Boat hook
- ☐ Bailer
- ☐ Mop
- ☐ Lashing line
- ☐ Out Boat Motor (OBM)

Types of Boats

Boats are appliances which are of utmost importance in flood operations. Hence it is necessary that the rescuers should know the types of boats which may be in operation in the flood affected area.

- ☐ Fiberglass Rescue Boat –



- ☐ Inflatable Boats



- ☐ Row boats



- ☐ Life Boats



- Military Boats



- Dinghy



Boat Maintenance

A most necessary part of the care and maintenance of a FRB is cleaning after each use and at regular intervals when garaged. The cleaning procedure for a typical aluminium hull is as follows:

- Hose down the hull with clean; fresh water to remove dirt or salt and to soften stains, rubbing down with a soft brush or cloth will assist.
- Using a soft scrubber and detergent, scrub the hull to remove stains. Do not over-scrub antiskid patches or abuse the paintwork.
- Suds should be hosed off with fresh water and excess water drained from the boat.

Use of Ropes

Rope

Rope is in common use in Flood Rescue Boats (FRB) and knowledge of ropes and knots is essential for boat crew. Details of rope construction, care and maintenance and various knots are given. Some of the rope work skills specific to FRB operation follow.

Ropes form an important item in Rescue equipment. Since an insecure or a wrong rope, or a bad splice or a wrong knot, which will not carry the required strain may cause considerable delay in operations and also involve risk.

Measurement of ropes

Ropes are measured by their circumference and are described as such in inches (millimetres). The word rope is usually applied to rope of one inch (25.40 mm) circumference and above. Smaller sizes are known as cord or line.

Strength of rope

Rope tensile strengths are based on test of new unused rope of standard construction in accordance with manufacturer's standard test methods. It can be expected that strengths will decrease as soon as a rope is put into use. Because of the wide range of rope use, changes in rope conditions, exposure to the many factors affecting rope behaviour, and the possibility of risk to life and property, it is impossible to cover all aspects of rope applications or to make blanket recommendations as to working loads.

All rope should be stored clean, dry, out of direct sunlight, and away from extreme heat. It should be kept off the floor and under no circumstances should cordage and acid or alkalis be kept in the same building. Some synthetic rope (in particular polypropylene or polyethylene) may be severely weakened by prolonged exposure to ultraviolet (UV) rays unless specifically stabilized and/or pigmented to increase UV resistance. UV degradation is indicated by discoloration and the presence of splinters and slivers on the surface of the rope.

Strength of rope and its ability to withstand strain and stress depend upon the following factors:

- a. The material of which it is made.
- b. How it is made?
- c. How the rope is used?
- d. Care and prevention during and after its use.

1.1 Rope knots

In rescue work knotting and lashing are required for joining and securing ropes and fastening hoist around objects and persons, and to lower hoist or secure with safety. Knots must be tied tightly.

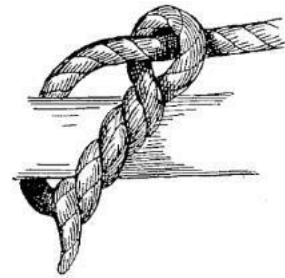
Important terms using in connection with ropes

Following are some important terms while using ropes for knots and lashing:

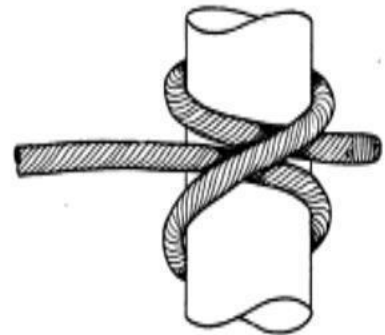
1. **Anchored:** Fastened to any immovable object e.g. large tree, post or picket well driven into firm ground for this purpose.
2. **Bight:** An open loop in a rope.
3. **Haul:** The act of pulling a rope.
4. **Hitch:** A closed loop on a rope. It means simple fastening of a rope around any object by winding and crossing one turn over another turn so that one bit on the other without actually knotting the rope.
5. **Paying out:** to ease off or slacken a rope.
6. **Reeve:** The act of threading of ropes through pulley or blocks.
7. **Running End:** The free end of a rope with which the knot is made.
8. **Standing part:** That part of the rope which is taking the load.

Types of knots

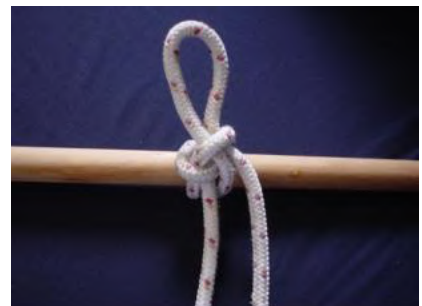
Timber hitch: This is made quickly and temporarily to secure a rope to a plank or a spar. Make a half hitch on the standing part of the rope leaving a long end which is twisted back and given a minimum of three turns. When used for lifting planks and spars, this hitch should be used along with a half hitch at the upper end of the plank or spar.



Clove hitch: This hitch is formed by forming two loops in the centre of rope, one in the left hand, the other in direction. Then the right hand one is passed in front of the other loop. Both are now passed over the spar and drawn tight. If the clove hitch is to be made at the end of a rope, pass the running end round the spar, bringing it out underneath the standing rope. Pass the running end round the spar again above the first half hitch, bringing the running end under itself to tighten pulling both the running end and the standing part. This forms the basis of many securing knots and can be used in the end or in the centre of a rope.



Draw hitch: It is formed as follows - a bight is passed around the spar and a second bight, which is then formed on the standing part of the rope, is passed through the first bight. A third bight is formed with the short end and passed through the second bight and whole tightened up by pulling on the standing part. The bights should be tightened as much as possible at each stage. This is quite



satisfactory on a round spar but not reliable on a square timber. This hitch will stand a considerable amount of strain on the standing part and yet can be easily released by jerking the free end. It is useful for self-recue and then recover the rope very easily.

Bowline: Take the running end of the rope in a right hand, pull it across the upturned palm of the left hand, through the fingers of the left hand, forming a loop to required size, pass the running end, which is held in right hand, up through the loop in the left hand, then underneath the standing rope and back down through the loop. Tighten the two ends. This is useful in recovering casualties from under the debris or basements, where the rescuer has to crawl to the casualty and back again



Fisherman's bend: This is related to the round turn and two half hitches and is made by forming a round turn on the spar or other line to be secured, and making a half hitch round the standing part of the line in such a way that it passes through the round turn. A further half hitch is next made with the end on the standing part. The end should be seized to the standing part. This is also used for securing a line to a spar or to another line.



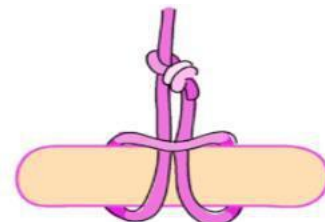
Ship shank: It is formed by gathering up the amount by which it is desired to shorten the line. Half hitches are then thrown round the ends of each bight. The two bights then should be seized



Midshipman's hitch: It is made by putting a half hitch well up on the shank of the hook of a pulley block and the part of the hitch is then placed over the bill of the hook.



Bale sling: It is used for slinging a cask in upright position. The task is placed vertically on the end of the line. An overhead knot is then formed with both ends of the line on the top of the cask and open head of the cask and hauled taut, the ends being tied above the cask by reef knot.



Flood Rescue – Words of Command for Rowing Boats

While rowing boats it is important to have a co-coordinated working and understanding amongst the crew members so that the task is performed with discipline and efficiency. In waterman ship also there is need for maintaining drills in rowing of boats. The drill is performed with Commands called 'words of command' in Waterman ship. These commands should be brief and without any ambiguity or confusion.

Step one : Before entering the boat

- ☐ Crew fall in single line-tallest to right, Shortest to left-size in single rank size.
- ☐ From the right number.
- ☐ From the right in 'Two's number.
- ☐ Open rank march (odd number one step forward,
even number one step backward)

The crew will cover one behind the other;

- ☐ **Crew Detail** : Odd number (front-rank) star board side-
Even number port side (rear rank)

- ☐ ☐ ☐ No. 1 and 2 stroke (near to & facing coxswain)
- ☐ ☐ ☐ 3 to 8 (3, 4, 5, 6, 7 & 8) rowers (facing coxswain)

(Note : If the crew numbers are less, the rowers will be less to that extent)

- ☐ ☐ ☐ No. 9 Bow man
- ☐ ☐ ☐ No. 10 Coxswain (Commander)

- ☐ ☐ ☐ **File in**: The Crew will take right turn. Bow man (No.9) enters the boat and keep the boat ready for loading. He will be on the shore holding the bow end.
- ☐ ☐ ☐ Next the Coxswain/Commander enters into the boat and takes his position at the stern end and gives the word of Command.
- ☐ ☐ ☐ The rowers will take right turn and pick up one oar each which is kept at the right side and get into the boat.

1, 3, 5, 7 to Starboard side}
2, 4, 6, 8 to Port side } Facing Coxswain

- ☐ ☐ ☐ **Shove off Forward** : The bow man pushes the boat bow end towards upstream.
- ☐ ☐ ☐ **Trim the Boat** : The bow man Steadies the boat for rowing forward.
- ☐ ☐ ☐ **Take up Oars** : If the oars are already kept in the boat, the rowers will pick up oars and hold in vertical position keeping blade up and handle down.
- ☐ ☐ ☐ **Stand bye to down Oars** : The rower will hold the handle bending down-wards.

- □ □ **Down Oars:** -- Keep the Oar in the rowlocks in the rowlocks in line with the Gunwale and blade in its vertical position.
 - □ □ **Stand bye to give way :** The rowers will stretch forward and the Oars are held 3" to 4" above the water.
 - □ □ **Give way all:** All the rowers will dip the entire blade and push the water counting (Two...one) On count two.....the water is pushed and on 'one' the oars the oars are held out of the water and brought backward and dip the blade in the water.
 - □ □ **Port Side Hold Water:** In case the direction of the boat has to be changed towards the left side, the rowers of the Port-side will hold water keeping the blade in the water.
 - □ □ **Star Board Side Hold Water:** If the direction of the boat is to be changed to right, the rowers of the star board (right side of coxswain) will hold water keeping the blade in the water and port side will continue to row.
 - □ □ **Hold Water All:** If the boat has to be stopped (in still water only), this word of command is used. All the rowers will stop rowing and keep the blade in the water.
 - □ □ **Toss Oars:** Wherever compliments are to be paid to seniors, this word of command is used. All the rowers will keep the oars vertical, inside the boat and the coxswain turns his head towards the direction of the senior officer. Sometimes, this word of Command is used to avoid the dashing or crashing of two boats either in same direction or coming from the opposite direction.
- On this word, of Command, the rowers will take two strokes and lift the Oars on third count. (one-two-three)
- □ □ **Way enough:** If the rowing is to be stopped, this word of command is used. On this word of command, the rowers will take three strokes counting 1, 2, 3 and lift the oars vertical on count of 4.
 - □ □ **Back Water:** In an emergency, this word of Command is used either for turning the boat on its axis or to reverse direction.
 - □ □ **Lay-in-Oars:** If the Oars are to be kept inside the boat, this word of Command is used.
 - □ □ **File Out:** The bow man will jump out and steady the boat. Others will get down and fall in single rank as they were at the beginning. The Coxswain will number them and reports to the leader seeking permission to break off.

Corpse Disposal

Introduction

The composition of a team to manage mass fatalities in disaster situations will vary from country to country, region to region, and from event to event, depending on many factors. Some of these factors are: the availability of qualified people who are physically able to do the work, the availability of essential materials and equipment, the response capacity of the affected country, the specific conditions at the disaster site, and how knowledgeable the decision-makers are about the policies governing management of mass fatalities.

The work of handling, identifying, and disposing of dead bodies is based on forensic sciences and requires a multidisciplinary team. It is important to emphasize the close association that should exist among the professionals who perform this work. However, it may be impossible to mobilize a qualified team so it is necessary for the acting physician to understand the most important principles of managing dead bodies, and, in the absence of medico-legal experts, to carry out these tasks to the best of his or her abilities.

Notwithstanding the variety of conditions, there are certain premises that should be followed so that the organization and preparation of work done by medico-legal specialists is successful. They can be summarized as follows:

- ☐ Ability to rapidly locate and mobilize the team;
- ☐ ☐ ☐ Minimal need for material resources;
- ☐ ☐ ☐ Adaptability to difficult working conditions;
- ☐ ☐ ☐ Support from local health services and other institutions;
- ☐ ☐ ☐ Rapid and effective information processing; and
- ☐ ☐ ☐ Unified command in cooperation with the other participant

At least three working areas will be needed: the holding area, viewing area, and examination area. The size and characteristics of each depends on the nature of the event and the resources at the site.

Holding area

The human remains will be placed in a holding area as they arrive from the recovery site. The holding site must bring together certain basic conditions ranging from privacy, which is essential, to a place out of the sun where corpses can be placed, thereby slowing decomposition. In tropical countries or where temperatures are high it is advisable that this area be refrigerated to try to avoid decomposition, which is likely especially as a result of the injuries sustained.

The bodies should be arranged on their arrival to facilitate identification by classification. They should be placed in predetermined spaces, and classified by groups according to sex, skin color, and age. Other classifications can be added such as biotype and color and length of hair, and later, elements that require measurement, such as height and foot size, among others, can be added.

Viewing area

Visual recognition may be necessary for identifying a corpse. This identification process is codified in many countries and is an important element of routine medico-legal work, not only in disaster situations.

It is important to have a viewing area for family members, friends, or others who can help in the identification. First, photographs of jewelry, clothing, or identifiable objects or features found in the examination of the human remains will be shown. During the second phase family members and others will view photographs of the bodies and especially of the face if there are features that can help with identification. In the third phase, objects and, finally, the remains themselves are shown directly to family members or associates to conclude the visual recognition phase and obtain the desired identification.

Examination area

Since it is always necessary to examine the exterior of the human remains, including clothing, an examination area is needed. Autopsy is not necessary for all victims of a disaster, although it is advisable in some cases and essential in others. A station for conducting autopsy is needed in the examination area.

Instruments and Equipment

Rescue teams, whether firefighters, military, or civil defense workers, should have certain basic equipment. This includes equipment for tracking, debris removal, cutting, compression or decompression, fire extinguishing, illumination, and other basic activities linked to the work of search and recovery.

The teams should also have stretchers that can fold and are as light as possible, since bodies are often recovered in uneven terrain where it is impossible to use wheeled gurneys. Gurneys can be placed at intermediate receiving points where the ground is level, and can even replace typical work tables.

FLOW CHART FOR DISPOSAL OF DEAD BODIES AT DISTRICT LEVEL

1. Activate the DM Plan.
2. Nodal Officer in the Incident Response System will activate all other stake-holders associated with Disposal of the Dead.
3. Establish an Information Centre at the site of Disaster/District HQ.
4. Inform all other Stake-holders, both in government and Non-Governmental sector, including the elected, Panchayati Raj functionaries and the community
5. Activate Search and Rescue teams of Fire & Emergency Services, Police, SDRF, Civil Defence, NDRF and NGOs for the retrieval of the injured and the dead.
6. The injured will get the priority for First Aid and evacuation to hospital.
7. Prepare a record of details of the bodies retrieved in the Dead Body Inventory Record Register, allocated Individual Identification Number, photographed, and then Dead Body Identification Form initiated.
8. Associate relatives and community members for the identification of the bodies.
9. Hand over the identified bodies to the relatives or the community, and if necessary after cross-matching Dead Body Identification Form with that of the Missing Person Form, for the last rites as per local, cultural and religious denomination.
10. Unidentified or unclaimed dead bodies/body parts shall be transported to the mortuaries for proper preservation and storage at the designated sites.
11. Consult relatives, legal and forensic experts for positive identification.
12. Final disposal of unidentified bodies/body parts shall be done by District authorities after applying all the possible means of identification as per the legal provisions.
13. The bodies of foreign nationals shall be properly preserved either by embalming or chemical methods and then placed in body bags or in coffins with proper labelling. Handing over and transportation of such bodies shall take place through the Ministry of External Affairs, in consultation with the Consular offices of the concerned countries and other actors such as the International Committee of the Red Cross, if necessary and possible.

Use of Life Jacket and Life lines

A life jacket or **personal flotation device** (abbreviated as **PFD**; also referred to as **life belt**, **life vest**, **buoyancy aid** or **flotation suit**) is a piece of equipment designed to assist a wearer to keep afloat in water. The wearer may be either conscious or unconscious. PFDs are available in different sizes to accommodate variations in body weight. Designs differ depending on wearing convenience and level of protection.

Life jackets for outfitting large commercial transport ventures in potentially dangerous waters, such as coastal cruises, offshore passages, and overwater air flights, consisting of either a single air chamber or a pair of (twin or double) sealed air chambers constructed of coated nylon (sometimes with a protective outer encasing of heavier, tougher material such as vinyl), joined together. For use aboard ships they may be constructed of foam.

Quality life jackets always provide more buoyancy than offered by the buoyancy aids alone. The positioning of the buoyancy on the wearer's torso is such that a righting moment (rotational force) results that will eventually turn most persons who are floating face down in the water (for example, because they are unconscious) into a face up orientation with their bodies inclined backward, unlike more simply designed common foam buoyancy vests.



Life lines

A line (such as a rope) **used** for saving or preserving life that is launched from the outer edge of the deck of a boat or ship is referred to a Lifeline.

Throwing lines fly better through the air if the end is weighted, and this is one knot for the job. Tied in a length of cord it makes a neat, convenient hank to carry in a rucksack or on a belt loop.



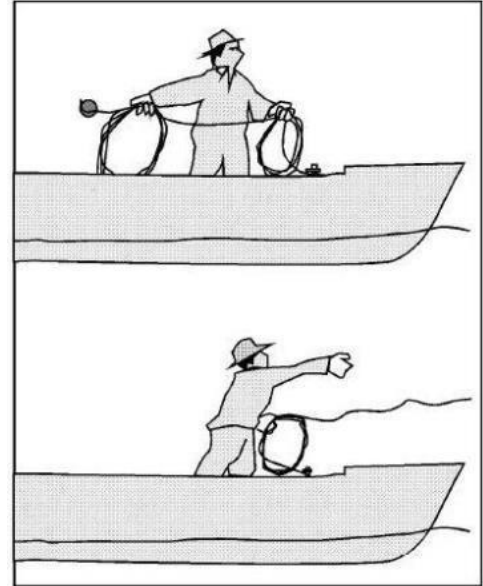
Throwing a Life Line (Breast Line) to a drowning victim

- ☐ A breast line is required to be thrown either from –
 - **Boat to water** - The line is thrown to saved a drowning / drifting victim in the water
 - **Boat to Shore** - The line is thrown to a person standing on shore to tie to moor the boat
 - **Shore to boat** - The line is thrown to save a drifting boat in a river.
- ☐ Size of Lifelines:

- Lifeline should be made of 1 ½ inch (circumference) cordage
- It's length should range between 48 feet to 60 feet

There is more than one method of throwing a breast line and most good throwers have their own variation:

- One method is that 1/3 of the line is taken in the right or throwing hand; the line is then thrown with the right arm straight and it must be allowed to run out freely from the coil in the left hand. The most frequent cause of bad throw is the failures to have this coil properly clear for running.
- Another method is that less than half the coil is taken in the right hand and both the halves are thrown together, letting go the right hand before left.
- Before throwing a line the standing end must be made fast to a fixed object with a clove hitch. At the running end a small weight or a heaving line knot may be tied.



To rescue a drowning victim the breast line may be tied with a lifebuoy or a life jacket on the other end to keep it afloat for the victim.



If possible to reach the victim the close enough, a oar can be extended to assist the victim to reach near the boat and then hauled on board.

UNDERWATER SEARCH AND RECOVERY

In order that a search for a missing person or overdue vessel is effective, it is essential that search patterns and procedures should be planned and rehearsed so that flood rescue boat crews can work together and join in with police and other search vessels with a minimum of difficulty or delay. However, flood rescue boat crews often operate in country areas where there are no boating facilities belonging to other organizations and therefore, they will have to carry out search operations using their own resources. Lakes, rivers and estuaries are the areas in which flood rescue boats are equipped to operate and they are usually the best vessels to carry out basic search operations on inland waters.

Basic Underwater Search and Recovery

Drowning

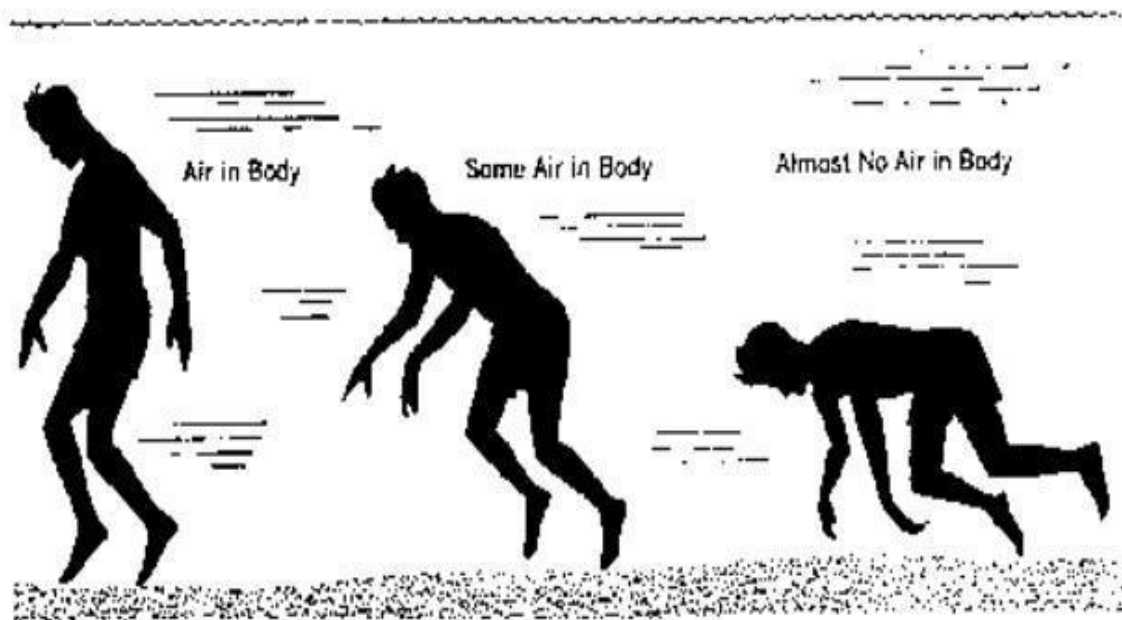
Flood rescue boat crews must be prepared to assist with searches for drowned or suspected drowned persons. Police have responsibility for such operations, particularly in relation to coroners' inquests, and any involvement must be at police request and under police direction. Crews may also be tasked to search for other objects.

Operation at scene of drowning

- ☐ A water search recovery team should consist of a minimum of the boat crew plus two. The leader will determine the number required in the boat, depending on the task. Two members are to maintain liaison with the police OIC and to act generally as a support team for the boat.
- ☐ The leader is to ascertain from police or witnesses, the location of the drowning and gather as much information relevant to the operation as possible. He/she will then brief the flood rescue boat crew prior to their commencement of operations.
- ☐ Searches can be conducted at night, especially if there is a support team ashore. Normal boat crew changes can be carried out on a roster basis and the shore team can attend to refreshments, fuel generators, floodlights, etc. Before deciding to conduct a search at night all factors, particularly the risks must be considered.
- ☐ On calm days, in lakes, ponds, etc, where there is no significant current; the search may be more efficient if the boat is rowed. Most outboards tend to move the boat too fast for effective dragging. The weight of the dragging/grappling equipment is a matter of experience and practice as it varies due to depths of water and current speeds.

General information on drowned bodies

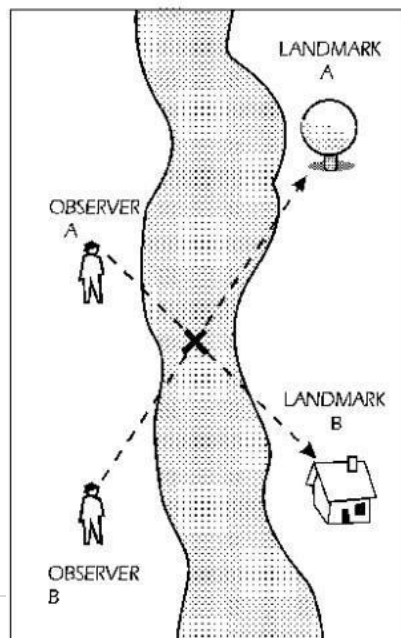
- The average body has about the specific gravity of water. This means that the body will displace its own volume of water and the volume of water displaced will weigh about the same amount as the body. Therefore, the average body will almost float; sometimes bodies of fat victims and of small children do not sink, but remain floating on the surface. As long as the body is totally submerged in the water it will weigh approximately half a kilogram. For this reason, heavy tackle is not needed to make a recovery. The slightest hook in the clothes or body will bring it to the surface provided gentle pressure is used and the hook is not torn out.
- When a person falls into the water, the momentum of the fall will make the body sink. The victim will be holding some air in the lungs, and there will be some trapped in clothing, instinctive swimming movements will bring the victim back to the surface. He/she may gasp, take in air and water, and sink again; this cycle may be repeated until he/she finally sinks to the bottom.
- The position of the body in the water largely depends upon the amount of water in the lungs and stomach. In drowning cases where there is little water or no water in the lungs and stomach the body will be in an almost upright position. With less air in the lungs and stomach, the body will be in a crouched position, and with almost no air in the body it will be in a crawling position.



- A body will rise slowly to the surface when sufficient gas is formed in the intestinal tract to make the body buoyant; this gas is the result of bacterial decomposition. The time to generate the necessary gas will depend upon the temperature of the water and contents of the victim's stomach when drowned. In summer, the average time is eighteen to twenty-four hours. In winter, or when the water is very deep and cold, the time will be much longer. A body will not rise suddenly from the bottom, but rises gradually as more gas is formed and the body becomes buoyant.
- A body will usually remain in the general area where it submerged and will likely be found within 10–20 m of that location. Even with a strong current, it will probably be found within 30–60 m of where it went down. The average body under average conditions will be within one and one-half times the depth of the water for example, if the water is 10 m deep the body will probably be found within 15 m of where it went down.
- Where a current exists, or where the victim was wearing a life jacket, a body may drift to the first eddy or deep hole, depending upon the force of the current and obstructions on the bottom. If the body is floating, it may hang up on some obstruction downstream. If a recovery operation has sufficient people available at the scene, it is good policy to dispatch personnel down current on the chance that the body was floating.
- Immediately after submersion, if the water is very calm, the victim may be located by a thin stream of air bubbles coming from the body. These bubbles are caused by water pressure on the chest and abdomen forcing out the air remaining in the body. Even under these circumstances, the body may be 3-4 m from the spot where the bubbles are breaking the surface of the water. Other things can give off similar streams of air bubbles, but any such leads should be checked out.

3. Position Fixing

To gain a fix, all witnesses should be questioned on the location of the last sighting. A line to some prominent object combined with a distance will often give a reasonable accuracy. Even greater accuracy is possible if two or more witnesses can give cross lines to prominent objects.



Position Marking

When the location of the last sighting has been determined it should be marked by a buoy or other marker as soon as possible. The next task for search teams is to determine the current and possible movement of a drowned body in elapsed time. Buoys can then be laid to define the boundaries of the likely area of search.

Operational Assessment

The initial thought that the master gives to the operation is important if a rapid and successful recovery is to be made. The following should be considered:

- ☐ Where was the victim last seen?
- ☐ How long has the victim been submerged?
- ☐ How was the victim dressed? (e. g. clothes, swim trunks).
- ☐ Type of bottom to be searched.
- ☐ Current flow.
- ☐ Direction of wind.
- ☐ Depth of water.
- ☐ Width of water.
- ☐ Obstructions, snags, etc.
- ☐ Banks undergrowth, trees, etc.

Locating starting point: Where there are witnesses to a drowning, the starting point is relatively easy to determine. If there is no sure fix, the starting point becomes an educated guess based on the information available.

Recovery Methods and Tools

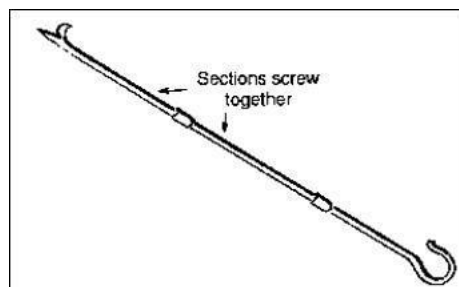
During the early stage of an underwater search, where there is a small area of probability, the common methods used for the location and possible recovery of a body or object, are by:

- ☐ ***Probing;***
- ☐ ***Dragging;***
- ☐ ***Grappling.***

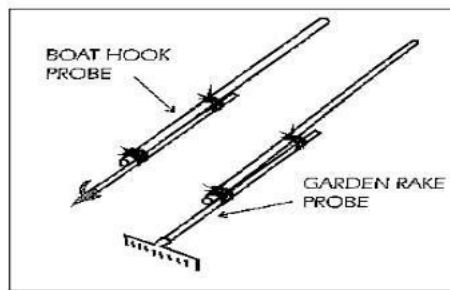
Emergency Service units may not have the proper tools for a bottom search, but many suitable tools can be improvised from common items.

Probing –

- In shallow water, particularly where there is debris or snags (logs, trees etc) it may be preferable to probe the bottom. Probing tools can be improvised from boat hooks, garden rakes, hoes, or similar tools, lashed to long poles or saplings.



Pike/Pole Iron for Probing or Grappling



Improvised Probing Tools

The probe may be held in a vertical position and the river bed tamped with quick up and down strokes. This action assists the operator to determine what is being struck by the lower end of the probe and lessens the possibility of the hook becoming fouled with debris on the bottom.

- In most cases, the depth in which it is practical to probe is not more than 5 to 6 meters. This method is not very efficient as it is difficult to ensure complete coverage of the area of probability. It does, however, permit a search through snags or obstructions.

□ Dragging

- Where the bottom is fairly flat and clear of debris or snags, a more efficient method of search is by dragging. To improvise a drag, weld mesh or a similar material can be used. A panel of the material about 2 m by 1 m is selected, then complete as follows:

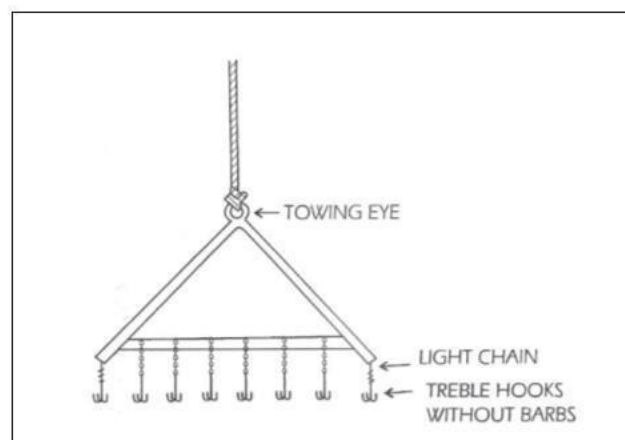
?????A leading edge is created by bending one of the longer edges over; this will assist the device in riding clear of mud and snags. The fold must not be greater than 50 mm in height or it may resist picking up a body.

?????Transverse frames on the trailing edge are cut from the panel.

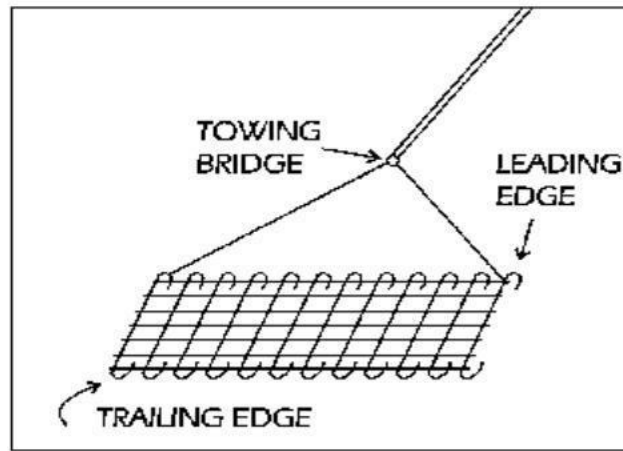
?????Alternate frames are bent up and down to form hooks.

?????A towing bridle is attached.

When completed, the device may be used either weighted or un-weighted.



Dragging Tool

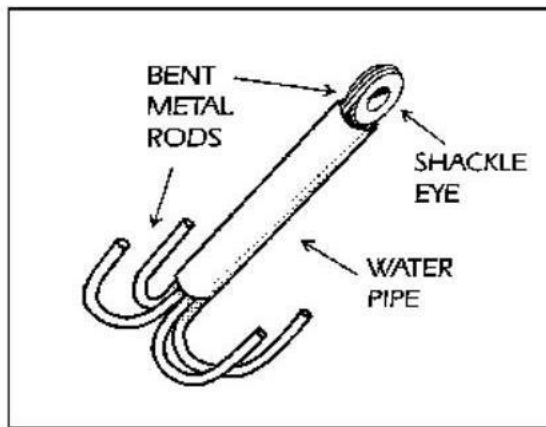


Improvised Dragging Tool

- If weighted, the drag travels along the bottom, and is intended to pick up a body lying on the bottom. A body coming into contact will normally be lifted onto the device and held by the uppermost hooks.
- If un-weighted, the device may pass over a body and snag with the lower hooks.
- The drag is moved in a series of sweeps until the area of probability has been covered. With this method a reasonably detailed search of an area may be effected.

Grappling

- Another method of bottom search is by grappling. This method can be used in either shallow or deep water. It may be the only practical method in water greater than 15 meters deep.
- A fairly readily available improvised grappling hook is a reef anchor. If not carried, a reef anchor can be made up quickly from common materials. To make a reef anchor:
 - Cut a 4mm diameter steel rod into four lengths of about 1.3 meters each.
 - Cut a piece of water pipe, about 20 mm internal diameter, into a length of about 150 mm.
 - The steel rods are bent in half and fed through the centre of the waterpipe.
 - An eye large enough to accept a shackle or line, is formed through the bent ends of the rods.
 - The free ends of the rods are bent to form four hooks retained by the water pipe.
 - If desired the anchor hook points may be filed sharp.

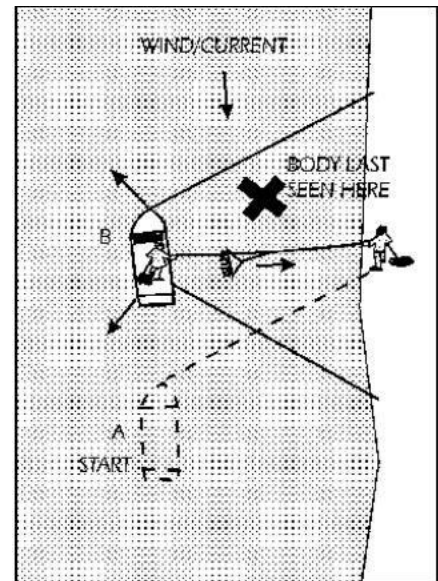


Improvised Grappling Tool

- The reef anchor may be used by dropping it into gaps between snags or it may be used as a form of drag. A number of small reef anchors made of lighter materials can be attached to a bar to form a drag bar.

7. Method of Recovery

In this method, the boat is securely anchored fore and aft. A person on shore does all of the moving by side stepping one half of the length of the dragging bar at each drag. If dragging from position 'A' is not successful, then the boat is moved to position 'B' and the procedure repeated and so on.



Working with Divers

Underwater diving is a specialist task. There may be occasions for flood rescue boats to act in support of divers involved in a bottom search for a body or an object.

If a flood rescue boats crew is asked to assist divers in a search, it is the responsibility of the leader to liaise with both the Police OIC and the Diving Supervisor to establish clearly the tasks to be carried out by both the boat and the crew. Information which should be sought is as follows:

- ☐ What is the job of the boat? (e.g. diving tender, safety boat, surface search, etc)
- ☐ What equipment and who will be travelling in the boat?
- ☐ What search patterns and methods of operation will be used?
- ☐ What safety precautions and signals will be used?
- ☐ What speeds and distances should the boat maintain?
- ☐ What action to take in the event of a find or a problem?
- ☐ What hazards are likely to be encountered?

EMERGENCY METHODS OF RESCUE

Introduction

Rescue will be conducted under almost every conceivable adverse condition. The method used for casualty removal will depend on the location of the casualty and the type of injury sustained. In some rescue operations, casualties will have to be lowered from the upper floors of buildings. In others, hoisted from below through holes in floors, or removed by a combination of those techniques. When casualties are handled by rescue personnel, take care to ensure that further aggravation of injuries does not occur.

Be aware that the safety of the casualty is paramount, even when immediate evacuation from a hazardous environment is necessary.

Make a careful assessment of the casualty's injuries, condition and possible entrapment and make a final check to ensure that the casualty is actually ready to move and is not caught or entangled in an unseen object.

After removal, many casualties will have to be carried over piles of debris and uneven ground before being handed over to the ambulance service or first-aid station. Speed of removal is important, but it must be consistent with safety and proper handling to prevent further injury.

The method used will depend on the immediate situation, the condition of casualties, types of injury and available equipment. Rescue leaders should conduct frequent exercises in the removal of casualties, using live people as casualties to give team members understanding and confidence in the various methods, enabling them to make decisions promptly in times of emergency. As important as learning the methods, rescuers should experience the physical effort required in transporting casualties, either by stretchers or by some improvised method. The transportation of casualties over long distances is a very tiring task and requires fit personnel.

Rescue techniques using no Equipment

This subject is covered under two headings:

- a. One-rescuer handling techniques.
- b. Two-rescuer handling techniques.

Clearly understand that the following techniques are for use in an emergency and that seriously injured casualties should, where possible, be placed on a stretcher. Conditions such as fire or imminent danger of building collapse may, however, dictate that removal from the scene is the first priority. In some cases, this may even take precedence over life-sustaining first aid.

Single-Rescuer techniques

- **Single-rescuer Human crutch** – For this method to work, the casualty must be conscious and capable of giving the rescuer some assistance. Figure below clearly indicates how to affect the single-rescuer human crutch. Note the position of the rescuer's hands, one holding the casualty's wrists and the other taking a firm grip of the clothes at the waist on the far side of the body. The injured side of the casualty should be closest to the rescuer.



- **Pick-a-back** - This is an effective method when conducted correctly and the casualty is lighter than the rescuer. When the casualty has been loaded (must be conscious), take care to ensure the casualty is supported well up on the rescuer's hips, with the body literally draped across the rescuer's back.



Firefighter's Crawl

This is an invaluable method where a casualty has to be removed from a burning or smoke-filled building. As shown in Figure below, both rescuer and casualty have their heads low down where the clearest and coolest air is to be found if the building is on fire. The entire weight of the casualty does not have to be supported by the rescuer. Cross the casualty's hands and tie with a bandage or similar. Vary the firefighter's crawl method according to personal preference. Probably the most effective method is for the rescuer to place an arm, shoulder and head through the casualty's arms as shown below and support the head with his palm to avoid injury dragging.



- **Removal Down Stairs Method**

This method is used to recover a heavy casualty down stairs, when the rescuer cannot use the pick-a-back or other methods. However, its use need not be restricted to staircases.

With the casualty lying flat, first tie the wrists together using a triangular bandage or similar. Next, come to the head and lift the casualty into the sitting position. Reach through



under the casualty's arms and grasp the wrists. The rescuer is then in a position to drag the casualty backwards and, if a staircase has to be negotiated, a large measure of support can be given to the casualty's trunk by the rescuer using a knee to ease over each successive step. Remember that the strongest part of any staircase is close to the wall.

Two-Rescuer techniques

□ Two-Rescuer Human crutch

As can be seen from Figure below, this method is similar to the single-rescuer human crutch, except that the casualty is supported on both sides with the arms of the rescuers crossed over on the casualty's back and grasping the clothing on the opposite sides of the body.



□ Two-Handed Seat

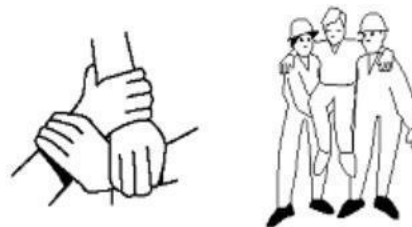
Rescuers kneel on either side of the casualty, get the casualty into a sitting position, place one arm under the knees and link up with the hand-to-wrist grip. They cross their free arms over the casualty's back, where they get a firm grip on the clothing (Figure below).



The leader gives the normal orders for lifting and lowering.

□ Three-Handed Seat

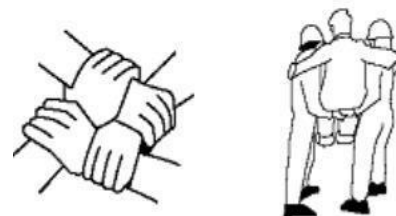
This method gives the casualty good support and is reasonably comfortable for the rescuers. It has the added advantage that the two-rescuer team has a spare hand for steadying.



One rescuer grasps their left wrist with their right hand and the second rescuer places their hand and wrist as shown in Figure. This forms a seat. If the casualty is capable of standing for a short period, load the casualty by placing the seat under the buttocks. If not, the rescuers place their hands under the casualty's knees first and then join up. In either case, the result should be as in Figure below.

□ Four-Handed Seat

This is a method where each rescuer grasps their left wrist and join hands as in Figure. This provides a comfortable seat for the casualty and places a minimum strain on the rescuers. However, as can be seen in Figure below, the casualty must be sufficiently conscious to hold on.



The Fore and Aft Method

This is perhaps the most suitable way in which two rescuers can handle an unconscious casualty.

Prepare the casualty in the same way as for the removal down stairs method. That is, tie the wrists together. The first rescuer stoops at the rear of the casualty. Reaching under the casualty's arms, the first rescuer grips the casualty's wrists. The second rescuer stoops between the casualty's legs, grasping the casualty underneath the knees. Following the standard lift orders, lift the casualty to the carrying position (Figure). If the casualty has a leg injury, minimize the effects of this by having the front rescuer cross the casualty's legs over and carry the casualty to one side as in Figure at below



The advantage of this method is that the rescuer supporting the casualty's feet has a free hand with which to open doors, clear debris etc.



It is again stressed that the foregoing one and two-rescuer techniques are generally confined to emergencies where removal from the scene is the first priority.

The Four-rescuer Techniques

When using four rescuers **use a stretcher** and where spinal injuries are not suspected, use the following method:

- ☐ Make ready the stretcher and place near the casualty's head or feet.
- ☐ The leader details three others to kneel down on one knee, on one side of the casualty (casualty lying flat on back). They all have the knee up closest to the casualty's head (Figure below).
- ☐ The leader kneels near the casualty's hip on the opposite side to the three others and eases the casualty on to one side.
- ☐ The other three place their hands and arms underneath the casualty and the leader lowers the casualty onto their arms.
- ☐ The leader gives the order '**Prepare to lift**' and, if no one dissents, follows it with the order '**Lift**', whereupon the other three, assisted by the leader, lift the casualty up.
- ☐ If necessary, the casualty can be briefly supported on the rescuers' knees (Figure 2 below). The leader then places the stretcher under the casualty.
- ☐ Final orders are given: '**Prepare to lower**', followed by '**Lower**'.
- ☐ The three rescuers, assisted by the leader, lower the casualty on to the stretcher (Figure below)

(Figure 7.200).



Blanket Lift (Four or Six rescuers)

The blanket lift is an effective method to load or move a casualty in a confined space:

- ☐ Make a stretcher ready using one blanket only.
- ☐ Roll a blanket lengthwise for half of its width and lay the rolled section along the side of the casualty (casualty flat on back).
- ☐ The leader then directs two (or three) rescuers to kneel down on each side of the casualty. The rescuers on one side ease the casualty over and the rolled section of the blanket is pushed well underneath the casualty.
- ☐ With the rolled up section of the blanket now under the centre of the casualty, ease the casualty over in the opposite direction and unroll the blanket. The casualty should now be lying flat on two thicknesses of blanket.
- ☐ Roll the sides of the blanket up close to the casualty's body to provide handgrips for the bearers (Figure below).
- ☐ On the order from the leader, lift the casualty waist high and carry to the stretcher.
- ☐ On the order from the leader, lower the casualty onto the stretcher.
- ☐ Complete the blanketing with one blanket, leaving the lifting blanket in position.
- ☐ This 'blanket carry' can also be used as an improvised stretcher for carries over moderate distances.



Clothing Lift (three rescuers)

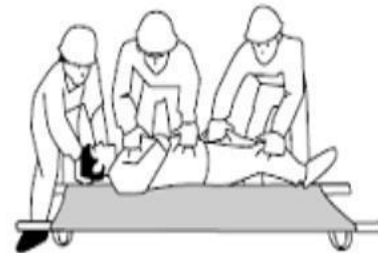
This is an emergency method that can be used when the casualty's injuries are not too severe and time is critical:

Blanket a stretcher and place it close to the side of the casualty.

Tie the casualty's hands together with a triangular bandage or similar material if unconscious.

- Roll the casualty's clothes together along the centre of the body.

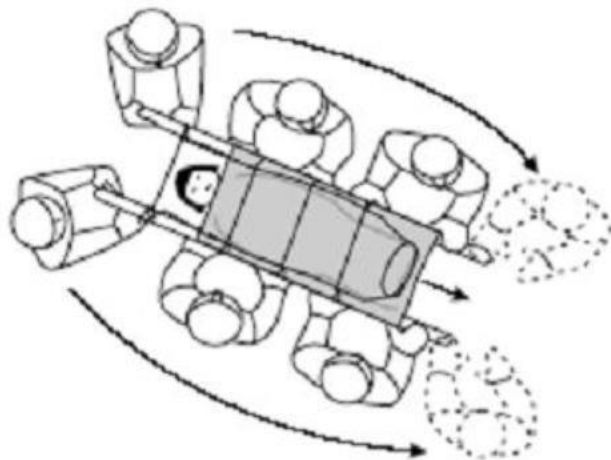
- Three rescuers take up position on the opposite side of the casualty to the stretcher and position their hands as illustrated in Figure below.



- The normal commands are given ('Prepare to lift' etc), then place the casualty gently on the stretcher.

Specialist Lifting/Loading devices

Specialist lifting/loading/extrication devices such as timber or synthetic spinal boards, scoop stretchers and spinal immobilization devices or harnesses are readily available from rescue equipment suppliers. Always use these devices in compliance with manufacturers' specifications and recommendations, and follow appropriate specialist training.



Lashing the Patient to the Stretcher

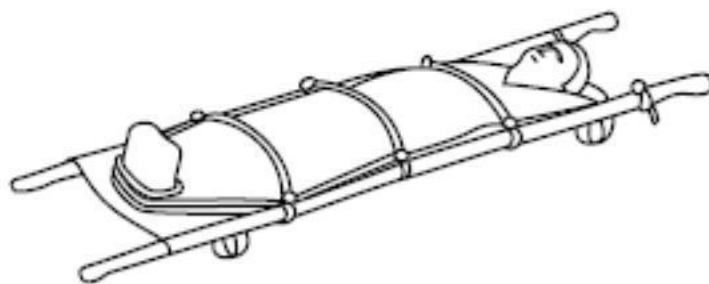
In many cases, casualties will have to be firmly secured to the stretcher to enable it to be handled in difficult places. No hard or fast rule can be laid down as to when a casualty should or should not be lashed in; however, the nature of the rescue should provide the answer. **if in doubt, lash the casualty in.**

The ideal size and length of rope for stretcher lashing is 12 m of 11mm or 12mm rope.

To commence the stretcher lashing, form a Figure of Eight loop around one of the top stretcher handles and through the 'D'. From this point take three Half-hitches around both the casualty and the stretcher, the first in the region of the chest, the second in the vicinity of the wrists and the third hitch just above the knees (Figure below).

Take a Round Turn around the feet and apply three Half-hitches to those already formed on the opposite side of the casualty's body. Finish the lashing with a Round Turn and Two Half-hitches on the remaining top stretcher handle.

- Vary the position of the three securing Half-hitches according to the location of the injuries that the casualty has sustained. In the case of a female casualty, place the top securing hitch just below the breast line.
- Place bricks or timber under the stretcher 'Ds', before lashing commences, to enable the rope to be passed under the stretcher more easily.



Improvised Floating Aids

Floods bring disaster and create complicated problems i.e. large numbers of floating equipment such as boats, dinghies and launches may be required to rescue and to convey essential food stuffs and medical aid to marooned people. Such equipment may not be readily available. Requirements will be more and resources will be less. To make up the deficiency, improvised rafts should be used. Improvised rafts can be made out of locally available material and it affords good scope for the exercise of resources and ingenuity.

Some of the following types of rafts used:

- ☐ Tarpaulin & Hay raft
- ☐ Pot-water wings
- ☐ Kerosene tin raft;
- ☐ The charpoy raft;
- ☐ Drums raft;
- ☐ Miscellaneous rafts.

Tarpaulins and hay raft

This is made out of locally available material and can safely convey two casualties and one rescue member or 158 Kg (350 lbs) of supplies. If made along with heavy bamboos to increase buoyancy, it can carry 1133 Kg (2500 lbs) of supplies.

Stores required for a small raft of this type are:

1. 16 Sandbags or gunny sacking.
2. Bamboos 7 – 8 inches -4 nos.
3. Bamboos 3 – 4 inches -4 nos.
4. Coir suthli / hay rope- 1.8 Kg (4 Lbs)
5. One Tarpaulin (from any load carrying vehicle)
6. One Fibre rope 914 cm (1 inch X 30 ft) length

Method of construction:

The dry hay is stuffed into sandbags or gunny sacks. The tarpaulin 30 X 30 cm (12 X 12 inches) is spread on even ground. The gunny sacks filled with hay are kept on two edges of the tarpaulin and rolled in, so as to leave between the two rolls space about 7.5 to 10 cm (3 – 4 inches). The two open ends are closed so that the raft has now raised sides. This is called free board. To give it a good shape lash at the bottom and the top the 243 and 121 cm (8ft. and 4 ft) bamboos, as through two frames are holding the raft in good shape. The raft is now ready. Care should be taken to see that the tarpaulin has no holes in it.



Drum Raft

It is made of 4 closed empty drums of 151 ltrs. (40 gallons) capacity. Its load carrying capacity is high. According to load carrying capacity it is divided into three classes:

- a. load class -- 2 tons
- b. load class--3 tons (jeep with trailer)
- c. load class--5 tons (truck)

Stores required for 151 ltrs. (40 gallons) capacity 4 tons:

- 2.54 cm(1inch) or more thick dry wooden planks or 10.16cm(4 inch) diameter fully matured bamboos of minimum 25.4 cm(10 inch) length.- Length and number will vary according to the size of raft
- 3.80 cm (1 and half inch) lashing line of 101.5 cm (40 inch) length - 14 nos.

Construction: 4 closed empty drums are placed longitudinally at distances from one another according to the available/required length of wooden planks/bamboos and the load is expected to be carried by the raft. Two wooden planks/bamboos are tied to the front and rear pair of drums is then joined by two wooden planks/bamboos by square lashing at two sides with rear pair. A frame is thus formed. The decking is then done by filling the gap in the frame by wooden planks, and/or bamboos by placing them sideways and they are secured by double-snake lashing, to the plank/bamboos tied to the drums.



Miscellaneous Rafts

1. **Ground sheet method:** This consists of a bundle of grass or leaves rolled up tightly into a water resistant ground sheet and can support the float of a man.
2. **Clothes and ground sheet method:** The outer clothing and equipment of two rescue members are wrapped up neatly and then rolled in a ground sheet or a piece of tarpaulin. This should be lashed securely to ensure clothes and equipment do not get wet. This can support one man.

3. **Bamboo pole:** An ordinary bamboo pole 7.60 cm (3 inch) diameter and 38.1cm (15 inch) long is held firmly between the feet and the knees and the man can propel with his hands.



4. **Barrel raft:** A number of barrels are lashed together with barrel hitch and then lashed firmly to a bamboo mat flooring with square lashing. This is something like a kerosene tin raft. A raft made out with two barrels can support or convey up to 113.398 kg (250lbs)

5. **The coracle:** This is made out of brush wood or soft bamboo into a circle 10.16 cm (4 inch) diameter and about 25.4cm (10 inch) thick. It is then wrapped up in piece of tarpaulin. This can support one man and 22.67 kg(50 lbs) of supplies.



6. **The crate raft:** This is made out of old packing cases which are light. Two or three equal size packing cases as lashed together and then wrapped up in tarpaulin can support two men or about 136.078 kg (300 lbs) of supplies.

7. **Trouser raft:** Trouser (C.G. or Khaki) filled with dry grass or leaves may also be used for floating purpose.

8. **Banana (tree) raft:** Developed banana (trees) cut to suitable pieces and joined together by bamboo and ropes by square and snake lashings make a very efficient raft for floating on and crossing shallow water sheets.



9. **Other miscellaneous rafts:** Motor type-tube, bladder, coconut with dry coats, water bottles in cluster also can be used as floating devices.

10. Apart from the above floating aids mentioned, one can also mark best use of the following available materials:

- ✓ Rubber tubes
- ✓ Door planks
- ✓ Banana stems
- ✓ Jawar stems
- ✓ Any hay bundle
- ✓ Air inflated pillows
- ✓ Door frame with bamboos
- ✓ Wooden charpoys

COMMON IMPROVISED BRIDGES

Introduction :

In the event of permanent bridges washed away or collapsed during floods, there is an urgent need for improvisation of bridges. To continue the normalcy of movement, i.e. passing and shifting people and materials has to be maintained till the permanent measures to repair or reconstruction of the bridge takes place. A span of 300 ft. to 500 ft. may be connected by improvised materials by the trained personnel of Home Guards and C.D. Organisation, or like bodies. These constructions are called improvised bridges, through which we can pass light loads ranging from 2 to 3 tons for a temporary period. The following improvised bridges are in use :

1. ROPE BRIDGE :

An easy method of bridging a gap upto 300 ft. span. Most of the materials required for this purpose are available with Rescue Party of C.D. Organisation or with Home Guards Platoons. Therefore, it becomes very easy for pooling, the required stores for the construction of a rope bridge.

Construction : 3 inches Cordages are set apart at a distance of $3\frac{1}{2}$ ft. to 4 ft. The strings are set diagonally at an interval of 2 ft. on main rope and $1\frac{1}{2}$ ft. on the foot rope. They are secured by clove hitches on main rope and crossed at the bottom of the foot rope by a seizing, with the help of whipping twine. Wind guy is tied to the main rope at suitable place to prevent any lateral movement. The preparations such as reeving, seizing, laying may be carried out on a open ground after taking necessary plan and survey of the place to be bridged. Then it can be carried to the work spot.

Time and Manpower : 2 sections of Home Guards (well trained) can construct a rope bridge of 300 ft. in 3 hours approximately.

Sequence of construction : The far side is first secured on a support (tree or any unnatural tower) by applying a magnus hitch. The three ends of the rope bridge (foot rope, hand rail) are separately secured at the required angle. The rope bridge is then unrolled to the near side. The two ends of the main rope/hand rails are passed through the power blocks which has been secured on the tower or support. Then the ends are secured to the tensioning tackle which is fixed to a hold-fast.

Then the foot rope is tensioned and secured to the support or object itself. Then the tackles are tensioned and secured to the hold fast. A loading and unloading point is made at convenient place preferably near the towers.

Note : (1) Must have control over crossing, i.e. the distance between each individuals should not be less than 20 ft.

(2) At a time, on the bridge, we should not allow more than 5 members for the safety reasons.

2. Lathi Bridge :

This is similar to that of rope bridge. Whatever requirements are needed for a rope bridge, is also required for this bridge. The Lathies or similar sticks are tied to the main and foot rope in place of strings. If the ropes are not available for strings, the same may be replaced by lathies or round bamboos. Generally, the square lashing procedure is followed for securing the lathies to the hand rails/main rope and foot ropes.

3. Bamboo Bridge :

For small traffic Movements, we may construct Bamboo Bridge, where bamboos are available in plenty. The horizontal and verticle support and also bracings etc. are tied or lashed by using required size bamboos and lashing ropes.

4. Composite Bridge :

Rope bridge, Bamboo bridge and other common bridges are only used for manual traffic. Where the necessity arises for shifting or movement of heavy loads or vehicles, the composite bridge is generally used. This is an improvised bridge constructed with the available materials on which light loads and heavy loads can be shifted. The composite bridges are generally constructed by the services for movement of troops, tanks and vehicles. The composite bridge may be constructed in short period and dismantled after use. The services and railways have some standard materials for construction of composite bridge. They are :

- 1) Steel Crib Pier
- 2) Tubular Scaffoldings

3) Timber Crib Pier,

4) Lashed trestles

1) Steel Crib Pier : This is made out of steel angles. This is a standard equipment of 20 ton bridging Crib and a simple built of such cribs. The permissible load is 5 tons on a panel point and then average of 12 tons on standing upright or vertical and 20 tons horizontally. These Cribs are of standard size of 6' x 2' x 2' connected with clips, bolts and nuts. The maximum height that can be derived is 20'.

2) Tubular scaffolding : The most commonly met is that known to the building trade as "1½" steam. In the service, it is referred to as 2" steel scaffold tube. It is 8 SWG and weighs approximately 3 lbs. per ft. run. (750 ft. to the ton) and also available in different size of 3" to 4" of 5 or 10 SWG whose weight are approximately 6½ Lb. per ft. run (560 ft. to the ton)

Tube upto 20 ft. length available, which are galvanised and treated against corrosion etc. Couplers (clips) are used for joining and fitting purpose. The couplers are available in different types.

3) Timber Crib Piers : A quality timber sleeper of size 10' x 9" x 9" or 6' x 9" x 5" length is used for making piers. These are very much in use with Railways and services. The following points have to be noted in construction.

1) The foundation must be level.

2) Each successive layer must be level to round or rough timber is being used, it will be necessary to the points of contact.

3) Each successive layer must be secured/fastened to the layer below. Bolts, nails, spikes, wire or cordage may be used.

4) The width of the base should never be less than one-third the height.

5) The longer sides should be given a better to provide stability against longitudinal force.

6) Lashed trestles : Where only round timber and lashings are available, a bridge for light loads can be made with trestles to which the road bearers are lashed. This type of bridge is very much suitable for Civil Defence purpose to keep the normalcy of traffic etc.
Points to note in constructing lashed trestles :

a) The legs are first lashed to the transom and ledger, and then the trestle is squared up by making diagonal braces equal before lashing them in position. Maintain 1/6 of slope.

b) The position of the ledger relative to the bottom of the legs depends on the nature of the bottom of the gap. If it is mud, the ledger should be lowered down; if it is rocky, the ledger should be high enough to clear any obstruction.

c) If the bottom is very soft, shoes of 2 inch planking about 15 inches square can be spiked the bottom of the legs.

d) Lashing must be tightly made and frapping turns well beaten in.

The lashed trestle can be carried to the bridging place and can be fixed by the use of foot rope and guide ropes. After erection, the trestle must be strutted upright by spars driven into the bed of the river and lashed to the legs. After the decking of the bridge is completed.

Names of parts of Lashed Trestle

Leg :

A round wooden leg of 9" mean diameter of 15 feet length. About 2 feet at the bottom will be driven

into the basement and about $1\frac{1}{2}$ feet or 2 feet at the tip is allowed as spare. Good quality of wood/timber has to be Selected. A slope of $1/6$ from the tip has to be maintained.

Ledger :

A strong round wooden log of 12' to 15' length with mean diameter of 6" which is secured at the bottom of the leg at a distance of 2 ft. 1 foot to $1\frac{1}{2}$ feet spare has to be given on each side. Cordage of 2 inches thickness is used. The method of tying is square lashing and the finishing or the collaring has to be inside of the ledger

Transom :

This is the upper part of the lashed trestle, a wooden log of 15 feet length with 9" to 10" mean diameter thickness. This is secured at the tip end of the leg, $2\frac{1}{2}$ ' to $3\frac{1}{2}$ ' feet, from point of the tip. A cordage of 2 inches is used and the method of securing is by square lashing. The finishing of lashing should be towards butt side of the transom.

Diagonal Branch :

Two 4" mean dia wooden logs are taken and placed crosswise, secured or lashed with rope by using diagonal lashing method and is placed between lashed trestle and secured by the rope to the legs by square lashing method. Then the whole set is called 'Lashed Trestle'.

Road bearer :

Two lashed trestles are erected face to face with proper interval. The road bearer is connected to each trestle and are secured by nails, clamp or with lashing to the road bearers or thick wooden logs.

Decking :

Is the wooden platform placed close to each other and lashed with the help of rope by snake lashing. Sometimes, decking logs are nailed or screwed. This finished decking is called 'Road' in which light traffic movements may take place

AERIAL (ROPE WAYS) CABLE WAY

Aerial rope ways provide a quick and simple means of transporting light weights across gaps. They are useful in rocky or mountainous country for crossing dry gaps, as a means of communication before a bridge is built or as an aid to the actual bridge building. Another use is as an alternative to porter or pack transport on rocky slopes.

The simple aerial rope way across a nearby level gap consists of a single cable, supported and anchored at both ends on which runs a snatch block or traveller which carries the load and which is hauled across the gap with ropes. The difference in level of the cable supports should not generally exceed one twenty-fifth ($1/25$) of the span.

a) **Selection of sites :** A smooth landing and loading space on each side of the gap is essential. Consider also access of transport to the far end for continuation of journey. The existence of a stout well rooted tree in the far bank will solve the problem of supporting the cable at that end. Fix the position of the support and measure the gap.

b) **Selection of cable :** The selection of cable is mainly depending upon the load that can be carried.

(please refer the table for guidelines)

AERIAL ROPE WAY

ROPE BRIDGE

Labels in the diagram include: NATURAL TOWER, POWER BLOCK, SHEER LEG, MAIN CABLE, TRAVELLER, DIP, WEIGHT OR LOAD, SLING, SPAN, HAULING ROPE, HOLD FAST, TENSIONING TACKLE, HOME BANK, UNLOADING POINT, POWER BLOCK, STRINGS, HAND RAIL ROPE, NATURAL TOWER, FOOT ROPE, WIND GUY, SPAN, and ROPE BRIDGE.

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ELEMENTS OF BANDAGING

(Use of Triangular and Roller Bandages)

1. Introduction

It is an amazing fact that a piece of cloth such as a bandage, properly utilised can save a life in emergencies such as severe bleeding from limbs or snakebites. The proper utilisation of these pieces of cloth called bandages, however, needs some training mostly practical. It is therefore, essential that the volunteers of first-aid parties as well as other services learn all about these bandages.

2. Uses of Bandages

Bandages are used for various purposes. These can be summarised thus.

- (i) To control bleeding.
- (ii) To control swelling—as due to contused injuries.
- (iii) To keep an injured limb at rest and support its weight e.g. by a sling.
- (iv) To secure a limb to a splint e.g. in cases of fractures, burns or lacerated wounds.
- (v) To hold dressings in place.
- (vi) To give support and rest to a joint which is sprained.
- (vii) To protect wounded parts of the body from exposure.

3. Types of bandages

There are many types of bandages in use but the most common types, especially useful in large scale emergency work are the triangular and the roller ones.

4. The triangular bandages

(i) Peculiarities of the triangular bandage

- (a) It is easy to apply.
- (b) It holds temporary dressings better compared to roller bandage.
- (c) It can be used for almost every purpose for which a bandage is needed.
- (d) It can be improvised out of any suitable material.

(ii) **Parts of a triangular bandage.**—(For diagram see attached chart) The bandage has

an apex or point, a base or longest side and two sides of equal length (100 cms) and two ends. It can be used as open or unfolded, broad-based or narrow folded. Each form is suitable for application for different purposes.

(iii) Rules for applying triangular bandage

- (a) The bandage must be reasonably clean and correctly folded as per the requirement e.g. narrow, broad etc.
- (b) The injured part or limb must not be disturbed or moved to any great extent for purposes of bandaging.
- (c) Once the bandage is fixed its position should not be changed by pulling or pushing it.

5. Triangular bandage as a sling (see sketches on the chart :

(i) **The large arm sling.**—This is applied in the following manner.

- (a) Stand in front of the patient.
- (b) Apply the open triangular bandage to the front of the chest, with apex towards the injured arm.
- (c) Place the upper end of the bandage over the other shoulder with the other end hanging down towards the ground.
- (d) Carry the upper end, round the back of the neck and forward over the shoulder of the injured side.
- (e) Then bend the injured arm carefully at the elbow and place the forearm across the chest with the hand pointed towards opposite shoulder.
- (f) Lower end of the bandage can now be brought over the forearm and tied to the upper end, in front of the shoulder on the injured side just below the collar bone.
- (g) The apex is then folded towards the elbow and fixed with a safety pin.

(ii) **The small arm sling.**—This is applied in a way similar to above but in this case the bandage

dage is used in its broad fold and no safety pin is used anywhere.

6. Other uses of open triangular bandage

(i) **On the head.**—This is used to keep a dressing in place on the scalp or forehead, particularly when the dressing is large or there are several wounds.

(ii) **For hand or feet.**—This bandage is particularly useful when the injury is extensive and the dressing is of considerable size as in a case of extensive burns.

(iii) **For chest or back.**—This bandage is used to hold dressing on burns or wounds of the chest or back. Place the point of bandage over the shoulder on the injured side, carry the bandage down over the chest or back so that the middle of the base is directly below the shoulder. Roll or fold the base as far up as you desire. Carry the ends around the body and tie them directly below the shoulder with a square knot. This leaves one long and one short end. Carry the long end up to the shoulder and tie to the point.

(iv) **For shoulder or hip or face.**—The open triangular bandage can also be used for holding dressing over shoulder or hips. Further, in case of burns of the face, the triangular bandage can be used to cover the entire face, after cutting two holes for eyes.

7. Triangular bandage as a broad fold

This can be used for various purposes, such as tying the splints and over dressings on the following parts of the body.

- (i) Head and ear.
- (ii) Neck.
- (iii) Arm, forearm, thigh or leg.
- (iv) Cheek or ear.
- (v) Elbow or knee.

8. Triangular bandage as a narrow fold

As "Narrow fold" is made by folding the broad fold to half its breadth, it increases in thickness proportionately and also becomes quite strong for these reasons, it can be most conveniently used for following purposes.

- (i) Keeping dressings in place over small areas over the limbs.
- (ii) Applying pressure to wounds for purpose of stopping bleeding.
- (iii) For holding the standard wooden or improvised splints in place.
- (iv) For padding splints at places where they are likely to cause pressure.

9. The roller bandage

(i) Material Used

- (a) Cotton.
- (b) Unbleached calico.
- (c) Gauze.
- (d) Flannel.
- (e) Muslin.
- (f) Adhesive plaster.

(ii) Parts of a bandage

- (a) Head or roller part.
- (b) Tail or "free end".

(iii) Varieties of bandaging procedures

- (a) Simple spiral for wrist and ankle.
- (b) Reversed spiral for fleshy parts.
- (c) Figure of eight for joints.
- (d) Spica for hip, shoulder and thumb.

(iv) Width and lengths of Roller Bandage commonly used

Parts to be Bandaged	Width in inches/ cms.	Length in yards/ Meters
Finger	1/2.5	2/1.8
Arm	2-2½ (5-6)	4-6/(3.5-5.25)
Leg	3-3½ (7-8)	6-8/(5.25-7.0)
Body (Trunk)	4-6/ (10-15)	8/7
Head	2-2½/ (5-6)	6/5.25

10. Rules for bandaging with a roller bandage

(i) Bandage limbs from below upwards and from within outwards over their fronts and in position in which they are to remain.

(ii) The bandage should be first securely fixed by couple of turns round the limbs.

(iii) Each turn should over-lap 2/3rd the ending turn, margins to be kept parallel.

(iv) Bandage the chest from below upwards and abdomen from above-downwards.

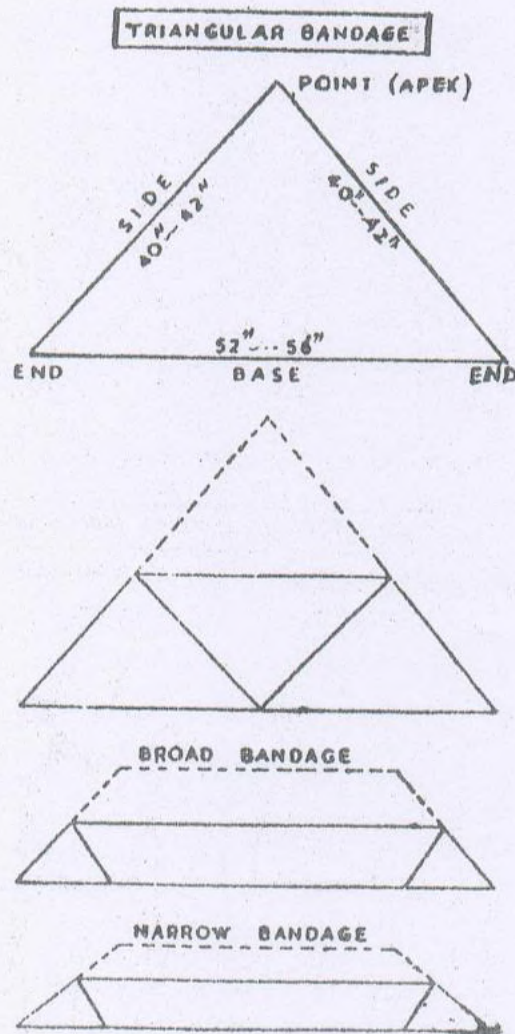
(v) Bandage evenly and firmly but not, with such pressure as to interfere with the circulation. Do not cover tips of fingers or toes, as their appearance helps to judge state of circulation in the limb.

(vi) The joints are not to be bent after bandaging. Therefore bandage the knee in straight or slightly bent position and elbow at right angles.

(vii) The end must be secured with a safety pin or with a stitch. The latter method is especially useful in case of children.

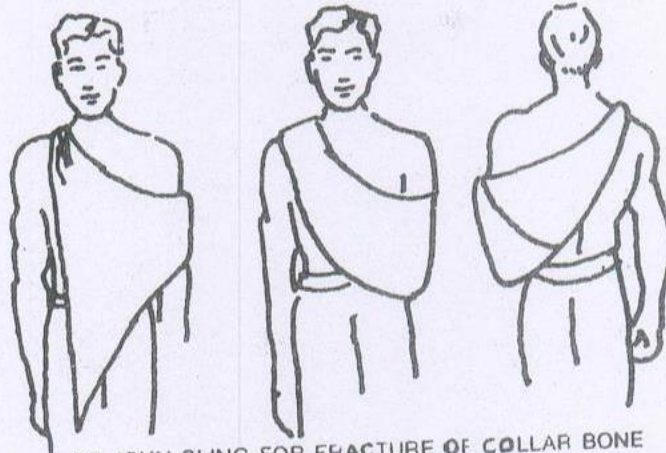
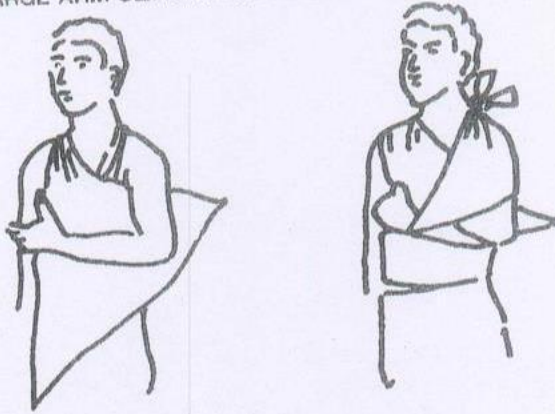
BANDAGES ARE USED FOR FOLLOWING PURPOSES

1. To keep an injured part at rest and to support its weight e.g. by means of a sling.
2. To secure a limb to a splint, to the trunk, or to its fellow.
3. To control bleeding or swelling by making and maintaining firm pressure.
4. To keep dressings in place.
5. To protect wounded parts from exposure.



TWO VARIATIONS OF LARGE ARM SLING

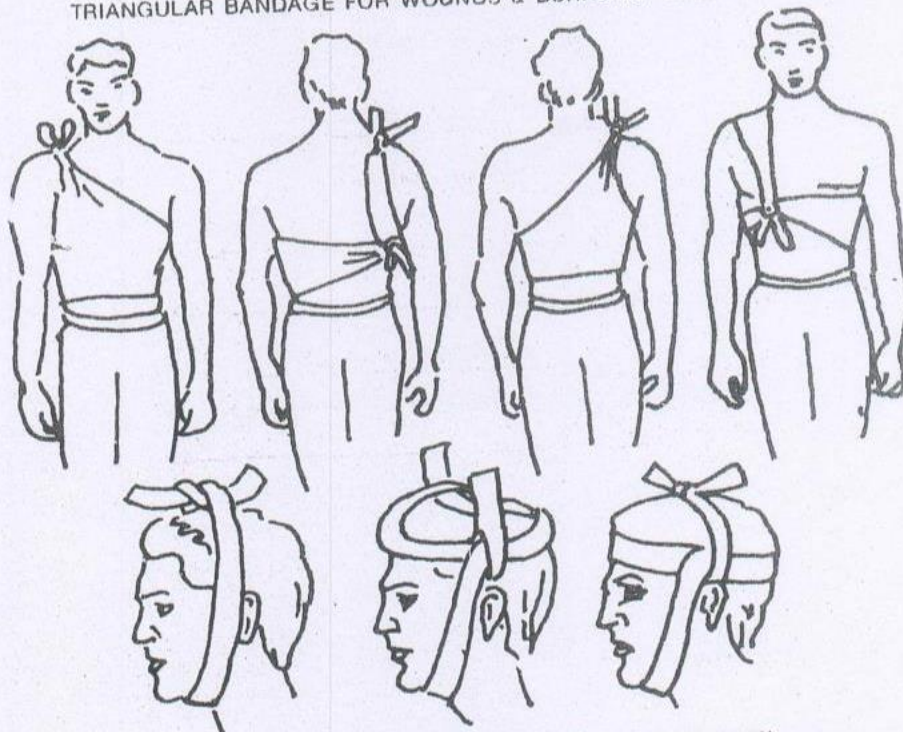
LARGE ARM SLING AS A SUPPORT TO THE FOREARM



ST JOHN SLING FOR FRACTURE OF COLLAR BONE
OR SCAPULA

SOME USEFUL BANDAGING PROCEDURE

TRIANGULAR BANDAGE FOR WOUNDS & BURNS OF CHEST OR BACK



BARREL BANDAGING FOR FRACTURES OF LOWER JAW

Basic life support – CPR & FBAO

Basic life support (BLS) is a level of medical care which is used for patients with life-threatening illness or injury until the patient can be given full medical care. It can be provided by trained medical personnel, including emergency medical technicians, and by laypersons who have received BLS training. BLS is generally used in the pre-hospital setting, and can be provided without medical equipment.

Many countries have guidelines on how to provide basic life support (BLS) which are formulated by professional medical bodies in those countries. The guidelines outline algorithms for the management of a number of conditions, such as Cardiac arrest, choking and drowning.

BLS generally does not include the use of drugs or invasive skills, and can be contrasted with the provision of Advanced Life Support (ALS). Most laypersons can master BLS skills after attending a short course. Firefighters and police officers are often required to be BLS certified. BLS is also immensely useful for many other professions, such as daycare providers, teachers and security personnel.

CPR provided in the field buys time for higher medical responders to arrive and provide ALS care. For this reason it is essential that any person starting CPR also obtains ALS support by calling for help via radio using agency policies and procedures and/or using an appropriate emergency telephone number.

An important advance in providing BLS is the availability of the automated external defibrillator or AED, which can be used to defibrillation or delivery. This improves survival outcomes in cardiac arrest cases.

Basic life support consists of a number of life-saving techniques focused on the medicine **ABC's** of pre-hospital emergency care:

- **Airway:** the protection and maintenance of a clear passageway for gases (principally oxygen and carbon dioxide) to pass between the lungs and the outside of the body
- **Breathing:** inflation and deflation of the lungs (respiration) via the airway
- **Circulation:** providing an adequate blood supply to the body, especially critical organs, so as to deliver oxygen to all cells and remove carbon dioxide, via the perfusion of blood throughout the body,

Healthy people maintain the ABCs by themselves. In an emergency situation, due to illness (medical condition) or trauma, BLS helps the patient ensure his or her own ABCs, or assists in maintaining fir the patient who is unable to do so. For airways, this will include maintaining optimal angles or possible insertion of oral or nasal adjuncts, to keep the airway unblocked. For breathing, this may include artificial respiration, often assisted by emergency oxygen. For circulation, this may include bleeding control or Cardiopulmonary Resuscitation (CPR) techniques to manually stimulate the heart and

assist its pumping action. In each case, the BLS provider is trained to detect ABC problems and attempt to correct them.

BLS also typically includes considerations of patient transport such as various forms immobilization to prevent additional injury, including cervical collars, splinting limbs, and full body splints (backboards).

Necessity of BLS

- Almost invariably or mostly a doctor will not be available on the spot.
- The condition of the patient may well aggravate if some preliminary treatment is not rendered before expert medical aid is available.
- Timely BLS may well prove life saving.
- The careful exercise of skilled BLS will take away the load of treating minor ailments and injuries from doctors.
- A careful TRIAGE (sorting of cases) by a First Aider and their labeling will enable doctors to pay immediate attention to the most serious cases.

Standard versus Emergency First Aid

- Standard procedure of Medical Aid prove time consuming with limited men & material
- Emergency First Aid measures have been evolved with an emphasis on improvisation in material and methods suited to mass casualty incidents.

Principles of BLS

- Simple and minimum essential procedures only should be carried out on spot and during transit. Minimum handling with Rapid Transport should be done
- The Destination, Mode of transport and FA measures during transit must be determined
- Prescribed equipment, if not available, improvisation should be made.
- Set procedures and sequence of action should be followed when treating casualties.
- Set procedure of action is necessary even after treatment. e.g. correct labeling

Role of BLS Provider in India

- Be calm and courteous but also firm & quick.
- Protect your safety and the safety of your crew, the patient, and bystanders
- Gain access to the patient
- Assess the patient to identify life - threatening problems
- Alert additional emergency medical service (EMS) resources.
- Provide Care based on assessment findings.

- Assist other EMS personnel
- Participate in record keeping and data collection as required
- Act as liaison with other public safety workers.
- Treat shock if it has set in
- Act confidently and courageously
- If required, use the skilled or the unskilled assistance from the onlookers.
- Send for an expert medical aid within a short time & distance
- Arrange for speedy, safe and convenient transport
- Immobilize fractures before moving the casualty.
- Splint limbs badly damaged
- Don't remove clothing, but cut it open, if required.
- Don't apply wet dressing
- Don't give drinks to unconscious and belly wound patients
- Don't try to do more than that is just necessary
- Remember that no case is to be regarded as hopeless
- Death is not be assumed
- Ensure final disposal of casualty to its correct destination
- First Aider must not leave the casualty unattended at any time
- Work in close liaison with rescuers
- Do right things in right order and do them swiftly and correctly.

Adult BLS sequence

- Ensure that the scene is safe.
- Assess the victim's level of consciousness by asking loudly "are you okay?" and by checking for the victim's responsiveness to pain.
- Activate the local EMS system by instructing someone to call 102. If an AED is available, it should be retrieved and prepared.
- If the victim has no suspected cervical spine trauma, open the airway using the head-tilt/chin-lift maneuver; if the victim has suspected trauma, the airway should be opened with the jaw-thrust technique. If the jaw-thrust is ineffective at opening/maintaining the airway, a very careful head-tilt/chin-lift should be performed.
- Assess the airway for foreign object obstructions, and if any are visible, remove them using the finger-sweep technique. Blind finger-sweeps should not be performed, as they may push foreign objects deeper into the airway.
- Look, listen, and feel for breathing for at least 5 seconds and no more than 15 seconds.
- If the patient is breathing normally, then the patient should be placed in the recovery position and monitored and transported; do not continue the BLS sequence.
- If patient is not breathing normally, and the arrest was witnessed immediately before assessment, then immediate defibrillation is the treatment of choice.
- Attempt to administer two artificial ventilations using the mouth-to-mouth technique, the mouth-to-mask technique, or a bag-valve-mask. Verify that the chest rises and falls; if it does not, reposition (i.e. re-open) the airway using the

appropriate technique and try again. If ventilation is still unsuccessful, and the victim is unconscious, it is possible that they have a foreign body in their airway. Begin chest compressions, stopping every 30 compressions, re-checking the airway for obstructions, removing any found, and re-attempting ventilation.

- If the ventilations are successful, assess for the presence of a pulse at the carotid artery. If a pulse is detected, then the patient should continue to receive artificial ventilations at an appropriate rate and transported immediately. Otherwise, begin CPR at a ratio of 30:2 compressions to ventilations at 100 compressions per minute for 5 cycles.
- After 5 cycles of CPR, the BLS protocol should be repeated from the beginning, assessing the patient's airway, checking for spontaneous breathing, and checking for a spontaneous pulse. Laypersons are commonly instructed not to perform re-assessment, but this step is always performed by healthcare professionals (HCP's). If an AED is available after 5 cycles of CPR, it should be attached, activated, and (if indicated) defibrillation should be performed. If defibrillation is performed, 5 more cycles of CPR should be immediately repeated before re-assessment.
- BLS protocols continue until (1) the patient regains a pulse, (2) the rescuer is relieved by another rescuer of equivalent or higher training, (3) the rescuer is too physically tired to continue CPR, or (4) the patient is pronounced dead by a medical doctor.
- At the end of five cycles of CPR, always perform defibrillation (AED), and repeat assessment before doing another five cycles.
- CPR continues indefinitely, until the patient is revived, or until the caregiver is relieved, or discharged by a higher medical authority
- The CPR cycle is often abbreviated as 30:2 (30 compressions, 2 ventilations or breaths). Note CPR for **infants and children** uses a 15:2 cycle when **two** rescuers are performing CPR (but still uses a 30:2 if there is only one rescuer)

Drowning

- Rescuers should provide CPR as soon as an unresponsive victim is removed from the water. In particular, rescue breathing is important in this situation.
- A lone rescuer should give 3 cycles of CPR before leaving the victim to call emergency medical services. A cycle of CPR consists of giving 30 chest compressions and 2 breaths to the victim.

Since the primary cause of cardiac arrest and death in drowning and choking victims is hypoxia, it is more important to provide rescue breathing as quickly as possible in these situations, whereas for victims of VF cardiac arrest chest compressions and defibrillation are more important.

Hypothermia

- In unresponsive victims with hypothermia, the breathing and pulse should be checked for 30 to 45 seconds as both breathing and heart rate can be very slow in this condition.

- If cardiac arrest is confirmed, CPR should be started immediately. Wet clothes should be removed, and the victim should be insulated from wind. CPR should be continued until the victim is assessed by advanced care providers.

Foreign body airway obstruction (choking)

- Rescuers should intervene in victims who show signs of severe airway obstruction, such as a silent cough, cyanosis, or inability to speak or breathe.
- If a victim is coughing forcefully, rescuers should not interfere with this process.
- If a victim shows signs of severe airway obstruction, abdominal thrusts should be applied in rapid sequence until the obstruction is relieved. If this is not effective, chest thrusts can also be used. Chest thrusts can also be used in obese victims or victims in late pregnancy. Abdominal thrusts should not be used in infants under 1 year of age due to risk of causing injury.
- If a victim becomes unresponsive he should be lowered to the ground, and the rescuer should call emergency medical services and initiate CPR. When the airway is opened during CPR, the rescuer should look into the mouth for an object causing obstruction, and remove it if it is evident.

Conclusion

In India approximately 10,00,000 cardiac arrests per year take place and the Survival to Hospital discharge presently is as low as only 5-10%. Moreover, the Bystander CPR vital intervention before arrival of emergency services is such crucial that early resuscitation and prompt defibrillation (within 1-2 minutes) can result in more than 60% survival. That is where skilled BLS provider can make a big contribution.

Flood Protection & Emergency Repairs

Sand bag walling

Although new styles of flood protection products have been developed in recent years, sandbags still provide valuable defence against flood water. However, it is vital they are used correctly if they are to provide full benefit. Local authorities must hold stores of sandbags at district level to use in the event of a flood.

Filling sandbags and building a wall can be strenuous so it is very important that all those involved are fit enough to help. The local flood plan should include a list of volunteers from the community who are willing and able to carry out the work.

Required equipment - Building a sandbag wall up to 600mm high requires approximately 80 filled (3/4 filled) sandbags per linear metre of wall to be built.

- To build a sandbag wall identify firm and level ground, free from obstructions.
- If the wall or dam is going to be in place for a long period of time PVC sheeting should be used to form a barrier on the wet side of the wall.
- If time and conditions permit sandbags should be compacted after being laid.

It is essential that everybody involved in building a sandbag wall is equipped with the appropriate personal protective equipment, including gloves, steel toecap footwear and hard hat.

Procedure for building sandbag walls -

- Lay alternate courses (Stretchers and Headers).
- Lay sandbags with seams and bag mouths facing inwards, as this is where moisture enters the bags.
- Shape the sandbags into rectangles before laying them.
- Use 3/4th filled sandbags to enable you to stagger joints.
- Have the neck of the sandbags facing the same direction.



- **Wire crated stone walling** is a wire mesh cage or box filled with rocks for use in civil engineering for constructing embankments for protection of riverbanks or roadside ensuring erosion control.



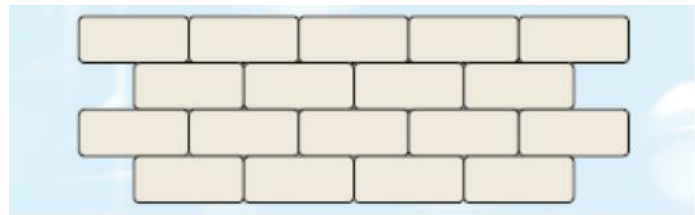
Instructions for building sandbag walls.

Before starting to build a sandbag wall or dam; decide on the required height and how long the wall will be in place. For this exercise, the wall is to be 600mm high and will be in place for a long time.

1. Level the site.

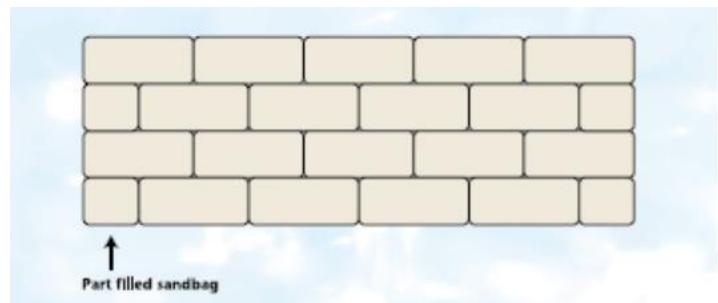
2. As the wall is going to be in position for a long period of time, lay out a roll of PVC sheeting (e.g. Visqueen sheet). Position the PVC sheet so that the lead edge falls approximately along the centre line of the wall, with all the spare sheet showing at the front (water side)

3. Shape the sandbags into uniform rectangular shapes.(Headers)



4. Lay the outside bags first and finish in the centre. This will help to "tie in" the outside bags.

5. Always lay sandbags so that all joints are crossed, possibly using a half-filled or three-quarter filled sandbag at the start of a row.



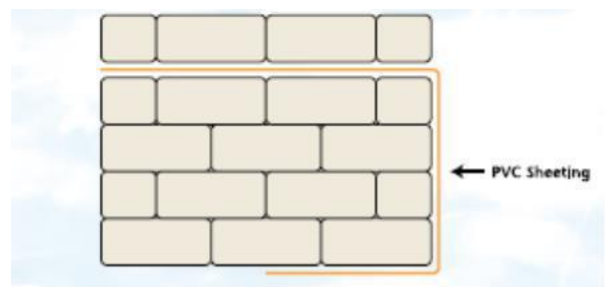
6. After laying every course, consolidate the sandbags. This can be done using feet or, on alternate courses, using a vibrating plate.

7. For the first course, and all alternate courses, use a Header course.

8. For the second course, and all alternate courses, use a Stretcher course.

9. When the sandbag wall reaches the appropriate height pull the PVC sheet up and over the top of wall.

10. Place a course of sandbags on top of the PVC sheet.



11. To lay sandbags in a doorway, it may be necessary to empty some of the contents out or shape the sandbags to achieve a good fit without overlapping (Figure 7)

DERRICKS, SHEERS AND GYNS

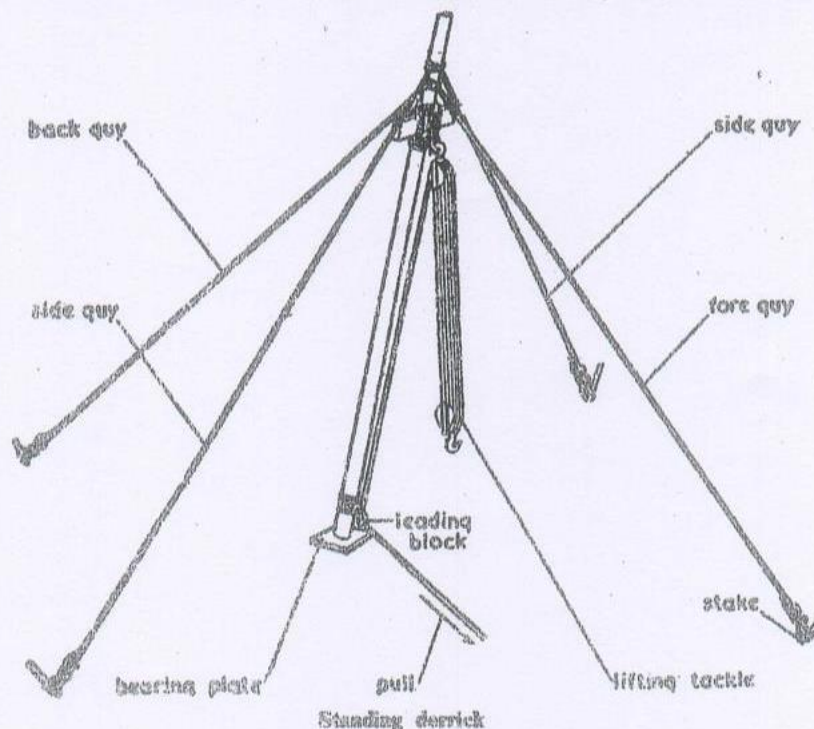
39. Introduction.—When no suitable crane for lifting a heavy object is available some form of derrick sheer or gyn must be rigged for this purpose. These are used with tackles for lifting and lowering heavy weights each apparatus being used in a different way.

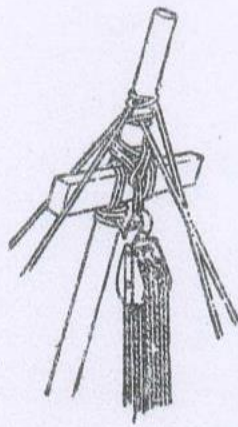
40. The derrick is a single upright spar; the swinging derrick consists of an upright spar with a swinging boom pivoted at its foot. Sheers consists of two upright spars with their heads lashed together and their feet splayed out. A gyn is a tripod by three spars with their heads lashed together. A ropeway consists of an overhead jackstay of rope set up between two sheers, or gynes, along which a travelling block is hauled back and forth.

41. In choosing poles for such apparatus, it is important to ensure that they are long and strong enough to permit the load to be lifted to the required height after allowance has been made for the length of the tackle when chock-a-block, plus the length of the sling or chain in use, the height of the object to be lifted, and with sheer legs and gynes, additional allowance must be made for the slope of the legs.

42. Standing derrick

(a) Description.—A standing derrick is a single spar or pole (or two more lashed together for strength) with the butt on the ground on a solepiece and the pole held vertical by three, or sometimes four guys. The weight can be lifted and moved to the right or left and to the front, but only to a limited distance. To support the lifting tackle and to prevent it from binding on the derrick pole a short crosstree (or crosshead) about 18 inches long is affixed to the derrick pole by a square lashing with rope or wire bond. The crosstree should not be shouldered or bolted to the upright as this weakens both crosstree and derrick pole. Its normal position is from 1½ to 2 feet from the top of the pole, but in all cases it is advisable to have it fixed as far down the pole as will give sufficient room to lift the weight the required distance. With any particular pole the shorter the length of pole bearing the load, the greater the load it can carry within the limits imposed by the type and size of pole in use.





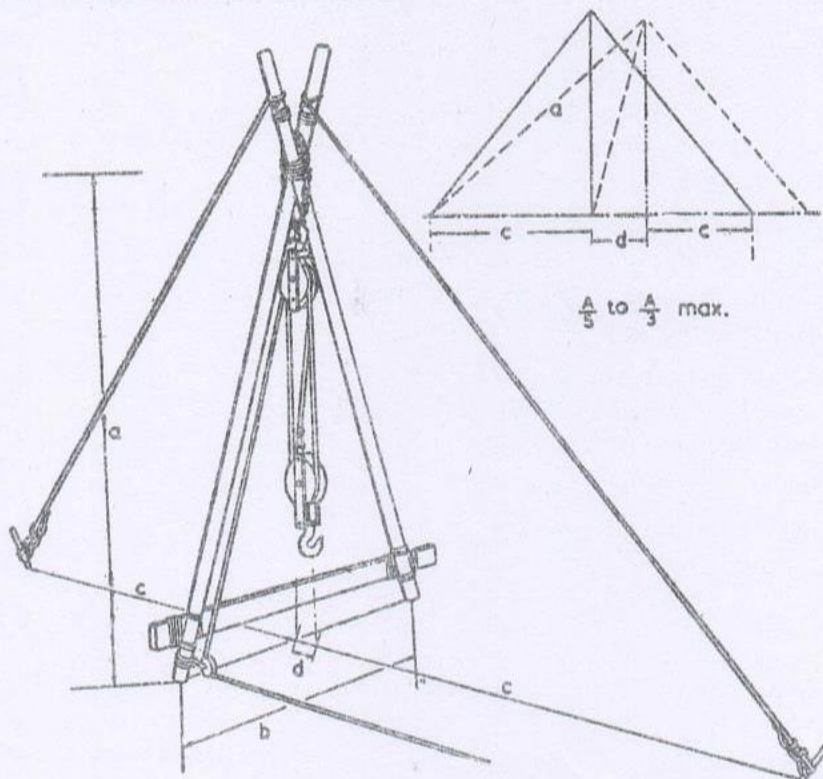
Head of Derrick

The major parts of a derrick are :—

- (i) **Guy.**—When using 40-foot $1\frac{1}{2}$ inch lashings for guy lines, the opposite guys are joined together by a reef knot or double sheet bend if the ropes are wet and the ropes are attached to the top of the pole by a clove hitch. When the 200 foot 2 inch rope is used as a fore and back guy it should be attached to the top of the pole by a clove hitch made in the centre of the rope. If it is impossible under certain circumstances to use a guy rope, a “lazy leg” may be used. This is done by lashing another pole to the pole of the derrick, using the diagonal lashing.
 - (ii) **Pickets.**—The distance of the guy pickets from the foot of the derrick should be equal to twice the height of the derrick if possible but never less than the height of the derrick. Where conditions are unsuitable for the use of pickets, improvised holdfasts may be used.
 - (iii) **Tackle.**—The block with the greater number of sheaves is used as the upper block and is attached above the crosstree by a wire bond, sling or chain and the square lashing protected from harm by sacking, etc. The hook of the block must be moused.
 - (iv) **Footing.**—The ground on which the derrick will stand must be firm, or steps must be taken to make it so. It is advisable to form a shallow hole into which the butt will be placed. If the ground is too soft to withstand the pressure of the butt, a footing of baulks of timber may be necessary, so constructed as to spread the load over a sufficiently large area of ground.
- (b) **Layout and preparation.**—Having chosen the position for the foot of the derrick, allowing for any necessary luffing, the points at which guy pickets will be driven in should be selected. After preparing the derrick, the tackle should be overhauled to the required length and the lower block temporarily lashed to the pole to prevent swinging during erection.
 - (c) **Raising.**—The initial raising is done by hand under the Leader’s direction. The guy at each picket is controlled by a man, and, as the pole is raised, the slack on the fore guy is taken in. During erection the guys are temporarily controlled with a round turn on the pickets and finally made fast with a round turn and two half-hitches.
 - (d) **Luffing.**—When raising a stretcher or weight over an obstruction, such as a wall, it is usually necessary to luff the pole slightly. When this is being done each guy line must be controlled under the direction of the Leader. Since the men must work in unison the Leader must give precise directions to haul or slacken and must not leave the men to exercise their own judgement otherwise misunderstandings may occur and lead to an accident. The initial luff should not exceed one-fifth of the effective height of the derrick to allow for stretch in the guy lines when the derrick is first loaded. The maximum luff at any time the derrick is in use thereafter must not exceed one-third of the height of the derrick. This limit of incline fixes the distance at which a weight can be picked up.

43. Sheer Legs

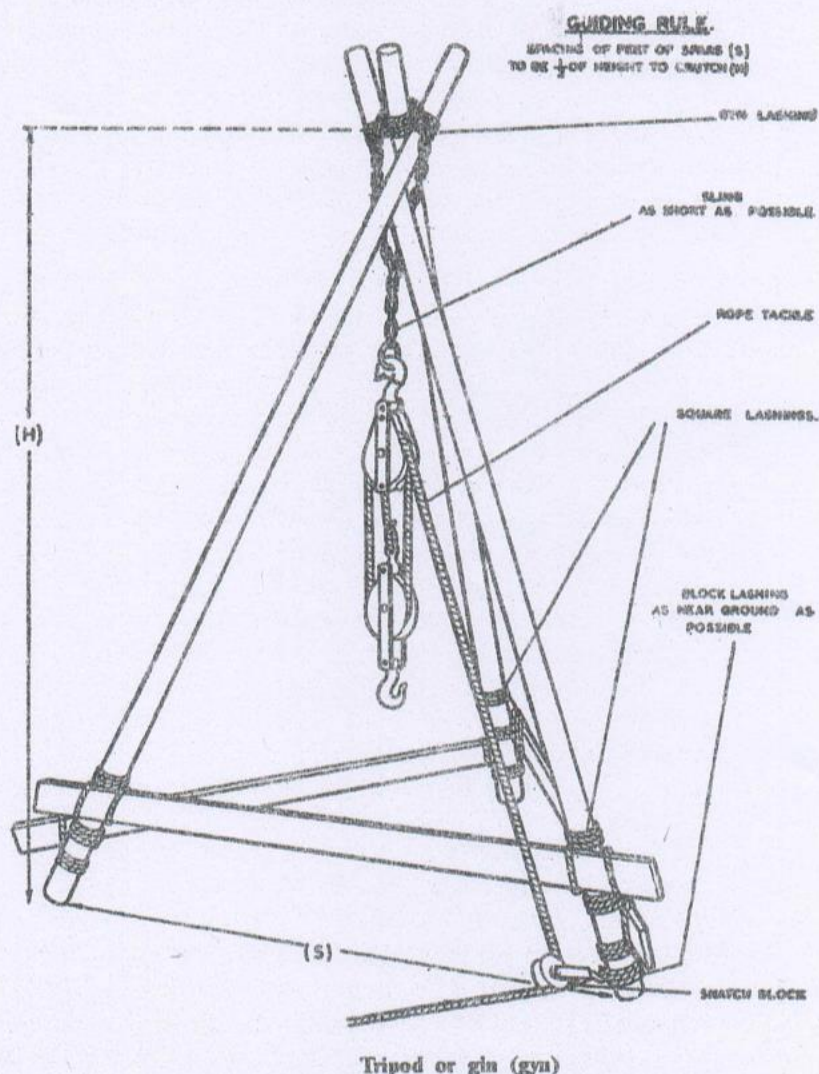
- (a) **Description.**—Sheer legs consist of two poles with their butts on the ground and their tops lashed together and held in the air by a fore and back guy, forming an inverted “V”. Sheer legs can sometimes be employed where the use of a derrick would be impracticable, but can only be used to move the weight in a straight line by swinging the load between the legs. For a given load, the two spars may each be lighter than the one required for a standing derrick.
- (b) **Layout and preparation.**—Two poles should be selected as nearly of equal length as possible and laid with their butts flush together on the ground, the tips being raised to a convenient height for working. Spacing pieces 2 inches to 3 inches thick should be inserted between the poles and lashed with a round lashing. The butts of the poles should be opened up until their distance apart is about one-third of the length from butt to lashing. To prevent the butts from splaying, a ledger should be lashed on near the butt, or an alternative a 40-foot lashing can be used, fastening it to each leg by a round turn and two half hitches, or holdfasts can be driven in and fastened to each leg. A sling or strop (i. e., a short length of heavy rope or chain) should be passed over the fork or crutch so that it will rest across the poles and not on the lashing between them. The lifting tackle is prepared and hooked into the sling, the lashing being suitably protected. The hook must be moused.
- (i) **Guys.**—The guys are similar to those required for a derrick but consist of two only, a fore and a back guy. They should be made fast above the round lashing by clove hitches in such a way that they will draw the spars together when the stress comes on to them—i. e. the fore guy to the rear pole and the back guy to the front pole. The length of the guys is similar to those used with a derrick. In certain circumstances a “lazy leg” can be used instead of a guy.
- (ii) **Tackle.**—A sling or strop is passed over the crutch to take the hook of the upper block of the lifting tackle. The hook must be moused. The tackle is prepared to the required length, and the lower block is temporarily lashed to one of the poles to prevent swinging during erection.
- (c) **Raising.**—The initial raising is done by hand under the Leader’s direction. The guy at each picket is controlled by a man and as the sheer legs are raised, the slack on the fore guy is taken in. During erection the guys are temporarily controlled with a round turn on the pickets and finally made fast with a round turn and two half-hitches. The butt must be placed sufficiently far from any obstruction to permit the top of the sheer legs to be luffed over it.
- (d) **Luffing.**—A sheer leg is luffed by carefully paying out on one guy and taking in on the other. All men must work in unison under the Leader’s direction to ensure sound operation and prevent accidents. The amount of luff permissible is similar to that allowed to derricks—i. e. initial luff one-fifth, thereafter one-third maximum.



Sheer legs

44. Gyn or tripod

- (a) **Description.**—A gyn or tripod consists of three poles lashed together near the tips and with the butts forming an equilateral triangle on the ground. No guys are required and the space occupied is small, but only a vertical lift is possible. The lifting tackle is suspended from a sling passed over the crook formed by the tips of the spars. The poles used should preferably be of equal length and strength.
- (b) **Layout and preparation.**—The three poles should be laid out side by side, the butts flush on the ground and the tops raised on a trestle or box. Having placed them they should be marked about 3 feet down from the tip of the shortest pole to show the position of the centre of the lashing. The centre pole should now be removed and reversed with its butt on the ground on the opposite side of the trestle. All three marks should be in line. Spacing pieces—i.e. 2-inch or 3-inch thick according to the diameter of the poles—should be inserted between the poles, after which they are lashed together with a figure-of-eight lashing. The two outer poles are crossed until their butts are at a distance apart equal to about half the effective length of the poles, the top of the centre pole to rest in the crook of the other two.



- (c) **Raising.**—The head of the gyn should be lifted as far as possible by hand and the centre pole brought in to form an equilateral triangle. The butts should be evenly spaced at a distance apart equal to about half the height from the butt to the lashing; they must all be on the same level or the weight will be distributed unevenly, and the gyn must be placed so that its head is as nearly as possible over the centre of gravity of the load.

NOTE: Whether a weight is suspended or not, the gyn should not be left standing unless the butts are secured against slipping by one of the methods in the sheer legs.

Flood Rescue Survival

Flood rescue boat operations often require crew and passengers to work and travel in unfavourable conditions. Boats operate in sun, wind and rain and those travelling in boats are in the open with little or no shelter. There is always the possibility of crew, passengers or the person being rescued being affected by exposure to the elements. The conditions most likely to have an effect are:

- **Heat;**
- **Cold;** and
- **Moisture.**

Heat

- □ □ In hot weather those persons in an open boat will be subjected to direct sunlight, light reflected from the water, and any light coloured surface such as the boat hull. If the boat is stationary, the effect will be most obvious. While moving, the effect is less obvious because of the breeze created by the boat's movement. In either situation, the end result can be similar; after a short period, people can suffer sunburn and/or heat exhaustion.
- □ □ A person suffering from heat exhaustion will often become pale and cold, have temperature variations, be dizzy and nauseous. First aid for this condition is to cool the casualty by providing shade and rest. A cold drink with added salts may assist.
- □ □ When operating in hot weather, all crew should wear shady hats or caps and sunglasses and cover up in loose fitting clothing, preferably of cotton. Minimise exposure to the sun and heat, drink plenty of fluids and wear a good sun block lotion.

Cold

- □ □ When it is raining, during winter when strong winds are blowing, or when operating at night, cold will have an effect. The most common effect of cold conditions is discomfort, but if not checked, discomfort can extend to hypothermia.
- □ □ Hypothermia is basically a loss of body core temperature. The human body has a body core temperature of about 37 °C. With prolonged exposure to cold, people may tend to lose body heat faster than the body can cope. With this loss of body heat there will be a loss of efficiency, injury or even death. A loss of as little as 2 °C in body core temperature will cause serious hypothermia.
- □ □ Where there is any wind, a 'wind chill' effect can be created even when the still air temperature is quite high.
- □ □ Possible signs of hypothermia include extreme shivering loss of coordination, mental rigidity, uncaring or flippant attitude, confusion and amnesia muscular rigidity, collapse and unconsciousness.
- □ □ The first aid for hypothermia involves gently re-warming the casualty by the provision of shelter, rest, warm clothing, warm (never hot) drinks (no alcohol or cigarettes), and huddling together to share body heat.
- □ □ In cold weather operations, crew should wear layered clothing which can easily be adjusted to changing temperatures. This clothing should be preferably of wool, with a light windproof outer layer, gloves and wool hat or balaclava.

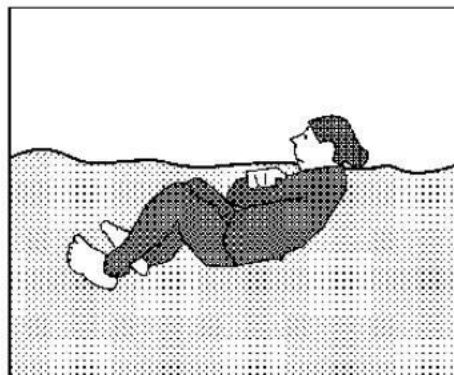
Moisture

- □ □ □ Wet conditions are common when operating in flood rescue boats. Crews are required to wade, work in the rain or mist and are frequently splashed by waves or spray. When combined with cold and wet conditions, this can be extremely uncomfortable and exhausting and will greatly increase the likelihood of hypothermia.
- □ □ □ Another problem relating to wet conditions is immersion. Persons trapped in flooded buildings, marooned by flood water or the survivors of sunken boats may have been immersed in water or exposed to cold for long periods. These conditions may affect the survivability of the victim/s.
- □ □ □ Studies have shown that an average person wearing a life jacket and immersed in water has a life expectancy under various conditions.
- □ □ □ The above figures are intended as a guide only. There are many variables relating to individuals and the effect of clothing.
- □ □ □ Generally the precautions for wet conditions are similar to cold. Clothing requirements are much the same with the exception of waterproof clothing. Crews are advised to carry a change of clothing.

Heat Escape Lessening Position (HELP)

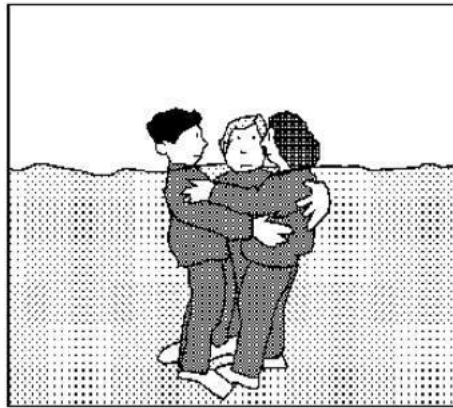
- □ □ □ A person in the water will lose body heat at a greater rate than in dry air. Attempts to swim or any vigorous movement, while appearing to create body heat, will cause more rapid loss. The areas of the body where the greatest loss of heat occurs are the groin, the trunk, the neck and the head.
- □ □ □ Where a survivor is unable to swim to shore and is likely to be in the water for any length of time, the rate at which body heat is lost must be minimized. To reduce this rate, a survivor should adopt the heat escape lessening position (HELP).
- □ □ □ In the HELP the chest and groin are protected from much of the heat loss to the water, with up to a 50% reduction in heat loss. To effect this position, the survivor:
 - □ □ □ holds the arms so as to cover the sides of the chest and upper body;
 - □ □ □ raises the legs, shielding the groin and chest; and
 - □ □ □ then endeavors to float on the back.

For greatest effect, it is desirable for the survivor to have floatation assistance.



Survival Position

Where a number of survivors are in the water, they should huddle together and individual body heat loss will be reduced. Individuals huddled together should shield as much of their collective body trunks as possible.



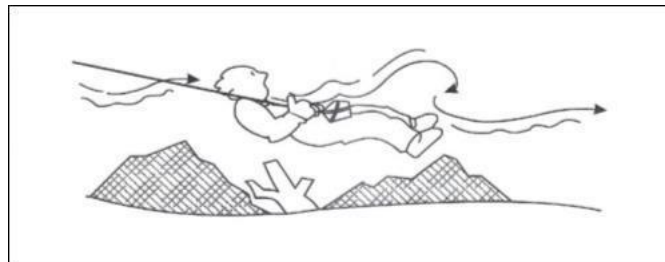
Huddling Position

Self Rescue

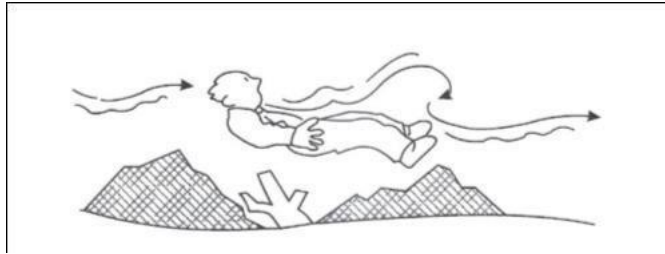
- □ □ □ The procedure to be used if a boat capsizes has been described in detailed in 'Emergency Drill'. It states: 'where safe to do so, crew members should stay with the boat'.
- □ □ □ In situations where there is a current and it is not safe to stay with the boat, or where a crew member is swept away from the boat, personal survival becomes the main priority.

Defensive Position

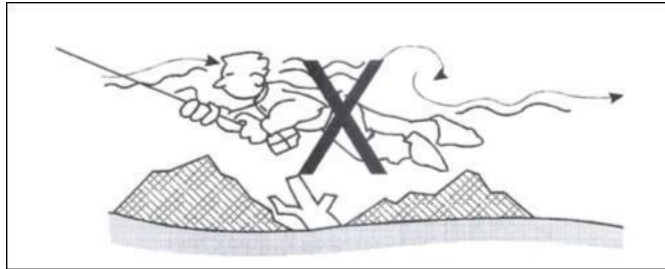
Once in the water, adopt the standard defensive position for swimming in a current i.e. lying/floating on your back with your feet pointing downstream. Use your feet to fend-off any obstacles.



Defensive Swimming Position



Safe Towing Position (Helmet should be worn if possible)



Never face into flood water

- □ □ □ Try to maintain a horizontal position as near to the surface as possible. A vertical position in the water will increase the possibility of hitting submerged obstacles and/or becoming stuck or snagged. Look downstream for obstacles, calmer water and exit points. Swim with the current and manoeuvre yourself towards calmer water and a safe exit point.
- □ □ □ In fast-flowing rivers with tree-lined banks, it may well be safer to stay mid-stream initially, until you find a safe exit point, than to risk being swept into and under trees near the bank.
- □ □ □ In the defensive swimming position you can manoeuvre yourself by kicking your legs back and forward, and paddling with your arms. You can also use your body to 'ferry glide' to help you manoeuvre in the current.

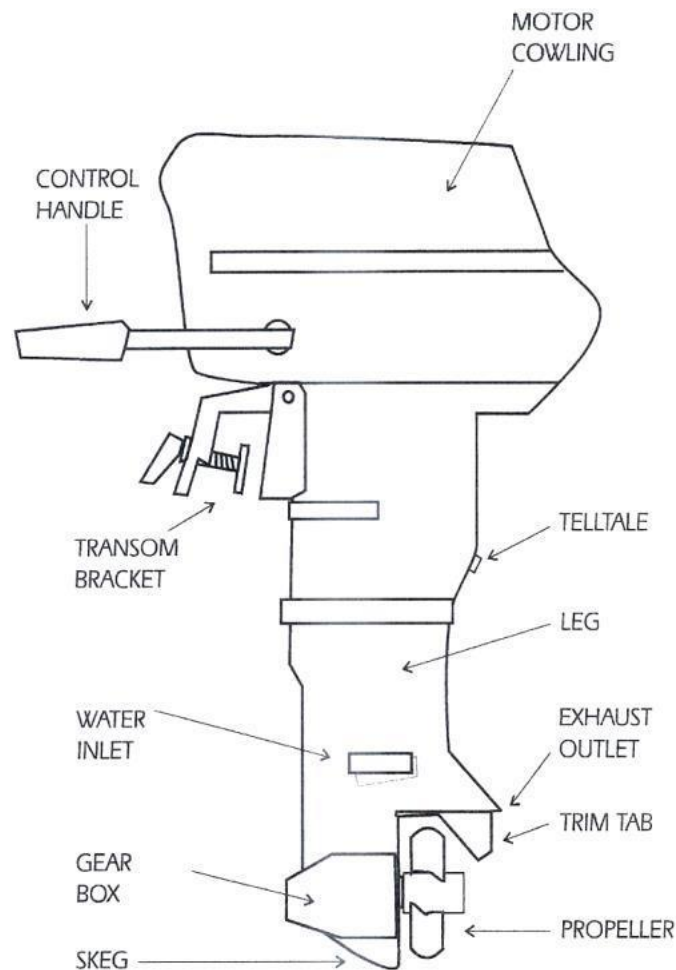
Outboard Motors

Flood rescue boats are never to be considered 'out of use' and must always be kept in a state of readiness for action. Regular and efficient maintenance of the hull, the trailer and the out boat motor are critical. Every flood rescue boat and motor comes with the manufacturer's operation instructional manual. Always read the owner's manual before attempting any maintenance. Motors must be serviced by qualified marine motor mechanics as recommended by the manufacturer. Flood rescue boat crews must not tamper with motors as many lives are depend on proper servicing and worthiness of motor.

Out Board Motor Terms

By knowing the part of one make or model of motor, crew will often be able to use a motor they may have never seen before. Crew must be aware of the fact that various manufacturers have different names for the same parts. Important parts of the motor are described below.

- ☐ **Angle Adjustment Pin/Rod:** This allows the motor to be set at different angles so that the trim of the boat can be varied.
- ☐ **Anti-Cavitation Plate:** The plate positioned above the propeller to prevent cavitation.
- ☐ **Clamp Screws:** These secure the motor by the stern brackets to the transom.
- ☐ **Exhaust Relief:** The two holes in the shaft below the pump indicator are for dispersal of excessive exhaust fumes.
- ☐ **Fuel Connector:** The point at which the fuel line is connected to the motor.
- ☐ **Fuel Line:** The hose linking the fuel tank to the motor.
- ☐ **Motor Rest:** The frame or projections on the motor head allowing the motor to be laid down when removed from the boat.
- ☐ **Motor Shaft:** The section of motor below the engine, ending at the propeller region.
- ☐ **Priming Bulb:** The bulb on the fuel line used to pump fuel from the tank and inject fuel into the carburetor for starting.
- ☐ **Shift Lever:** The gear selection lever for forward, neutral and reverse.
- ☐ **Skeg or Skid:** Provides directional stability and protects the propeller.
- ☐ **Tiller Handle:** The arm used for steering and throttle control.



Parts of an Outboard Motor

- ❑ **Stern Brackets:** The brackets for placing the motor on a boat's transom.
- ❑ **Tilt Grip:** The grip on the motor cover for tilting the motor forward.
- ❑ **Tilt Lock:** The lever which allows the motor to tilt or to be locked in position.
- ❑ **Twist Grip Throttle:** The moving part on the end of the steering arm to govern the speed of the motor.
- ❑ **Water Pump Indicator:** The outlet, often called a 'tell-tale' which allows a steady discharge of water to pass through, indicates the correct operation of the cooling system.

Flood Rescue Boat care and maintenance

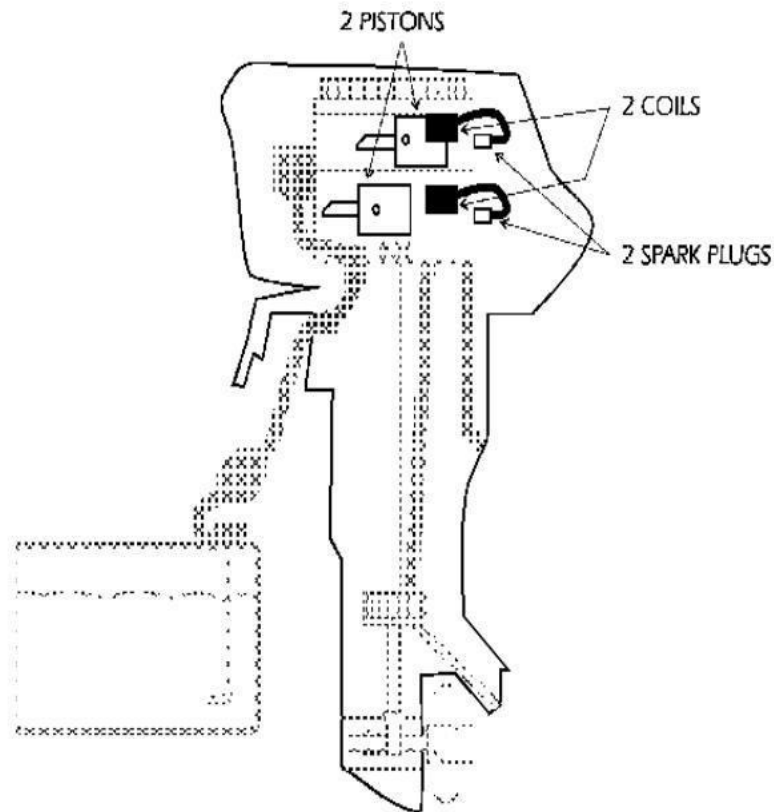
Flood Rescue Boats are predominantly equipped with petrol-powered two-stroke outboard motors. Some flood rescue boats may be fitted with four-stroke motors. In this, most commonly used two-stroke motors are discussed. Crew members are advised to consult the owner's manual supplied with the motor provided to their unit and make them selves familiar with all recommended procedures and practices.

Motor Systems Overview

Each outboard motor consists of a number of systems whose combined actions produce power to drive an flood rescue boat. All crew should be familiar with the main systems. This will assist in motor operation and fault finding.

The ignition system

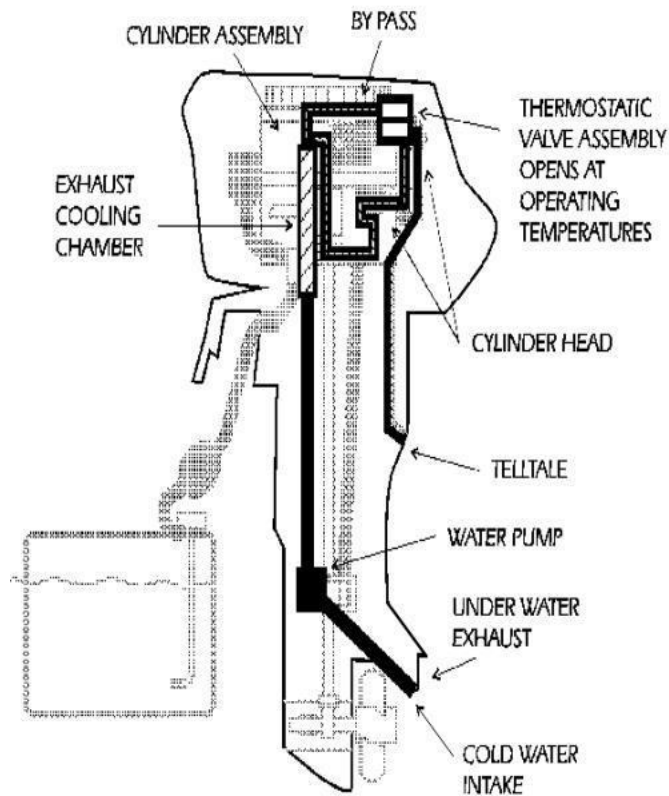
An electric current at 6 to 12 volts is transformed into a momentary charge of extremely high voltage capable of jumping the spark plug gap into the cylinder and igniting the fuel-air mixture.



The cooling system

Outboard motors are commonly cooled by water. Water enters the system through an intake and is directed to the water pump located in the lower unit. Cooling systems on most outboard motors show a water discharge through the exhaust outlet or through a 'tell-tale' to indicate the circulation of water through the cooling system.

Note: After use in salt or dirty water, always flush the cooling system with clean fresh water. Watch for wasp's nests blocking intakes or outlets, especially if a motor has not been used for some time.



The fuel system

The majority of flood rescue boat motors are two-stroke motors that run on a mixture of oil and petrol. The oil can be premixed with petrol or supplied from an oil reservoir in the motor. A number of newer motors use the oil reservoir system. This is called a variable ratio oil system. If a motor has its own oil reservoir the fuel system will mix the appropriate amount of oil with the fuel to lubricate the motor. Crews must ensure the oil reservoir is topped up with the correct grade of oil according to the owner's handbook.

Most flood rescue boat motors are lubricated by premixing oil with petrol at a defined ratio. It is critical to verify the correct fuel:oil ratio in the owner's manual. Fuel mixing is a potentially hazardous activity and must be done in a ventilated area away from any source of ignition. Never decant fuel into portable containers onboard the vessel.

PICKETS AND HOLDFASTS

36. General.—Pickets and holdfasts are used in rescue work for the purpose of making fast a line, a rope, a wire rope or chain which will be under strain. They fall within two main clauses :—

- (a) Those found in situ on the site, e.g. reinforced concrete or metal standards, gate posts of solid masonry, metal frame work of buildings etc.
- (b) Those which have to be set up e.g. by use of pickets, beams set in to water gutters or man holes in the street and wedged in position, baulks of timber placed across opening in buildings.

37. Pickets.—Pickets should be of sound timber, if possible of ash which is not only hard but has sufficient resilience to “give” rather than to snap as a softer wood might do. In most cases 5 feet is a suitable length, with a diameter, if of ash, of 3 inches, but if of softer wood a diameter of 4 inches and over may be necessary. Pickets used for training which may need to be used time and time again should be carefully selected and will have a longer life if sharpened at the driven end, and bound with wire or an iron band at the head to prevent splitting by being frequently driven in. As regards pickets generally, a picket in soft ground will be pulled out if subjected to too great a load, but in hard ground it will break off at ground level. The picket is normally the weakest part of any guy, etc. and should be carefully watched throughout the operations, since it will give an early indication of any excessive strain on the guy. Failure by pulling out usually occurs gradually, but breaking of the picket is liable to occur suddenly. In driving pickets of different sizes, the strongest should be nearest the weight. Whenever possible, they should be withdrawn in the same direction as they were driven. They should never be loosened by hitting them sideways, as this may break them.

- (a) **Driving in a picket.**—The photograph below illustrates a single picket being driven in and the right way in which it should be held by a lashing line so as to drive it at the correct slope in one direction and at right angles to the line of the pull. In ordinary soil, pickets can be grouped for holdfasts for strains upto 2 tons. They may be used as single pickets as shown here, or may be formed into a holdfast arranged as a series of pickets in the line of pull. The pickets should be driven into the ground to appear upright when viewed from the front—and at a slope equal to 90 degrees to the line of the pull when viewed from the side as shown here. Normally, for security, they should be driven two-thirds of their length into the ground. When used to provide anchorage for a guy, for instance from a derrick, the guy should be made fast to the picket with a round turn and two half hitches. A single ash picket of 3 inches diameter properly driven into good ground can normally be expected to take a safe load of 400 kg. For greater loads a combination of pickets should be arranged and these can be formed in line as one behind one, one behind two or one behind two behind three, according to need, known respectively as 1 and 1, 2 and 1 and 3, 2 and 1, the strongest picket

always being nearest to the weight of load being taken. The lashings connecting the pickets should be at 90 degrees to the pickets and should come from near the head of the picket in front to ground level at the backing-up picket. This determines the distance between the pickets, which however should never be less than 3 feet apart. When sound pickets are properly driven into good grounds the safe loads that they can normally be expected to take are :—

- (i) Single picket 300—400 kgs.
- (ii) 1 : 1 picket 600—800 kgs.
- (iii) 2 : 1 picket 900—1200 kgs.
- (iv) 3 : 2 : 1 picket 2400 kgs.

- (b) **Driving a 1 : 1 picket.**—To lash 1 and 1 picket holdfast using 40 foot 1½ inch lashing lines, make a clove hitch near the head of the front picket leaving enough running end to ensure that when this is married to the line, the twisted ropes will reach to and round the base of the backing-up picket. See Fig. "A". Make four to six turns around both pickets "marrying in" an additional lashing line if necessary. Fig. "B" shows this. Before applying frapping turns round the lashing, tighten up the turns by pulling on alternate lengths of lashing from each side, working from the first to the last turn put on.

Two men bracing themselves with their feet together can quickly and efficiently apply the necessary forces to tighten the turns.

The 1 and 1 picket holdfast lashing is finished off by winding frapping turns around the turns, using up whatever spare rope is left, and finishing with a clove hitch around the lashing. Such a holdfast will take a load of from 600—800 kgs.

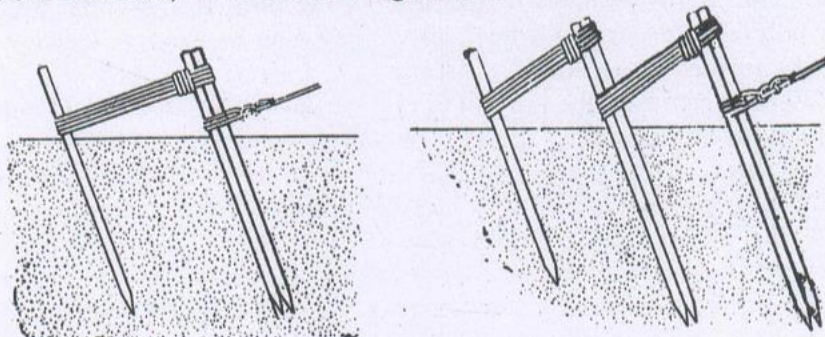
- (c) **Driving in a 2 : 1 picket.**—A two and one picket holdfast will take a load of 900-1000 kgs. and is constructed as shown. The front pickets are driven in side by side close together, and the backing up picket at least 3 feet behind. The lashing is made as previously described, and all turns must be tightened before the frapping turns are put on. The guy is attached to the front and stronger picket by a round turn and two half hitches.

- (d) **Driving in a 3 : 2 : 1 picket.**—A completed 3, 2 and 1 picket could be expected to take a load up to 1000 kgs. if the pickets are sound and properly driven into ground and securely lashed. Care should be taken, in setting out, that the pickets are in a straight line with the direction of the line of pull.

38. **Holdfasts.**—Holdfast is an arrangement made by pickets or other materials to hold or take strain. They can be classified into three categories, i.e. man-made, natural and improvised.

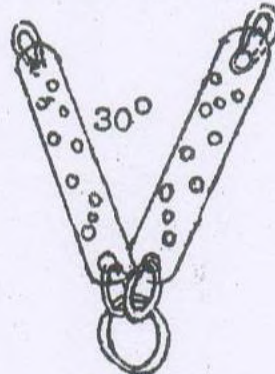
(a) **Man-made**

- (i) **Picket holdfasts.**—May be used in ordinary soil for pulls not exceeding two tons. The normal picket is an ask stake 5 ft long and 3 in. in diameter, with one end pointed (and, when possible, shod with iron) and the other end found with an iron hoop; it should be driven to a depth of 3 ft at an inclination of about 20 degrees with the vertical. Pickets may be used singly or lashed together in combination of one-and-one, two-and-one, or three-two-and-one, as shown in fig. below.



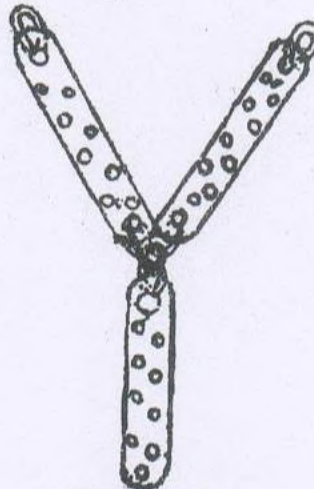
Holdfasts

- (ii) **Ordnance pattern holdfast.**—This holdfast is an ordnance item consists of an iron shell with slots through which number of crowbars can be driven to fix it to the ground. Number of these shells can be joined together to form various shapes to increase the strength of the holdfast. This holdfast can be arranged in the following manner.
- (aa) **V shaped.**—The two arms are placed at an angle of 30° joined by a shackle. It can sustain a pull/weight of 2000 kgs. in hard ground.



"V" Shape

- (ab) **Y shaped/three legged holdfast.**—This consists of three individual holdfasts joined together by means of shackles and fixed to the ground by means of crowbars. It can sustain of weight of 3000 kgs.



Three Legged

- (ac) **Tandem.**—This consists of two holdfasts joined together by shackles in a straight line/tandem and fixed to the ground by crowbars. It can sustain a weight of about 2000 kgs.

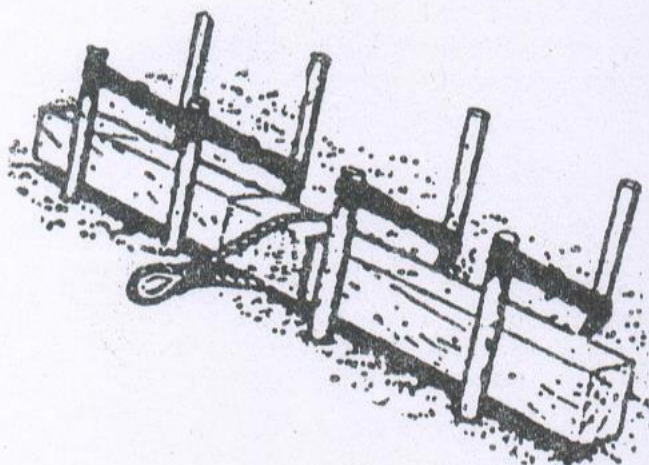


Tandem

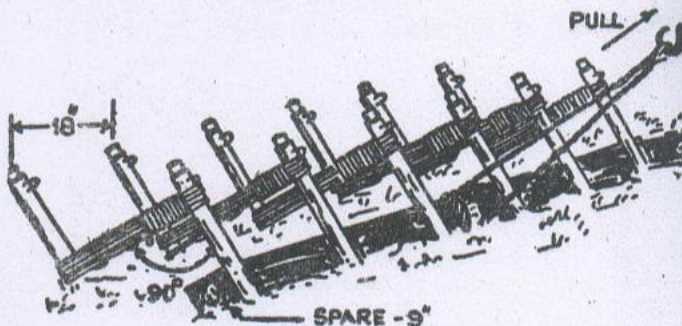
- (b) **Natural.**—At times the rescue party members have to depend on natural objects to act as holdfasts e.g. trees and boulders available at the site. However one should ensure that these objects are firmly embedded into the ground before use. However it may be difficult to assess the load bearing capacity of such holdfasts.

(c) **Improvised**

- (i) **Baulk and picket holdfast.**—Baulk and picket holdfast consists of a baulk of timber placed behind a line of driven pickets which are backed by another line of pickets; it may be used for pulls of between 2 and 10 tons. Only two lines of pickets should be used, driven in in combinations of one-and-one or two-and-one, with each combination at least 18 in. from the next. A three-two-one combination of pickets should not be used, because of the difficulty of driving the pickets so that each will bear its fair proportion of the stress. The front row of pickets should be exactly to line so that the stress on the baulk is divided equally among them, and the ground under the baulk should be cut away to allow the face of the baulk to bear fairly against the inclined pickets. The baulk should be well parcelled where the strop passes round it.



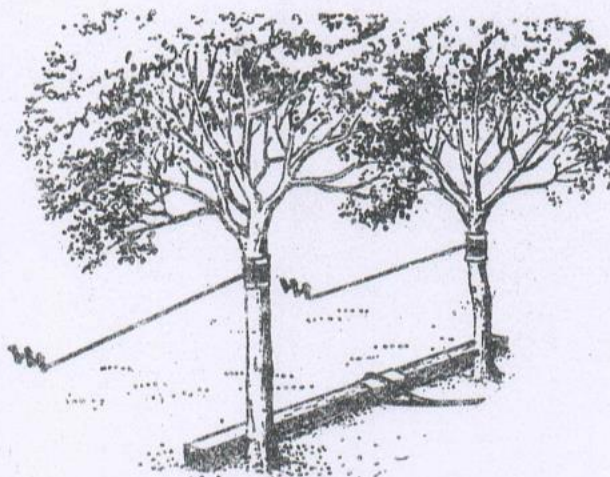
Baulk and picket holdfast



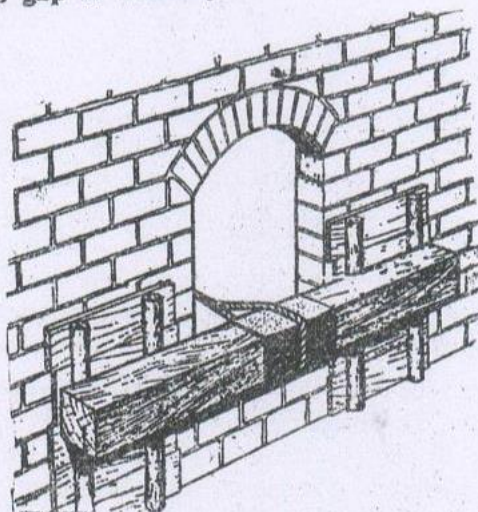
Spare 9'

- (ii) **Baulk holdfast.**—These can be prepared by using varieties of structures both natural and artificial ones.

(aa) **Baulk across two trees**



(ab) Baulk across gap in masonry



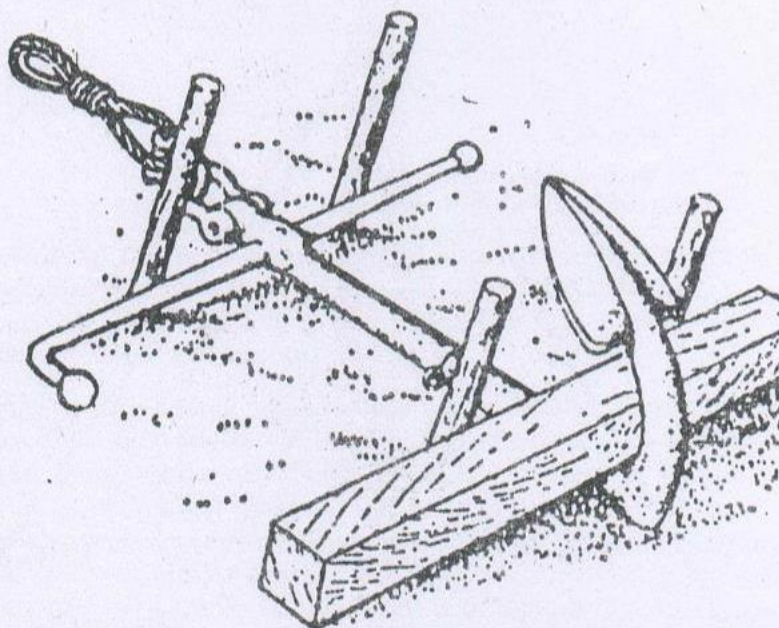
(ac) Baulk across a window

(ad) Baulk across a manhole

(iii) Lamp post as a holdfast

- (iv) **Buried holdfast.**—A buried holdfast, used for pulls of over 10 tons, consists of a baulk or baulks of timber hid in a trench and then covered with well-rammed earth. The trench should be 2 ft longer than the baulk and have a vertical face; its depth will depend on the nature of the soil and the pull which the holdfast is required to withstand. A subsidiary trench to take the strop must be cut, as shown in fig. below; its slope should not be steeper than one in three and chocks should be placed to support the baulk clear of the bottom of the trench to enable the strop to be passed. Planks can be laid vertically and horizontally between the baulk and the face of the trench to distribute the stress over a greater area.

- (v) **Anchor holdfast.**—An anchor holdfast consists of an Admiralty pattern anchor embedded and supported by pickets, as shown in fig. below



Anchor holdfast

COMMUNICATIONS—WIRELESS TELEGRAPHY, RADIO TELEPHONY AND MORSE CODE

1. Object:

The success of relief operations depend upon the availability of rapid and accurate communications. The success is obtained by rapid dissemination of the information to those for whom it is intended. Telephone, wireless-sets, flags and messengers are some of the important means of communications. Radio (wireless) can be a most valuable and rapid means of communication for the present day C.D. Services. We can use a wireless set for talk in the same way as a telephone or the way the messages are transmitted by means of dots and dashes in the telegraph offices. The former method is called Radio telephony and the latter wireless telegraphy. One of the system of dots and dashes in telegraphy is called the Morse Code. The transmission of messages on wireless acts is easy if a set laid down procedure is followed. In the following paragraphs we will study this procedure. We will also describe the limitations and operation of a wireless set.

2. Morse Code:

To increase the rapidity of communications on a given system of communication wireless, telephone etc. some sort of code is necessary, in the same way as with the use of code a stenographer can write down messages at a very rapid speed. The most important code used for signalling purposes is that known as Morse Code, named after Samuel Morse, an American telegraph engineer who invented this code. This code is now used universally. It is built of dot, dash and the space. Dash is equal to length of 3 dots and the spacing between this element of letters is one dot while the spacing between letters is equal to length of three dots and between words six dots. Each letter of alphabet, punctuations and given figures have been given a dot dash code and the receiver on receipt of these dots and dashes translated the same into letters and thus a perfect message is sent and received. The code is given in the attached appendix. Learning of code is like learning a new language and therefore, requires practice and time. The speed of sending and receiving messages on the code is many times more than the receipt and despatch of messages by telephony. The same code is used in lamp and flag signalling.

WIRELESS FOR CD

3. Range and Limitations:

Radio (Wireless) can be very useful and satisfactory means of communications in C.D. but it has certain limitations also. Apart from the country-wide net of wireless fixed stations used by civil and military

authorities two main types of wireless sets may be used for Fire and C.D. Services.

- (i) Sets of 5 to 10 watts output kept in vehicles. These may be termed "Mobile" stations/units.
- (ii) Set of about $\frac{1}{2}$ watt output which may be carried by a man. This is called a "Walkie Talkie" set. These sets may be used in future by C.D. Services.

Broadly speaking the frequencies (wave lengths) for C.D. etc. purposes will be such that the sets will be able to give satisfactory communications upto optical horizon. Thus the places, which may not be very far away, but are screened from each other by hills, high buildings etc., may not be able to hear to each other. In such cases, some times, the moving of the set just a few yards on one direction or the other may give satisfactory reception. The atmospheric conditions also affect the reception. There may be screening even where the set is working inside a steel framed building. In a bigger mobile set good transmission/reception is obtained by increasing the height of the aerial. A Walkie Talkie cannot employ separate aerial arrangements on top of high buildings as can be done in case of bigger sets. In Walkie Talkie the communication can be improved by taking the set to a higher position. Owing to the limited range of Walkie Talkies it may often be necessary to use a bigger set (Mobile) as the Control Station (definition given below) for Walkie Talkies in a built up area. If distances are short the Walkie Talkies can be used as Control Stations. The range of the various sets to be used in C.D. may be as follows:

- (i) Between Mobile sets in rural areas 3—5 miles.
- (ii) Between Mobile sets in urban built up areas 1—2 miles.
- (iii) Between a fixed station and a Walkie Talkie in urban area 1—3 miles.
- (iv) Two Walkie Talkies in built up area—100 yards to 500 yards.
(Longer range if sets used from higher positions).

4. Instructions for Walkie Talkie Sets:

All Walkie Talkie sets are turned to a fixed specified frequency and cannot be adjusted to any other frequency without change of the crystal at the workshop. There are only three controls on this set—"ON", "OFF" and "Press to Talk". The set when switched "ON" takes a few seconds to warm up and

a 'hissing' sound is heard when it is ready for operation. On a wireless set you cannot transmit and receive at the same time. Therefore press the switch on the microphone when you want to transmit and release it when you want to receive the transmission. Dry battery is used in these sets. Therefore to conserve the life of battery, switch off the set when not in use. Switch on only when you are ready with the message. Do not turn your head away from the microphone when speaking and keep microphone upright and close to your mouth. Never hold the microphone horizontal i.e. flat. Adjust head-phone to comfortable position on the ear. If your signals were strong (as reported by the other station) at time of commencement of the transmission and become weaker during the transmission, it is an indication that your battery is not in a satisfactory condition.

5. Uses of Wireless Sets:

The wireless sets may be used in C.D. in some of the following ways.

- (i) Between Control/Sub-Control Centres and the
 - (a) Depots.
 - (b) Warden Posts.
 - (c) One Sub-Control Centre to other Sub-Control or Control Centres.
 - (d) Fire Stations (Fire Liaison Officers direct Control with Fire Stations etc).
 - (e) Incident Control Officers.
 - (f) Rescue Parties.
 - (g) Higher authorities of Military authorities.
 - (h) Rest Centres etc.
- (ii) Between
 - (a) Warden Post and Wardens in their areas.
 - (b) Warden Posts and Fire Stations.
 - (c) Incident Control Officer and Leaders of parties at place of incident.
 - (d) Rescue parties.
 - (e) Units of Mobile columns.
 - (f) Mobile columns and control etc. centre.

The wireless sets may be used to duplicate the telephone communications.

R.T. PROCEDURE

6. Necessity:

There will be a number of wireless sets workings on the same frequency in a net. On Walkie Talkie sets you cannot transmit and receive simultaneously. The different people and operators may have to man/use sets from time to time. Therefore in order to prevent misunderstanding and confusion and to achieve uniformity and rapidity, it is essential to lay down a standard procedure for transmission and reception in wireless sets both for telephony and telegraphy uses.

7. Instructions for R.T. Procedure:

- (i) R.T. Procedure is based upon the principles of
 - (a) Brevity.
 - (b) Accuracy.
 - (c) Security.
 - (d) Speed.

Remember BASS

(ii) R.T. messages must be spoken in a way that will ensure maximum intelligibility to the receiver. Remember RSVP.

- (a) Rhythm (speak complete phrases that will make sense).
- (b) Speed (constant and medium speed).
- (c) Volume (speak louder than ordinary).
- (d) Pitch (pitch voice high, do not drop voice at ends).

(iii) Simplicity:

- (a) Use short well known words.
- (b) Figures and difficult words should be repeated by saying "I say again".
- (c) Spelling—Spell out words which are liable to confusion. Before spelling a word say "I spell", words or abbreviations should not be pronounced before or after spelling. For spelling the phonetic equivalents for letters and figures will be used. There are different equivalents for use in Post and Telegraph Departments and the Police and Military. These are given in the attached Appendix.
- (d) Sending of figures—Say "Figures" before giving out figures. Each digit of a figure should be pronounced separately (except exact multiples of hundred or thousand) and carefully as follows:—

0—ZERO	6—SIX
1—WUN	7—SEVEN
2—TOO	8—ATE
3—THUR-REE	9—NINER
4—FO-WER	
5—FI-YIV	

EXAMPLES :

314—Figures THUR-RE WUN FOW-WER

100—Figures one hundred.

0700 hours—Figures Zero Seven hundred hours.

1100 hours—Figures one one hundred hours
(and NOT figure eleven hundred hours)

1000 hours—Figures one Zero hundred hours
(and NOT one thousand hours)

1000—Figures One thousand
31 AB 7—'Figures' three one 'I spell' Alfa Bravo 'figures' seven.

8. Standard R. T. Phrases :

Used to standardise procedure and avoid lengthy transmission.

Phrase	Meaning or Use
(i) All After	When asking for repetition, verification or correction.
(ii) All Before	
(iii) Message for you	Used when a message is offered between various stations.
(iv) Nothing Heard	Used in establishing communications meaning "No signals heard".
(v) O.K.	(a) Correct. (b) "Reception is satisfactory". (c) "I am ready to receive your message, carry on."
(vi) Out	My transmission is over and I do not expect you to make further transmission on this subject.
(vii) Out to you	"I am finished with you and am about to call another station. No reply is expected from you."
(viii) Over	My transmission have ended and I expect to hear further transmission from you on this subject.
(ix) Read Back	Used when the sender requires a message to be repeated back exactly as received.
(x) Report my signals	Used when a station wants to know the audicity of his signals from the other stations.
(xi) Romeo	Received the message.
(xii) Say Again	Used by the receiver to obtain complete repetitions of a transmission.
(xii) Cancel	Cancel the last word or phrase (the words, phrases indicated)
(xiv) Figures	Before giving out figures.
(xv) Hullo	Used in calling. A sender begins with 'Hullo' if he thinks that receiver may have difficulty in catching the opening of his transmission.

(xvi) I say again	When repeating.
(xvii) I spell	When spelling a word or sending letters.
(xviii) Message for	Included in the call by an out station when sending a message to another station.
(xix) Send your message	Carry on to send the message.
(xx) Strength Five	Used in establishing communications meaning "Very good perfectly readable" (in reply to phrase (x) above).
Strength Four	"Good, readable".
Strength Three	"Fairly good, readable but with difficulty".
Strength Two	"Signals weak, readable now and then".
Strength One	"Signals very weak, R.T. impossible".
(xxi) Wait	"Pause for a few seconds" other stations must not interrupt.
(xxii) WILCO	"Message received, understood and will be complied with".
(xxiii) Word After	When asking after repetition or verification.

9. Wireless Net :

A number of wireless stations (i.e. sets) working on the same frequency for the purpose of communicating with one another is termed a wireless net. One station on a wireless net, normally the one serving the Senior Headquarters is appointed the Control Station of the net. This control station is responsible for the efficient clearance of all traffic on the net. For any wireless transmission on a net it is essential for the transmitting station to identify himself and name the station with which he wishes to communicate. This is done by means of a call. Each type of unit or sub-unit in C.D. Services may be given a 'code' name (e.g. MC, A, P etc.) and this is then called the call sign for that station. In U.K. for the purposes of their Headquarter Section training in reconnaissance work the following standard call signs have been given.

Curriculum Design

AAPDAMITRA FLOOD DISASTER RESPONSE

OBJECTIVE : To train Community Volunteers at District level in Flood Rescue Operations in order to build capacities for organizing Aapdamitra (Flood Rescue Response Teams) during Flood Disasters.

ENABLING OBJECTIVE : On completion of the training program the participants will be able to:

- ☐ Act as First Responder during Floods
- ☐ Operate Flood Rescue Equipment
- ☐ Organize immediate relief measures.

DURATION: 96 Periods (8 periods of 40 minutes each day) - 12 days

S.No.	Subject	Lecture (L) Demonstration (D) Practical (P)	No. of Periods
1	General features of Natural disasters salient features of disaster response & relief. Principles of Disaster Management. Role first responders in Disaster Relief Operations	L	2
2	How floods are caused, different causes of failures of embankments. Importance of vigilance and watch. Embankments and Emergency repairs, Problems created and role of local administration in relief work. Special rescue problems in dealing with secondary hazards i.e. landslides, etc	L	2
3	Warning against Flood Disasters – weather forecasting, IMD alerts, and warnings by district administration and importance of Community Risk Mapping.	L	2
4	Surface Water Rescue: safety considerations, methods PPE & training	L/D	2
5	Flood Rescue Emergency Drill, Casualty Handling & Recovery	L	2
6	Flood Rescue: Rules of river, Flood Water Behavior	L	2
7	Flood Rescue: Boats, types of boats, parts of a boat and safety equipments.	L/D	2
8	Types & Use of ropes/SWR in rescue work. Knots and lashings etc.	D/P	4
9	Flood Rescue- practice words of command	D/P	2
10	Corpse disposal organization. Its necessity, equipments, manpower & procedure of disposal of dead.	L/D	2
11	Use of life jackets and life lines, throwing of Breast line & Life buoys	D/P	4
12	Life Buoys & Hooks, Procedure of use & Safety lines. Underwater Search & Recovery: information on drowned bodies fixing, marking and assessments, recovery methods and tools.	D/P	4
13	Emergency methods of Rescue-Transportation and handling of casualties.	D/P	4
14	Preparation of improvised flood rescue and swimming aids-Types, their constructions & application in water body.	D/P	8

15	Preparation of various types of rope bridges.	D/P	6
16	Use & practice of triangular & roller bandages-use of splints, etc	D/P	6
17	Cardio Pulmonary resuscitation & Artificial Respiration	D/P	6
18	Flood Protection & Building Sand Bag Walls	D/P	6
19	Construction of Derrick, sheers and Gyn.	D/P	6
20	Flood Rescue Survival: impact of heat, cold and moisture, heat escape lessening position and self rescue	D/P	2
21	Out board motor, acquaintance with parts and its working. Using out board motor on boats	L/D	4
22	Hold fasts and Anchorages-Types and their uses	D/P	4
23	Communications - Use of wireless sets and equipment, Radio telephony and use of Standard Phrases	D/P	2
24	Outdoor exercise of flood rescue operation with improvised rafts, Life jackets, Improvised swimming aids, etc	P	4
25	Practical Examination		5
26	Written Test		1
27	Course Inauguration & Validation		2
	Total		96