Man overboard safety and rescue is our concern and speciality.
INTRODUCTION

The Markus Lifenet or Markusnet as most experience and initiative of a trawler captain Mr. Markus B. Thorgerisson. The originator Mr. Markus B. Thorgerisson was the one who had the most influence to introduce this equipment in Iceland, in the beginning. Markusnet is becoming an international standard for equipment to retrieve man overboard, the equipment is named after him due to his pioneer work.

Petur Th. Petursson took over the company Markusnet after Markus past away 1984, at the same time Petur took over further development of the Markusnet. The Markusnets described in this guide are designed by Petur and are the final step in the development work, concerning function and standardization.

The Markusnet has often meant the difference between life and death in recent years, in frequently harsh conditions, both at sea and in harbors.

The importance of Markusnets onboard deck vessels, is not least to provide safe ground for realistic training of “Man overboard rescue” on the vessel itself as well as to be the security, when needed to transport people between liferaft or small boat onto a ship in risky circumstances.

This guide is published to draw attention of the officers on board, to the value of the Markusnet and assist them to organize and execute rescue training on board.

The Markusnet is mainly designed as manual unit to retrieve man overboard instantly from deck vessel or alike, in standing, sitting or horizontal position. It is also designed for use with crane.

Minimum of two Markusnets should be on every deck vessel and when operating in-water rescue, one of the Markusnet units should be for the in-water rescuer only, to secure his way back onboard. Avoid lifting manually more than one person at a time. Two persons in the net can destroy the manual lifting possibility.

It is our hope that this guide will encourage regular scheduled drills for the use of the Markusnet and the seamen will take more responsibility for the life saving and act more as a professional rescuer when needed to rescue someone from the water.

This Man overboard safety and rescue guide should be included within the vessel Safety Manual for reference by the crew.

This manual is written by Pétur Th. Pétursson in consultation with the Marine Safety Training Center in Iceland.

Artwork is based on drawings from Haukur Halldórsson.

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PACKING THE MARKUSNET SHOULD BE PART OF THE TRAINING

RECOMMENDED LOCATION AND NUMBER OF MARKUSNETS

It is advisable to have at least two Markusnet units on board every ship, at conspicuous places outside near gangways. Both units should be made ready when a man is overboard.

Fasten the mounting bracket with the top edge of the lid 80 cm above deck or floor.

MAINTENANCE AND PACKING

- Make sure that the Markusnet is ready for use after drills.
- After drills in sea water, rinse the Markusnet with fresh water and allow to dry before repackaging.
- Use the opportunity to have a new crew member repack the net, under your close supervision.
- Equal safety-loop (chest-loop). Let the throw-line slide into the bag through the palm of the hand holding the bag, using the other hand to press the line into the bag. Make sure that the throw-line is not twisted when pulled into the throw-bag.
- Leave 1 meter of the attachment line outside the case. Inside the container coil it at the bottom and coil the lifting lines separately beside each other on top of the attachment line. Lay parallel floats side by side at the top of the lifting lines.
- Coil lifting line on outer end on the floats and throw-bag on top ready for use. Carefully place case on mounting bracket, fasten lid hasps and when the Markusnet is on deck, anchor attachment line to the ship.

TREATING A PERSON AFTER A RESCUE FROM COLD SEA

After retrieving a man from a cold sea there is always a large chance of him going into shock. It is therefore a good rule to have the person, regardless on how well he may look, recline immediately in order for the blood circulation to the head becomes normal as soon as possible. If possible, put him in warm and dry clothes as well to place him in a warm room.

Unconscious man should be lifted in horizontal position when possible.

Further materials concerning the treatment of hypothermia should be read, for example, "Survival in Cold Water", published by IMO, or translation of that booklet in your language published by the local authorities.

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PRACTICAL KNOW-HOW CONCERNING USE OF MARKUSNETS

The MS Markusnet design is based on many years of development and experience. Every part of the unit has specific purpose to make the Markusnet most reliable and effective to retrieve man overboard in hazardous situations at sea, while the rescuer can stay on deck and maneuver the unit.

THE MAIN PURPOSE OF THE MARKUSNET IS TO PROVIDE MANUAL MAN OVERBOARD RESCUE POSSIBILITIES

It is important to have in mind that the Markusnet is designed to use manually to lift one person at a time, from the water or life-raft, but can also be used to hoist person by crane, both in vertical and horizontal position.

It is also intended to provide in-water rescuer security and secure his way back onboard. To fasten helpless casually in, to be hoisted up in horizontal position. To provide second security when there is a need to transport people from boat onto a ship in difficult situations.

THE MAN IN THE WATER LOOSES THE ABILITY TO THINK LOGICALLY AND IS LIKELY TO BE DANGEROUS TO A HELPER (IN-WATER RESCUER)

A great majority of those who fall into a cold sea, loose their ability to think logically, as the fear of the uncertain situation takes over natural way of thinking. Those who have experience in this matter know that such victim is not likely to pull a life-ring or chest loop over their head nor to have experience in this matter know that such victim is not likely to pull a life-ring or chest loop over their head nor to pull a thing which seams to be a float barrier under their body. Such victim is likely to be dangerous to the in-water rescuer as he / she approach him in the sea.

THE TWO MAIN ROLES OF THE THROW-LINE UNIT ARE, TO ACTIVATE THE WILL POWER OF THE MAN OVERBOARD AND TO BE SECURITY FOR THE IN-WATER RESCUER.

The throw-line bag is designed to ease the throw and to catch the eye of the man in the sea and call for his reaction to pull himself into the net, where he can feel safe and secured.

After the man in the sea are in the net, the rescuers can lift the person secured up manually in seconds or hoist him with crane or other hoisting equipment at the rescue spot.

The throw-line unit, is the bait in this sense, which helps the victim to seek into safety by himself.

The THROW-LIN / SAFETY-LINE has also another role. The in-water rescuer can, by fastening the chest-loop on the throw-bag around his chest, link himself to the rescue platform (quay or deck) with the attachment line hook, before he /she goes in to the water. By lowering the net into the sea, enough to fasten the victim in the net and by fastening lifting lines to the rescue platform, the in-water rescuer has both opened a realistic in-water rescue possibility and secured his way back on board or onto a quay.

THE NET STRUCTURE PROVIDES SEVERAL POSSIBILITIES

When the in-water victim has pulled the net to himself, he can either swim into the net until he feels the float-wire, at the outer end, under his feet or he can just take hold of the ends of the float-wire, pull it under his feet and clasp his arms around the net, as he is pulled up by the lifting lines in standing position. The in-water victim can also allow his legs to slip through the bottom meshes of the net and be taken secured up in sitting position with his legs facing the vessel side to protect his body. He can also turn his body when he is entering the net and hold the float-wire under his knees and as he is pulled in, he comes up in a secured sitting position with his legs pointing away from the vessel side. Then there is the possibility to fasten unconscious victim in the net in a horizontal position and lift him up manually with 3 knot-lines (B and E) or hoist him up. We strongly recommend that the victim is taken up in a standing position whenever he is fit for it and has to be lifted manually.

The victim will in such position make minimum resistance to the side of the vessel and is likely to climb by himself over the reeling, which usually is the most difficult lifting part.

TWO LIFTING LINES WITH KNOTS ARE NEEDED TO LIFT ONE MAN MANUALLY

By having lines (B) attached to the inner end corners of the net structure, with knots at 50 cm intervals, the rescuer does not have to use his energy to squeeze the lifting lines (B) and should therefore be able to concentrate to use his energy for lifting.

Two lifting lines (B) provide the possibility to divide the weight onto two rescuers or more.

One rescuer can lift one victim manually by pulling one line (B) until the weight of the other line (B) has transferred from it to the other. Then, fasten the line with the weight. After fastening the line with the weight the rescuer pulls the other line, vice versa. By this method the rescuer can gradually lift the victim without putting to much strain on his own body.

THE CONTAINER IS THE KEY TO THE UNIT MOVEABILITY

The container for the Markusnet gives the possibility to store the unit outside near gangways and move the unit with one hand ready for use to the rescue spot and start operation immediately. The attachment line is to secure the unit to the ship where it is stored or to the rescue platform at the time of rescue.
Man overboard rescue-net sign is available from the manufacturer of Markusnets.

Note.:  Due to the fact that the Markusnet is designed to retrieve man over board in a hazardous situation, mainly manually used and operation and repackaging is part of the crew training. The use and operation of Markusnets are completely the users responsibility.

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THE MARKUSNET GIVES VARIETY OF RESCUE APPLICATIONS

Markusnets have been used on variety ways in a hazardous situation and different difficult circumstances. Here are described a few methods which have given a good results in a very difficult conditions.

When rescuer is alone and the man overboard can enter the Markusnet by himself.

The best way to help the in-water victim which can enter the net him self, is to throw the throw-bag to him and lower the net out to him at the same time he pulls the throw-line to him. When the in-water victim has pulled the net to himself, he should take hold of the ends of the float-wire, pull it under his feet and step on it in the middle and then clasp his arms around the net, as he is pulled up by the lifting lines in standing position.

The on board rescuer pulls the net to the boat and as high as possible. Then he fastens the lifting lines and assist the man overboard to climb over the railing himself.

If the net is not pulled high enough, the on board rescuer has to fasten one of the lifting lines and pulls the other one until the weight of the fastened one has transferred from it to the other, then fasten the line with the weight. After fastening the line with the weight the rescuer pulls the other line, vice versa until the net is high enough for the in-water victim to clime over the railing.

If the in-water victim is wounded, it is better to let him sit in the net, fasten the net around him with the security snap hook and then pull him into security. If there is no hoisting equipment on the vessel, we recommend when possible, to get some outside help, due to the fact it can be very difficult to pull a sitting person over the railing alone.

WHEN AN IN-WATER VICTIM IS UNCONSCIOUS OR NOT ABLE TO HELP HIMSELF AND THE RESCUER NEEDS TO GO AFTER HIM IN THE WATER, WITHOUT HELP FROM ANOTHER PERSON.

When an onboard rescuer on a deck vessel can’t see any response from the in-water victim after calls or when throw-line has been thrown to the in-water victim, is a fast and definite reaction needed:

1. Make the Markusnet ready into the sea at the vessel side, fasten the safety line (chest loop on the throw bag) to you, fasten the hoist hook from the vessel to the front end hoisting strap, and give a suitable slack. Sail to the in-water victim with great caution, ready to disconnect gear from the engine and jump in the water.

2. At the same time you jump in the water you hold with one hand to the float-wire of the net and with the other hand you catch the victim around his chest and pull him into the net over the float-wire. Fasten the victim securely in the net by latching the security snap hooks together.

3. Then you climb up the emergency ladder or the net. When you have lifted the victim onboard, you should recline him immediately, and if possible put him in warm and dry clothes as well to place him in a warm place until you reach a doctor or expert in treatment of hypothermia.

Remember! (NOTE)

That two persons can easily lift one man together, but six people have difficulty lifting two persons at the same time. Make a rule in your training to only lift one man in Markusnet at a time. Have at least two Markusnet on your vessel for group rescue and double security.

Remember! (NOTE)

Always secure your way back if you need to jump in to the water for rescue. If possible let always know what you are going to do, lower a rescue ladder, Markusnet or life-raft into the sea and always be connected to the ship with a safety-line.

A rescuer which enters cold sea to fetch an in-water victim should always, when possible be dressed in dry suit, equipped with hoisting harness and manually inflatable life-vest enough for two persons. It is recommended to use neoprene hoot and glows and dry suit without much buoyancy and with socks instead of boots, to ease swimming and function in the water.

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IN WATER RESCUE

If the in-water rescuer has to pull out the Markusnet himself, he should hold the in-water victim in front of him between his arms and as he pulls the line, he should allow it to float away on his lee side.

Sometimes it can be better to pull the rescuer and the victim to the net, which is lowered to them at the same time.

The in-water rescuer pulls unconscious in-water victim into the Markusnet. It is recommended to fasten the net around the victim with the security snap hooks, when he is manually lifted (when the deck height is 5 m or less), but if hoisted with crane, then the crane hook is hooked in the eyes on the side hoisting straps on the net (on Markusnet types M4 and MS). If unconscious person is lifted in sitting position (when the deck height is 5 m or more) it is necessary to do it quick and securely and recline him immediately when he is onboard.

Advise to the operator in wheel house on a deck boat or ship, when the vessel can make a danger for the in-water rescuer and in-water victim.

Hold the ship into the wind, slightly leeway, for the onboard rescuer to have the best possible way to take action on the windward side of the vessel in retrieving man over board, to enable the man overboard to enter the net or the in-water rescuer to put the a unconscious victim into the net, approximately 5 meter away from the ship and to enable the deck rescue team to use the sea wave to ease the lift of the victim on board.

Advice to the rescuers on deck.

Every crew member has to know his duty during the man overboard search and rescue operation, be able to support the in-water rescuer in anyway without hesitation.

In hazardous situation and if possible there should be another in-water rescuer standby to go in the sea to help the first one, to ensure the security for the in-water rescuer and safe rescue operation.

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THE CREW COORDINATION IS VERY IMPORTANT SAFETY FACTOR

RESCUE FROM LIFE-RAFT

The story is based on actual rescue of 7 seamen that were rescued in hazardous conditions, from a life-raft onto the deck vessel Ólafur Bjarnason SH 137, 8th Mars 1989.

Method: Control ropes were fastened on both sides of the life-raft opening, to be able to pull the life-raft to the ship and give a slack as needed. The throw-line from the Markusnet thrown out to the people in the life-raft, and then they pulled the Markusnet to them. One person was taken sitting in the net, each time, with his legs through the mesh and when the sea wave was at its top the life-raft was pulled to the ship side and the person was lift on board the ship through the side door. When each person was loose from the life-raft, the control ropes are given out to prepare for the next lift and avoid danger to the people in the life-raft.

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MAN OVERBOARD SAFETY POLICY AND MANAGER OF SAFETY

International safety guidelines state that every vessel must be able to carry out man overboard rescue. Yet so far there are very little guidelines how to carry out such a rescue operation, unless to throw a life buoy to the in-water victim to mark the place and give the victim something to hold him floating.

But what then, when you have to act immediately? How should you retrieve the victim up, if there are not anyone else to help you, no hoisting unit and you are alone on the deck or quay and need to think of everything.

Here is necessary to have safety principles, which is to have very well thought safety management policy for the shipping company and a Safety Managing Director for the company which serves the on board Safety officer (board) and is in charge of that the safety principles are kept.

WHAT CAN BE DONE TO CONTRIBUTE COMPLETE MAN OVERBOARD SECURITY?

To reach the set goal, it is very important that each crew member learn to be a rescue-minded and that a safety officer onboard are specially trained to make surrounding for the crew to act as professional man overboard rescuers.

RESCUE THINKING

The rescue minded sailor looks to himself as a rescuer and is the one that cares about himself, his family, friends, associates and colleagues at sea in conscious manner and are willing to learn to be a good rescuer.

He or she is well aware of possible accident traps when they occur and follows specified guidelines to eradicate such traps.

He knows how to handle the rescue and safety units onboard. He drills regularly to use the rescue equipment and also goes after the manuals and coach instructions. He understand the importance to build a trust between a crew-members and to know his limitation in a difficult rescue situation when needed to go on the limit of security by saving peoples lives.

MAN OVERBOARD SAFETY DEPUTY

On board every vessel should be a special crew member who is the Safety Deputy which has the following duties.

- To be the contact person between Company Safety Manager and the crew.
- To attend to maintenance regarding man overboard security.
- To be the deputy for the crew in the safety committee onboard regarding man overboard security.
- To be the leader in dangerous man overboard rescue operations.
- To know how to handle a mob boat and be ready to take place of in-water rescuer, when in-water rescue is the only or the most secure rescue method.
- To take decision with the captain and the in-water rescuer, about if and when is the right moment to proceed with in-water rescue.
- To collect all possible know-how regarding man overboard rescue and see to that all crew members can have it.
- To order man overboard rescue and safety equipment and be in charge of the maintenance of such equipment according to International safety guidelines and company safety policy.
- To be responsible for training of new crew members, coordination of all the crew members, that man overboard drills are prepared and made and that reports and task lists are completed after each drill and registered in the safety diary.
THE IMPORTANCE OF REGULARLY SCHEDULED DRILLS

When someone falls overboard it is invariably unexpected and under difficult conditions. At such moments there is no time to think. One begins to act automatically, and these actions are based entirely on the knowledge and training gained previous to the accident. Only those who have been trained to react correctly are consciously aware of what they are doing.

The chances of well-trained seamen dealing with the unexpected are much greater than those who have not gone through on-board drills and learned how to use the available life-saving equipment. Practice in the retrieving of a man overboard with the Markus Lifenet is extremely valuable, particularly if it is followed up by education and discussions and the experience is used to encourage understanding of the value of training with other life-saving equipment.

The following are a few points that describe the value of good training:

- It promotes understanding about the conditions and dangers on board.
- It creates mutual trust between crew members during rescues.
- It increases knowledge and discussion about safety on board.
- It increases inner consciousness regarding safety equipment.
- It directs thoughts to conditions which increase chances of danger.
- It decreases the danger to rescuers when accidents occur.
- It increases the likelihood of successful rescue.

Advice to professional seafarers!

All seamen should make it a point to have an annual medical check-up, and take a course in on board safety. If health allows, one should jump into the sea in a float working-suit under controlled conditions, and sink 3-4 meters in the sea thereby becoming quickly wet. This then prepares the body and the subconscious for the unexpected, i.e. falling overboard, thereby considerably increasing your rescue chances and alertness.

CHECK-LIST BEFORE ORGANISING ON-BOARD TRAINING

The aim of training in the retrieving of a man overboard should be the following:
1. To prevent a person from falling overboard.
2. To reduce danger to rescuers.
3. To increase chances of a successful rescue.

In order to ensure that the training is realistic, its purpose and scope must be clear from the start.

MAN OVERBOARD RESCUE TRAINING EXERCISES CAN BE DIVIDED INTO THREE CATEGORIES.

1. PRIMARY DRILLS
All points regarding rescuing a man overboard are discussed in depth, and the crew practices as a group. In addition, safety and life-saving equipment is inspected, and the question of how to reduce accidents is discussed. Such training should take place at least once a year, when all regular crew is on board. The drills can take place at sea or in the harbour. Initially, it may be desirable if outside drill supervisor were present to lead the training exercises, for example from the local life-saving association or safety training centre, until enough experience is gained.

2. UNANNOUNCED DRILLS.
This is to train the crew for the unexpected. Such exercises could be appropriate shortly after a new member joins the crew. These drills should be practiced under the supervision of the 1st made or the boatswain and without anyone else's knowledge except the new crew member who enters the sea dressed in a rescue suit attached to a lifeline. The purpose of such drills is to increase the new crew member's ability to save himself if he falls overboard, build up his trust and check on the reaction of the crew.

3. EXTRA DRILLS. These are drills held during the primary drills with other equipment, and drills in abandoning ship. In such cases drilling with Markusnet is of secondary importance, but it should be at hand and used only in an emergency or if it is appropriate.
THE PURPOSE OF DRILLS MUST BE CLEAR TO ALL

TRAINING SCHEDULE
In order that each drill is given the correct amount of time according to its importance, the ship's officers need to draft a practice schedule where the following are determined:
1. What is the main drill; the secondary drill ...?
2. When should drills be held?
3. Where should drill be conducted?
4. How long should the main drill last?
5. Who should prepare and supervise the drills?
6. Should the training be followed-up with some other form of instruction?

PROPOSALS FOR MAIN DRILLS IN RESCUING A MAN OVERBOARD
1. The entire crew informed that main drills in retrieving a man overboard will be held when the vessel has reached outer harbour and has stopped. Everyone with the exception of an officer on the bridge should gather on deck dressed in float working suits or rescue suits (unless other precautions have been taken which don't make the rescue suits necessary).
2. The Lifenet, extra lifeline and a crane shall be made ready for use. Crew member assigned roles: a) unconscious casualty, b) rescuer to enter water, c) back-up rescuer, d) supervisor on deck, crane operator and deck hands.
3. Drills explained and executed.
4. After practice the new crew member is shown how to pack the net.
5. Everyone assembled in the mess. The practice session is reviewed with the main points discussed. The supervisor uses questions as the primary method of making points.
6. The supervisor enters the drills and other information into the ship's safety-diary.

IMPORTANT POINTS WHEN A MAN HAS GONE OVERBOARD
- That a plan exists on how to rescue a man/men overboard.
- That the man overboard forms a plan and calls out.
- That he correctly appraises conditions.
- That the first who is aware of the accident calls for assistance, throws out a life-ring or throwing line from the Lifenet, and doesn't lose sight of the man overboard. Remember that a line-gun could also be important.
- That an emergency call is immediately transmitted.
- That the rescuer calls for assistance if possible, that he attaches himself to a lifeline if he has to enter the water, and that if he is alone he secures his way back on board by lowering the Markusnet, emergency ladder or the piloy ladder.
- That the correct retrieving location on deck is chosen.
- That there are no additional dangers to the men in the water.
- That only one man at a time is retrieving in the Lifenet, when the manual lifting is used, and that weight on the lifting lines is distributed as equally as possible.
- That the casualty is as soon as possible placed in a horizontal position to increase blood circulation to the head, and then moved to a warm room and dressed in warm clothing and/or wrapped in a blanket.
- That the event be discussed and important points written in the ship's safety diary.
- That conditions on board are checked to determine if the accident could have been avoided and if necessary, improvements made.

ADVICE TO SEAFARERS
If you fall overboard then hold your mouth and nose closed, protect your head, and form a sensible plan of action. In other words, immediately form an emergency plan.

When you reach the surface you shall look for movement, listen for sounds and call for help. (Use the whistle if you have one.) Concentrate on likely rescue possibilities and determine your chances of swimming.

It is only sensible to swim if there is reason to believe that a chance of reaching your destination exists. Too much movement in cold water causes hypothermia. NOTE! You can not reach a ship moving away from you. Increase your knowledge about hypothermia and the ship's rescue and safety equipment.

Always wear approved float working suits and helmets while working on deck. Bear in mind that it is only possible to lift manually one person at a time. Two persons in Markusnet together destroy the manual lifting possibility.
**Instruction**

**For retrieving man overboard**

1) Release attachment line, 2) release hasp of lid and lift handle slightly up. When the lid falls to you, lift the container from the mounting hook and grasp the handle on the back of the container and carry the unit to the rescue spot and fasten it there if possible with the attachment snap hook. 3) Grasp the neck of the throw-bag, release the velcro band. 4) Release the lifting lines “B” and “C” overboard as needed to cover the height and throw the bag to the casualty allowing for windage, as you release the net to wards it.

5) Allow the man overboard to pull the net to him at the same time you straighten and hold tension on the lifting lines “B” and “C" as he has stept into the net and put his arms around the net, he has secured himself sitting in the net-bag or secured himself by other method and 7) lift the casualty up. The best way to lift a conscious man overboard who can enter the net by himself, is to lift him standing on the outer edge of the net. Always when possible lift hypothermia victim up in sitting or horizontal position.

8) The Markusnet used as ladder on deck boat. 9) Rescuer enters sea and fasten unconscious casualty in the net. 10) Rescue from life-raft. Two pulling lines attached to both sides of the life-raft opening. The throw-bag thrown to the men in the life-raft and they pull the net structure into the life-raft. One man at a time made ready sitting with his legs through meshes and as the life-raft is pulled to the rescue ship on top of a wave, the man is pulled onto the ship and through the side opening if possible or to the deck.

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Written by Pétur Th. Pétursson in concultation with the Marine Safety and Survival Training Center in Iceland. 
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