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THETIS LIFE-SAVING APPLIANCES TRAINING MANUAL

Merenkulun koulutusohjelma

2019



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Satakunnan ammattikorkeakoulu
Merenkulun koulutusohjelma
Tammikuu 2019
Sivumäärä: 11
Liitteitä: 1

Asiasanat: turvallisuus, merenkulku, turvalaite, pelastautuminen,

Opinnäyteyössä oli tarkoituksena tehdä uusi Training manual Alfons Håkansin hinaaja Thetikselle. Työ oli tilaustyö, jonka sain aluksen päälliköltä ollessani jäänmurrossa talvella 2018. Entinen training manual oli yleinen opas kaikille laivoilla oleville pelastautumisvarusteille. Tarkoitukseni oli tehdä omasta manuaalistani juuri Thetiksen turvalaitteissin perehtyvä opas ja otin manuaaliini uudet kuva Thetiksen pelastautumiskalustosta. Tekstin kokosin eri alusten samanlaisista manuaaleista ja internet lähteistä.

THETIS TRAINING MANUAL

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Degree Programme in maritime management

January 2019

Number of pages: 11

Appendices: 1

Keywords: safety, seafaring, safety device, saving oneself

The purpose of this thesis was to make a new training manual for Alfons Håkans' tug Thetis. Thesis was custom-made, this topic I got from the vessels master during the ice breaking season on winter 2018. Old training manual was a general guide to all life-saving appliances used on board the ships. My aim was to make my manual focused to Thetis's safety equipment and I took all the pictures from Thetis's equipment. I collected all the text from the other ships' manuals and from the internet.

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1 JOHDANTO

Tämän opinnäytetyön tarkoituksena on tehdä uusi Training manual Alfons Håkansin AHTS / IB Thetikselle (Liite 1). Aikaisempi manuaali oli yleismaailmallinen, jota on sovellettava aluskohtaisesti. Omaan manuaaliini otin kuvat kyseisen laivan turvallisuus- ja pelastautumisvarusteista ja muokkasin tekstejä vastaamaan kyseisen aluksen varusteita. Tein manuaalista helposti muokattavan, jotta sitä voitaisiin hyödyntää myös muilla yhtiön aluksilla vaihtamalla kuvat ja jättämällä ylimääräisiä osoita pois. Lisäsin manuaaliini paljon kuvia havainnollistamaan tekstiä ja tekemään manuaalista mielenkiintoisemman.

Sain aiheen päättötyölleni aluksen päälliköltä ollessani jäätä murtamassa Merenkurkussa ja selkämerellä talvella 2018. Päätimme että manuaalista tulee englannin kielinen, jotta se palvelisi myös ulkomaalaista miehistöä. Sovimme yhdessä päälliköiden kanssa, että keskittyisin ainoastaan aluksen pelastautumisvälineisiin, ja jättäisin palontorjunta ja sammutuskaluston pois manuaalista. Fire fighting training manual on oma oppaansa, joka perehtyy syvällisesti ainoastaan näihin varusteisiin. Tämä löytyy jo laivasta erillisenä kansiona.

2 AHTS / IB THETIS



Kuva 1. IB Thetis (Kuvaaja: Jaakko Tolonen)

Thetis on hankittu Alfons Håkans oy:n sisaryhtiö Finntugsille vuonna 2016. Alus on rakennettu vuonna 1983 Kanadassa Husky Oil-öljy-yhtiölle, ja Maersk osti sen vuonna 2000. Se on kulkenut aikaisemmin mm. nimillä: Storm Express, Placentia Bay ja Maersk Placentia. Alus on aikaisemmin hinannut öljynporauslauttoja ja toimittanut niille erilaisia tarpeita, kuten sementtiä, polttoainetta ja vettä. Nykyään alus on muunneltu jäänmurtokäyttöön ja se on rahdattu Ruotsille jäänmurtokalustoksi Selkämerelle ja Merenkurkkuun.

Thetiksen pituus on 71,5m, leveys 16m, syväys 7,5m, ja kone tehoa: 8100kW. Se on rekisteröity Kyprokselle ja kotisatama on Limassol.

3 TRAINING MANUAL

3.1 Training manual yleisesti

Training manual on kansainvälisen merenkulkujärjestö IMO:n SOLAS kokoelman 3. luku pykälä 35 ja 19 mukainen opas laivalla käytössä olevista pelastautumisvarusteista. Se on opas päällystölle koulutettaessa miehistöä ja se on myös ohje miehistölle, kuinka varusteita tulee käyttää ja missä ne sijaitsevat laivalla. Manuaalin on oltava jatkuvasti saatavilla jokaiselle laivalla olevalle. Jokaisen laivalle tulevan on luettava training manual läpi, myös vanhojen miehistönjäsenten mikäli manuaaliin on tullut päivityksiä. Manuaalissa on myös miehistön hälytysluettelo. On tärkeää, että jokainen miehistön jäsen tietää oman tehtävänsä mahdollisen hädän sattuessa.

4 TYÖSKENTELY

4.1 Tiedon hankinta

Tietoa hankin pääasiassa muista saatavilla olevista training manuaaleista sekä internetistä. Minulla oli käytössäni Thetixen vaha manuaali, joka minun oli tarkoitus korvata työlläni, lisäksi olin saanut käyttööni yhtiön toisen hinaajan; Zeuksen manuaalin yhteyshenkilöltäni ja lopuksi sain käyttööni vielä Wasa Dredgingin M/S Sinnanin manuaalin. Löysin paljon tietoa varusteiden SOLAS- vaatimuksista internetistä.

4.2 Työskentelymenetelmät

Koko työni alkoi tammikuussa 2019. Aloitin käymällä Thetixellä ottamassa kuvia aluksen pelastautumisvarusteista. Kuvausreissuja tein yhteensä neljä. Alus oli Turun satamassa valmistautumassa uuteen jäänmurtokauteen ja pääsy sinne oli vaivatonta. Skannasin paljon aluksen turvallisuuslaitteiden ohjeita sekä kopioin hyödyllisiä tiedostoja laivan tietokoneelta. Haastattelin myös useaa konepuolen henkilöä, jota tiesivät pelastautumisjärjestelmistä paljon asioita.

Aloitin työni tekemisen tietokoneella luomalla kansion jokaisesta pelastautumisvarusteesta, jonka suunnittelin tulevan omaan manuaaliini. Näihin kansioihin lajittelin kaikki skannaamani tiedostot turvallisuuslaitteiden käyttöoppaista. Loin jokaisesta turvallisuusvarusteesta oman Word tiedoston mihin aloin kirjoittamaan tekstiä. Ongelmaksi osoittautui saada skannaamani PDF-tiedostot yhdistettyä kirjoittamani tekstin perään Word-tiedostoon.

Selasin läpi sekä Zeuksen, että Thetiksen ja muita internetistä löytyviä manuaaleja ja kokosin kaikista tärkeimmät tiedot yhteen ja kokosin asiat omaan työhöni. Perehdyin myös hieman eri turvallisuusvarusteiden SOLAS vaatimuksiin ja lisäsin niitäkin työhöni. Kun perustiedot oli kirjoitettu, lisäsin itse ottamani kuvat Thetiksen pelastautumis- välineistä tekstien viereen. Muotoilin kaikkien sivujen ulkoasun samanlaiseksi, jotta työni olisi viimeistelty ja ”ammattimaisempi”. Lopuksi kaikkien tekstien ulkoasu oli viimeisteltävä ja kielioppi sekä oikeinkirjoitus oli tarkistettava. Tässä työssä pyysin apua kaveriltani, joka opiskelee myös samaa alaa, mutta on minua parempi englannin kieliopissa.

4.3 Työn tavoitteet

Opinnäytetyöni tavoitteena oli tehdä uusi training manual AHTS Thetikselle. Tavoitteena oli korvata laivan vaha manuaali, joka oli yleismaailmallinen ohje kaikista laivoilla käytettävistä pelastautumisvälineistä. Tavoitteenani oli, että tekemäni työ tulisi käyttöön ja että se palvelisi hyvin uusia miehistön jäseniä heidän perehtyessään aluksen turvallisuusvarusteisiin. Tavoitteena oli myös pitää manuaali helposti muokattavana, jotta sitä olisi helppo hyödyntää myös muissa yhtiön aluksissa tekemällä pieniä muutoksia. Tämän takia toimitin tulostetun manuaalin lisäksi myös muistitikun laivalle, jossa on koko työni kaikki tiedostot, jota perämies voi helposti päivittää jos turvallisuusvarusteisiin tulee muutoksia.

4.4 Työn viimeistely

Työn viimeistely alkoi sillä, että lähetin oikoluettuna ja korjatun työni sähköpostilla laivalle, jossa siitä annettiin kommentteja ja korjausehdotuksia. Työn viimeisessä vaiheessa tulostin koko työni tavalliselle paperille ja luin sen läpi, annoin työni kommentoitavaksi myös parille ulkopuoliselle ja he saivat antaa mielipiteensä siitä. Merkkasin kaikki muutettavat asiat työhöni ja korjasin niitä tietokoneella. Viimeinen työvaihe oli tulostaa työ ja koota se mappiin. Lopuksi ostin USB muistitikun, johon kokosin kaikki tekemäni tiedostot. Tähän muistitikkun perämiehet voivat jatkossa päivittää manuaalissa muuttuvia asioita. Mapitetun työni ja muistitikun toimitin laivalle ja siellä se otettiin käyttöön.

LÄHTEET

Kuva 1: Jaakko Tolonen, arkisto kuva

I/B Thetis Training Manual, Alfons Håkans oy

I/B Zeus Training Manual, Alfons Håkans oy

M/S Sinnan Safety Training Manual, Wasa Dredging Ltd

LIITE 1

Life Saving Appliances

Training manual

Thetis



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Life-Saving Appliance Training Manual

Name of ship: _____

Port of registry: _____

Owner: _____

Type of ship: _____

Call sign: _____

IMO number: _____

Year of build: _____

Main particulars:

Length: _____

Breadth: _____

DWT: _____

GT: _____

Main engine power: _____

Service speed: _____

Ice class: _____

Life-Saving Appliance Training Manual

This training manual is a guide book which will provide you information on how to use and where life-saving appliances are located on board. It has been developed in accordance with SOLAS 1974-including (SOLAS Ch III, Sect. 5, reg 35). This manual must be located in all public areas, or in each crew members cabin. Most important is that it is easily available for all crew members whenever needed.

On assumption that this manual is filled out correctly with information regarding life-saving appliances on this vessel, the manual meets the requirements of SOLAS Life-Saving Appliance (LSA) code.

The information and pictures in this training manual is collected by a student of Satakunta university of applied sciences. This is a thesis which is done customization from the shipping company.

1st edition, January 2019



Muster list



Ships muster list is a guide to each crew member. This list contains every crew members duties and responsibilities in case of an emergency. Everybody must be completely sure where to go and what to bring when an accident occurs. The alarm signals are also mentioned so that the person is not confused as to the nature of the emergency. Muster lists are located so that everybody on board can easily find and read them.

The SOLAS convention requires every ship to carry notes- muster list- indicating what each individual crew member is to do in an emergency. Muster list varies with shipping company, ship type and crew size, but they must always contain the following information:

- When is alarm signal used?
- What do these signals sound like?
- Who does what?
- Substitutes for key persons
- Who is responsible for maintenance of life-saving appliances?

Everybody on board must be certain of their task if an emergency occurs. For your colleagues' and your own sake, it is important that you perform your own task thoroughly. You must therefore study the muster lists as soon as you have signed on.

Pay particular attention to:

- What is my task? Do I understand what I have to do?
- Where I have to go?
- Where is the equipment I have to use, and how does it work?
- Who gives the orders?
- Whom do I report to?
- What are the ships alarm signals?

Training in the various activities is given via regular musters and drills. Your place on the muster list is usually specified by your position.

In Thetis muster lists are located at all decks, somewhere at a gangway.

Muster station

Every ship has designated muster stations, which are meeting points for the crew and passengers during an emergency, typically on the open decks where a large number of people can be controlled. Crew is mustered in the muster station when alarm is sounded and there further information is given.



Thetis' muster stations are located at the changing room and at main deck outside.



Cold as hazard

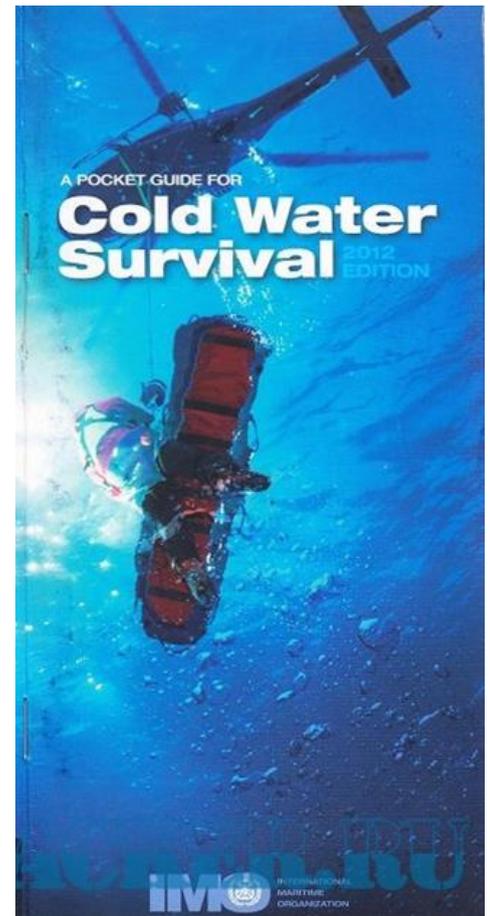
One of the major hazards in emergency situations is the substantial risk of becoming wet and cold. This is a direct hazard to life – and everything possible must be done to avoid going into the water and becoming wet.

The cooling from being in cold water is the most frequent cause of death in accidents at sea. In emergency situations dying from cold is even greater risk to human life than drowning. The water temperature plays a dominant role in the possibility of survival.

An understanding of how your body reacts to cold air or water exposure and knowing the steps you can take to help your body delay the damaging effects of cold stress, will help you in your struggle to stay alive in the event of cold water exposure.

The loss of body heat is one of the greatest hazards to the survival of a person at sea. The rate of body heat loss depends on: water and air temperature, wind speed, sea conditions, length of time spent in the water, protective clothing, mental and health status of the survivor, alcohol or other drugs in the body and the manner in which the survivor conducts himself.

An abnormally low body core temperature can be recognized by a variety of symptoms. Very early during the exposure, the body tries to combat the excessive heat loss both by narrowing its surface blood vessels, to reduce heat transfer by blood to surface and by shivering, to produce more heat. However if the exposure is severe, the body is unable to conserve or produce enough heat and the body core temperature begins to fall.



When the body core temperature is below 35°C the person is suffering from hypothermia.

By then, discomfort, tiredness, poor coordination, numbness, impaired speech, disorientation, and mental confusion are well established. As the internal temperature falls further, unconsciousness may occur, shivering is replaced by muscle stiffness, and the pupils of the eyes may be enlarged. The heartbeat becomes irregular, slow and weak and pulse is barely detectable. Although death may occur at any stage of hypothermia, when the person's temperature is very low, it is difficult to understand if the person is alive or dead. Death by hypothermia is then defined as a failure to revive on rewarming.

A ship may sink in less than 15 minutes. This affords little time to formulate a plan of action, so careful planning is essential to be ready in emergency. Here are some sound pointers for you to remember when abandoning a ship.

Put on as many layers of warm clothing as possible, including foot protection, making sure to cover head, face, neck, hands, and feet. Fasten, close or button up clothing to prevent cold water flushing through the clothing.

If an immersion suit is available, put it on over the warm clothing.

If the immersion suit does not have inherent flotation, put on a lifejacket and be sure to secure it correctly before immersion.

In cold water you will lose full use of your fingers immediately.

If time permits, all persons should, before boarding the liferaft or immediately after boarding, take an anti-sea-sickness medicine. Seasickness will interfere with your survival chances as vomiting removes precious body fluid, and seasickness in

general makes you more prone to hypothermia and impairs your will to survive.

Avoid entering the water if possible, e.g. use over-side ladders, or, if necessary lower yourself by means of a rope or fire hose. Stay out of water as long as possible. Try to minimize the shock of sudden cold immersion. A sudden plunge into cold water can cause rapid death, or an uncomfortable rise in breathing rate may result in an intake of water into the lungs. If jumping into water is unavoidable, you should try to keep your elbows to your side and cover your nose and mouth with one hand while holding the wrist firmly with the other hand. Avoid jumping into the liferaft canopy or jumping into the water astern of a liferaft, in case the ship has some remaining headway.

Once in the water, whether accidentally or by ship abandonment, orient yourself and try to locate the ship, liferafts, lifebuoys or other survivors. If you were unable to prepare yourself before entering the water, button up clothing now. In cold water, you may experience violent shivering and great pain. These are natural body reflexes that are not dangerous. You do, however, need to take action as quickly as possible before you lose full use of your hands. Button up clothing turn on signal light and locate the whistle etc.

While afloat in the water, do not attempt to swim unless it is to reach a nearby craft, a fellow survivor or a floating object on which you can lean or climb. Unnecessary swimming will 'pump' out any warm water between your body and the layers of clothing, thereby increasing the rate of body heat loss. In addition, unnecessary movements of your arms and legs send warm blood from the inner core to the extremities (arms and legs) and thus to the outer parts of the body. This can result in

very rapid heat loss. Stay calm and take up a good position to prevent drowning.

The body position you assume in the water is also very important in conserving heat. Try to float as still as possible - with your legs together, elbows close to your side, and arms folded across the front of your lifejacket. This position minimizes the exposure of the body surface to the cold water.

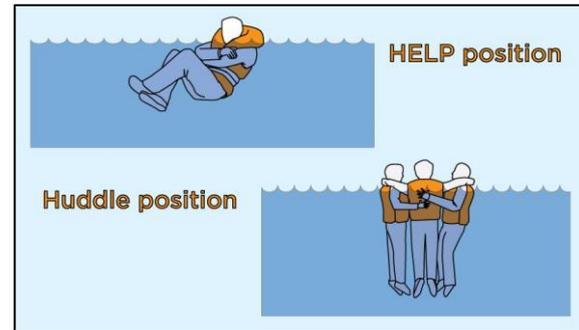
Try to board a liferaft or another floating platform or object as soon as possible. in order to shorten the immersion time.

Remember that you lose body heat many times faster in water than in air. Since the effectiveness of your insulation has been seriously reduced by water soaking, you must now try to shield yourself from wind to avoid a wind-chill effect. If you manage to climb aboard a liferaft, shielding can be accomplished with the aid of a canvas cover, a tarpaulin or an unused garment. Huddling close to the other occupant of the liferaft will also conserve body heat.

Keep a positive attitude of mind about your survival and rescue. This will improve your chances of extending your survival time until rescue comes. Your will to live does make a difference.

Treatment of the immersion survivor

The treatment of hypothermia will of course depend on both the condition of the survivor and the facilities available. Generally speaking, survivors who are rational and capable of recounting their experiences, although shivering dramatically, merely require removal of all wet clothes and replacement with dry clothes or blankets. If possible, they should be taken from the water horizontally and carried this way, or else be returned to the horizontal as quickly as possible and kept this way. Hot sweet drinks should be given but only if the victim is



CAUTIONS IN FIRST AID FOR HYPOTHERMIA

-   DO NOT use radiant heat (fire, electric heaters)
-   DO NOT rub affected area
-   DO NOT provide person alcohol
-   Avoid putting person in the bath

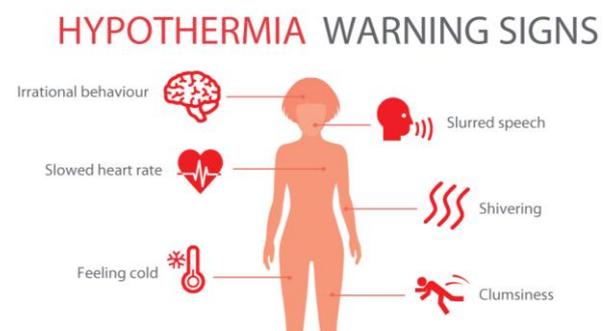
fully conscious with gag and cough reflexes. Rest in a warm environment not exceeding 25°C / normal room temperature. is recommended. Do not allow alcohol, smoking, or massaging or rubbing of the cold skin. However, always bear in mind that even conscious survivor can collapse and become unconscious shortly after rescue. They should therefore be kept resting horizontally, with their legs slightly elevated, and be watched until core rectal temperature has exceeded 35°C.

In more serious cases, where the survivor is not shivering and is semi-conscious, unconscious, or apparently dead, immediate first-aid measures will be necessary to preserve life while awaiting medical advice on more detailed management procedures. this advice should be sought as soon as possible, and first-aid measures should not be delayed while advice is being sought. The recommended first-aid measures for such an immersion survivor are as follows:

On rescue, always check the survivor's breathing and carotid pulse for one minute each side of the neck.

If the survivor is not breathing, make sure the airway is clear, tilt the head back, lift the chin and start artificial respiration immediately (mouth-to-mouth). If the heart appears to have stopped beating, then cardiac compressions may be applied. However, you should be certain that there is no pulse at all remember that hypothermia weakens and slows the pulse greatly, and once started, it must be continued properly until the patient is fully rewarmed or delivered to a hospital.

If the survivor is breathing but unconscious, lay him in the unconscious position. This is necessary to ensure that the person's breathing is not obstructed by his tongue or his vomit.



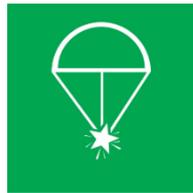
Avoid all manhandling which is not necessary to determine whether there are any serious injuries. Do not even remove wet clothes, do not massage.

Prevent further heat loss through evaporation and from exposure to the wind. Carefully wrap the patient in blankets, TPA or large plastic bag and transfer immediately to wind sheltered area or below deck in normal room temperature, keeping him in horizontal position. Advice on rewarming and decisions regarding further treatment should normally be given only by a doctor. If no medical advice is immediately available, continue to apply the essential life-saving procedures given in the paragraphs above. In addition, even if rescued person is cold and appears dead, or if he deteriorates and/or the pulse and breathing are lost, resuscitation attempts should not be ended before patient has been rewarmed. In sheltered warm room the person's clothing can be cut and removed with minimum of disturbance. Then wrap person in blankets to reduce further heat loss. The best method of active rewarming is the use of forced warm air (maximum 40°C), which has to be blown under the blankets covering the rescued person. Never use a hot bath, shower or sauna.

Passive methods of warming are not very effective. Do not attempt warm the person by vigorous actions. You can apply heating pads hot water bottles under the blanket, to person's head, neck, chest and groin – but never place these warm objects against the bare skin as cold skin is easily burned.

If the above-mentioned methods of warming are not available then apply body warmth by direct body-to-body contact with the rescued person. In addition, wrap a blanket around both the rescued person and the person supplying the warmth. In all cases try to monitor the pulse and breathing.

Rockets, LTA



Parachute rockets, hand flares and line throwing appliances are pyrotechnical distress signal units that must be on board every ship. The ships supply of pyrotechnics is held in various places. Some are in the rafts in watertight containers, in the lifeboats and on the bridge.

Parachute rockets

Parachute rockets/ emergency rockets are used under extreme emergency situations such as distress, these are provided onboard ships to grab the attention/inform ships within range to seek help and assistance of the vessels for rescue. Basically, it is a visual method of sending SOS signals. Parachute rockets are used for alerting help when no one is in eye sight or far away in the horizon. When the rocket is launched by pulling the string at the bottom, the rocket shoots up in the sky and parachute falls down slowly with red burning flare. The rocket must shoot to a height of 300 meters from the point where it was launched, and the flare will burn for about 40 seconds. If a red parachute rocket is noticed you should always contact the nearest rescue co-ordination center to alert more help, and head for the direction from where the rocket is launched. Parachute rockets must never be used when a helicopter is around.

Line-throwing apparatuses, parachute rockets and hand flares should be stored in an upright position at dry locker allowing easy use in an emergency situation.



Hand flares

Red hand flares are simply brightly burning red flares. The flare will burn for about 60 seconds and it will not die if submerged under water.

They are used when rescuers are already near to signal for example to a helicopter pilot where the casualties are located in the vessel.



Line-throwing apparatus (LTA)

An approved line throwing apparatus must be on board every ship. LTA must be able to throw a line at least 230 meters in calm weather with reasonable accuracy. The line must have a tensile strength of at least 200 kg, and clear instructions must be marked on how to use the apparatus.



The line throwing apparatus is used during rescue situations to create a connection between the rescue ship and the ship in distress to provide towing or to rescue people. It also can be used as a help in very difficult mooring operations. LTA is useful also in man overboard situations. The apparatus is fired so that the line falls close to the person in water.



Before shooting, the end of the line must be fixed to the ship or, even better, to another stronger line which is fixed to the ship and ready to go out.

In Thetis all ship pyrotechnic distress signals and line throwing appliances are stored on the bridge. They are located under the bridge sofa.



Immersion suit



An immersion suit, or survival suit is a special type of waterproof dry suit that protects the wearer from hypothermia and from immersion in cold water, after abandoning a sinking or capsized vessel. They usually have built-in boots, a hood, and gloves. Immersion suits are generally made of neoprene, it is completely waterproof and has an ability to withstand extreme temperatures of water and fire. The immersion suit fits the person's body without exposing any part to the water. Immersion suits are always made of bright yellow, orange or red color so that they easily attract the attention of paramedics or rescue. Immersion suits should be unpacked and donned in 2 minutes without help from another crew member. The crew member must be able to jump from a height of at least 4.5 meters into water without injury to himself or causing any damage to the immersion suit. Crew members should be able to swim and carry out normal work e.g. climbing up and down pilot ladders and wear a lifejacket without any help while wearing the suit. Immersion suits are often equipped with a whistle and so-called tagline/buddy line. This line keeps all the people together, so no person gets lost while in the water.

In Thetis there are 21 immersion suits in the changing room right beside the door to the aft deck. There are also two pieces on the bridge deck and two pieces in the engine control room. Suits are packed in airtight plastic bags which are stored in blue storage bags. Plastic packings must not be opened until a real emergency situation occurs. In the



changing room immersion suit locker there is one training suit that is opened from the plastic packing and it can be freely used for training purposes. This training suit is marked with a red tag that says “training suit” the blue bag is also marked with yellow-green electric tape.

Anti-Exposure suit (AES)

This type of immersion suit is a lighter version than normal immersion suit. It is usually made of lighter material so that it is easier for the wearer to move around with it. This type of suit usually also has proper rubber boots in it. Anti-exposure suits are normally worn by the MOB or Fast rescue boat crew who must be protected mainly from the wind and splashes, not survive long periods in the cold water. They must also maintain better movability if they need e.g. pull a person up from the water. **In Thetis there are two Anti-exposure suits on board.**

Thermal protective aid (TPA)

Thermal protective aids main job is to keep the person warm by blocking the wind and reflecting the body heat back to the body. Thermal protective aid is made of very thin material so that packing can be kept small, and it is easy to store in a MOB-boat or life raft. TPA is usually baggy so that it suits every person and moving with it is quite hard.

In Thetis there are two TPAs in the MOB-boat. There are also few inside liferafts.



Lifejackets

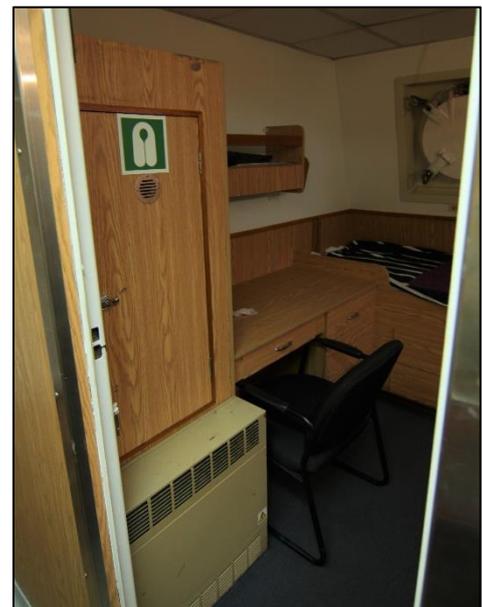


Most commonly used lifesaving appliance is the life jacket. It is used in almost all kinds of emergency situations on ships.

The number of lifejackets on board must be equal to one lifejacket per person on board. Lifejackets must be placed so that they are easily accessible, and the location must be clearly marked with IMO sign. Lifejackets must be able to survive from an impact of fire for short period. They must also survive when jumped from 4,5 m height to water.

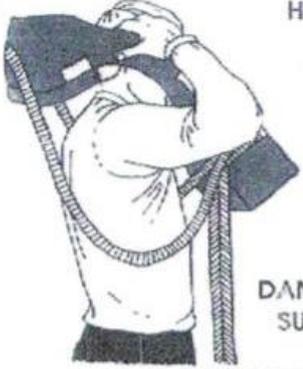
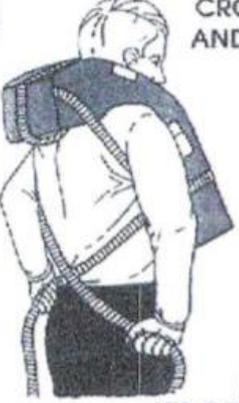
In Thetis there are as many lifejackets per cabin as many there are bunk places. There are lifejackets in every remote manned place e.g. in the engine control room and on the bridge. Lifejackets are usually stored packed in the wardrobe of each cabin.

In Thetis there are also self inflatable lifejackets hanging at the changing room wall, but they are used for deck working only not for life saving purposes. Every lifejacket is equipped with a whistle, name tag and a flashing light that activates when it touches the water.



INSTRUCTIONS

PERSONS OVER 32kg/PERSONNES PLUS DE 32kg

| | |
|--|--|
| <p>1</p>  <p>PLACE HEAD THROUGH HOLE AND ARMS THROUGH SIDE LOOPS.</p> <p>PASSEZ LA TÊTE DANS L'OUVERTURE SUPÉRIEURE ET LES BRAS DANS LES OUVERTURES LATÉRALES.</p> | <p>2</p>  <p>TIE NECK STRAPS. PULL BODY STRAPS DOWN AS TIGHT AS POSSIBLE.</p> <p>ATTACHEZ LES COURROIES DU COU. TIREZ LES COURROIES DU CORPS VERS LE BAS ET SERREZ AUTANT QUE POSSIBLE.</p> |
| <p>3</p>  <p>CROSS STRAPS AT BACK AND PULL TO FRONT. TIE STRAPS TOGETHER AT FRONT.</p> <p>CROISEZ LES COURROIES DERRIÈRE LE DOS ET RAMENEZ-LES À L'AVANT. ATTACHEZ LES COURROIES À L'AVANT.</p> | <p>4</p>  <p>WRAP COLLAR AROUND NECK AND SECURE.</p> <p>ENROULEZ LE COLLET AUTOUR DU COU ET FIXEZ-LE.</p> |

SMALL PERSONS SHOULD SECURE THE TIE-TAPES TIGHTLY OVER THE LIFEJACKET.
ADULTS: HELP CHILDREN!

Liferaft



A liferaft is a small, rigid or inflatable raft carried for emergency evacuation in the event of a disaster aboard a ship. It is always the master's decision to abandon the vessel. When the decision is made abandoning-alarm signal is given. Muster list specifies each crew members task in this situation. Emergency VHF, EPIRB, SART, rockets, hand flares and a logbook should be taken along to liferaft. If the vessel is floating the liferaft lashings are opened and it is dropped to sea. Painter line is connected to the ship and it is an about 20m long line. When all slack is pulled out from the painter line it must be jerked hard to launch the raft. When the raft is fully inflated people can enter it by pilot ladder or by first jumping into water and from there climbing to the raft. Jumping to water is always dangerous and risk of hypothermia increases when you have wet clothes on.

If the ship is sinking the hydrostatic release will cut the lashing automatically when it is in depth of 4m. While the ship is going down it is pulling a painter line and launches the raft at the end. The painter line will break the red loop so called "weak loop" in the hydrostatic release and a raft is freed from the ship. Painter line can also be cut by knife if needed. If possible, painter line should keep connected to ship. A big ship is more easy to find by rescuers than a small liferaft that is drifting alone at the sea.

Everybody must wear a lifejacket and some warm clothes when abandoning the ship and evacuating to a liferaft. If possible, every crew member must also wear an immersion suit. When it is time to enter the liferaft try to board the liferaft dry without



entering the water. People must be dried as soon as possible if they have become wet before boarding the raft. Wet clothes chill a person faster than dry clothes. So, take off wet clothes, wring them out and put them on again. Very chilled person can be given a TPA. It is also possible to sit/lie close together to keep each other warm.

If there is sufficient time, the master can issue orders to collect extra blankets, provision or water to bring in the raft.

There is a high risk of injury when leaving the ship in a hurry. There is therefore a first aid kit (medicine chest) on board. The medicine chest's contents include seasickness tablets.

Everybody on board should take the prescribed number of seasickness tablets immediately after they come on board the liferaft. Even if the person is a tough old sea dog who has never been seasick, this is a different situation. The raft is small, and it can roll a lot even in light wind, and vomiting reduces a person's chances of survival because it increases dehydration.

Immediately after boarding the raft inflate base and roof. This increases the insulation so that heat is better retrained in the raft. Additional inflation may be necessary after a long period in the raft. Close the entrance to retrain the heat. However, it must be possible to maintain a lookout at all times.

If you are far out sea, some days may pass before help can appear. Fresh water is therefore in the raft. A measuring cup and a drinking cup are provided for sharing out the water. It is best to allocate the daily ration in two or three allotments per day. Most rafts have facilities for collecting the rain water, and you should immediately set them up.

Never drink seawater!

The body cannot process the large quantity of salt and it will only make you thirstier.

You must prepare for quick rescue when a rescue vessel has found you. Everybody should be wearing a life jacket and if possible also an immersion suit.

Remember to keep the liferaft dry there are several tools in the raft for bailing out the water. It is important to keep the boat dry so that the people do not become wet and cold, and also for reasons of hygiene. Keep your raft together with other rafts and boats including empty ones and keep a lookout. This makes the search easier, and other rafts/lifeboats also contain extra provisions, water and equipment. Rafts and boats can be fixed to each other but remember to keep good distance, so they are not damaged by collision. Remember to turn on the masthead light and ensure that it is burning when it is dark. Save the electricity during daylight if possible. Set the sea anchor when you are well away from the ship. The sea anchor is a cone-shaped bag made of canvas. There is a little hole in the bottom of the bag, so water can run out, ensuring that the bag does not collapse. The sea anchor is used for two reasons, in lifeboat to keep the boat's bow up against the waves, and to reduce drift away from the position where the accident occurred. The search will generally begin where the report on the emergency was first sent. The rescue center's calculation models for the speed at which the raft is moving are based on the sea anchor being out. If this is not done, you may move away from the accident position more quickly than the rescuers are reckoning on.

It is not necessarily the commander of the boat or the ship's master that is the most suitable leader. The most suitable leader is often discovered in the actual situation.

The ship's master or the commander of the boat generally acts as the person in charge. But if they are not able to act for one

reason or another, the most suitable person should be appointed. Arrange a duty system so there is always somebody on watch. This person will keep look out for other survivors, ships and planes. The life boat or raft is not the “Wild West”. There must be law and order. The person in charge should prepare some rules. It is important that you maintain discipline under the chosen person. The situation has probably given some of you a shock. But it is the job of the person in charge to make it clear to everybody that the situation is far from hopeless, and that the raft is specially built and equipped for exactly the situation you are in now. The person in charge must be aware that not everybody who has been rescued has the same mental strength. It is therefore important to keep a constant eye on everybody’s condition and to keep spirits as optimistic as possible. Tell stories or sing song to help you all think about something else. Person in charge will decide whether smoking is permitted but remember smoking can make you thirsty and seasick. Naked flames can also damage the raft.

In Thetis there are two liferafts. Both are designed for 25 persons. Liferafts are located on forecastle deck. These areas are also called liferaft stations. Stations are equipped with emergency lights, a guide how to launch a raft and a pilot ladder for climbing down to the raft.



As standard, a selection of emergency equipment and life-saving appliances is packed inside the liferaft.

Emergency pack (A-pack) content:

| | |
|------------------------------|-------|
| Parachute rocket signals | 4 |
| Hand flares | 6 |
| Signaling lamp | 1 |
| Batteries (spare) | 2 |
| Bulb (spare) | 1 |
| Whistle | 1 |
| Signaling mirror | 1 |
| Emergency ration kg. | 5 |
| Drinking water (liter) | 15, 5 |
| Drinking cup | 1 |
| Safety tin opener | 3 |
| Fishing tackle | 1 |
| First aid kit | 1 |
| Anti-seasickness tablets | 60 |
| Bailer | 1 |
| Sponges | 2 |
| Instructions for survival | 1 |
| Table of life-saving signals | 1 |
| Sea anchor & cord | 1 |
| Scissors | 1 |
| Smoke signals | 2 |
| Seasickness bags | 10 |
| Rescue bags (TPA) | 2 |



Liferaft Equipment:

| | |
|--------------------------|---|
| Operational instructions | 1 |
| Bailer | 1 |
| Sea anchor & cord | 1 |
| Knife (buoyancy) | 2 |
| Paddles (set of 2) | 1 |
| Repair kit | 1 |
| Pump | 1 |
| Rescue quoit & line | 1 |
| Water bags (set) | 1 |



MOB BOAT

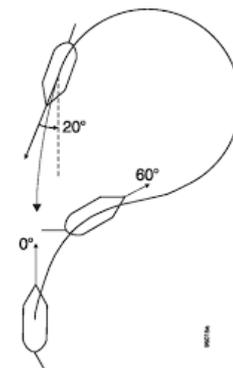


If you see somebody fall overboard, immediately throw out a lifebuoy and alert the bridge. The duty officer will then sound the MOB alarm with bells or whistle.

The MOB boat crew must now prepare the boat for launching as quickly as possible.

If the ship is moving the helmsman will turn the rudder to the side where the person is. Then ships stern will swing away from the man overboard. After that the helmsman turns the other way and makes the vessel circle. He will continue the turn until the bow points toward the person. Vessel is stopped beside the man overboard and the person is picked up by all means necessary.

If the person who has fallen overboard cannot be seen from the ship, helmsman should do a "Williamson turn". In this maneuver, the rudder is turned fully towards the side where the person fell overboard. When the vessel is about 60° from the original course, the rudder is turned fully to the opposite side. When the ship approaches a course of 180° from its original course, the rudder is eased off and steadied when the course is almost towards the person in the water.



Circumstances may vary depending on the weather and how fast the alert reaches the bridge. Good results can be achieved with regular drills. Take careful note of how the boat is launched on the ship – your colleagues' lives might depend on it.



In Thetis MOB boat procedures are done with its own crane that is located at forecastle deck starboard side of the vessel.

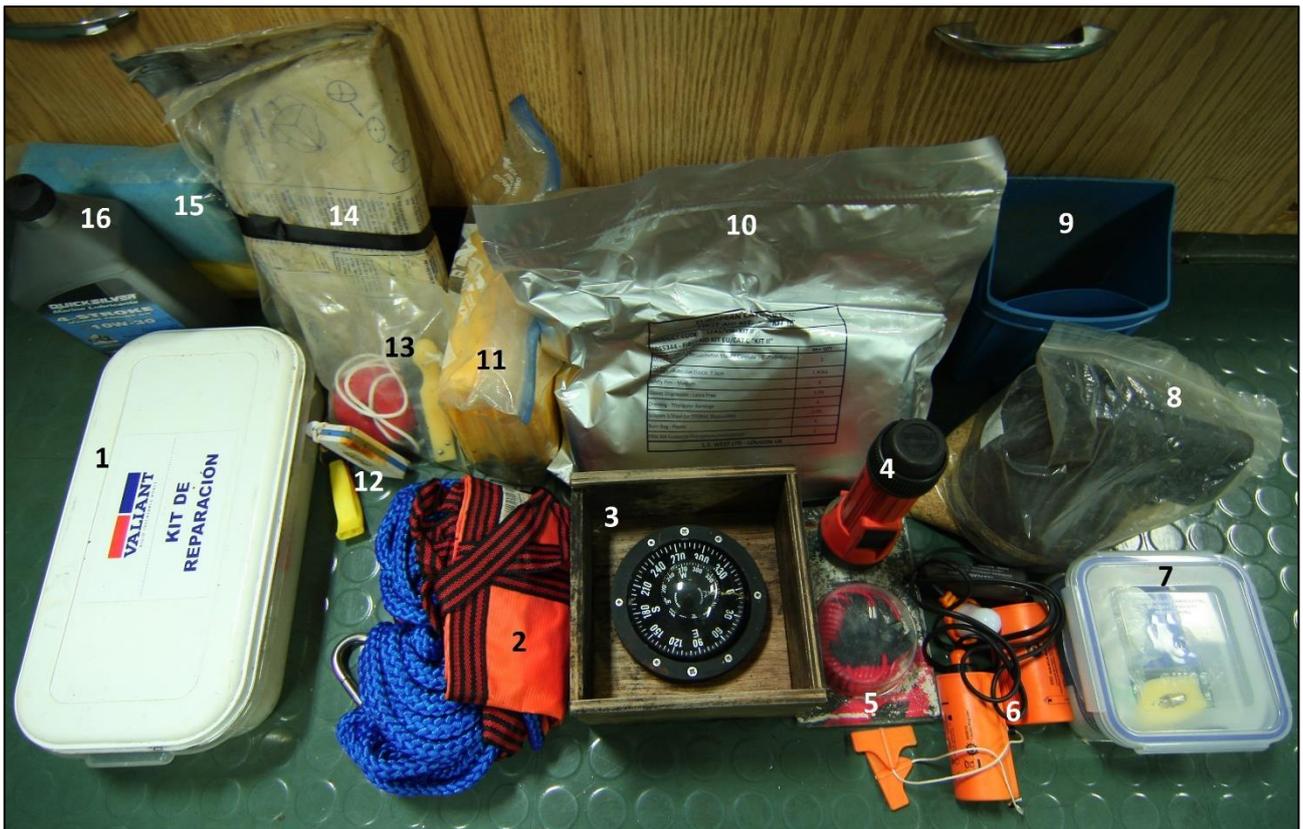
If the MOB boat is lowered while the ship is driving forward, the blue painter line must be secured tight to a bollard when the boat is about to touch water. Bridle hook must be launched first after that painter line can be launched by pulling the white line from the boat.





1. Painter line. Line is usually stored coiled inside MOB boat.
2. MOB boat fire extinguisher
3. 12v. battery and equipment locker
4. Equipment locker
5. Bridle hook automatic and manual release handles
6. Safety ropes for MOB boat crew
7. Fuel tank fuel hose is usually disconnected from motor
8. Paddle

The MOB boat crew must generally wear AES (anti exposure suit) or at least immersion suit. Life jackets must always be worn.



1. MOB boat repair kit
2. Sea anchor
3. Compass
4. Hand light
5. Spare deadman switch
6. Emergency light
7. Spare bulbs and batteries
8. Search light
9. Bailer
10. Emergency food
11. Thermal protective aid
12. Whistle
13. Knife
14. Radar reflector
15. Sponge
16. Spare engine oil

Lifebuoys



The number of lifebuoys is determined by the length of the ship. Lifebuoys must be easily accessible on both sides of the ship and placed along the side of the ship on all open decks. Lifebuoys must be placed so that they can quickly be thrown overboard. Each lifebuoy is clearly marked with the vessel's name and port of registry. Also reflectors and a line going around the lifebuoy are compulsory.

There are three different types of lifebuoys onboard Thetis.

Lifebuoy with line:

In Thetis there are three lifebuoys equipped with line. There are two on both sides of the ship on the forecastle deck and one at the main deck.

Line length should be at least twice the height to water from where the lifebuoy is located. Minimum length is 30 meters.

Lifebuoy with light:

Generally, at least half of all lifebuoys must be fitted with a self-illuminating rescue light. Color of the light must be white, and it must be capable of burning for at least 2 hours.

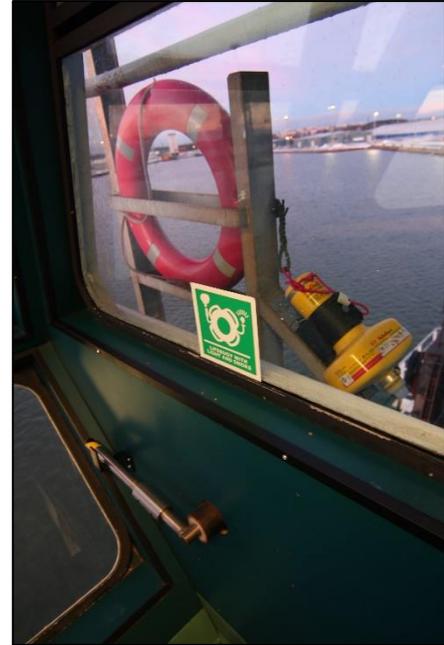
In Thetis there are six lifebuoys with light. Four on the forecastle deck and two on the main deck.



Lifebuoy with smoke:

At least two of the vessels lifebuoys must be fitted with an automatic smoke signal. Smoke colour must be orange and highly visible, it must be active for at least 15 minutes. Most ships have combined light and smoke buoy, which is placed on each bridge wing so that they can be released quickly from inside the bridge. These type of lifebuoys are also called MOB buoys.

In Thetis there are two MOB buoys. They are located outside of the bridge wing and can be released from inside by turning and pulling the handle.



EEBD



EEBD, Emergency Escape Breathing Device. This device is used for escaping an area with hazardous conditions such as fire smoke or poisonous smokes. EEBD can produce 15-32 minutes worth of air supply depending on the activity level of the user, it is enough to escape from hazardous spaces. It is important to remember that EEBD is not a fire-fighting equipment and must be used only for emergency escaping purposes.

EEBD can be donned very quickly. Just unpack the case, pull out the unit and insert the mouthpiece and nose clip. The compressed oxygen delivery system activates automatically when the device is removed from the clear case. The hood can be donned at any time during the escape if necessary.

In Thetis there are many EEBD on each deck, also in the remote areas such as rudder engine room.

There is also one training EEBD which can be used for training purposes. The training EEBD is in the blue box. It is exactly same type which are hanging at the gangway walls and it gives a good example how the real EEBDs look like inside the box.



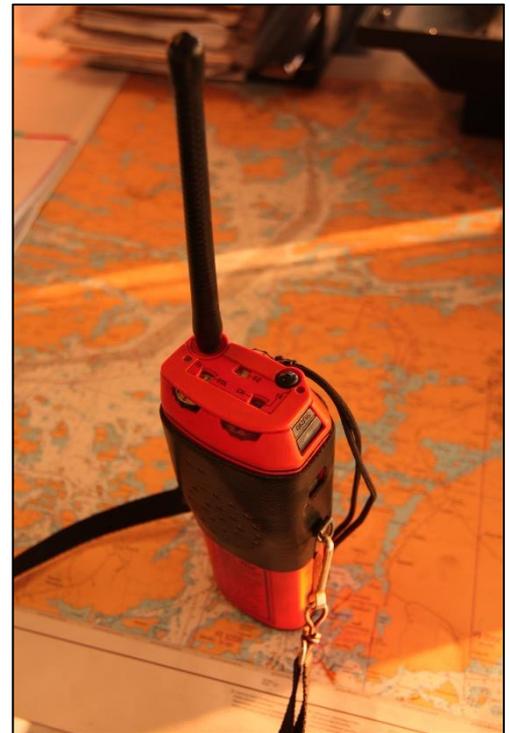
Emergency VHF



Any submersible, floating, hand-held VHF will serve the purpose of an emergency radio as long as the batteries hold out. Emergency VHF should be easy to use even for an unskilled person it must be operable with immersion suits gloves on and with only one hand. Color of this VHF is recommended to be bright, either yellow or orange. Emergency VHF must also survive from dropping to hard surface.

Emergency VHF are used only in case of an emergency. They must always be fully charged. They must be taken with in to the life raft or life boat. With these VHF's it is possible to contact rescuers or call for help. Radio must be used sparingly in the emergency situation, attempting contact only if there is another vessel visible on the horizon. Desperate distress calls to no one by a panicked crew will drain the battery and decrease the change of surviving. Emergency VHF must be able to operate at least 8 hours at its highest rated power.

In Thetis emergency VHF's and spare batteries are located on the bridge in their housing fully charged all the time.



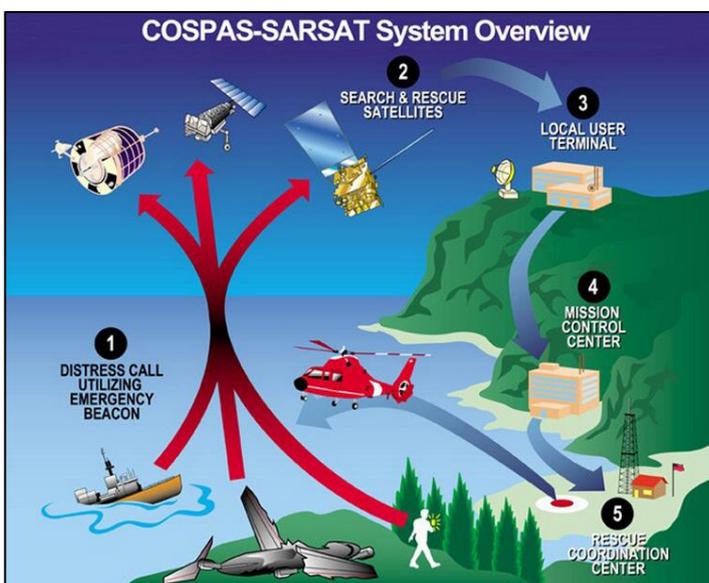
EPIRB



EPIRB (Emergency Position-Indicating Radio Beacon). Is used to alert search and rescue services in the event of an emergency. It does this by transmitting a coded message on the 406 MHz distress frequency via satellite and earth stations to the nearest rescue co-ordination center. An EPIRB is included in a ship's GMDSS radio communication equipment. An EPIRB resembles a small buoy, beacon that can be activated manually or automatically.

There are two types of EPIRBs available. One which can be hung on the bulkhead. This type is easy to bring along in the boat or raft. The second model is a float free EPIRB. It must be placed high up high in the ship. This model is equipped with a hydrostatic release and automatic activation when it is submerged.

In Thetis there is only one EPIRB. It is located at the wheelhouse top, it is a float free type EPIRB.



SART



SART (Search and Rescue Transponder) is a self-contained, waterproof transponder intended for emergency use at sea. All ships must carry a radar transponder/SART on board. It must be positioned so that it is easy to take along in the raft or boat.

When the SART detects a signal it immediately transmits twelve pulses on the same frequency. This signal is seen by the radar as "echoes" and will be displayed on the screen as a series of twelve dots with a gap of 0.6 miles between them. The first dot is at the position of the SART and the others go in a straight line towards the edge of the screen. If the rescue vessel approaches the SART, the twelve dots will become short arcs. These arcs increase in size if the vessel gets closer. If the rescue vessel is very close, the SART will be activated permanently by the side lobes of the radar antenna. The signal of the SART will then be visible as twelve complete circles on the radar screen. This will tell the search-and-rescue team that they have more or less arrived.

All GMDSS vessels up to 500 ton must carry at least one SART. Bigger vessels must carry at least two SARTs.

SART must be always taken along to liferaft or lifeboat. SART informs acoustically and visually when radar has spotted it. SART is only triggered by any X-band radar (3cm) within a range of approximately 8 nautical miles.

In Thetis there are two SART buoys both are located at the port side bridge wing. These SAILOR SARTII -type SARTS will remain in standby mode for over 96 hours once activated.



Drills

Drills are important preparation for real emergency situations. Every crew member should therefore participate in drills where real situations are simulated. In these drills crew members can try out the ship's life-saving and firefighting equipment and procedures for the various emergency situations. Training and instructions on board in use of the ship's life-saving appliances, including the equipment in lifeboats and liferafts, and in use of ship's fire-fighting equipment, must be given as soon as possible, and at least two weeks after a crew member signs on to the ship.

Each crew members participation in these drills is compulsory. Drills are necessary to practice tasks and become familiar with equipment. They indicate well whether something is not functioning as intended. Although drills must be performed to the greatest possible extent as if it was a real emergency, they must always be performed with the greatest care. Drills are not a real situation and performing the drills carries always some risks. Therefore, drills must be always carefully planned and carried out. Study the life-saving appliances you are going to use in the drill, read the user instructions and ask for some help if needed.

Every crew member with duties involving safety must be thoroughly familiar with these duties before the voyage begins. Every crew member must take part in at least one boat and fire drill a month.

Don't hesitate to ask during the drills if there is anything you are in doubt about.

Ask – while there is time to answer.