PERSONAL SAFETY AND SOCIAL RESPONSIBILITIES

maritime words & expressions

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AGENDA

COMPETENCE 1 – GEOGRAPHY & LAND FORMS
COMPETENCE 2 – SHIP & CREW
COMPETENCE 3 – CARGO
COMPETENCE 4 – DUTIES ABOARD
COMPETENCE 5 – PAINTING
COMPETENCE 6 – MEASURING
COMPETENCE 7 – FITTING TOOLS AND MATERIALS
  A. Maritime Community; B. Mariners & Seafarers
COMPETENCE 8 – MARITIME COMMUNITY
COMPETENCE 9 - ORGANISATION
  A. The Ship’s Company; B. Organization On Board
COMPETENCE 10 - EMERGENCY
  A. Shipboard Emergencies; B. Life Saving Equipment
COMPETENCE 11 – SAFETY 1
  A. How To Use A Life Jacket; B. Personal Safety - Tips & Warnings; C. Life Raft; D. Facts To Be Remembered
COMPETENCE 12 – SAFETY 2
  A. Fire Prevention; B. First Aid;
100 QUESTIONS TEST (to pass - 60% positive answers required)
GOAL OF THE TRAINING

This training is intended to ensure that seafarers are aware of the hazards of working on a vessel and can respond appropriately in an emergency.
MV DONA PAZ - THE WORST MARITIME DISASTER EVER IN TERMS OF LIVES LOST

Collision, fire, explosion, overloaded

MV DONA PAZ - 20DEC1987, Tablas Strait, Philippines; 1518 vs 4400 passengers; Causalities – 4386, survived - 26
Constructors’ pride, neglecting of procedures
Weather; bow visor and ramp in a poorly maintained condition

M/S Estonia

The M/S Estonia set out from the harbour of Tallinn, Estonia, on 27 Sep. 1994 at approx. 7 p.m. She was heading towards Stockholm and carried 989 people; causalities 852.

At a quarter to one, banging noises were heard from the stern. The noise was caused by the visor, which had detached, allowing the waves to fill the ship with water. At 01:02 the vessel heeled 40-50 degrees to starboard.
M/S Jan Heweliusz

Weather, hurricane-force winds
INTRODUCTION ON THE TRAINING REQUIREMENTS

The international convention on Standards of Training, Certification and Watchkeeping for Seafarers (or STCW), 1978, as amended, sets qualification standards for masters, officers and watch personnel on seagoing merchant ships.

- STCW was adopted in 1978
- STCW entered into force in 1995
- STCW was significantly amended in 1995, i.e. training requirements: the amendments require that seafarers be provided with "familiarization training" and "basic safety training" which includes (1) basic fire fighting, (2) elementary first aid, (3) personal survival techniques, and (4) personal safety and social responsibilities.
Test your knowledge - fill in the blanks

Q1: (V) canal vs. (Z) channel
A ___ is the physical confine of a river or ocean strait consisting of a bed and banks.
___ are human-made ___ for water; types: aqueduct (or water conveyance); waterway canals; city-canal (gracht).

Q2. Put elements of the Beaufort Wind Force Scale in ascending order
(K) storm, (R) strong wind, (E) gale, (C) calm, (O) breeze, (T) hurricane
Check your answers

A1: (V) Canals are human-made (Z) channels for water. Types: aqueduct (or water conveyance); waterway canals; city-canal (gracht). A (Z) channel is the physical confine of a river, slough or ocean strait consisting of a bed and banks.

A2: (C) calm; (O) breeze; (R) strong wind; (E) gale; (K) storm; (T) hurricane
### Match characters with numbers

<table>
<thead>
<tr>
<th>Maritime term</th>
<th>Civilian term</th>
</tr>
</thead>
<tbody>
<tr>
<td>B bulkhead</td>
<td>1 room</td>
</tr>
<tr>
<td>C keel</td>
<td>2 main body</td>
</tr>
<tr>
<td>D hull</td>
<td>3 bottom part</td>
</tr>
<tr>
<td>E compartment</td>
<td>4 bunk</td>
</tr>
<tr>
<td>F frames</td>
<td>5 wall</td>
</tr>
<tr>
<td>G starboard</td>
<td>6 ribs</td>
</tr>
<tr>
<td>H hatch</td>
<td>7 empty</td>
</tr>
<tr>
<td>I berth</td>
<td>8 right</td>
</tr>
<tr>
<td>J head</td>
<td>9 journal</td>
</tr>
<tr>
<td>K void</td>
<td>10 restroom</td>
</tr>
<tr>
<td>L log book</td>
<td>11 cover</td>
</tr>
</tbody>
</table>
Mooring lines and more...

The lines are fixed to deck fittings on the vessel at one end, and fittings on the shore.
Parts of sailing ship
Three rotational degrees of freedom of a ship

Roll is when the vessel rotates about the longitudinal (front/back) axis
Pitch is when the vessel rotates about the transverse (side-to-side) axis
Yaw is when the vessel rotates about the vertical (up-down) axis
FYI

- A **wrench** or **spanner** is a tool used to provide grip and mechanical advantage in applying torque to turn objects—usually rotary fasteners, such as nuts and bolts—or keep them from turning. Higher quality wrenches are typically made from chromium-vanadium alloy tool steels and are often drop-forged. They are frequently chrome-plated to resist corrosion.

- In **American English**, **wrench** is the standard term, while **spanner** refers to a specialized wrench with a series of pins or tabs around the circumference. The most common shapes are called open-end wrench and box-end wrench.

- In **British English**, **spanner** is the standard term. The most common shapes are called open-ended spanner and ring spanner. The term **wrench** refers to a type of adjustable spanner.
FYI

- **Boatswain /boʊtsən/**
  A warrant officer on a warship, or a petty officer on a merchant vessel, in charge of rigging, anchors, cables, mending, etc.
  Also: bo's'n, bosun;
  Other: b. pipe, b. chair
COMPETENCE 9 – ORGANISATION ON BOARD

Instruction:
Read the questions Q1 to Q16. Answer YES or NO by putting a letter Y or N.
Do not write on the text booklet.

Q1: The Master is in full control of the ship.
Q2: He is superior to all crew members.
Q3: The master is responsible only for the crew.
Q4: He is only responsible for the deck department.
Q5: The C/E is responsible for the deck department.
Q6: He takes precedence over the engine staff.
Q7: The C/E is only responsible to the Master.
Q8: He is the leader of the fire fighting drills on board.
Q9: The C/M is in charge of the deck department.
Q10: All the crew are the C/M’s subordinates.
Q11: The C/M is responsible to the C/E.
Q12: He is not responsible for the life boats drills.
Q13: There are 4 levels of responsibility on a ship.
Q14: The operational level is associated with Ratings.
Q15: Ratings work at the support level of responsibility.
Q16: The 2nd/E belongs to the management team.
Liferaft's - how to launch if the vessel sinks

If the ship sinks, the water pressure will, within 4 m, activate the sharp knife which cuts the white strong rope and the liferaft will float free.
Liferaft

Install the raft where it can be easily launched, but where it will float clear if the ship sinks before launching.

Do not install the raft vertically. The gas cylinder inside will fall to the bottom and chafe the fabric. Install it in a cradle or shaped bed, secured with a senhouse slip and weak link or a hydrostatic release.

The painter must be secured to a strong point on the vessel.

The raft should not be exposed to paint, exhaust smoke, sparks, heavy seas or spray.

Have the liferaft inspected and repacked and the hydrostatic release tested according to the recommendations and requirements of the manufacturer.

If you have an inflatable life raft, be sure it is installed properly.
Before setting off to sea –
get your EMERGENCY PACK

### Communications and Navigation

<table>
<thead>
<tr>
<th>Description</th>
<th>Image</th>
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<tbody>
<tr>
<td>Compass</td>
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<tr>
<td>EPIRB</td>
<td><img src="image" alt="EPIRB" /></td>
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<tr>
<td>Red Flare</td>
<td><img src="image" alt="Red Flare" /></td>
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<tr>
<td>Radar Reflectors</td>
<td><img src="image" alt="Radar Reflectors" /></td>
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<tr>
<td>Floating Lantern</td>
<td><img src="image" alt="Floating Lantern" /></td>
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<tr>
<td>VHF-Marine Radio</td>
<td><img src="image" alt="VHF-Marine Radio" /></td>
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<tr>
<td>GPS-Marine</td>
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### Food and Water

<table>
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<th>Description</th>
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<tr>
<td>Emergency High-CALORIE-RATIONS AND/OR HARD-BREAD</td>
<td><img src="image" alt="High-CALORIE-RATIONS" /></td>
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<tr>
<td>Fishing Kit</td>
<td><img src="image" alt="Fishing Kit" /></td>
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<tr>
<td>Rainwater Collection Equipment</td>
<td><img src="image" alt="Rainwater Collection" /></td>
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<tr>
<td>Seawater Desalination Kit</td>
<td><img src="image" alt="Seawater Desalination" /></td>
</tr>
<tr>
<td>Water (typically 3 liters/person)</td>
<td><img src="image" alt="Water" /></td>
</tr>
<tr>
<td>Non-Perishable Food (canned-fruits, vegetables, and soup, pasta, etc.)</td>
<td><img src="image" alt="Non-Perishable Food" /></td>
</tr>
</tbody>
</table>

### Other Tools and Boating Items:

- Hatchet and Knife
- Waterproof Flashlight
- Heaving Line
- Ladder
- Sea Anchor (also called a "seadrogue")
- Bilge Pump
- Boat Hook
- Bucket and Baller

10k
Methods of signaling

- Signal mirror
- Red flare
- Dye markers

On a sunny day, a mirror is your best signaling device - pilots have reported seeing mirror flashes up to 160 km away under ideal conditions.
Methods of signaling

**Personal Locator beacon (PLB)**
1. Transmit on 121.5 and 406 MHz
2. Activation – automatic if immersed in water for 15” or manual when activation button pressed
3. Illumination cord around the neck transmits and flashes SOS signal for 20-30 hrs
Do you know that during windless day, survivor’s cry for help at sea may be heart for up to 15 km.
TEMPERATURE MIGRATION
hypothermia vs. hyperthermia

Hypo... is a condition in which *core temp.* drops below that required for normal metabolism and body functions which is defined as 35.0 °C.

Hyper... is an elevated body temperature due to failed thermoregulation. Hyperthermia occurs when the body produces or absorbs more heat than it can dissipate. When the elevated body temperatures are sufficiently high, hyperthermia is a medical emergency and requires immediate treatment to prevent disability or death.
HYPOTHERMIA
... history of tragic events

Military and civilian examples of deaths caused by hypothermia

During Napoleon’s Bonaparte’s retreat from Russia many troops suffered from hypothermia [1812]

Uruguayan Air Force Flight 571 – only 16 out of 45 survived [13OCT1972]
Hypothermia ...

**SIGNS & SYMPTOMS**

**Mild (32-35°C)** - shivering,

**Moderate (28-32°C)** - shivering becoming more violent; The victim becomes pale. Lips, ears, fingers and toes may become blue.

**Severe (<28°C)** - Difficulty in speaking, inability to use hands and stumbling is also usually present, the exposed skin becomes blue and puffy, muscle coordination becomes very poor, walking becomes almost impossible. Major organs fail. Clinical death occurs.

**RISK FACTORS**

- Drugs; Alcohol
- Cold water or low temp.
- Poor clothing
- Living in cold environ.
- Burn
- Extremes of age

Heat is lost much more quickly in water than on land (w.t. approx. 10 °C often leads to death in 60’; 4°C often leads to death in 15’)

10g
Heat production

The word mitochondrion comes from the Greek μίτος or mitos, thread + χονδρίον or chondrion, granule.

In cell biology, a mitochondrion (plural mitochondria) is a membrane-enclosed organelle found in most cells.

These organelles range from 0.5 to 10 micrometers (μm) in diameter.

Mitochondria are sometimes described as "cellular power plants"

Approx. 400-700 in each cell
What to do to reduce of heat escape?

Q: What happens in cold water?

Cold water removes heat from the body 25 times faster than cold air. About 50% of that heat loss occurs through the head. Physical activity such as swimming, or other struggling in the water increases heat loss. Survival time can be reduced to minutes.

DO YOU KNOW that strong swimmers have died before swimming 100m in cold water. In water under 40 °F, victims have died before swimming 30m.
What to do to reduce heat escape?

1. Stay on the raft as long as you can - cold water kills even good swimmers;
2. Hypothermia numbs your senses, easiest activities become impossible;
3. Take care of your blood circulation, i.e. wiggle your fingers/thumbs, reduce heat escape;
4. While warming up - do it slowly, in stages - cold blood in your arteries is main cause of stroke.

USCG: 50’/50°F/50%
Dehydration?

Dehydration symptoms generally become noticeable after 2% of one's normal water volume has been lost. Initially, one experiences thirst and discomfort, possibly along with loss of appetite and dry skin.

Clean drinking water is essential to humans

Humans daily water demand [litres]

- **Min. 1.5 litre**
  - **2.2** litres for women
  - **2.9** litres for men
  - **4.5** litres for women

1. Dehydration is best avoided by drinking sufficient water. The greater the amount of water lost through perspiration, the more water must be consumed to replace it and avoid dehydration.
2. Body cannot tolerate large deficits in total body water - without water a human can survive 4 days (max 7).
3. Long term dehydration leads to fatigue, drop of immunity, unconsciousness and to death.
Consumption of seawater

Accidentally consuming small quantities of clean seawater is not harmful, especially if the seawater is consumed along with a larger quantity of fresh water. However, drinking seawater to maintain hydration is counterproductive; more water must be excreted to eliminate the salt (via urine) than the amount of water that is gained from drinking the seawater itself.

seawater vs. human body

Water covers 70.9% of the Earth's surface (fresh water: 3% oceans +0.9% other +2% rivers and swamps)

The salinity of water in major seas varies from about 0.7% in the Baltic Sea to 4.0% in the Red Sea.

After drinking seawater, the blood’s sodium concentration will rise to toxic levels, removing water from all cells and interfering with nerve conduction, ultimately producing fatal seizure and heart arrhythmia.
A human body is usually about 95% of the density of water and so will normally float with about 5% of it above the surface, but unfortunately the stable position for it to float is with the upper back just breaking the surface and the head, arms and legs hanging down.

A life jacket is designed not to keep you afloat but to keep you afloat with your face above the water, and to do this it must be put on correctly. Nothing except a properly designed and properly worn life jacket should ever be used as a life preserver.
Immersion suit

The body temperature will not be 2°C lower than normal temperature after immersion in 0°C - + 2°C still water for 6 hours

As of 1 JUL 2006: 1 immersion suit per person on board (Maritime Safety Committee)

- Emergency suit for fishing vessels, merchant shipping and on offshore installations
- Coated flame retardant, waterproof Oxford Nylon
- Body warmth reflecting inner layer
- 3mm buoyancy foam with closed cells for insulation and buoyancy
- Sewn and welded seams
- Watertight zip, Adjustable ankle straps
- Approved light, buddy line and lifting strap
- Attached three finger gloves
- Whistle
- Storage bag included
- SOLAS approved and in accordance with Marine Equipment Directive 96/96/EC
1. A person has fallen overboard and is being picked up with a lifeboat. If the person appears in danger of drowning, the lifeboat should make ______. (A-an approach from leeward; B-the most direct approach; C-an approach from windward; D-an approach across the wind)

2. A person who sees someone fall overboard should ______. (A-go to the bridge for the distress flares; B-run to the radio room to send an emergency message; C-call for help and keep the individual in sight; D- immediately jump in the water to assist the individual)

3. The key to rescuing a MOB is _______. (A-good communication; B-dedicated crew; C-good equipment; D-well-conducted drills)

4. One of your crew members falls overboard from the starboard side. You should IMMEDIATELY _______. (A-begin backing your engines; B-apply left rudder; C-throw the crew member a life preserver; D-position your vessel to windward and begin recovery)

5. On a small boat, if someone fell overboard and you did not know over which side the person fell, you should ____. (A-immediately reverse the engines; B-stop the propellers from turning and throw a ring buoy over the side; C- increase speed to full to get the vessel away from the person; D-first put the rudder hard over in either direction.

6. You are standing the wheel watch when you hear the cry, "Man overboard starboard side". You should instinctively _____. (A-give full right rudder / B-give full left rudder / C-put the rudder amidships / D- throw a life ring to mark the spot)

7. The #2 lifeboat on a tanker would be ______. (A-forwardmost on the port side / B-forwardmost on the starboard side / C-abait #1 lifeboat port side / D-abait #1 lifeboat starboard side)
1. A person has fallen overboard and is being picked up with a lifeboat. If the person appears in danger of drowning, the lifeboat should make ______. the most direct approach;
2. A person who sees someone fall overboard should ______. call for help and keep the individual in sight
3. The key to rescuing a MOB is _______. well-conducted drills
4. One of your crew members falls overboard from the starboard side. You should IMMEDIATELY _______. throw the crew member a life preserver
5. On a small boat, if someone fell overboard and you did not know over which side the person fell, you should ____. stop the propellers from turning and throw a ring buoy over the side.
6. You are standing the wheel watch when you hear the cry, "Man overboard starboard side". You should instinctively ______. give full right rudder
7. The #2 lifeboat on a tanker would be ______. forwardmost on the port side
COMPETENCE 11 - HOW TO USE A LIFE JACKET

Owing a lifejacket is not a guarantee of safety unless you know how to use it

1. In an emergency there is no time to learn how equipment works. You should practice putting on your lifejacket and making the final adjustments for a safe fit.

2. Children should be encouraged to learn how to put on their lifejackets for themselves.

3. You should also practice in the water so that you know how the equipment functions and in particular, get used to the flotation position it gives you.

4. Crewsaver recommend the use of thigh straps with all Lifejackets, most versions have these fitted as standard. They make the Lifejacket safer to use by helping to prevent it riding up in the water.

LIFEJACKET DONNING INSTRUCTIONS

1. Pull the lifejacket over your head through the center hole.
2. Pass the securing belt around your back and snap the buckle together. Tighten the belt by pulling on free end.
3. Fasten top of lifejacket with a firm knot in the pull strings.
4. In the event of jumping into the water from a great height place the hands on the lifejacket, under the chin and hold down.
Hope keeps your spirit high

Survival at sea is a real test of one’s physical and mental endurance

Never give up your hope
1. What would happen if you took one of the sides of the FIRE TRIANGLE away? The fire would stop.
2. What type of nozzle do you have at the end of your fire hoses? Either Jet or Jet/Spray Nozzle.
3. Do you carry spare fire hoses on your ship? You should have at least one spare.
4. Why so many extinguishers in the engine room? Because this is the primary source for a fire to start.
5. You see a fire in the galley, its a chip pan on fire, what are you going to do? Your priority is to make sure you do not get hurt, close the door for the galley, scream "FIRE" and make sure everyone is alerted.
6. Can you manage to put this fire out? This would depend on what the heat source was, is it gas, electric, or diesel?
7. It's an electrical source of heating, can you put the fire out now? Yes, outside the galley there should be an isolator switch, if I switch off the electricity to the fire, this would help, now I can go in and put a fire blanket over the chip pan, as long as I have a fire team alongside me. What would you do if it was a gas fueled cooker? Turn off the gas at the mains (Bottled Gas) What would you do if it was a diesel fueled cooker? Turn off the main fuel source in the engine room.
Key elements of fire safety

填入空白处

1. Maintaining proper fire exits and proper exit signage.
2. Never allow the fire to come between you and your means of escape.
3. Placing and maintaining fire extinguishers in easily accessible places.
4. Prohibiting flammable materials in certain areas of the facility.
5. Conduct fire drills at regular intervals throughout the year.
6. Keep your senses alert and vigilant, do not neglect any symptoms of fire.
Dangerous situations on board

- Being involved in collision, grounding; stranding of the ship on rocks, land or shoal; accident, fire or explosion, machinery or steerage breakdown or fault.

- **Incidents:** navigation, aviation.

- Persons injured or recovered from the water or lost overboard, or in distress, or in need of assistance.
What is the triangle for a fire to start?

Model for understanding the major components necessary for fire

- Heat
- Fuel
- Oxygen

Air contains 20.95% oxygen
Firefighting equipment

A. Automatic sprinkler
B. CO2 extinguisher
C. Fire axe
D. Helmet
E. Hose
F. Hose coupling
G. Hose wrench
H. Life safety line
I. Nozzle
J. Pike pole
K. SCBA
L. Utility rope
M. Fire blanket
Is fire considered as the most devastating to crew and ship?

- Toxic fumes (*i.e.* carbon *monoxide*) and smoke kill
- Explosion
- Consumption of oxygen
- Hard or impossible to control
- Cause severe burns (skin, lungs, etc.)
- Flames and smoke trap the crew

- Evacuation is a challenge – blackout, dark alleyways, metal melts or expands
Worst-case scenario examples
Is fire considered as the most devastating ...?
Major mishaps aboard oil rigs are rare. But accidents like the Transocean Deepwater Horizon oil rig explosion show the risks as companies explore farther and drill deeper.

A fire aboard the mobile offshore drilling unit burns 52 miles southeast of Venice, La. Helicopters, ships, and an airplane searched waters off Louisiana's coast Wednesday for missing workers after the oil rig explosion and fire.
Yeoman Bontrup

On July 2, 2010 a conveyor belt on the cargo ship Yeoman Bontrup, berthed at Glensanda Quarry's pier on Loch Linnhe (UK), caught fire and the blaze spread to the superstructure.

The fire, in which no-one was seriously hurt, burned for more than 24hrs.
Lisco Gloria
sailed from German town Kiel to Lithuania

Nearly 240 people were rescued from the ferry in the Baltic Sea in the early hours of Saturday, after an explosion on the ship set it on fire.

Lisco Gloria, the 200-meter long ferryboat, was sailing under the Lithuanian flag.
Russia is observing a day of mourning after as many as **110 people died** when an **overloaded boat** sank on the Volga. Some 50 children were said to be among those who drowned when the Bulgaria, a tourist boat, sank on Sunday.

Around 80 people were rescued on the wide section of the river in Tatarstan, 750km east of Moscow. Some 50 bodies have been found. Officials say the boat's capacity was 120 passengers and crew, but it had been carrying 208 people.
Costa Concordia after she ran aground on the night of 13 January 2012, at around 21:45 local time (UTC+1), Costa Concordia hit a rock off Isola del Giglio (42°21′55″N 10°55′17″E); a 50-metre long gash was later found to have been made. With water rushing in, the vessel started to list to port. The ship reversed course but was now listing heavily to starboard.

The ship drifted back into shallow water and came to rest lying on the starboard side in an unsteady position on a rocky underwater ledge with half of the ship above water and in danger of sinking into a trough 70m deep.

She was carrying 3,229 passengers and 1,023 crew members, all but 32 of whom survived; as of 29 Jan 2012, twenty-one bodies had been found, with 11 people known to be missing and presumed dead.
Costa Concordia
26 totally enclosed lifeboats (TELB) with inboard diesel engine

Lifeboat drills are to make sure that after ABANDON SHIP ORDER all passengers and the whole crew should be able to evacuate in 30 min.

Board when instructed, sit and fasten seat belts. Place and operate EPIRB and SART.