The Nicos J. Vardinoyannis

Seafarers' *Handbook*

Produced for Mariners
by the Seamen's Church Institute

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New York and New Jersey with a grant from
"Nicos J. Vardinoyannis Fund"
Ioanna N. Vardinoyannis - Fourier and Pyrros N. Vardinoyannis

Note To The Reader

The purpose of this handbook is to communicate information about the marine environment and shipboard life pertinent to crews of merchant marine vessels. The information contained here has been compiled from a variety of sources, which are noted at appropriate places in the text. This handbook is not a substitute for training and continued professional education.

This icon honoring St. Nicholas, the patron saint of seafarers, is on display in SCI's St. Nicholas chapel in New York City.

Artist: Joseph Cammarato

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Dedication

This book is dedicated to the work, ideas and memory of our father, Nicos J. Vardinoyannis. It is dedicated to all his accomplishments and the many more time didn't allow him to complete.

Nicos Vardinoyannis was born in 1931 in a small town near the northern shore of the island of Crete. The sea had always been his big love and it was this love that marked, from the very beginning, the course of his life. He joined the Greek Navy in 1952 where he served for ten years, leaving with the rank of Lieutenant Commander.

He left the Navy but remained close to the sea. What he lacked in capital he made up in perspicacity and courage — he founded a bunker fuel business in 1962, having perceived a shortage of bunker fuel on the Mediterranean side of the Suez Canal. In 1962 he began leasing two old oil tankers from Aristotle Onassis, the *Ariston* and the *Aristophanes.*

Demand grew quickly and in 1966 he built the Kali Limenes and Siros (an island in the Aegean Sea) bunkering stations, under the name "SEKA S.A." He expanded his business in 1967 to include oil shipping activities with a fleet of 20 tankers, all flying the Greek flag. On Nov. 11, 1972 Nicos Vardinoyannis inaugurated the Motor Oil Hellas Corinth Refinery. Unfortunately, he passed away only eight months after the opening of the refinery at the age of 42.

As well as being a caring husband and father, Nicos Vardinoyannis was also a caring businessman and employer. He was personally involved in the purchase and management of all his tankers and cared deeply for the people he employed. He continually worked to improve the harsh conditions of life of his seafarers and managed the group like one big family. His love for the sea made him a pioneer in environmental protection issues.

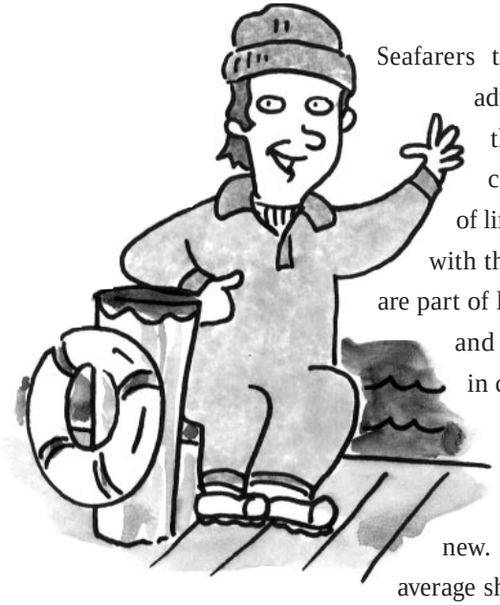
Our father was an idealist. He believed in what he was pursuing and pursued what he believed in. He created a healthy and dynamic business which reflected his ideas, values, and vision. His name is well known in Greece and throughout the shipping world. For us, his memory was, is, and always will be a source of strength, inspiration and pride. We know he would love the book we are today dedicating to him with all our love and respect.

In this effort we had the valuable assistance of **The Seamen's Church Institute,** without which the realization of this edition would be very difficult, if not impossible. Therefore we express our deep feelings of respect and our sincere thanks to **The Seamen's Church Institute** and all the people who have worked hard on this edition.

Ioanna N. Vardinoyannis - Fournier
Pyrros N. Vardinoyannis

Welcome

As a seafarer, you belong to a unique community of hardworking men and women from more than one hundred nations.



Seafarers typically are people who love adventure and enjoy learning new things. Seafarers come from many cultures, but share a common way of life while at sea. You are all familiar with the rigid rules and long hours that are part of life on a ship. You all leave family and friends at home. You all have a lot in common.

Your workplace is a curious mixture of the very old and the very new. Over the years, the size of the average ship has grown tremendously, but some basic elements have not changed. The modern ship still has many similarities to the ships that sailed the oceans in the 16th century. Your job titles and many ship terms were developed during the 16th century. You travel on trade routes that are hundreds and even thousands of years old. But there are also aspects of your ship that are altogether new.

The shipping industry has always been and continues to be a leader in communication technologies. Many ships employ the latest technologies for navigation and communication. For more than a decade, ships have been using satellites and digital equipment to send and

receive messages . Satellites also send weather information to onboard computer systems. And satellites are used to send and receive distress messages. Some ships use high-tech equipment to detect hazards in cargo holds. They also employ sophisticated fire prevention and suppression equipment. You are probably working with some of the world's best technology.

To keep up with the latest technologies, and to safeguard yourself from hazards, you need training. This book, with its overview of many seafarer and ship-related topics, is a good reference for this training.

The Seamen's Church Institute of New York and New Jersey is an advocate for the personal and professional well-being of merchant seafarers. The Institute provides hospitality, social services, maritime training, and legal assistance to seafarers of all nationalities.

We care about you. Because we care, we have compiled, in this handbook, safety information, crime prevention tips, and disease prevention information, along with an overview of international conventions that affect your profession. We want you to stay well. We also want you to enjoy your career at sea.

The Rev. Peter Larom
Executive Director

Part 1
The Seafarer

Chapter 1

Seafarers' Rights

YOUR RIGHTS

As a seafarer aboard a merchant ship, you have many rights that are protected by law. Most seafarers are capable and responsible individuals, but because of their vulnerability, courts and legislatures regard seafarers as a category of workers entitled to special consideration and treatment.

Maritime law has long recognized that seafarers need special protection and care. Seafarers' work has always been difficult and dangerous, requiring long separations from home, family, and friends, as well as exposure to perils at sea. The law reflects the concern that if commerce is to move safely and efficiently over water, it is necessary to care for the people who work on ships. To a large extent, admiralty and maritime law (the law governing ships and shipping) was developed to protect seafarers and preserve their rights. Many maritime laws are based on ancient texts, dating back to the Crusades or even earlier. These ancient laws form the basis for all modern laws.

BASIC HUMAN RIGHTS

Some rights are so basic that you are entitled to them regardless of where you live or with whom you are employed. These basic human rights include:

The right to life.
Your job should not put your life in unreasonable danger. You have the right to receive a fair salary and enjoy safe working conditions and appropriate rest periods.

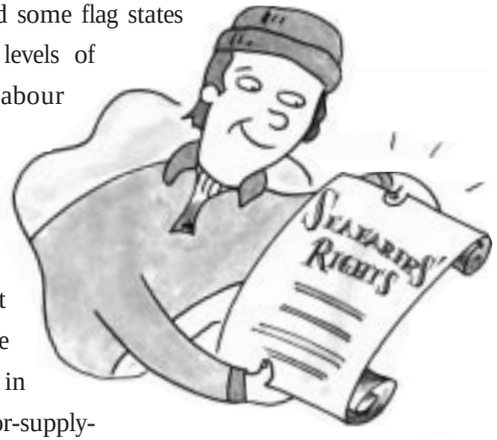
The right to respect—regardless of age, ethnic background, race, religion, or sex.
All human beings are entitled to be treated with equal dignity. You have the right to such basic necessities as food, clothing, and shelter. You also have the right to worship freely, provided this worship does not interfere with your work or with the rights of another crew member to worship.

BASIC SEAFARERS' RIGHTS

The following are basic seafarers' rights that apply in most maritime nations. A few nations, however, limit one or more of these rights.

The right to a written contract (ship's articles).
All seafarers are entitled to a written contract, which should contain details about your salary, the time period for which you are hired, and other important employment rights.

The right to wages.
All seafarers are entitled to be regularly paid a fair wage for their work. Many labor-supplying countries determine the



minimum levels of pay, and some flag states also determine minimum levels of pay. The International Labour Organisation (ILO) has recommended that the minimum pay for an able seaman (A/B) in 1998, should be US$435 per month, but this is not binding. Unless the contracted wage rate is in violation of flag-state or labor-supplying-state laws, the rate of pay in your contract is the controlling element.

The right to free medical care, wages, and living expenses during your recuperation if you become ill or injured during the performance of your work.
This right is called "maintenance and cure." If you become ill or injured (except through your own deliberate act) while you are working, you are entitled to medical care up to the point of maximum medical cure paid for by the shipowner, and to wages, food, and shelter during the period of your recovery (through the end of the voyage). Some contracts restrict the amount of your recovery for "maintenance," but your contract may not otherwise reduce or restrict your right to maintenance and cure. Any contractual terms that attempt to do so should be deemed unlawful by a court.

The right to be repatriated.
When your contract ends or when your contract is terminated without cause by the shipowner, you have the right to return to the port where you were hired, the port where you

joined the vessel, or another port mutually agreeable to you and the master. The shipowner pays for all repatriation costs.

The right to shore leave.

Shore leave is necessary for your emotional and physical well-being. This is a basic right that should be granted to all seafarers except in the most extreme circumstances. Some countries, however, do place limits on shore leave.

The right of free association.

You have the right to associate with other seafarers and to engage in collective bargaining. The International Labour Organisation (ILO) has determined that seafarers have the right to join unions. Union activity, however, is prohibited in some countries.

THE CENTER FOR SEAFARERS' RIGHTS

The Center for Seafarers' Rights assists thousands of seafarers each year. The center is a division of The Seamen's Church Institute of New York and New Jersey. It serves as a center for research, legal assistance, and training on issues relating to seafarer abuse and exploitation. It provides free counseling, assistance, and referrals to merchant seafarers and to seafarers' welfare agencies worldwide.

The Center for Seafarers' Rights can help you understand your employment contract, be repatriated, obtain shore leave, receive medical care or benefits, and deal with other seafarers' rights issues.

If you have a question about your rights, contact:

THE CENTER FOR SEAFARERS' RIGHTS

THE SEAMEN'S CHURCH INSTITUTE OF
NEW YORK AND NEW JERSEY

241 WATER STREET
NEW YORK, NY 10038

TEL. (212) 349-9090 x240
FAX: (212) 349-8342

E-MAIL: csr@seamenschurch.org
WEBSITE: http://www.seamenschurch.org

EMPLOYMENT CONTRACTS

The right to a written contract is one of your most important rights. Employment contracts are sometimes called *ship's articles.* From seafarers' contracts flow the various rights of seafarers, such as wages and maintenance and cure. Maritime law enables you to force the shipowner, the master, and even the ship itself to honor the terms of your contract.

You should not sign a contract unless you understand your rights and responsibilities under that contract. You have a right to understand all the terms of your contract. You may ask the manning agent or your union representative to explain the terms of your contract. Most maritime nations require your shipowner either to give you a copy of your contract or to make it available to you on your ship. Get a copy of your contract if it is offered to you. You should also get a copy if you feel that you have a dispute with your employer.

The International Labour Organisation has determined that all seafarer contracts should contain the following information:

Your name, date of birth or age, and birthplace

Date and place that agreement was completed

Name of the vessel(s)

Your job on the ship

Your wages

The duration of your agreement and conditions thereof

Sometimes seafarers have no written contract. If you work with no contract, you are at the mercy of your employer because you have no proof of the terms of your employment. Although the flag state and the courts of some countries may protect some of your basic rights, you should insist upon a written contract that clearly defines the terms of your employment.

Sometimes seafarers are asked to sign blank contracts when they apply for employment. The terms of the contract can then be filled in without the seafarer's knowledge. **Do not sign a blank contract.**

Sometimes seafarers are asked to sign two contracts that specify two different rates of pay. Sign only one contract.

When a dispute arises over employment-related rights, the terms of your contract will usually be the most important factor in resolving the dispute.

WAGES

In wage matters, the claims of seafarers are highly favored by the courts. Seafarers' wage claims have been called "sacred claims" by the courts and are protected by a lien (property right) against the vessel.

Is there a minimum wage?

The International Labour Organisation (ILO), a United Nations agency, recommends minimum wages for seafarers.

As of 1 January 1998, the minimum ILO wage for an able-bodied seaman (A/B) is US$435 (per month). Although several governments and industry organizations recognize the ILO minimum wage for their seafarers, this minimum wage is only a recommendation to shipowners. It is not your right to receive this wage rate unless it is specified in your contract. Unless your pay scale is less than that required by law, you do not have a right to any particular minimum wage. The only minimum wage is that specified by the laws of a flag state or a labor-supplying nation. If you wish to increase your wages, the most effective way of doing so is to negotiate a new contract through collective bargaining by a trade union.

What is Collective Bargaining?

Collective bargaining is a process by which a trade union negotiates with a shipowner for better wages or working conditions for everyone. This process generates a collective bargaining agreement (CBA) that provides similar contracts for all the seafarers that are represented. When you are part of a collective bargaining agreement, your contract rights are the same as those of your coworkers under the same contract.

A common feature in CBA's is a procedure for handling grievances. Whenever you have a problem with your contract or working conditions, you should first try to solve the problem through your grievance procedure. The International Transport Workers' Federation (ITF) is an association of transport workers' unions, and it has a section devoted to seafarers. It is a good resource for help with grievance procedures. See Part II for telephone numbers of local ITF representatives.

Similarly, if you want help in negotiating your contract terms or initiating a collective bargaining agreement, you should contact the ITF or your trade union.

RECRUITMENT

Manning agents work for the shipowners, who pay them to find seafarers to work on their ships. It is illegal for manning agents to charge seafarers for finding them work. Manning agents may only charge small fees for processing applications. Reputable manning agents do the following:

- Do not charge seafarers fees for finding them jobs
- Do not charge fees for obtaining government documents for seafarers
- Do not charge seafarers transportation fees
- Respond quickly and accurately to questions from the family members of seafarers
- Forward mail to seafarers
- Make allotment payments to family members and bank accounts, on time and at a fair currency exchange rate

MAINTENANCE AND CURE

The one remedy that seafarers have been able to count on over the centuries is the right to be taken care of when they became sick or injured in the service of their vessel. As mentioned earlier, shipowners have a duty to provide medical care and other benefits for seafarers working aboard their ships.

What is Maintenance and Cure?

Maintenance is reasonable and actual room and board expenses. If you recuperate ashore, your actual room and board expenses should be paid by the shipowner. **Cure** is the reasonable medical expense needed to bring you to maximum medical cure.

"Maintenance and cure" is a basic right that is part of every employment contract for seafarers even if it is not mentioned in your contract (ship's articles). Maintenance and cure cannot be contracted away. Some collective bargaining

agreements limit the amount of recovery for maintenance. Courts have differing opinions about whether such limitations are valid.

Every seafarer who becomes sick or is injured while employed aboard a vessel, without willful misbehavior, is entitled to wages to the end of the voyage. Every seafarer is also entitled to sustenance, lodging, and medical care to the point where maximum medical cure attainable has been reached. Your injury or illness does not have to occur while you are on the vessel, as long as you became ill or injured while you were in the service of the vessel.

If you normally receive tips as a part of your salary, your wages during recuperation should include what you would customarily receive in tips.

REPATRIATION

International conventions, the domestic laws of most flag states, and general maritime law all recognize your right to be repatriated at the end of your contract.

Who Pays Repatriation Costs?

The shipowner is required to pay the costs of repatriating seafarers who are left behind by reason of injury or illness (not due to the seafarer's willful act), shipwreck, or for any other cause for which the seafarer cannot be held responsible.

Do You Have to Return to the Port Where You Joined the Vessel?

You should be repatriated to one of three places: the port

where you were hired, the port where you joined the vessel, or any other port on which you and the master agree.

Is the Shipowner Always Required to Pay Repatriation Costs?

The shipowner may not be required to pay repatriation costs for a seafarer who quits without cause before the term of his or her employment contract expires.

SHORE LEAVE

Shore leave is necessary to a seafarer's emotional, spiritual, cultural, and physical well-being. Shore leave is a basic right that should be granted to all seafarers except in the most extreme circumstances. Some countries, however, place limits on shore leave.

Most countries do not require visas for seafarers to come ashore. A seafarer's identity card is sufficient. Some countries, however, do require a visa.

SAFETY

The Safety of Life at Sea (SOLAS) Convention aims to guard your most important right, your right to life. It requires shipowners to maintain and operate safe ships and to supply enough safety equipment to keep all crew members secure. It requires fire protection systems, survival craft, and Global Maritime Distress and Safety System (GMDSS) radio equipment. It also mandates a safety management system on each vessel through the International Safety Management Code (ISM).

SOLAS also addresses your right to accurate information about possible hazards associated with your work. It requires that you be informed about the properties of each cargo carried, and that you receive safety training for that cargo. It also states that you have a right to ask for and be given a Cargo Information Sheet that lists all physical and health hazards for the cargo.

The International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) aims to guard your right to life. It protects your basic rights to a safe work environment and to adequate rest periods. STCW requires minimum training standards and minimum rest requirements for crew members. It describes minimum manning requirements. It also requires that, before the start of each voyage, you be given detailed familiarization training that emphasizes safety.

The Merchant Shipping (Minimum Standards) Convention (ILO 147) is an international convention that grants port authorities permission to inspect ships. The inspections are to ensure that the ships meet minimum standards for safety,

health, and seafarers' rights. If the inspectors find hazardous, unclean, or unsafe conditions, the port state government may detain the ship and order that repairs be made.

For more information on SOLAS, STCW, and ILO 147, see chapter 11 p. 199.

UNIONS

You have the right to associate freely and to bargain collectively for better wages and working conditions. This includes your right to join a union. Regrettably, some countries do not accept this basic internationally accepted right and prohibit normal union activity.

Unions are involved in protecting your rights under collective bargaining agreements and in negotiating new contracts for the betterment of all the workers covered by the same contract.

The International Transport Workers' Federation (ITF) can help you identify unions that have met its rigorous standards for membership. For more information about unions and the ITF, contact:

INTERNATIONAL TRANSPORT WORKERS' FEDERATION

49-60 BOROUGH ROAD

LONDON SE1 1DS, UNITED KINGDOM

TEL. 011-44-171-403-2733

E-MAIL: Info@itf.org.uk

WEBSITE: http://www.itf.org.uk

NATIONAL LAWS

Many nations have detailed laws that cover contracts, wages, and other seafarers' rights. You have the protection of a nation's laws when you work on a ship flying the flag of that nation or when you are a citizen of that nation.

The Center for Seafarers' Rights publishes booklets describing your rights under the laws of the following nations: Bahamas, Cyprus, Liberia, Malta, Norway, Panama. Some of the issues covered in these booklets are:

Contract requirements

When wages begin and frequency of pay

How wages are distributed between cash payments and allotments

Injury and illness

Vacation pay and holiday pay

Accommodations and provisions

Union representation

Repatriation

Death benefits

Redress of grievances

Sources of help

Safety

Termination

ASSISTANCE

When you have questions concerning your employment, first speak with your supervisor. If you believe that your supervisor is not giving you good information, or if you have additional questions about your rights, contact the Center for Seafarers' Rights or a trade union representative.

When you are in port, a "ship visitor" from the local seamen's club or agency might come on board. Ship visitors are port chaplains, priests, ministers, rabbis, and volunteers who are trained to understand your work and the maritime industry.

ASK FOR SEAFARERS' RIGHTS BOOKLETS WHEN YOU VISIT A SEAMEN'S CLUB, OR DOWNLOAD THEM AT NO CHARGE FROM THE INTERNET (http://www.seamenschurch.org).

Chapter 2

Services Available from the Port Chaplain

Port Chaplains intend to welcome you and to offer assistance. Telephone numbers for many seamen's centers are included in Part II.

MINISTRY

Chaplains lead worship services on board ship, when requested, or pray with an individual seafarer. In many ports, they can provide you with Bibles and devotional materials in different languages.

If there is a major crisis, such as a death or serious injury on one of your voyages, contact a chaplain at the first opportunity. Chaplains are trained to counsel people who are upset and grieving. They can also assist your vessel with the difficult job of notifying the deceased person's family at home. Chaplains visit and help seafarers who are in hospital or prison. If you are in trouble and need help, or have been the victim of a crime, the chaplain will help you find the appropriate aid from the local seafarers' agency, or union, or your nation's consulate.

Chaplains also will share information about AIDS and other sexually transmitted diseases (STDs). For a free pamphlet on AIDS prevention, contact:

S C I

THE SEAMEN'S CHURCH INSTITUTE OF
NEW YORK AND NEW JERSEY

118 EXPORT STREET
PORT NEWARK, NJ 07114

TEL: (973) 589-5828
FAX: (973) 817-8565

E-MAIL: chaplain@seamenschurch.org

COMMUNICATION

Chaplains know it is very difficult to communicate with family members while on board ship. Each seamen's club offers different services, and many are organized to provide these kinds of services for you. Ask your ship visitor for the help you need.

RECREATION

Many seamen's clubs provide food, drinks, and recreation. They can help you arrange transportation to the club or into town for shopping. Some clubs have sports facilities. Ask the chaplain to help you arrange basketball or football competitions for crews from different ships. In some ports, chaplains can arrange sightseeing tours for groups of seafarers.

This is a blank page. We can decide what to do with them at the end. But I need a page here.

Chapter 3

Religion On Board Ship

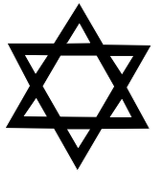
INTRODUCTION TO WORLD RELIGIONS

On board ship, many religions may be represented. Your religion affects the deepest part of your being and culture and should be respected by everyone. Show the same respect for the religions of others. You may have an opportunity on board ship to learn about faiths other than your own. You should learn about and honor each other's beliefs, worship practices, moral codes, and cultural practices. The five major religions are Buddhism, Christianity, Hinduism, Islam, and Judaism.

The religious backgrounds of your fellow seafarers may dictate their eating habits, their holidays, and their prayer practices. Strict observance of some religions requires no drinking, no smoking, no swearing, and no eating of certain foods.

Around the world, there are about one billion Christians. Christianity is the faith of those who follow Jesus Christ and believe

that he is the promised redeemer and the son of the one all-powerful God. Christians are chiefly divided into Orthodox Catholics, Roman Catholics, and Protestants. For historical and political reasons, Orthodox Catholics are found mostly in the countries of Eastern Europe. Roman Catholics and Protestants are found mostly in the countries of Western Europe and in former European colonies.



The Jewish people believe in the same God that Christians do, but Jews do not revere the person of Jesus Christ. Judaism, much older than Christianity, traces its origins back nearly 4,000 years to Abraham, the patriarch who is considered the father of the Jewish faith. Both Jews and Christians use the Bible as a treasured source of beliefs. The first five books of the Bible are known as the Torah. These books contain the early history of the Jewish people and of Israel.

Muslims, followers of Islam, believe in the same God that Jews and Christians do. They also believe that God (Allah) sent them a special prophet, Muhammad, who revealed God's law to them and wrote God's teachings in a book called the Koran. The Koran is sacred to Muslims. Muslims are also familiar with Bible traditions. There are two branches of Islam, Sunni and Shia.

Hinduism is the oldest of the major religions. It is believed to have begun almost 4,000 years ago. Hinduism is a faith that reveres the many gods described in the Indian Vedas. The Vedas are four holy books that are sacred to Hindus. The

first Veda, Rig-Veda, includes hymns and verses in Hindi. It was written around 2000 BC. The third Veda, Upanishad, written somewhere between 1000 and 500 BC, discusses the relationship between people and the gods. There are three supreme gods and a great number of lesser gods; the lesser gods often represent natural forces. The most supreme god is Brahma. Hinduism incorporates many diverse practices.

The Indian subcontinent is also the home of Buddhism. This is the religion of about one-eighth of the world's people. Buddhism is the name for a complex system of beliefs developed around the teachings of a single man. This man, known today as Buddha, was Siddhartha Gautama, who lived 2,500 years ago in India. Buddha means "Awakened or Enlightened One," and all Buddhist teachings try to share the Buddha's experience of awakening to truth.

Whatever religion your shipmates practice, it is important to honor their beliefs. It is good to learn about the faiths of others. Sometimes learning about another faith, and seeing how it is treasured, helps us to treasure our own faith.

SIMPLE SERVICE: CHRISTIAN WORSHIP

When in port, you may choose to worship on board in a service conducted by the local chaplain or attend a service at the seamen's club, or you may be able to arrange transportation to a house of worship of your own faith. At sea, daily worship is up to you and your shipmates. In this section, we pro-

vide resources to help you create a simple service of prayer and praise to be used on board ship.

Daily worship offers a time to reflect on the past and the hope of the future. It provides the opportunity to turn to God in thanksgiving for the blessings of this life, to ask God for courage, wisdom, peace, and well-being for your family and friends.

ORDER FOR DAILY WORSHIP GATHERING

First Reading: Old Testament

_____

Psalm

_____

Second Reading: New Testament or Gospel

_____

Response to Scripture:

One or more persons may comment briefly, or all may meditate on the passage in silence.

_____

Prayers of the People

_____

The Lord's Prayer

_____

Dismissal

_____

PRAYERS AND HYMNS

Prayers for Daily Worship

Prayers of the People.

This prayer is offered aloud. A leader reads these or similar verses. After each verse, all respond: "Lord, hear our prayer."

For our families at home, keep them safe, grant them your gift of peace, and help them grow strong in their faith, we pray to the Lord… For all who labor far from home, that they may do so safely, and know that you are watching over them and protecting them, we pray to the Lord… For this ship, all aboard her, and for us, that we may learn to deal with each other honestly and fairly, we pray to the Lord,… For those who lead us, that they look to you for wisdom and skill and will lead us with compassion and understanding, we pray to the Lord… For those who are sick, especially _____ and _____ , that they may soon worship you in fullness of health, we pray to the Lord… For all who have died, especially _____ and _____, that they may rest in peace and their families shall come to know your comforting grace, we pray to the Lord… Amen.

Prayer of Confession

I confess to almighty God, to you, my brothers and sisters, that I have sinned through my own fault in my thoughts and in my words, in what I have done, and in what I have failed to do; and I ask blessed Mary, ever Virgin, all the angels and saints, and you, my brothers and sisters, to pray for me to the Lord our God. Amen.

Lord's Prayer (As Taught by Jesus)

Our Father, who art in heaven, hallowed be Thy name. Thy Kingdom come, Thy will be done, on earth as it is in heaven. Give us this day our daily bread, and forgive us our trespasses, as we forgive those who trespass against us. And lead us not into temptation, but deliver us from evil. For thine is the Kingdom and the power and the glory, forever and ever. Amen.

Jewish Shema

Hear, O Israel, the Lord our God, the Lord is one and you shall love the Lord your God with all your heart, with all your soul, and with all your might. And these words, which I command you this day, shall be upon your heart; and you shall teach them diligently to your children, and you shall talk of them when you sit in your house, and when you walk by the way, and when you lie down, and when you rise up. And you shall bind them as a sign upon your hands, and they shall be like frontlets between your eyes. And you shall write them on the doorposts of your house, and upon your gates.

Muslim Prayer of Faith

Ye who believe! Turn unto Allah in sincere repentance! It may be that your Lord will remit from you your evil deeds and bring you into gardens underneath which rivers flow, on

the day when Allah will not abase the prophet and those who believe with him. Their light will run before them and on their right hands; they will say, Our Lord! Perfect our light for us, and forgive us! Lo! Thou art able to do all things!

Hindu Prayer

May all the beings reach happiness and peace.
May their happiness be as great as possible.
Whatever beings live in our world
Weak or strong
Prone or standing
Small, medium, or large
Healthy or frail
Hiding or in the open
From the egg or the womb or seed
May all beings be happy
With a mind free of prejudice,
A mind of loving kindness
Our minds open outward
In all directions
Toward Infinity.
Free of hatred and spite
We radiate loving kindness.
Thus in this our world of suffering and death
The true nature of Divinity
Appears here among us all.
Sutta Nipata
(World Interfaith Education Association)

Buddhist Prayer
Loving Kindness, Sutta Nipata
May all beings be filled with joy and peace.

Let no one deceive another,
Let no one anywhere despise another,
Let no one out of anger or resentment
Wish suffering on anyone at all.

Just as a mother with her own life
Protects her child, her only child, from harm,
So within yourself let grow
A boundless love for all creatures.

Let your love flow outward through the universe,
To its height, its depth, its broad extent,
A limitless love, without hatred or enmity.

As you stand or walk,
Sit or lie down,
As long as you are awake,
Strive for this with a dedicated mind and
Your life will bring heaven to earth.
This is known as living her life divine.

Occasional Prayers

For Health and Strength
For health and strength and daily food,
We praise Thy name, O Lord.

Prayer for Our Loved Ones
Lord God, keep under Your protection all those whom we

love; watch over any who are sick or in trouble, linking us through prayer with all who have a place in our hearts. Through Jesus Christ our Lord. Amen.
(Source: Chaplain Corps, U.S. Navy)

Eternal Father Strong to Save
Eternal Father, strong to save,
Whose arm has bound the restless wave,
Who bade the mighty ocean deep, its own appointed limits keep:
Oh hear us when we cry to Thee
For those in peril on the sea.

Lord stand beside all those who sail
Our Merchant ships in storm and gale.
In peace and war watch they keep
On every sea on Thy vast deep
Be with them, Lord, by night and day,
For Merchant Mariners we pray.

SAINT NICHOLAS, PATRON SAINT OF SEAFARERS

In the fourth century, Saint Nicholas was Bishop of Myra in Lycia, an ancient region of what is now Turkey. Nicholas has been recognized as a saint by the Orthodox Church since the fifth century and by the Roman Catholic Church since the eleventh century. Legend says that he miraculously saved seafarers in distress off the coast of Lycia, which is why he is the patron saint of seafarers. His feast day is December 6.

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Chapter 4

Smuggling, Piracy and Stowaways

Life at sea presents temptations and dangers that are unique to seafaring. Here are some warnings about smuggling practices and penalties, as well as warnings about piracy and about stowaways.

SMUGGLING

Smuggling has several meanings.

> Smuggling can mean secretly importing into a country items that are legal to sell without paying customs and duties. Cigarettes and liquor are examples of items that are frequently smuggled to avoid duties.

Smuggling can mean secretly importing items that are illegal to own and sell. Illegal drugs are the most common items smuggled.

Smuggling can also mean secretly exporting items that are illegal to export. Each country bans certain items for export. Most countries ban the export of endangered wildlife, artifacts from ancient ruins, sophisticated military equipment, and nuclear materials. Most smuggling is controlled by large criminal operations. The individuals running these criminal operations often use violence to control the people they have hired to smuggle items. They frequently threaten to harm the families of smugglers who try to quit. The punishment for smuggling is always severe; in some countries, it is death.

Smugglers often recruit seafarers by befriending them and giving them plenty of free food and liquor. Once they have become a seafarer's friend, they then ask him to carry a package to a friend in Europe or North America. A very small amount of an illegal drug can be worth a lot of money, and it can be hidden in what appears to be a harmless package.

When you go ashore in a drug-producing country, be careful who you socialize with. Do not accept large gifts. Never agree to deliver packages to someone in another country, especially if you are offered money or gifts to do so.

PIRACY

Pirates and armed robbers still attack ships and their crews. Pirates are criminals who force their way into seafarers' quarters and steal their belongings. Sometimes they injure and kill seafarers. These attacks occur with alarming frequency in Southeast Asia, South America, and West Africa.

Pirates often use small, high-speed vessels to attack ships moving through the Strait of Malacca and the South China Seas. In South America and West Africa, armed robbers most often board ships that are anchored or in a berth. Pirates have become a major problem off the coast of Somalia. Pirates and robbers usually take what is in the ship's safe and anything of value from the crew's living area.

If attackers board your ship, do not resist them with force. Remember what is important: Human lives are more important than money, personal property, or cargo. The items that pirates steal are not worth risking your life to protect. Your personal property is probably covered by your ship's insurance. Most shipowners would rather pay your personal-property claims than pay death and injury claims that would result from your attempt to protect property.

Preventing Pirate Attacks

What can you do to protect yourself from pirates and armed robbers?

The best protection is prevention. Pirates seek out easy targets. If your ship looks as though it will respond to an attack, pirates might decide not to approach your vessel. We recommend that you do the following:

Practice! Conduct regular training and drills on anti-piracy procedures.

Maintain vigilance; keep a good look-out. Illuminate suspect vessels and take evasive maneuvers. Sound alarms and whistles. Pirates may avoid vessels that are aware of their presence.

Illuminate your vessel as much as possible without hampering

navigation. The bow and overside lights should be left on if possible.

Maintain secure areas on your ship. All doors leading to the bridge, engine room, steering gear compartments, and crew quarters should be secured and controlled.

Remain in a secure area during the night.

If an attack occurs.

If your ship is attacked, sound alarms and alert other crew so they can proceed to a secure area. Do not resist attackers. Violent responses to a pirate attack increase the risks to the crew. Remember that your life and the lives of your co-workers are worth more than any property a pirate might steal.

REPORT ALL ATTACKS. BY REPORTING AN ATTACK, YOU CAN HELP PREVENT FUTURE ATTACKS.

REPORTS MAY BE MADE TO YOUR SHIP'S FLAG STATE AND TO THE INTERNATIONAL MARITIME BUREAU (IMB) REGIONAL PIRACY CENTER IN KUALA LUMPUR, MALAYSIA:

TEL: 603 201 0014

FAX: +603 238 5769

TELEX: MA 31880 IMBPC1

E-MAIL: lmartin@imbkl.po.my

ADDITIONAL SOURCES OF INFORMATION:

"Piracy and Armed Robbery," Merchant Shipping Notice M.1517, United Kingdom Department of Transport. Available from Room G3 Spring Place, 105 Commercial Road, Southampton SO1 OZD, United Kingdom.

"Pirates and Armed Robbers: A Master's Guide," International Shipping Federation, 30-32 St. Mary Axe, London EC3A 8ET, United Kingdom.

PREVENTING STOWAWAYS

A stowaway is a person without proper authority to obtain passage who hides on board a ship. Stowaways might simply be trying to flee from persecution or they might be trying to obtain a better life in another country. An individual who is leaving a country because he or she is being persecuted is often seeking asylum abroad.

The immigration policies of some countries impose an unfair burden on shipowners and crew members. Shipowners and seafarers sometimes find themselves in a predicament when port countries do not let stowaways disembark, even to be repatriated. Some countries impose fines on ships for bringing stowaways ashore, and the shipowners must pay all costs associated with repatriating the stowaways.

There is no uniform procedure accepted by all governments for the handling of stowaways. The International Maritime Organization (IMO) has prepared guidelines for handling stowaways. These guidelines address the responsibilities of

ship operators, masters, port authorities, and governments. The basic principles addressed in these guidelines are:

Asylum-seeking stowaways should be given the protections spelled out in international laws.

Stowaways should be treated humanely.

Shipowners, masters, port authorities, and governments should have measures in place for preventing stowaways from coming on board ships, and for detecting them before ships leave port.

After stowaways are found, the country where the ship is scheduled to make its next port of call should accept the stowaways. The government of this country should identify the stowaway and repatriate him with the help of the shipowner.

The stowaway's apparent or claimed country of nationality should make every effort to help determine the stowaway's identity and citizenship. Countries should accept the return of their citizens or nationals.

When stowaways are found, a standard procedure should be followed to return the individual to his home country. It is primarily the shipowner's responsibility to repatriate stowaways. Every ship should have procedures for handling stowaways, and these procedures should be carried out by the master or his delegates.

The most humane way to deal with stowaways is to prevent them from coming on board. You can do this by maintaining a deck and gangway watch and by checking accommodation areas.

Treatment of Stowaways When Found

If you find a stowaway or a group of stowaways, report the discovery immediately. The master needs to report the finding to the shipowners and to immigration authorities at the next port of call.

You will probably find that stowaways are tired, frightened, and very hungry. Whether the stowaway is seeking asylum or seeking better economic conditions, he or she is still a human being. Provide all stowaways with food, water, and protection from the weather. Also provide first aid if it is required.

Points to Remember

It is not your job to decide whether or not an asylum claim is legitimate. That is the responsibility of immigration authorities in the next port.

You do have a responsibility as a crew member to take actions that will avoid jeopardizing the safety of the crew or the ship. Keep stowaways away from critical areas of the ship and away from areas where crew members are working.

You have a responsibility to treat stowaways humanely.

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Chapter 5

First Aid

WHAT IS FIRST AID?

The information given here is basic, not a replacement for good first-aid training. You are encouraged to get knowledge and practice by taking cardiopulmonary resuscitation (CPR) and first-aid courses when they are offered to you.

First aid is the immediate care given to a person with minor injuries, such as cuts, minor burns, and sprains. It may also be the initial stabilizing treatment given to a person with more serious injuries, such as broken bones.

Reporting medical emergencies and getting medical help are also first-aid functions. The first-aid provider who runs for help is just as important as the first-aid provider who stays with the victim. In an emergency, time is often wasted looking for

a phone. Memorize the locations of your ship phones and intercoms that you can use in an emergency.

Serious injuries require a doctor. Below are examples of injuries and illnesses that require medical treatment from a doctor:

Excessive bleeding

Poisoning

Loss of consciousness

Severe head injuries

Open chest wounds

Open abdominal wounds

Severe shock

Burns covering more than 15 percent of the body

Burns on the face

Severe allergic reactions

Cardiac problems

Cardiac arrest

Electrical shock

Carbon-monoxide poisoning

Gas poisoning

Smoke inhalation

Near-drowning

Spinal injuries

Broken bones

Eye injuries

When You Are First on the Scene

You may need to rescue the victim from a dangerous situation. Move the victim if he or she is in danger, or have the electric power shut off.

Here is the order of actions that you might take in a major emergency:

1. Survey the scene. Is there a hazard from which the victim needs to be rescued?

2. If necessary, rescue the victim and yourself.

3 Check for breathing and for a pulse. If necessary, restore breathing and heartbeat.

4. Stop heavy bleeding by applying pressure.

5. Treat for poisoning.

6. Prevent shock.

7. Check the victim carefully for other injuries.

Victim Not Breathing

If a person is not breathing, you must take action immediately. To perform rescue breathing:

1. Lay the victim on his back on a flat surface and tip the head back to open the airway. (Do not tip the head back if there might be a neck injury.)

2. Open the mouth and make sure nothing is blocking the airway.

3. Pinch the person's nose shut. Then position your mouth over his mouth.

4. Give the person two good blows of air. Blow in enough air to make the chest rise.

5. Check the carotid artery on the side of the neck for a pulse. Check pulse for at least five seconds. If there is no pulse and you are trained in CPR, administer CPR. If there is a pulse, continue administering rescue breaths. (If you do not find a pulse and you are not trained in CPR, continue with the rescue breathing. The heart may be beating even though you did not find a pulse, so mouth-to-mouth breathing could keep the person alive.)

6. Be sure the head is still tipped back. Pinch the nose again. Take a deep breath. Put your mouth over his mouth and blow. Watch his chest rise as you blow. Take a breath. As you are taking your breath, watch his chest fall.

7. Again, make sure his head is still tipped back, pinch the nose, put your mouth over his mouth, and blow.

8. Give the victim a breath about every five seconds.

9. About every minute, or 12 breaths, check the victim's pulse, and watch to see if the victim has resumed breathing. If you find no pulse and are trained in CPR, administer CPR. If the person is still not breathing, continue with the rescue breathing.

10. Continue with the rescue breathing until the person starts breathing on his own or someone else takes over for you. Do not stop unless you are certain that the individual is dead.

When a person starts to breathe again, watch him or her closely to make sure that breathing continues. Stay with the person until medical help arrives. A person who has stopped breathing should be seen by a doctor.

SHOCK

Shock is a condition where an injured person's vital organs slow down. Shock can happen to anyone who is badly injured, and it is worsened by extreme pain or fright. Here are the signs that a person has gone into shock:

Pale or bluish skin, cold to the touch and sometimes clammy

Weakness

Rapid pulse

Increased breathing rate

Nausea, vomiting

Apathy

Unresponsiveness

Dilated pupils

There is nothing a first-aid provider can do to stop shock symptoms once they occur. There are, however, several ways to prevent shock from occurring:

Control heavy bleeding, often the cause of shock.

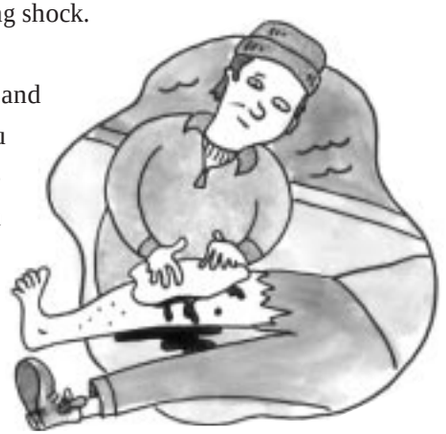
Keep victim lying down.

Keep victim at a comfortable temperature. In cold weather, keep him warm. In hot weather, keep him cool.

Do your best to comfort, quiet, and soothe the victim.

HEAVY BLEEDING

Immediately apply pressure to the wound that is bleeding heavily. Cut clothing to expose wound. When a clean pad is available, place the pad on the wound and press firmly with your hand. Add extra pads as needed. Do not remove the blood-soaked pads. Wrap the wound with a bandage and elevate the wound if possible. Continue to apply pressure and follow steps for preventing shock.



If you apply direct pressure and elevate the wound and you still cannot control the bleeding, and if the wound is to an arm or leg, then you need to apply pressure at a pressure point. With your hands, press firmly on the major artery supplying blood to the limb that is wounded. Do not apply pressure at a pressure point unless you really need to, and do not stop applying pressure to the wound. Use a tourniquet only as a last resort. Before you use a tourniquet, ask yourself if the situation is bad enough to risk losing a limb. Once a tourniquet is used, it must be removed by a doctor.

All persons who have been bleeding heavily should be seen by a doctor. While you wait for the doctor, keep the person

lying down. If the wound was not to the head, elevate the feet. If the wound was to the head, then elevate the head. Keep the victim warm.

ELECTRICAL SHOCK

Remember to survey the scene. If you can de-energize the circuit locally, do so. Otherwise, use your radio or send someone to de-energize the circuit. Do not leave the victim. Move the victim away from the live circuit as quickly as possible. Do not touch the victim with your bare hands unless the power has been turned off. You may use rubber gloves, pieces of wood, and other nonconductors to try to move the victim away from the live circuit.

If the victim is not breathing after being moved away from the live current, give him or her rescue breaths as soon as possible. Then check for pulse. If there is no pulse, administer CPR.

After breathing and heartbeat are restored, check for other injuries. Keep the victim lying down and warm. Try to maintain a normal body temperature. Treat electrical burns the same way that you treat heat burns.

All electrical-shock victims should be seen by a doctor.

STROKE

A stroke is a brain injury. It can be caused by a blood clot entering the brain or it may be caused by a blood vessel rupturing in the brain. The symptoms of a stroke depend on whether the stroke is a minor one or a major one.

The signs of a major stroke are unconsciousness, heavy breathing, paralysis of facial muscles, paralysis of hands or feet, or paralysis on one side of the body.

The signs of a minor stroke are dizziness, headache, pupils of unequal size, blurred vision, sudden failure of memory, change of mood, muscular difficulty, difficulty speaking, or ringing in the ears.

If you believe a person has suffered a major stroke, have the victim lie down, maintain normal body temperature, and get medical help. Do not give the victim anything to eat or drink. Unconscious victims should be rolled on their sides so that fluids can drain from their mouths. Frequently check breathing and pulse.

If you believe a person has suffered a minor stroke, urge him or her to see a doctor. Minor stroke victims often do not want to believe that something is seriously wrong.

GAS POISONING AND ASPHYXIA

Gas poisoning occurs when a person is exposed to a hazardous concentration of gases or vapors. Asphyxia occurs when a person cannot get enough oxygen. Both conditions are life-threatening and should not occur if proper procedures are followed. Never enter a confined space before the atmosphere is tested with two instruments. A toxic-gas instrument that measures the expected gases must show that these gases are not present. An oxygen-deficiency meter must show that the oxygen concentration is at least 19 percent. Seafarers have died when they entered cargo holds that contained hazardous vapors or insufficient oxygen. Very often,

the would-be rescuers also died for the same reason. Rescuers frequently believe that they can hold their breath long enough to pull a co-worker to safety. Sadly, that is usually not the case.

Workers who have been overcome in a cargo hold or any other confined space should be pulled into fresh air by a trained rescue team. Your ship should have a team of individuals trained in the use of SCBA (self-contained breathing apparatus) gear, safety harnesses, rescue hoists, and first aid.

Once the victim has been pulled into fresh air, check for breathing. If he or she is not breathing, tip the head back and give two full rescue breaths. Check for pulse. If there is no pulse, begin CPR. Call for medical help.

CONTAMINATION BY POISONOUS OR CORROSIVE CHEMICALS

When working with chemicals, always wear the personal protective equipment (PPE) suggested by the Cargo Information Sheet, Material Safety Data Sheet (MSDS), or product label. Even very hazardous chemicals can be handled safely with the right protective equipment.

Skin contamination

Put a contaminated person under a shower or hose immediately. Remove clothing while under the shower. Do not, however, pull contaminated clothing over the face. If a shirt cannot be unbuttoned, cut it. Victims have suffered serious eye injuries when they have pulled contaminated clothing over their heads. Wash skin for at least five minutes.

If the chemical was a strong acid or a strong caustic, you might need to use a neutralizing solution. Follow ship procedures for use of these solutions. Do not use such solutions unless you have been trained in their use.

Closely watch the victim. Call for medical help. Take precautions to prevent shock.

Eye contamination

Immediately flush eyes with water while holding the lids open. This is difficult because victims instinctively close their eyes. You will need to hold the head down in the eyewash and you will need to help the victim hold his eyelids open. If possible, have another co-worker help you. If you do not have an eyewash station, turn the victim's head sideways with the contaminated eye lower than the uncontaminated eye and flush with clean, fresh water. Flush the eyes for 30 minutes. If the injured worker wears contacts, they will need to be removed, but do not waste time trying to remove them immediately. Flush the eyes. Then have the injured worker remove the contacts and then flush some more.

Do not use any neutralizing solution in the eyes. After flushing, cover the eyes with clean eye pads and seek medical help.

INGESTION OF A POISONOUS CHEMICAL

Check to see if the victim is conscious and breathing. If the victim is not conscious and not breathing, give two good res-

cue breaths. Check for pulse. If there is no pulse, perform CPR. If there is a pulse, but no breathing, perform rescue breathing. Call for medical help. If possible, call a poison control center, and follow the instructions given to you over the phone.

If the victim is conscious, try to determine from the victim what poison was ingested or inhaled. If the person cannot speak, look for clues such as smell of breath, burns around the mouth, and labels on nearby cans and bottles.

If there are clues that the poison was a petroleum product or a strong acid or caustic, and the person is not convulsing, encourage the victim to drink one glass of water or milk in small sips. Call for medical help. Keep the victim calm and warm until medical help arrives.

If there are clues that the poison was some other chemical, such as a pesticide, follow the instructions for that product on the Cargo Information Sheet or the Materials Safety Data Sheet. Call for medical help. Keep the person calm until medical help arrives.

If the victim is having convulsions, do not give anything to drink. Lay the victim down. Protect his head by placing pillows and rolled blankets around it. Stay with the victim and check breathing and pulse until medical help arrives.

When the victim is taken to the hospital, bring with you information on the chemical that you believe was ingested. You can bring the Cargo Information Sheet, the Materials Safety Data Sheet, or the product label. This information may be useful to the doctors.

FOOD POISONING

Some signs of food poisoning are nausea, vomiting, chills, diarrhea, and cramps. You should suspect food poisoning if the victim recently consumed food that did not taste right or made others sick. Call for medical help.

If the person is conscious, not vomiting, and is not having trouble swallowing, then you can give milk or water in small sips. This will help dilute the poison. Never induce vomiting unless you are instructed to do so by a poison control center.

There are three major types of food poisoning: botulism, shellfish poisoning, and general food poisoning.

Botulism usually comes from eating smoked meats. Its symptoms are muscle weakness, headache, dizziness, slurred speech, disturbed vision, breathing difficulty, and swallowing difficulty. This person needs a doctor. While waiting for the doctor, keep checking breathing and pulse.

Shellfish poisoning comes from eating contaminated shellfish. Its symptoms are numbness (starting in the face and spreading throughout the body), dizziness, increased salivation, and muscle weakness. This person needs a doctor. While waiting for the doctor, keep checking breathing and pulse.

General food poisoning comes from eating poisonous plants, mushrooms, and berries. Symptoms include nausea, vomiting, cramps, hallucinations, and slurred speech. If the victim vomits, save a sample of the vomit so it can be analyzed by the doctor. If that is not possible, note the color and texture of the vomit so that you can describe it to the doctor. If there is

going to be a delay before this person is seen by a doctor, give 30 grams of medicinal charcoal in a glass of water. The victim should sip it slowly. The charcoal will absorb some of the poison and lessen the amount absorbed into the victim's bloodstream. (Only give charcoal for general food poisoning. Do not give it for botulism or shellfish poisoning.)

BROKEN BONES

Broken bones are also called fractures. A simple fracture is a broken bone that does not pierce the skin. A compound fracture is a broken bone that does pierce the skin. The signs of a broken bone are the sound of bone snapping, a bone with a strange or deformed appearance, a bone poking through the skin, or a swollen and discolored area that is painful when touched.

Do not move the victim until the broken bone has been splinted (unless he is near live electrical wires or some other hazard). There are three steps to follow: Stop the bleeding. Splint. Prevent the victim from going into shock.

If clothing is bloody or wet, remove it without moving the injured part of the body. You may need to cut away the wet clothing. If the fracture is a compound one with the bone protruding, do not try to push the bone in. Cover the bone with sterile gauze or clean cloth. If there is heavy bleeding, stop the bleeding by applying pressure. If the fracture is in a finger, hand, arm, foot, leg, or other part of the body that can be immobilized with a splint, use a splint. Keep the injured area warm by covering it with a blanket or clothing. If the fracture is to a bone that cannot be splinted, such as the

shoulder or a rib, have the person lie as quietly as possible. Immobilize and protect the injured area by surrounding the person with pillows, rolled blankets, or rolled towels. Prevent shock.

Dislocations

A dislocation is the movement of a bone end out of a joint. Dislocations usually are caused by falls. Broken bones and dislocations can occur together. The signs of a dislocation are similar to those of a simple fracture. They include swelling, tenderness, deformity, pain, and discoloration. Do not try to move the dislocated bone back into place. Immobilize the injured area, and transport the injured person to a doctor.

Sprains and Strains

A sprain is an injury to a ligament, tendon, or blood vessel. Sprains usually happen when an arm or leg is jerked or moved in a way that is not natural. A strain is an injury to a muscle. When a muscle is strained, it is torn away from the bone or muscle to which it is normally attached. Strains usually happen when a muscle is overworked.

The signs of a sprain are swelling, tenderness, discoloration, and pain when the sprained area is moved. Treat the sprain by immobilizing the sprained area with a splint. Use ice packs to reduce swelling.

The primary sign of a strain is muscle soreness. Back strains are frequently caused by improper lifting. Treatment for a strain is rest and heat. A heating pad or hot moist towels can be used to provide some relief. If the strain is to a back muscle, the victim should lie on his back on a hard surface. Get medical attention for serious strains.

FAINTING

Fainting happens when the brain does not get enough blood for a few minutes. A person who feels faint should either sit down with his head between the knees, or lie down. It is important to try to breathe deeply. A person who faints actually loses consciousness for a moment, recovering almost immediately. After the fainting spells, the victim should lie down and rest for at least 10 minutes. If a victim does not recover from a faint immediately, there is a more serious problem. Call for a doctor. Stay with the victim and keep checking for breathing and pulse.

BURNS

Burns can be caused by steam leaks, hot oil leaks, hot metal surfaces, the sun, electric shock, and chemicals. The treatment for the burn depends on the burn's depth, size, and location.

The terms *first degree*, *second degree* and *third degree* all describe the depth of a burn. Deep burns damage more tissue and are therefore more serious than shallow burns.

The signs of a shallow first-degree burn are red skin, pain, and swelling. The signs of a second-degree burn are deep red skin with a glossy appearance caused by leaking fluid. There may also be some skin loss and blisters. The sign of a third-degree burn is the loss of all skin layers. There may also be some charring of the skin.

Burns to the hands, feet, face, and genital organs are critical because of their location. Hospitalization is required for such burns.

If a person is unconscious, check breathing and pulse. If necessary, administer CPR.

If the person has received chemical burns, immediately flush the area with water. Follow the instructions detailed earlier for chemical contamination (pp. 64–65).

Remove clothing and jewelry from the burned area. If clothing sticks to the burn, do not try to remove it. Determine whether the burn is a first-, second-, or third-degree burn. If you are unsure, choose the higher degree. Follow the steps given below for the appropriate degree.

First-Degree Burns

Apply cold, wet cloths to the burned area or immerse the burned area in cold, clean water. Do not use salt water. Keep applying cold, wet cloths or keep immersed in cold water until the pain subsides. Usually this takes 5 to 10 minutes. Either leave the burn uncovered or cover with clean, dry gauze. The skin should heal by itself. If the skin does not heal by itself, seek medical attention.

Second-Degree Burns

Immerse burned area in cold, clean water. Do not use salt water. Keep immersed in cold water for 10 to 15 minutes. Gently dry the area with sterile gauze and cover with gauze. Do not break blisters. If the burn covers a large area, have the person lie flat with legs elevated. Watch for signs of shock. Keep the victim warm. Get medical attention. Second-degree burns require hospitalization when they cover 15 percent of the body or involve one of the four critical body locations (hands, feet, face, genitals).

Third-Degree Burns

Do not immerse third-degree burns in water unless they are chemical burns. With chemical burns, it is important to wash away all the chemical. With all third-degree burns, it is important to prevent infection. Water increases the danger of infection, so it should not be used for cooling. Cover the wound loosely with sterile gauze. Do not wrap the burn tightly (as you would do with a bleeding wound) and do not use tape. Do not use any cloth that might leave lint in the wound. After the burn is loosely covered, you can apply ice packs for cooling, but do not let the dressing get wet. Do not use ice packs if the weight of the packs causes pain. Have the person lie flat with legs elevated. Watch for signs of shock. Keep the victim warm. Get medical attention. One cause of shock for burn victims is loss of fluids. You can give a burn victim water to drink, but do not give fruit juice or alcohol. Third-degree burns always require hospitalization.

1st Degree	2nd Degree	3rd Degree
	(Requires hospitalization for burns to critical areas)	**(Always requires hospitalization)**
Red skin	Deep red skin with glossy appearance	Lost skin layers
Swelling	Blisters	Charred skin
Cool with water (not salt water)	Cool with water (not salt water)	Do not use water (unless needed to flush out chemical in a chemical burn)
Do not bandage	Bandage loosely	Bandage loosely

HEATSTROKE AND HEAT EXHAUSTION

Heatstroke and heat exhaustion are two forms of heat stress. Watch your co-workers for signs of heat stress, and encourage them to watch for signs of heat stress in you.

Heatstroke is the more severe form of heat stress, and it is an emergency. A person with heatstroke has a very high internal body temperature and has lost the ability to control body temperature by sweating. This person's body temperature is so high that brain damage and death are both possibilities if the person is not cooled quickly. The signs of heatstroke are red or flushed skin that is hot and dry, dizziness, nausea, headache, rapid pulse, and unconsciousness. The body tem-

perature can be as high as 106˚F (41˚C). You may have noticed that this person was sweating profusely a short time earlier but now is not sweating at all. Cool a heatstroke victim quickly. Soak the person in cool, but not cold water. You can sponge the person with rubbing alcohol or cool water. Do so until his body temperature falls below 102°F (39°C). Then stop the cooling and observe for 10 minutes. If the victim's temperature starts to rise again, start cooling again. Give the victim water to drink. Do not give any coffee, tea, or alcohol.

Heat exhaustion is less serious than heatstroke. The signs of heat exhaustion are fatigue, weakness, and collapse. First aid for heat exhaustion includes moving the victim out of the heat and encouraging the victim to drink lots of water or sports drink, but not alcohol. If the victim's temperature starts to rise, or if there is no improvement in one hour, get medical attention.

Heat cramps are muscle pains and muscle spasms that can occur after working or sweating in the heat. The cramps happen after excessive salt loss and are made worse by drinking too much water. Prevent heat cramps by drinking a sports drink that contains salts or by eating a snack food that contains salt. (Do not eat salty snack foods if you have a heart or kidney problem or have been told by a doctor to restrict your salt intake.)

First aid for heat cramps consists of drinking water that contains table salt. Add one teaspoon of salt to a full glass of water and sip it slowly.

Heatstroke (Requires medical attention)	**Heat Exhaustion (Requires rest and fluids)**
Red or flushed skin	Pale skin
Hot and dry skin	Clammy skin
High body temperature	Body temperature is almost normal
Dizziness, nausea	Headache
No sweating	Lots of sweat
Strong, rapid pulse	Weak pulse
Unconsciousness, grogginess, slurred speech	Heat cramps
Convulsions	

FROSTBITE AND COLD EXPOSURE

Frostbite occurs when exposure to cold weather causes fluids under the skin to freeze. Frostbitten skin looks white or grayish yellow. It also looks pale and glossy. If the victim has lost feeling in the frostbitten part or if it is blue or blistered, the frostbite is severe and requires medical attention.

Cover the frostbitten area with clothing or with a blanket and take the victim indoors. If the feet or legs are frostbitten, do not allow the victim to walk. If the hands have feeling and are not shaking violently, give the victim a warm drink, but not coffee, tea, or alcohol. Gradually warm the affected area.

The warming process is frequently painful and the victim may shiver or shake as frostbitten areas warm. Still, it is important to warm the skin quickly. If possible, immerse the frostbitten part in a bowl of warm water. As the skin thaws, it swells and becomes red. Stop the warming when the skin does turn red. Never massage frostbitten skin. Place sterile gauze between frostbitten fingers and toes. Elevate frostbitten parts. Get medical attention quickly for frostbite. The victim should not smoke. Smoking constricts blood vessels in the skin and slows the healing process.

Overexposure to cold weather can cause the following symptoms: shivering, numbness, low body temperature, drowsiness, and muscle weakness. Take a cold-exposure victim indoors. Remove any wet or frozen clothing. Warm cold, numb hands by running them first under cold tap water. Cold tap water is many degrees warmer than the numb skin, so it will feel like hot water. Remove any clothing or jewelry that might interfere with circulation as frozen arms and legs thaw and swell. Give the victim something warm to drink. Do not give alcohol.

An extreme case of overexposure is called hypothermia.The hypothermia victim may be pale or even unconscious. The breathing and pulse will be very weak. Take the hypothermia victim indoors. Bring the body temperature back to normal by wrapping the victim in warm blankets. Do not give any hot drinks until he is fully conscious. Get medical attention quickly.

EXCESSIVE FATIGUE

Not everyone needs the same amount of sleep. Most people need about eight hours of sleep each day. That sleep is most effective when all eight hours are taken at once; two four-hour naps do not equal an eight-hour sleep. STCW 95 (Standards of Training, Certification, and Watchkeeping) recognizes this need for rest. See chapter 11 for more information on STCW 95.

People who are sleep-deprived are less coordinated and more easily confused than those who have had sufficient sleep. They are also more susceptible to illness because their immune systems are weakened. Learn to recognize signs of fatigue in yourself and in your co-workers.

Fatigue can occur even when a person appears to be getting enough sleep. It can be caused by anemia, thyroid imbalance, or other medical conditions. Encourage anyone who is fatigued all the time to see a doctor.

DISEASE PREVENTION

There are numerous diseases spread by hundreds of kinds of bacteria, viruses, and parasites. We can prevent most of these by reducing our exposure to harmful germs. Four common ways we catch diseases are:

Consuming contaminated water or contaminated food

Breathing bacteria and viruses spread in the air

Being bitten by an insect or animal

Acquiring a sexually transmitted disease (STD)

There are some simple precautions that you can take to reduce your chances of catching diseases spread in each of the above ways.

DISEASES SPREAD BY WATER AND FOOD

There are numerous diseases spread by water and food. The infectious agents are viruses, bacteria, and parasites. When you are in an area where you are not sure whether the food and water are safe, follow these rules:

WHAT TO DO

Boil local water for five minutes before drinking it, or drink only bottled water.

Open all bottled water yourself. Do not drink from one that is already open (it may have been filled from a tap).

Wash your hands, using soap, before you eat.

Peel all fresh fruits.

Eat foods that grow with a protective covering such as oranges, bananas, and corn.

Eat in well-established restaurants.

Eat hot, well-cooked foods.

WHAT NOT TO DO

Don't eat raw seafood.

Don't eat meat that is raw or rare.

Don't drink unpasteurized milk or eat unpasteurized cheeses.

Don't drink from a water bottle that has already been opened.

Don't eat raw foods that cannot be peeled.

Don't eat foods that require a lot of human handling during their preparation.

Don't purchase "street food" from small stands or pushcarts.

Don't put ice cubes in your drinks.

Disease	Symptoms
AMEBIASIS	Nausea, diarrhea, weight loss.
Cause: A parasite that can exist in water and in food. The parasite can also be transmitted by sexual contact with an infected person.	
ANGIOSTRONGYLIASIS	Severe headaches and stiffness in the neck and back
Cause: A worm-type parasite found in raw or undercooked snails, prawns, fish, and land crabs in Asia and the South Pacific. Lettuce and other leafy vegetables that have come in contact with infected slugs and snails can also be contaminated.	
ANISAKIASIS	Sudden severe stomach pain, with nausea and vomiting. Symptoms usually occur within six hours of eating seafood.
Cause: A worm-type parasite found in raw or undercooked seafood.	
CHOLERA	Diarrhea, vomiting, and dehydration.
Cause: *Vibrio cholerae* bacteria found in water and in food.	
CRYPTOSPORIDIOSIS	Abdominal cramps and diarrhea.
Cause: *Cryptosporidium* bacteria found in water and in food. Can be transmitted by close contact with someone who has this illness.	
GIARDIASIS	Diarrhea, nausea, vomiting, gas pain, and weight loss.
Cause: *Giardia lamblia* bacteria found in water, dairy products, fruit, and vegetables.	
POLIO	Some people have few or no symptoms. Others have fever, headache, vomiting, severe muscle pain, stiffness of the neck and back, paralysis.
Causes: 1. Exposure to an individual who has been recently infected with polio. The bacteria live in the throat for about a week. 2. *Poliomycetium* bacteria found in water in regions where sanitary conditions are poor.	
TRAVELER'S DIARRHEA	Diarrhea, fever, nausea, vomiting.
Cause: *E. Coli* bacteria found in water, dairy products, fruit, and vegetables.	
TYPHOID FEVER	Sustained fever, headaches, constipation, fatigue.
Cause: *Salmonella typhi* bacteria found in shellfish, dairy products, fruit, and vegetables.	

Take advantage of vaccines that are available for polio, diphtheria, cholera, typhoid fever and several types of hepatitis.

DISEASES SPREAD BY AIRBORNE AGENTS

A few serious diseases are spread through the air. The germs can be bacteria or viruses that float in the air, near someone who is coughing or sneezing. You can avoid catching these diseases by staying away from strangers who appear to have them. During outbreaks of these diseases, avoid congested places such as buses and trains. You can also reduce your risk by washing your hands regularly. You pick up germs by touching surfaces where airborne germs have fallen. Then you infect yourself by rubbing your eyes with contaminated hands, and by handling your food with contaminated hands.

Disease	Symptoms
DIPHTHERIA	Sore throat, low-grade fever, swelling in the neck.
Cause: *Corynebacterium diphtheriae* bacteria spread by contact with fluids from an infected person. You can also get it from handling blankets, towels, and clothing used by an infected person.	
MENINGITIS	Intense headache, fever, appetite loss, intolerance to light and sound, stiffness in neck and back, and tightening of hamstring leg muscles.
Cause: Three kinds of bacteria and one virus. It is spread person to person through the air or through close contact.	
TUBERCULOSIS (TB)	Persistent cough with sputum or blood, fatigue, weight loss, fever, night sweats.
Cause: TB bacteria spreads through the air from person to person. Generally, you have to be close to a TB-infected person for a long time to become infected. There is a difference between being infected with TB and having TB. Most people have defense systems that fight the TB bacteria by producing antibodies. Only about 10 percent of infected people develop TB disease.	

DISEASES SPREAD BY MOSQUITOES, FLIES, AND TICKS

Some of our most feared diseases are carried by mosquitoes. Luckily, only a tiny portion of mosquitoes are infected with viruses and transmit diseases to humans. Most mosquitoes are annoying, but not harmful. Mosquitoes breed in standing water. Mosquitoes feed in the early morning and again in the late afternoon and evening. During these periods, wear insect repellent, or at least wear long sleeves and long pants.

Here are some simple rules for avoiding insect-borne diseases:

WHAT TO DO

Get vaccinations.

Use mosquito netting over your bed.

Use insect repellent, one that contains DEET= diethytoluamide (N,N-diethyl-m-toluamide).

Wear long pants and long sleeves when mosquitoes are numerous and feeding.

WHAT NOT TO DO

Don't leave standing water around where mosquitoes could breed and multiply.

Dengue Fever

Dengue fever is a viral illness spread by aedes mosquitoes. It is found primarily in tropical Asia, Africa, and the Caribbean. Dengue fever is treated with bed rest and medications for

pain and fever. Dengue fever is a disease that you can catch more than once. Sometimes the second case is much worse than the first, and is called dengue hemorrhagic fever. Dengue hemorrhagic fever is a very serious illness in which the patient has abnormal bleeding and very low blood pressure.

Malaria

Malaria is caused by a virus carried by the anopheles family of mosquitoes. The virus infects a patient's red blood cells and causes fever, chills, muscle aches, and headaches. The malaria patient usually has several cycles of fever, each followed by chills. There are four kinds of malaria, only one of which is life-threatening. The correct medical treatment depends on the malaria type. Anyone who experiences malaria symptoms following travel in a malaria zone should see a doctor immediately. Malaria can be treated, and a complete cure is possible if the medical treatment is started right away. Two of the malaria viruses can lie dormant for long periods of time yet cause a relapse of the disease up to four years later.

The medications that can be taken to prevent malaria have side effects, and they need to be taken regularly (before, during, and after exposure) in order to be effective. The most common side effects are nausea, vomiting, diarrhea, and dizziness. In some regions, the malaria viruses are resistant to some of the preventive medicines. The medications are recommended for use only in high-risk malaria areas during the wet season; the risk of infection during the dry season is small. The malaria risk is also smaller in urban areas than in rural areas.

Yellow Fever

Yellow fever is caused by a virus carried by the Aedes aegypti mosquito. This disease causes a high fever with chills, muscle aches, headache, and vomiting. Victims may appear to recover and then become more ill. In the more serious stage of the illness there may be bleeding, jaundice, and kidney failure. There is an effective vaccination for yellow fever.

DISEASES SPREAD BY SEXUAL CONTACT

There are more than 20 disease-causing microbes that can be spread by sexual contact. Diseases spread by sexual contact are called sexually transmitted diseases (STDs).

To absolutely prevent STDs, you can abstain from sex or be monogamous with someone who is not infected. Being monogamous means you have sex only with your lifetime partner, and your partner has sex only with you.

All STDs have an incubation period during which people are hosts to dangerous microbes. They can transmit diseases to other people, but they have no disease symptoms themselves. This means that you cannot tell who might be carrying a dangerous disease. To minimize your chances of acquiring STDs, use latex condoms. Condoms provide significant protection from many bacterial infections.

If you experience any STD symptoms, get prompt medical attention. Most STDs are treatable. If left untreated, some can cause very, very severe illnesses, including cancer, liver disease, and blindness. At the present time, there is no cure

for HIV infections. HIV causes AIDS (acquired immunodeficiency syndrome) which can result in premature death. Early medical treatment for HIV can improve health and prolong life, so it should be sought.

Disease	Symptoms
AIDS/HIV *Incubation period: years*	There may be no symptoms for years. Earliest symptoms are persistent swollen glands and chronic infections.
Cause: HIV virus is spread by: 1. Vaginal, oral, or anal sexual contact with infected person. 2. Contaminated needles used for drugs, tattooing, and body piercing. **Comments:** HIV is a disease with many stages. During the early stages, which can last years, there typically are no symptoms. The final stage of this illness is AIDS. HIV illnesses have been reported in 160 countries. There is no cure at this time.	
CHANCROID *Incubation period: 2-14 days*	Chancre sores.
Cause: Bacterial infection **Comments:** Chancroid chancres are not as firm as syphilis chancres (see below).	
CHLAMYDIA *Incubation period: 1-3 weeks*	Abnormal genital discharge; painful urination; pain in testes during sex, for men; pain in lower abdomen during sex, for women.
Cause: Bacterial infection spread through direct contact with secretions in genitals, mouth, and throat. **Comments:** Can be cured with antibiotics.	
CRAB LICE	Itching; visible lice and lice eggs in pubic hair.
Comments: Can be treated with anti-lice treatments.	
GENITAL HERPES *Incubation period: 2-20 days*	Blister-like sores, mild itching, and burning. The sores will heal and be gone for months, but they return.
Cause: Viral infection spread by skin-to-skin contact. **Comments:** There is no complete cure, but medication relieves symptoms and reduces the number of repeat outbreaks.	

Disease	Symptoms
GRANULOMA INGUINALE *Incubation period: 8-80 days*	Lumps or blisters in the genital area. Blisters slowly enlarge into sores.
Cause: Bacterial infection spread through sexual contact. **Comments:** This disease is common in the tropics and subtropics. It can be treated with antibiotics.	
HEPATITIS B	Fever, headache, muscle ache, fatigue, appetite loss, vomiting, darkened urine, yellow eyes, diarrhea.
Cause: Viral infection spread through sexual contact, through the sharing of hypodermic needles, and by unsanitary body piercing and tattooing. **Comments:** A vaccine is available. This virus is able to penetrate "natural" condoms; use latex condoms.	
PAPILLOMAVIRUS	Painless, fleshy warts on genitals, anus, and throat. If left untreated, it can cause cancers of the cervix, penis, and anus.
Cause: Viral infection spread through sexual contact.	
SYPHILIS *Incubation period: 10 days to 3 months*	Painless open sore in the genital area called a chancre. Later symptoms include a skin rash that begins on hands and feet. If left untreated, bacteria can damage heart, eyes, brain, spinal cord, bones, and joints.
Cause: Direct contact with the chancre on an infected person. **Comments:** Can be treated with antibiotics.	
TRICHOMONIASIS *Incubation period: 4-20 days*	Painful urination. If left untreated, it can lead to inflammation of bladder or urethra.
Cause: Parasite is spread through sexual contact. **Comments:** Treatment is available.	
DIPHTHERIA	Sore throat, low-grade fever, swelling in the neck
Cause: Corynebacterium Diphtheriae bacteria spread by contact with fluids from an infected person. You can also get it from handling blankets, towels, and clothing used by an infected person.	

Disease	Symptoms
MENINGITIS	Intense headache, fever, appetite loss, intolerance to light and sound, stiffness in neck and back, and tightening of hamstring leg muscles
Cause: Three kinds of bacteria and one virus. It is spread person to person through the air or through close contact.	
TUBERCULOSIS (TB)	Persistent cough with sputum or blood, fatigue, weight loss, fever, night sweats
Cause: TB bacteria spreads through the air from person to person. Generally, you have to be close to a TB-infected person for a long time to become infected. There is a difference between being infected with TB and having TB. Most people have defense systems that fight the TB bacteria by producing antibodies. Only about 10 percent of infected people develop TB disease.	

ADDITIONAL SOURCES OF INFORMATION

Health Canada—Public Health Information:
http://hwcweb.hwc.ca

Epidemiology Fact Sheet, a list of contagious diseases, their causes, symptoms, and steps that can be taken to avoid contracting and/or spreading diseases. (Hawaii Department of Health Communicable Disease Division):
http://www.hawaii.gov/health/cdd/chicdd01.htm

Travel Health Information and Referral Service:
http://www.travelhealth.com/genguide.htm

Travelinfo—Southern Africa—Health Tips (Malaria):
http://rapidttp.com/travel/healthm.html

United States Centers for Disease Control and Prevention: Diseases, Health Risks, Prevention Guidelines, and Strategies
http://www.cdc.gov/diseases/diseases.html

ATSDR Science Corner, Agency for Toxic Substances and Disease Registry:
http://atsdr1.atsdr.cdc.gov:8080/cx.html

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Part 2
Ports

Chapter 6

Ports of the World

Perhaps the best thing about a maritime career is the chance to visit many of the world's ports. Here are some tips for staying safe while ashore, plus some basic information for many large ports.

BE SAFE WHILE IN PORT

When you are in port, eat at respectable restaurants. Take advantage of seafarers' clubs. In places where the tap water is not safe, do not drink any beverage except those that come in a can or bottle that you open yourself. (More health tips are given in the Port List later in this chapter, as well as in chapter 5.)

Know how to contact your ship by phone. Know how to contact the local police. Phone numbers for the police at many ports are included in the Port List. If you are robbed, injured, or arrested, contact your ship, the ship's agent, or a chaplain at the local seafarers' club.

If your ship leaves without you, contact the ship's agent in the port where you are. You may also want to contact your union or a local chaplain.

Protect Your Money

In some places, criminals prey on foreigners, including seafarers. In one common scam, thieves operate illegal taxis. These taxis often have a driver with a companion, and the car has unusual markings. (Generally, legitimate taxis are operated by one driver only.) The thieves use scopolamine and other drugs to incapacitate foreigners and then rob them. Scopolamine can be put into drinks, cigarettes, or gum, or concealed in a piece of paper. Do not accept cigarettes or gum from taxi drivers!

In another scam, thieves on trains offer travelers a drink containing drugs. When you pass out, they rob you. Another

twist: thieves dress like policemen and offer to check your US dollars for counterfeits! The thief will claim the dollars are fake and try to keep them.

Historically, thieves have seen seafarers as easy targets. Thieves know that you carry cash and that you are unfamiliar with the area. Do not carry more money than you need when you go ashore. Do not carry all your money in one wallet or one pocket. Never put your money or wallet in your back pocket, where pickpockets can grab it easily. Pickpockets operate in many ports, and they often work in groups. If you are jostled or if you are approached by someone asking for something, be extra alert. They may be trying to distract you while a partner steals from you. Be extra careful when you are in a train or bus station, on a train, in an elevator, at a tourist site, or in any area that is known to be dangerous. Also, watch for thieves around hotels, discos, bars, nightclubs, and beaches. Do not walk in narrow alleys or poorly lit streets. Try not to travel alone. Stay in a group with some of your shipmates.

Watch Out for Smugglers

Remember that unsuspecting seafarers have been jailed because they unknowingly carried contraband. In places where illegal drug trafficking is a problem, do not accept gifts of any kind from strangers. Be suspicious of anyone trying to befriend you. They may be trying to get you to carry drugs for them. There is more information on this danger in chapter 4, p.45.

Watch Out for Prostitutes

Life in port presents many temptations and risks. You should know that bar girls and prostitutes sometimes work with thieves. In one familiar scam, a bar girl befriends you and asks you to buy her a drink. You buy the drink, not realizing that the bar will charge you 10 or 20 times its value. Always ask, "How much?" before you buy anything. In another scam, a bar girl encourages you to become drunk and then leads you to a deserted spot, where you are beaten and robbed by her friends.

Several risks are associated with engaging in sex with prostitutes. One is the obvious risk of infection and disease. It is important to use condoms if you engage in this activity. Do not use any petroleum lubricant with the condom, because the lubricant damages the condom. The second risk is that you may be arrested. In many countries, prostitution is illegal, and visiting a prostitute can land you in jail—or at least under arrest.

When you are relaxing in port, do so with friends. Do not visit bars alone, and always ask, "How much?" before making any purchase.

PORT LIST

This section contains some basic information about some of the world's larger ports. For a longer version of this list, contact:

THE CENTER FOR SEAFARERS' RIGHTS

THE SEAMEN'S CHURCH INSTITUTE OF
NEW YORK AND NEW JERSEY

241 WATER STREET
NEW YORK, NY 10038

TEL. (212) 349-9090 X240
FAX: (212) 349-8342

E-MAIL: csr@seamenschurch.org
WEBSITE: http://www.seamenschurch.org

In the directory that follows, phone numbers are given in the form needed when dialing them from within the country. To call these numbers from outside the country, dial: [International access code] + [Country code] + number shown.

The numbers shown include the city/area codes in parentheses. You do not need to use the area/city code if you are dialing from inside the city. If you are outside the city but within the country, dial: [Long-distance code] + [City code] + local number.

Every effort has been made to find current phone numbers. If we were unable to verify a phone number or service, it has been omitted. Please use local directory assistance.

Key to Symbols

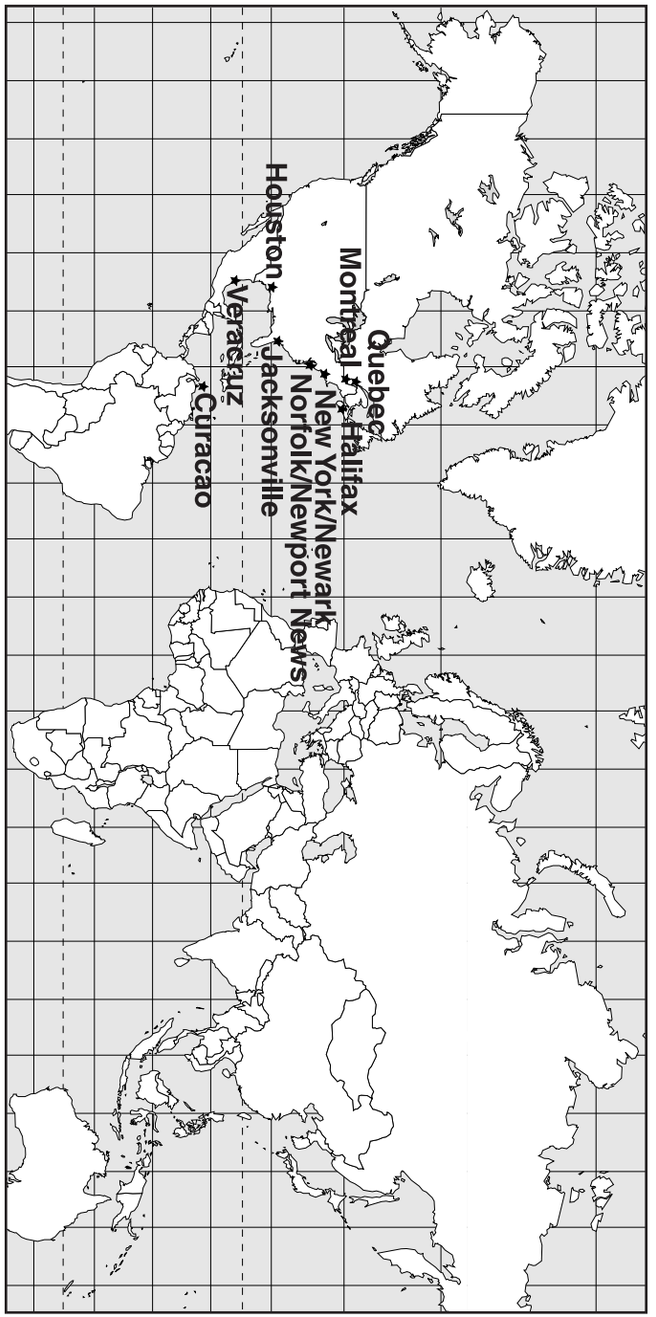
- phone number for a Port State Control agency
- † a Christian center
- international telephone
- snacks
- meals
- bar
- beds
- transportation to center or to town

The Port List is divided into the following subsections: North America (Atlantic and Pacific), South America, Northern Europe, Southern Europe, Middle East and West Asia, East Asia and the South Pacific, and Africa.

Ports of North America

The ports selected here are in the countries of Canada, the United States of America, Mexico, and the Netherlands Antilles. This region also includes the following countries: Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Cuba, Haiti, Jamaica, and the Dominican Republic.

To come ashore in the United States, you need a crew member visa and a shore pass. Leave your passport with the ship master for safekeeping.



Ports of North American Atlantic Coast

Ports on the North American Atlantic Coast

Curacao, Netherlands Antilles
Lat./Long.: 12°06' N, 68°57' W
Time Zone: GMT - 4
Currency: Netherlands Antillean guilder, guilden or florin (Naf); 1 Naf = 100 cents
Languages: Dutch, Papiamento, English, Spanish
Climate: Tropical
Health: Take precautions against sunburn and heatstroke.
Crime: Burglary is commonplace.
Telephone Country Code: 599 City Code: 9
Police/Fire: 4444 Ambulance: 625822
Apostleship of the Sea: (9) 369-378 †
Seafarers' Center in Curacao: (9) 377-272
Seamen's Club in Willemstad: (9) 375-317

Halifax, Canada
Lat./Long.: 44°38' N, 63°45' W
Time Zone: GMT - 4
Currency: Canadian dollar ($); 1 dollar = 100 cents
Languages: English, French
Climate: Seasonal. Cold winters; cool summers.
Telephone Country Code: 1
Long-Distance Code: 1 Area Code: 902
Police: 4105 Fire: 4103 Ambulance: 429-5151
Harbor Police: 426-3629
Halifax Coast Guard: 426-6030
Missions to Seamen at Pier 24: (902) 422-7790 †

Houston, Texas, USA
Lat./Long.: 29°45' N, 95°20' W
Time Zone: GMT - 6

Currency: US dollar ($); 1 dollar = 100 cents
Languages: English, Spanish
Climate: Hot and humid summers; mild winters.
Telephone Country Code: 1 Long-Distance Code: 1
Area Code: 713
Police/Fire/Ambulance: 911
Coast Guard: (713) 671-5100
Barbours Cut Seamen's Center in La Porte: (281) 470-8332. Volunteers are available to pick up seafarers at the dock. †
British and International Sailor's Society:
Genoa United Methodist Church: (713) 944-1855 V †
Houston International Seafarers' Center, Dock 23: (713) 672-0511. Volunteers are available to pick up seafarers at the dock. †
Seafarers Center Inc.: 713-672-0511, http://www.wwsites.com/TX/Seafarers/
ITF: (713) 928-3381

Jacksonville, Florida, USA
Lat./Long.: 30°20' N, 81°24' W
Time Zone: GMT – 5
Currency: US dollar ($); 1 dollar = 100 cents
Languages: English, Spanish
Climate: Hot and humid summers; mild and wet winters.
Telephone Country Code: 1 Long-Distance Code: 1
Area Code: 904
Police/Fire: 911 Ambulance: 633-2211
Coast Guard: (904) 791-2648
Apostleship of the Sea: (904) 356-3104 †
Seafarer Fellowship Center at Blount Island: (904) 751-3785 †

Seafarer Fellowship Center at Tallyrand Avenue:
(904) 633-9971 ✝

Montreal, Quebec, Canada
Lat./Long.: 45°30' N, 73°33' W
Time Zone: GMT - 5
Currency: Canadian dollar ($); 1 dollar = 100 cents
Languages: French, English
Climate: Seasonal. Very cold winters; mild summers.
Health: During winter months, take precautions against frostbite.
Police/Fire/Ambulance: 911
Telephone Country Code: 1 Long-Distance Code: 1
City/Area Code: 514
Mariners' House of Montreal, International Seamen's Centre: (514) 935-2160 ✝
Missions to Seamen: (514) 843-6577 ✝
Montreal Seamen's Club, Pier #3: (514) 849-3234
The Seafarers' Center: (514) 844-1476 ✝
ITF: (514) 931-7859

New York/Newark (New York/New Jersey), USA
Lat./ Long.: 43°00' N, 74°00' W
Time Zone: GMT - 5
Currency: US dollar ($); 1 dollar = 100 cents
Languages: English, Spanish. New York City has many ethnic neighborhoods where other languages are spoken, including Chinese, German, Greek, Italian, Korean, Russian, Arabic, Ukrainian.
Climate: Seasonal. Cool to cold winters; hot summers.
Other: It is illegal in New York City to drink alcohol on a public sidewalk or in a public park.
Telephone Country Code: 1 Long-Distance Code: 1

Area Codes: Manhattan: 212; Brooklyn/Bronx/Staten Island/Queens: 718; Jersey City: 201; Newark: 973
Police/Fire/Ambulance: 911
Coast Guard: (212) 668-7494

SEAFARERS' CENTERS IN NEW YORK

APOSTLESHIP OF THE SEA, SEAFARERS' CENTER, PIER 88: : (212) 307-1937 ✝

SEAMEN'S CHURCH INSTITUTE OF NEW YORK AND NEW JERSEY, 241 WATER STREET: (212) 349-9090 ✝

DANSK SØMANDSKIRKE, BROOKLYN: (718) 875-0042 ✝

DEUTSCHE SEEMANNSMISSION, C/O SEAFARERS & INTERNATIONAL HOUSE: (212) 677-4800 ✝

THE NORWEGIAN SEAMEN'S CHURCH INC.: (212) 319-0370 ✝

SEAFARERS & INTERNATIONAL HOUSE: (212) 677-4800 ✝

SEAMEN'S HOUSE,YMCA: (212) 741-0012 ✝

STELLA MARIS CENTER, BROOKLYN: (718) 834-1234 ✝

SVENSKA SJÖMANSKYRKAN: (212) 832-8444 ✝

UNITED SEAMEN'S SERVICE: (212) 775-1033 OR 775-1034

SEAFARERS' CENTERS IN NEW JERSEY

GREEK ORTHODOX MARITIME MINISTRY: (201) 792-0697 ✝

SEAMEN'S CHURCH INSTITUTE OF NEW YORK AND NEW JERSEY: (973) 589-5828 ✝

STELLA MARIS CHAPEL: (201) 589-7946 ✝

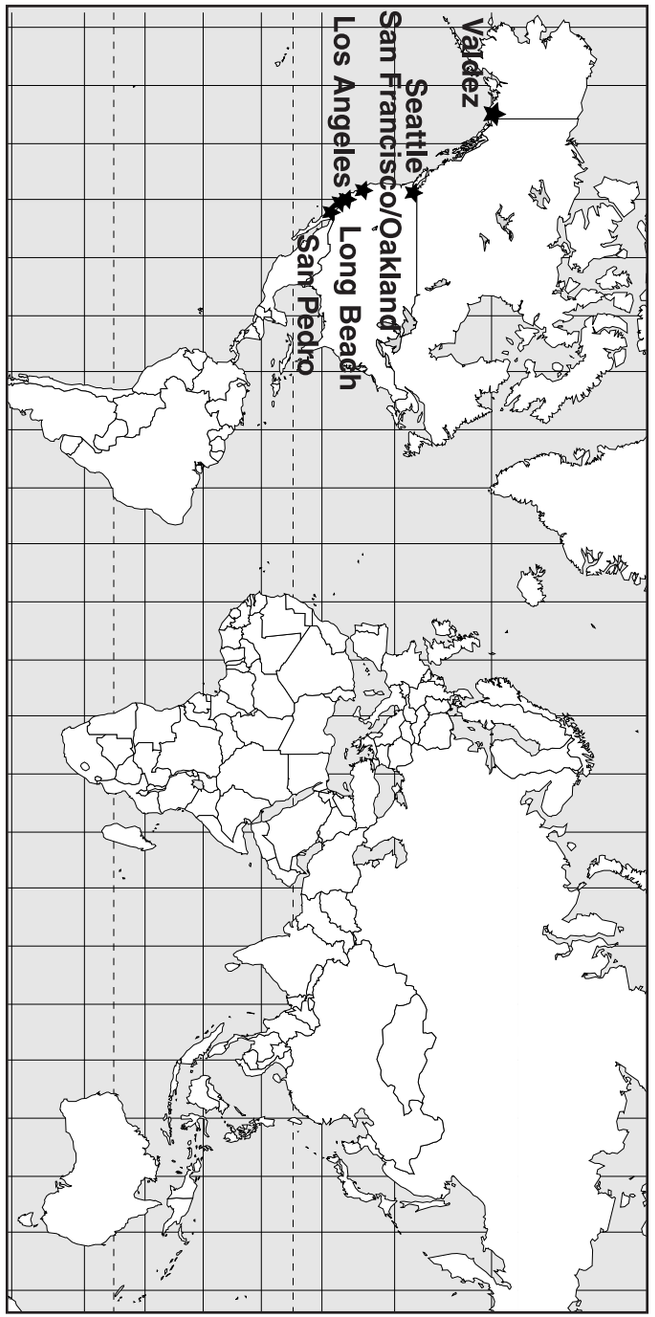
ITF (MANHATTAN): (212) 244-4000

Norfolk/Newport News, Virginia, USA
Norfolk Lat./Long.: 36°51' N, 76°19' W
Newport News Lat./Long.: 36°59' N, 76°26' W
Time Zone: GMT - 5
Currency: US dollar ($); 1 dollar = 100 cents
Language: English
Climate: Seasonal. Cool winters; hot summers.
Telephone Country Code: 1 Long-Distance Code: 1
Area Code: 757
Police/Fire/Ambulance: 911
International Seamen's House, 1222 W. Olney Rd., Norfolk: (757) 623-4222 †
International Seamen's Friend House, 2901 Huntington Ave., Newport News: (757) 247-6113 †
Lighthouse Baptist Seamen's Mission, 1455 W. 38th St., Norfolk: (757) 626-3935
ITF (Baltimore): (301) 994-0010 x5236

Veracruz, Mexico
Lat./Long.: 19°09' N, 96°10' W
Time Zone: GMT - 6
Currency: Mexican peso ($); 1 peso = 100 centavos
Language: Spanish
Climate: Tropical. Between November and April, strong northerly winds are prevalent. Very wet summers.
Telephone Country Code: 52 City Code: 29
Police: 2-28-23 Fire: 2-25-00 Ambulance: 2-01-40

Ports on the North American Pacific Coast

San Francisco/Oakland, California, USA
Lat./Long.: 37°48' N, 122°25' W



Ports of North American Pacific Coast

Time Zone: GMT - 8
Currency: US dollar ($); 1 dollar = 100 cents
Climate: Mild winters; warm summers.
Telephone Country Code: 1 Long-Distance Code: 1
Area Codes: San Francisco: 415; Oakland: 510
Police/Fire/Ambulance: 911
Coast Guard (Oakland): (301) 980-4429
Apostleship of the Sea, 399 Fremont St., San Francisco: (415) 421-7845 †
Den Norske Sjømannskirke (Norwegian Seamen's Church), 2454 Hyde St., San Francisco: (415) 775-6566 †
International Maritime Center in Oakland: (510) 839-2226
Norwegian Government Seamen's Service, Norway House: (415) 346-4711
Scandinavian Seamen's Mission: (415) 775-6566 †
Seafarers Ministry of the Golden Gate (Oakland): (510) 553-5599, http://www.acts.org/smgg †
ITF (Los Angeles): (310) 830-9646

Los Angeles/Long Beach and San Pedro, California, USA
Lat./Long.: 33°43' N, 118°16' W
Time Zone: GMT - 8
Currency: US dollar ($); 1 dollar = 100 cents
Climate: Warm summers; mild winters.
Telephone Country Code: 1 Long-Distance Code: 1
Area Codes: Long Beach: 562; Los Angeles: 213; San Pedro: 310
Den Norske Sjømannskirke, 1035 S. Beacon St., San Pedro: (310) 832-6800
International Seafarers' Center, 120 S. Pico Avenue, Long Beach: (562) 432-7560
Seamen's Church Institute, Seafarers' Communications Center, 101 West 11th St., San Pedro: (310) 832-2563

Apostleship of the Sea, Seafarers' Communication Center, Berth 93A, San Pedro: (310) 548-3200
ITF (San Pedro): (310) 830-9646

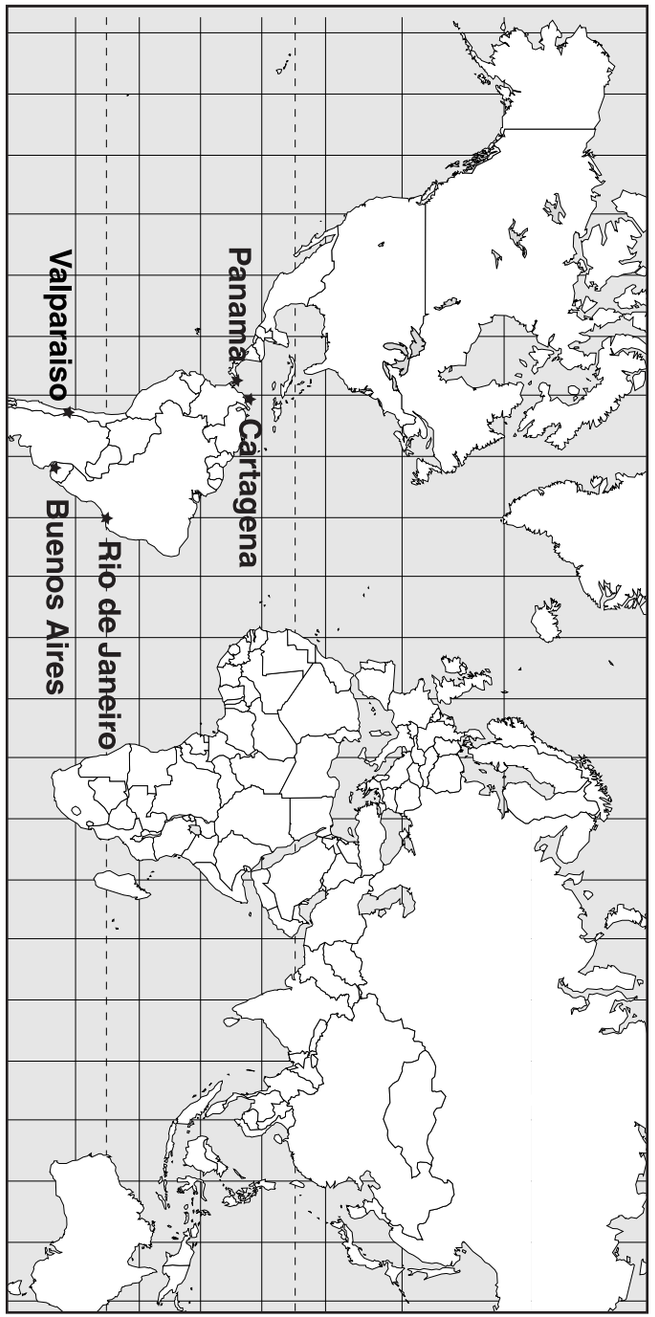
Seattle, Washington, USA
Lat./Long.: 47°36' N, 122°20' W
Time Zone: GMT - 8
Currency: US dollar ($); 1 dollar = 100 cents
Climate: Cool summers; rainy winters.
Telephone Country Code: 1 Long-Distance Code: 1
Area Code: 206
Police/Fire/Ambulance: 911
Catholic Seamen's Club: (206) 441-4773 †
Christian Seamen's Center: (206) 937-0277 †
Episcopal Seamen's Service: (206) 938-3890 †
Seattle International Seamen's Center, 101 Alaskan Way: (206) 748-0347 †
United Seamen's Service: (206) 935-7037
ITF: (206) 824-8993

Valdez, Alaska, USA
Lat./Long.: 61°07' N, 146°17' W
Time Zone: GMT - 9
Currency: US dollar ($); 1 dollar = 100 cents
Climate: Very cold winters; cool summers. Winter winds reach gale force but usually only for short periods. Valdez receives more than 40 inches of rain and 200 inches of snow each year.
Health: Winter winds combine with low temperatures to produce very low windchill factors. Take precautions against frostbite and hypothermia.
Telephone Country Code: 1 **Long-Distance Code:** 1
Area Code: 907

Ports of South America

International seafarers have been visiting these ports since the late 15th century. The ports selected here are in Argentina, Brazil, Chile, Colombia, and Panama. The South America region also includes Bolivia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Trinidad and Tobago, Suriname, and Uruguay.

Buenos Aires, Argentina
Lat./Long.: 34°36' S, 58°22' W
Time Zone: GMT - 3
Currency: Austral; 1 austral = 100 centavos
Languages: Spanish, English, Italian, German, French
Climate: Summer occurs in January and is hot. Winter occurs in July and is cool and rainy.
Crime: Watch for pickpockets.
Telephone Country Code: 54 City Code: 1
Police/Ambulance: 101 Fire: 107
Stella Maris Club: (01) 342-6749
The Missions to Seamen
Axel Johnson Minne till Svenska Sjoman
Dansky Kirke
ITF: 01-331-4043



Ports of South America

Cartagena de Indias, Colombia
Lat./Long.: 10°26' N, 75°33' W
Time Zone: GMT - 5
Currency: Colombian peso; 1 peso = 100 centavos
Language: Spanish
Climate: Tropical.
Shore Leave: Shore leave is available. Crew members are issued a card that must be signed by both the ship master and the port captain. The master is responsible for guaranteeing that all crew members reboard the ship. Deserters are arrested by local police and a fine is levied on the ship.
Telephone Country Code: 57
Terminal Fire Department/Terminal Ambulance: VHF Channel 16
ITF (Bogotá): (1) 287-2093

Cristobal/Balboa, Panama (Panama Canal)
Cristobal Lat./Long.: 9°21' N, 79°54' W
Balboa Lat./Long.: 8°58' N, 79°34' W
Time Zone: GMT - 5
Currency: Panamanian balboa (B); 1B = 100 centesimos; 1B = 1 US$
Languages: Spanish, English
Climate: Tropical. Hot and humid.
Health: Take precautions to avoid heatstroke and sunburn.
Inoculations: If traveling outside the urban area, hepatitis, typhoid, tetanus, yellow fever, and polio vaccinations are recommended. Malaria suppressants are also recommended.
Other: Canal towns are Cristobal, Gatun, Darien, Gamboa, Las Cascadas, Empire, Culebra, Paraiso, Pedro Miguel Locks, Balboa.

Telephone Country Code: 507 City Code: None
The Marine Bureau, Marine Safety Unit: 52-4243
ITF: 441-5067/225-6954

Rio de Janeiro, Brazil
Lat./Long.: 22°54' S, 43°11' W
Time Zone: GMT - 3
Currency: Cruzeiro (Cr$); 1 Cr$ = 100 centavos
Languages: Portuguese, Spanish, English, French
Climate: Seasonal. Mild winters; warm summers. Winter months are May to August.
Inoculations: Yellow fever vaccination is recommended.
Shore Leave: An identification card with photo is required. The card is provided by the agent, and you must give it to the Federal Police as you leave the ship.
Telephone Country Code: 55 City Code: 21
Police: 190 Fire: 232-1234 Ambulance: 222-2121
ITF: (21) 233-2812/263-1965

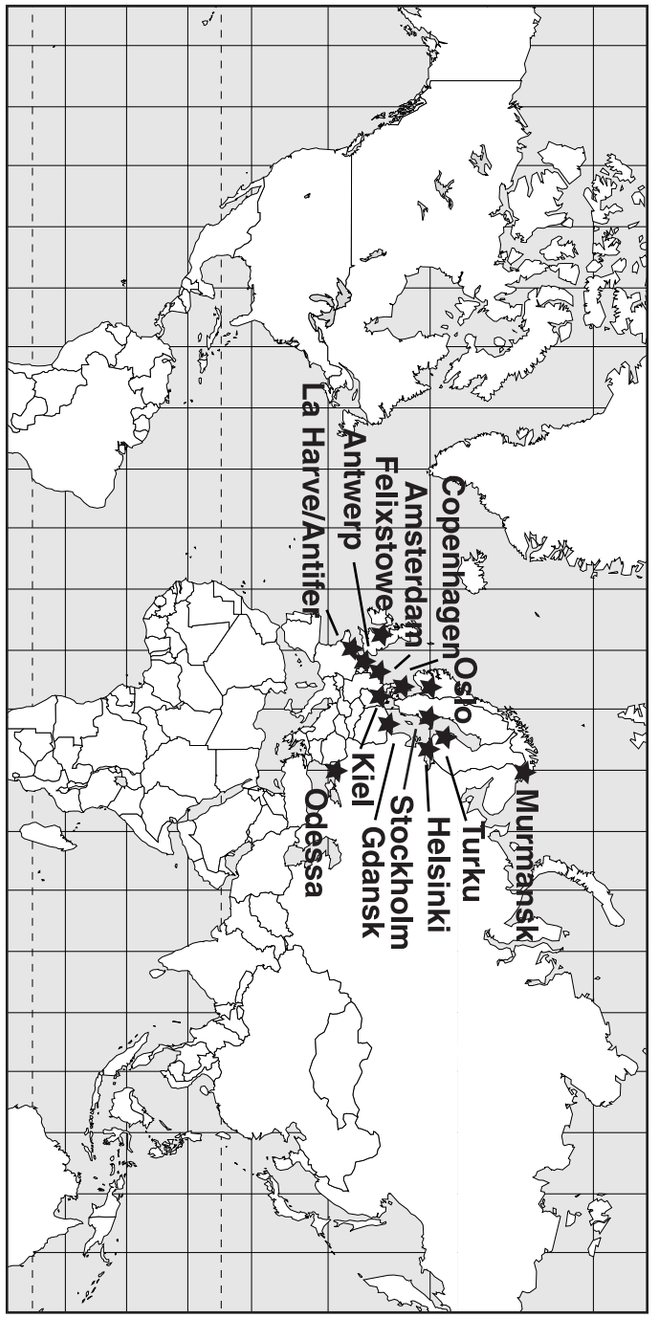
Valparaiso, Chile
Lat./Long.: 33°02' S, 71°39' W
Time Zone: GMT - 4
Currency: Chilean peso (Ch$); 1 Ch$ = 100 centavos
Language: Spanish
Climate: Seasonal. Cold, rainy winters; hot, dry summers. Winter months are May to September.
Health: Tap water is usually OK, but it is not potable after occasional winter floods. Do not eat unwashed raw foods or undercooked meats.
Inoculations: Typhoid, hepatitis, and tetanus vaccinations are recommended.

Shore Leave: Shore leave is allowed. You must carry an identification card with you.
Telephone Country Code: 56 Long-Distance Code: 0
City Code: 32
Apostolato del Mare: (32)239-838
Deutsche Seemannsmission: (32) 660-720
Missions to Seamen
Valparaiso Seamen's Institute: (32) 212-717 †
Maritime Federation of Chile: (32) 217-727
ITF: 257-721

Ports of Northern Europe

The ports selected here are in Belgium, Finland, France, Germany, Great Britain, Netherlands, Norway, Poland, Russia, Sweden, and Ukraine. The Northern Europe region also includes Belarus, Iceland, Ireland, Latvia, Lithuania, and Luxembourg.

Amsterdam, Netherlands
Lat./Long.: 52°22' N, 4°53' E
Time Zone: GMT + 1
Currency: Netherlands guilder, gulden, or florin (f);
1 f = 100 cents
Languages: Dutch, Frisian, English
Climate: Rainy winters; cool summers.
Shore Leave: Shore leave is available. No special requirements.
Telephone Country Code: 31 Long-Distance Code: 0
City Code: 20
Police: 222222 Fire: 555555 Ambulance: 212121
Apostleship of the Sea: (20) 633-3537 †
British and International Sailor's Society
Seamen's Welfare of Amsterdam
Seamen's Centre: (20) 611-7708
ITF (Rotterdam): (010) 215-1166



Antwerp, Belgium
Lat./ Long.: 51°13' N, 4°23' E
Time Zone: GMT + 1
Currency: Belgian franc (BF) 1 BF = 100 centimes
Languages: French, Flemish
Climate: Cool summers and cooler winters. A raincoat and umbrella are required year-round.
Shore Leave: Identification cards are required.
Telephone Country Code: 32 Long-Distance Code: 0
City Code: 3
Police: 232-1840 Fire/Ambulance: 100
Antwerp Seafarers' Centre (Seemannsheim): (3) 233-3475
†
Antwerp Mariners' Club: (3) 542-1458
†
British and International Sailor's Society: †
Norwegian Government Seamen's Service: (3) 542-1180/1/3
Swedish Seaman's Service: (3) 541-3707
Dansk Sømandskirke: (3) 232-1376 †
Den Norske Sjømannsmisjon: (3) 232-1376 †
Deutsche Seemannsmission: †
Suomalainen Merimieskirkko: (3) 232-8047 †
International Seamen's Mission:
(3) 232-1609
Svenska Sjömanskyrkan: (3) 541-3707 †
(3) 541-3707
ITF: (03) 224-3502/3506

Copenhagen, Denmark
Lat./Long.: 55°42' N, 12°37' E
Time Zone: GMT + 1
Languages: Danish, Faeroese, Greenlandic

Currency: Danish krone; 1 krone = 100 ore
Climate: Cold winters; cool summers. Frequent rain.
Shore Leave: There are no restrictions. You are advised to carry some photo identification.
Telephone Country Code: 45 City Code: 33
Danish Maritime Authority: (39) 27-15-15
Police/Fire/Ambulance: 112
Apostleship of the Sea, Bishop's office: (33) 116-080 †
Danish Government Seamen's Service: (33) 3543-3111
Dansk Sømandskirke I Fremmede Havne: †
Norwegian Seamen's Church: † (33) 574-1005
Deutsche Seemannsmission: † (33) 152-610
Indenlandsk Sømandsmission (Bethel): (33) 130-370 †
ITF (Esbjerg): 75-139940

Felixstowe, United Kingdom (UK)
Lat./Long.: 51°58' N, 1°21' E
Time Zone: GMT
Currency: UK pound (UK£); 1£ = 100 pence
Climate: Cool summers; mild winters. Raingear needed year-round.
Shore Leave: There are no restrictions. You must carry a Seaman's Book or passport.
Telephone Country Code: 44 **Long-Distance Code:** 0
City Code: 1394
Police/Fire/Ambulance: 999; within dock area: 4300
British & International Sailors' Society: (1703) 337-333
Deutsche Seemannsmission: (1394) 271-021
Felixstowe Seafarers' Centre: (1394) 673-599 †
ITF (London): (0171) 403-2733

Gdansk/Gdynia, Poland
Gdansk Lat./Long.: 54°21' N, 18°40' E
Gdynia Lat./Long.: 54°32' N, 18°34' E
Time Zone: GMT +1
Currency: Zloty (zl); 1 zl = 100 groszy
Language: Polish
Climate: Cold winters with frequent snow; mild summers with frequent rain.
Shore Leave: You must have your Seaman's Book and a shore permit from Polish Immigration authorities. The shore permit is only valid within the Gdansk/Sopot/Gdynia area.
Other: There are duty-free shops on Ziolkowsiego Quay and at Wolnoici 16 Street in Nowy Port.
Telephone Country Code: 48 Long-Distance Code: 0
City Code: 58
Police: 997 Fire: 998 Ambulance: 999
Apostolatus Maris Gdansk: † (58) 430-346
The Finnish Seamen's Mission Gdansk–Brzezno: (58) 434-496 †
Apostolatus Maris Gdynia: † (58) 208-741
Svenska Sjömanskyrkan: † (58) 200-263
National Section of Port Workers: (58) 43 16 30
ITF: 627-8103

Helsinki, Finland
Lat./Long.: 60°10' N, 24°57' E
Time Zone: GMT + 2
Currency: Markka /Finnish mark (FMk); 1FMk = 100 pennia
Languages: Finnish, Swedish
Climate: Very cold winters; cool, wet summers. Temperatures are mild for the subarctic because of the North Atlantic current and the Baltic Sea.

Shore Leave: There are no restrictions. You must carry with you a Seaman's Book or passport.
Telephone Country Code: 358 Long-Distance Code: 0
City Code: 9
Police: 002 Fire: 112 Ambulance: 112
Apostleship of the Sea: (9) 637-853 †
Deutsche Seemannsmission: (9)63-6070
Finnish Seamen's Service: (9) 668 9000
Hotel Skatta (Finnish Seamen's Service): (9) 668-9000
Missions to Seamen:
Seamen's Club (Finnish Seamen's Service): (9) 668-9000
Suomen Merimieslåetysseura:
Svenska Olaus-Petriförsamlingen: (00) 443-831 †
ITF: (9) 615 202 0155

Kiel, Germany
Lat./Long.: 54°19' N, 10°10' E
Time Zone: GMT + 1
Currency: Deutsche Mark (DM); 1 DM = 100 pfennige
Language: German
Climate: Cool, cloudy, and wet.
Shore Leave: Crew members from nations that normally require visas to enter Germany need to obtain shore passes. For crew members who do not require visas to enter Germany (such as EU nationals), no shore passes are issued. These crew members can use their Seaman's Book or passport as identification.
Telephone Country Code: 49 City Code: 431
Police: 110 Harbor Police: 579-320 Fire/Ambulance: 112
Deutsche Seemannsmission und Seemanns-Frauenheim: (431) 331-492 †
ITF (Hamburg): (40) 285-8870

Le Havre/Antifer, France
Lat./Long.: 49°29' N, 0°06' E
Time Zone: GMT + 1
Currency: French franc (F); 1F = 100 centimes
Language: French
Climate: Cool and wet winters; mild and wet summers.
Shore Leave: Shore leave is limited. You are restricted to the port and town area. You should carry your passport or Seaman's Book with you for identification. You are not allowed to travel to Paris or other parts of France unless you have police authorization and a pass.
Telephone Country Code: 33 City Code: 235
Police: 17 Fire: 18 First Aid: 15
Apostolatus Maris:
British and International Sailor's Society:
Deutsche Seemannsmission–International Seafarers' Centre: (235) 495-836 also (235) 423-532
Maison du Marin: (235) 413-532
ITF: (235) 23 63 73

Murmansk, Russia
Lat./Long.: 68°58' N, 33°03' E
Time Zone: GMT + 2
Currency: Ruble
Language: Russian
Climate: Seasonal. Cold winters; cool summers.
Customs Information: Items of historical or cultural value, such as icons, rugs, art, and antiques, cannot be taken out of the country without permission from the Ministry of Culture. A 1001 percent duty is charged on these items.
Telephone Country Code: 7
Main Inspection on Safety of Navigation (Moscow):

2-51-03-4 Interclub, 1 Karl Marx Street
Police: 02 Fire: 2252/2254 Ambulance: 003/2395/2422
ITF (St. Petersburg): (0812) 114-9732

Odessa, Ukraine
Lat./Long.: 46°29' N, 30°46' E
Time Zone: GMT + 2
Currency: Ukrainian ruble
Languages: Ukrainian, Russian
Shore Leave: Shore leave is permitted during the day only. There is no overnight shore leave. Carry your Seaman's Book or passport for identification.
British International Sailor's Society
Seamens Center: (482) 335-854
Telephone Country Code: 380 City Code: 482
Police: 02 from town, 902 from port Fire: 01 from town, 901 from port Ambulance: 03 from town, 903 from port
Seamen's Club, 15 Rosa Luxemburg St., Odessa:
Ukrainian Marine Trade Unions' Federation: (482) 22-35-58
Black Sea Christian Center: (482) 323-459

Oslo, Norway
Lat./Long.: 59°54' N, 10°43' E
Time Zone: GMT + 1
Currency: Norwegian krone (NKr); 1 NKr = 100 ore
Languages: Norwegian, Lapp, Finnish
Climate: Mild winters (for this latitude); cool summers.
Shore Leave: There are no restrictions on shore leave.
Telephone Country Code: 47 Long-Distance Code: 0
City Code: 22
Police: 002 Fire: 001 Ambulance: 003
Apostleship of the Sea, St. Hallvards Kirke: (22) 672-383 †
Apostleship of the Sea, St. Olavs Domkirke: (22) 207-268 †

Den Norske Sjömannsmisjon: (22) 338-333 † ☕
Deutsche Seemannsmission:
Svenska Margaretafösamlingen: (22) 209-408 † ☕
ITF: (22) 42 58 72

Stockholm, Sweden
Lat./Long.: 59°20' N, 18°03' E
Time Zone: GMT + 1
Currency: Swedish krona (Skr); 1 Skr = 100 ore
Language: Swedish
Climate: Very cold winter, spring, and fall. Bring warm outdoor clothing. Mild summers. Bring sweaters and raingear.
Shore Leave: Shore leave is allowed. If traveling outside the port area, carry a Seaman's Book or passport for identification.
Telephone Country Code: 46 Long-Distance Code: 0
City Code: 8
Police/Fire/Ambulance: 90-000
Norsk Kirke i Stockholm:
Seamen's Hotel:
Sjöfartsklubben Kaknas (Seamen's Club): (8) 667-9690 or 663-2421
Sjöfartsklubben Katarine Seamen's Club at Seamen's Hotel: (8) 640-9496
Sjömansinstitutet (Swedish Seamen's Club): (8) 615-8800 or 428-270
Swedish Government Seamen's Service: (8) 667-9690
ITF: (8) 643-2742/714-5325

Turku (Åbo), Finland
Lat./Long.: 60°27' N, 22°15' E
Time Zone: GMT + 2
Currency: Markka (FMk); 1 FMk = 100 pennia

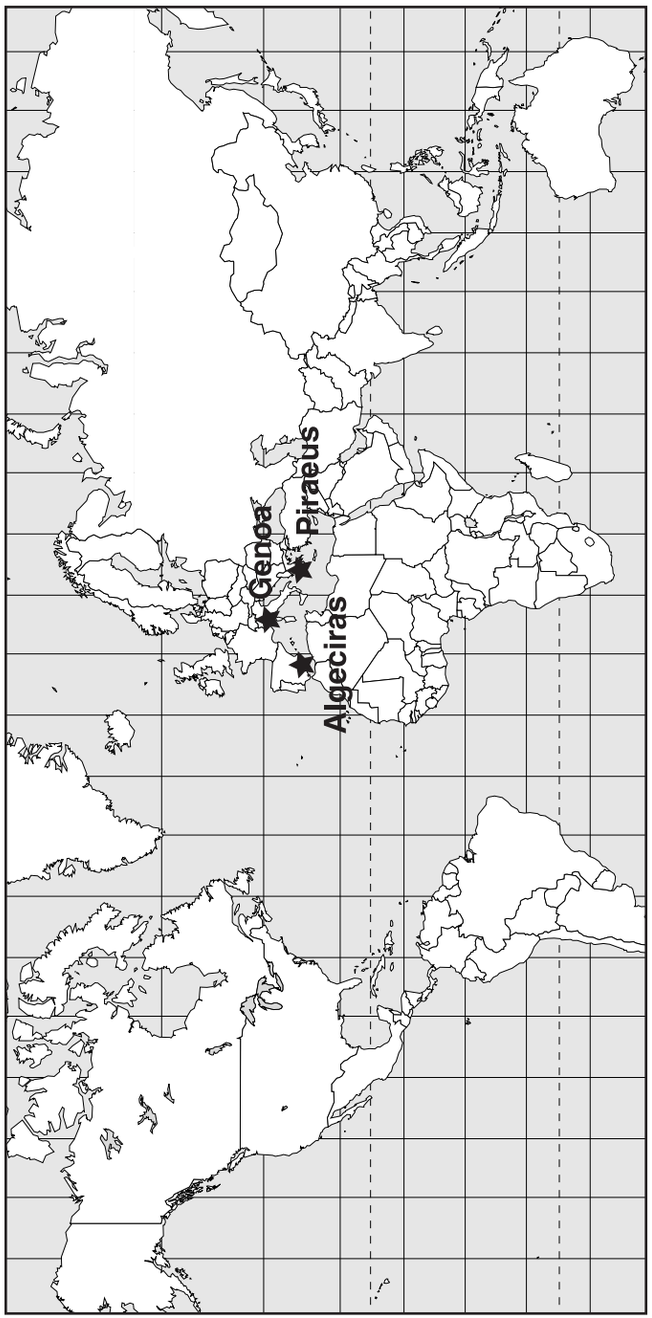
Climate: Seasonal. Cold winters; cool summers. Sweaters and raingear are needed in the summer.
Languages: Finnish, Swedish
Health: During winter months, take precautions against frostbite and hypothermia.
Shore Leave: Shore leave is allowed. There are no special requirements.
Telephone Country Code: 358 City Code: 2
Police/Fire/Ambulance: 112
Apostolatus Maris:
Bridgettine Convent Guest-house: (2) 501-910
Finnish Seamen's Service: (2) 304-995
Meremieskako: (2) 303-940
ITF (Helsinki): (9) 615 202 0155

Ports of Southern Europe

The ports selected here are in Greece, Italy, and Spain. The Southern Europe region also includes Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Malta, Portugal, Romania, Slovenia, and Yugoslavia.

Algeciras, Spain
Lat./Long.: 36°07' N, 5°26' W
Time Zone: GMT + 1
Currency: Peseta (Pta); 1 peseta = 100 centimos
Language: Spanish
Climate: Hot summers; mild winters.
Shore Leave: You need a valid Seaman's Book.
Telephone Country Code: 34 City Code: 956
? Maritime Inspector General (Madrid): (314)580-1400
Police: 091 Fire: 662222 Ambulance: 604144
ITF: 956-63 45 24

Ports of Southern Europe



Genoa (Genova), Italy
Lat./Long.: 44°24' N, 8°54' E
Time Zone: GMT + 1
Currency: Italian lira (L); 1 L = 100 centesimi
Languages: Italian, French
Climate: Seasonal.
Shore Leave: You must have a Seaman's Book or passport and a shore pass.
Telephone Country Code: 39 Long-Distance Code: 0
City Code: 10
Police: 25-69-75 Fire: 25-25-25 Ambulance: 59-59-51
Apostolatus Maris: (10) 299-562
Deutsche Seemannsmission: (10) 214-545 ✝
ITF: (10) 28-39-41

Piraeus, Greece
Lat./Long.: 37°57' N, 23°42' E
Time Zone: GMT + 2
Currency: Greek drachma (Dr)
Languages: Greek, English, French
Climate: Seasonal. Mild and wet winters; hot and dry summers.
Shore Leave: Shore passes are required.
Customs: It is illegal to purchase or export Greek archaeological finds or antiquities.
Telephone Country Code: 30 Long-Distance Code: 0
City Code: 1
Police/Fire: 100 Ambulance: 166
Merchant Ship's Inspectorate: (1) 4111214-18
Apostleship of the Sea, c/o St. Paul's Church: (1) 412-9377
Deutsche Seemannsmission / British Sailor's Society: Seafarers' Centre: (1) 428-7566
Skandinaviska Sjömanskyrkan (Scandinavian Church):

(1) 451-6564 †

Pan-Hellenic Seamen's Federation: (1) 429-2958

Ports of "Middle East" and West Asia

The ports selected here are in India, Kuwait, Saudi Arabia, Sri Lanka, Turkey, United Arab Emirates, and Yemen. Other countries in this region are Iran, Iraq, Lebanon, Oman, Pakistan, and Syria.

Abu Dhabi (Mina Zayed), Dubai (Jebel Ali), United Arab Emirates (UAE)

Lat./Long.: 25°00' N, 55°03' E

Time Zone: GMT + 4

Currency: Emiriandirham (Dh); 1 Emiriandirham = 100 fils

Languages: Arabic, Persian, English

Climate: Extremely hot and dry desert.

Shore Leave: Shore leave is allowed. You need a valid Seaman's Book.

Customs: The following items cannot be brought ashore in the UAE: pornographic materials, alcohol, narcotic drugs, wireless transmitters, firearms, Israeli products, movies, political literature, religious literature.

Telephone Country Code: 971

City Code: 2 (Abu Dhabi), City Code: Dubai: 4

Apostlesip of the Sea in Dubai: (4) 470-087 †

Dubai International Seafarer's Center: (4) 435-551

Norwegian Seamen's Center, Dubai: (4) 370-062

Jebel Ali International Seamen's Center: (84) 36805

Ports of "Middle East" and West Asia

Aden, Yemen
Lat./Long.: 12°47' N, 45°03' E
Time Zone: GMT + 3
Currency: S. Yemeni Dinar 1S. (YD); Yemeni Dinar = 1,000 fils
Language: Arabic
Climate: Extremely hot and dry desert. During rainy season, flash floods can strike without warning.
Health: Chloroquine-resistant malaria suppressants are recommended for travel outside the city of Sanaa.
Other Hazards: There are land mines and other unexploded ordnance left over from the 1994 civil war in areas where fighting took place around Aden.
Shore Leave: You need an international certificate of proof of vaccination against yellow fever and cholera. Give passport to the Immigration Officer-in-charge and carry your shore pass with you at all times while on shore leave. Shore leave expires at 2300 hours. There is no overnight shore leave.
Telephone Country Code: 976
Fire: 22222 Police: 22851
Port Medical: 22626/7
Apostleship of the Sea: (2) 232-146
The Missions to Seamen: (2) 232-146

Bombay (Mumbai), India
Lat./Long.: 18°54' N, 72°49' E
Time Zone: GMT + 5 1/2
Currency: Indian rupee (Re); 1 Re = 100 paise
Languages: Hindi, Marathi, Gujarati, English
Climate: Warm. Summer clothing is suitable year-round.
Health: Tap water is not potable.
Crime: Watch for pickpockets. Theft is very common.

Caution: Penalties for possession of illegal drugs are harsh. Minimum jail sentence is 10 years.
Customs: India requires you to declare any gold or gold objects when you enter the country.
Shore Leave: Shore passes are issued. Carry passes with you at all times. Return the passes prior to vessel departure.
Telephone Country Code: 91 Long-Distance Code: 0
City Code: 22
Police: 100 Fire: 101 Ambulance: 102
Apostleship of the Sea, Holy Name Catherdral: (22) 202-1365
Royal Bombay Seamen's Society, Prince of Wales Seamen's Club: (22) 261-3731 or 261-2260 ✝
ITF: (22) 261-8368/8369

Colombo, Sri Lanka
Lat./ Long.: 6°57' N, 79°51' E
Time Zone: GMT + 5 1/2
Currency: Sri Lankan rupee (SLRe); 1 SLRe = 100 paise
Languages: Sinhala, Tamil, English
Climate: Tropical, hot, monsoonal. NE monsoons: December to March; SW monsoons: June to October.
Health: Tap water is not potable. Do not eat unwashed raw foods or undercooked meat. If you become seriously ill, you may need to be evacuated to Thailand or Singapore for medical treatment.
Shore Leave: There are no restrictions. You are advised to carry some photo identification.
Telephone Country Code: 94 Long-Distance Code: 0
City Code: 1
Harbor Police: 21075 Ambulance: 20428
Missions to Seamen: (1) 448-522
ITF: (1) 328-157/158

Dubai/Port Rashid, United Arab Emirates
Dubai: Lat./ Long.: 25°16' N, 55°18' E
Pt. Rashid: Lat./ Long.: 25°16' N, 55°16' E
Time Zone: GMT + 4
Currency: Emiriandirham (Dh); 1 Dh = 100 fils
Languages: Arabic, Persian, English
Climate: Extremely hot and dry desert.
Shore Leave: Daytime shore leave is allowed. There is no overnight shore leave. Passports and Seaman's Books are held by the agent or the Immigration Office while you are ashore.
Customs: The following items cannot be brought ashore: pornographic materials, alcohol, narcotic drugs, wireless transmitters, firearms, Israeli products, movies, political literature, religious literature.
Telephone Country Code: 971 City Code: 4
Coast Guard: (4) 450-520
Apostleship of the Sea:
Dubai International Seafarers' Centre, c/o Missions to Seamen: (4) 452-951 †
Norsk Sjømanscenter: (4) 370-062

Istanbul/Haydarpasa, Turkey
Lat./ Long.: 41°0' N, 28°59' E
Time Zone: GMT + 2
Currency: Turkish lira (TL)
Languages: Turkish, Kurdish
Climate: Hot, dry summers. Mild, wet winters.
Shore Leave: Shore leave is allowed. A Seaman's Book is required for identification.
Telephone Country Code: 90 Long-Distance Code: 0
City Codes: European side–Istanbul: 212,
Asian side–Haydarpasa: 216

Police (Istanbul): 527-45-00 Police (Haydarpassa): 144-94-03 Fire (Istanbul): 521-42-22 Fire (Uskudar): 333-20-30 Fire (Haydarpassa): 163-60-20 Ambulance (Istanbul): 521-42-22 Ambulance (Haydarpassa): 354-38 Ambulance (Uskudar): 333-0401
Seafarers' Union of Turkey: (212) 245-3130/3131

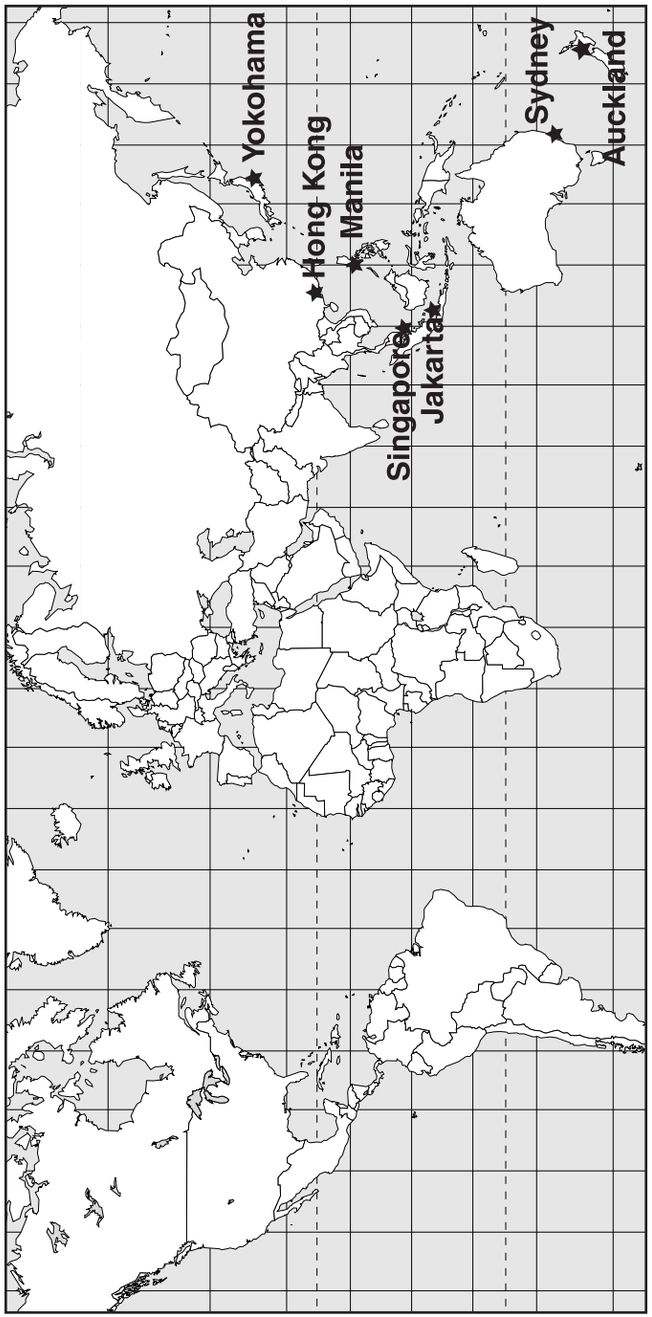
Kuwait
Lat./ Long.: 29°23' N, 47°59' E
Time Zone: GMT + 3
Currency: Kuwaiti dinar (KD)
Languages: Arabic, English
Climate: Desert. Very hot summers; short, cool winters.
Shore Leave: Shore leave is very restricted. It is permitted only for consular matters and medical reasons, or to make emergency telephone calls. A passport or Seaman's Book is required. Crew members who join a vessel in Kuwait are not allowed any shore leave in Kuwait.
Telephone Country Code: 965
Apostleship of the Sea–Kuwait, Bishop's House, P.O. Box 266: †

Ports of East Asia and the South Pacific

The ports selected here are in Australia, China, Indonesia, Japan, New Zealand, Philippines, and Singapore. Other countries in this region are Malaysia, Myanmar (formerly Burma), Papua New Guinea, Solomon Islands, South Korea, and Thailand.

Auckland, New Zealand
Lat./ Long.: 36°51' S, 174°49' E
Time Zone: GMT + 12
Currency: New Zealand dollars (NZ$); 1 NZ$ = 100 cents
Language: English

Ports of East Asia and the South Pacific



Climate: Wet, windy, and cool. Warm clothing and raingear needed year-round.
Shore Leave: Shore leave is available. No special requirements.
Customs: Handguns cannot be brought ashore. Many food items cannot be brought ashore.
Telephone Country Code: 64 Long-Distance Code: 0
City Code: 9
Police/Fire/Ambulance: 111
International Seafarers' Centre: (9) 373-4352
ITF New Zealand Waterfront Workers' Union:
(9) 358-0650

Hong Kong, China
Lat./ Long.: 22°15' N, 114°11' E
Time Zone: GMT + 8
Currency: Hong Kong dollar (HK$); 1 HK$ = 100 cents
Languages: Chinese (Cantonese), English
Climate: Tropical monsoon. Cool, humid winters; hot, wet summers. Average June rainfall: 18 in./45 cm. Warm and sunny fall.
Shore Leave: There are no restrictions when staying 14 days or fewer.
Telephone Country Code: 852
Director of Marine Shipping Division: 852-4404
Apostleship of the Sea–Mariners' Club, #2 Container Port: (03) 425-8077
Danish Mariners Club, Container Port Kwai Chung, Kowloon: (24) 286-771
The Mariners' Club: (03) 425-8077
Apostleship of the Sea–Hong Kong–Mariners' Club, 11 Middle Road, Kowloon: 2-368-8261 ✝
Hong Kong Seamen's Union: 2-384-2279/2-332-0766

Jakarta (Tanjung Priok), Indonesia
Lat./ Long.: 6°08' S, 106°45' E
Time Zone: GMT + 7
Currency: Rupiah (Rp); 1 Rp = 100 sen, but the sen is no longer used.
Languages: Bahasa Indonesian (form of Malay), English, Dutch
Climate: Tropical. Hot and humid.
Health: Tap water is not potable. Do not eat unwashed raw foods or undercooked meat.
Shore Leave: You need a shore pass issued by the Malaysian Port Authority, plus a passport or Seaman's Book for identification.
Telephone Country Code: 62 Long-Distance Code: 0
City Code: 21
Police: 430-1080 x6400 Fire: 430-1080 x2222
Ambulance: 440-3026 x199
Apostleship of the Sea–Seafarers' Centre:
(21) 494-667/539/543
Deutsche Seemannsmission–Seafarers' Centre:
(21) 494-667/539/543
Wisma Pelaut International–Seafarers' Centre:
(21) 494-667/539/543
ITF (Kesatuan Pelaut Indonesia): (21) 314-1495

Manila, Philippines
Lat./ Long.: 14°40' N, 121°00' E
Time Zone: GMT + 8
Currency: Peso (P); 1P = 100 centavos
Languages: Tagalog, English
Climate: Tropical. Rainy season is May to November.
Health: Do not drink the tap water.
Shore Leave: Crew members from countries with which the

Philippines has diplomatic relations are allowed shore leave. You must obtain a shore pass from the Immigration officer in the port. Sufficient crew must remain on board the vessel to manage the vessel in case of unforeseen incidents.
Telephone Country Code: 63 Long-Distance Code: 0
City Code: 2
Police: 59-90-11 Fire: 47-43-24 Ambulance: 62-38-58
Philippine Coast Guard: 483-257
Apostleship of the Sea, Pope Pius XII Catholic Center:
(2) 524-3167 †
Seamen's Center of the Associated Marine Officers' and Seamen's Union of the Philippines (members only):
United Seamen's Service, Manila International Seafarers' Center: (2) 527-2585/63 or (2) 527-2638
ITF: (2) 863-011

Singapore
Lat./ Long.: 1°16' N, 103°50' E
Time Zone: GMT + 8
Currency: Singapore dollars (S$); 1S$ = 100 cents
Languages: Chinese, Malay, Tamil, English
Climate: Tropical. Hot, humid, and wet.
Shore Leave: Shore leave is allowed. You will need a Seaman's Book and a passport or photo identification card.
Telephone Country Code: 65
Police: 999 Fire: 995 Ambulance: 995
Marine Department: 278-5611
Danish Seamen's Church: 274-6344
Dutch Seamen's Mission:
Korean Seamen's Mission: 354-9382
Stella Maris Maritime Club:
Japanese Seamen's Centre: 221-8621/8262

Ministry to Netherlands Seamen: 272-5000 ✝
Missions to Seamen: 737-2880 ✝
Norwegian Seamen's Mission: 775-7835 or 775-7628
✝
Norwegian Government Seamen's Service: c/o Norwegian Seamen's Mission (above)
Singapore Mariners' Club, Maritime House:
ITF: 336-2388

Sydney, Australia
Lat./ Long.: 33°55' S, 151°10' E
Time Zone: GMT + 10
Currency: Australian dollar ($A); 1$A = 100 cents
Language: English
Climate: Seasonal. Mild winter. Winter months are May to September. Sweater or overcoat needed in winter.
Shore Leave: There are no restrictions on shore leave. Your passport and Seaman's Book must be left with the ship master.
Telephone Country Code: 61 City Code: 29
Police/Fire/Ambulance: 000
Apostleship of the Sea:
Deutsche Seemannsmission:
Missions to Seamen, Flying Angel, International Seafarers' Centre: (29) 264-9900
Stella Maris Centre:
Mobile: 0-418-724-713
ITF Boomerang Seafarers' Club: (29) 669-3538
ITF: (29) 267-9134

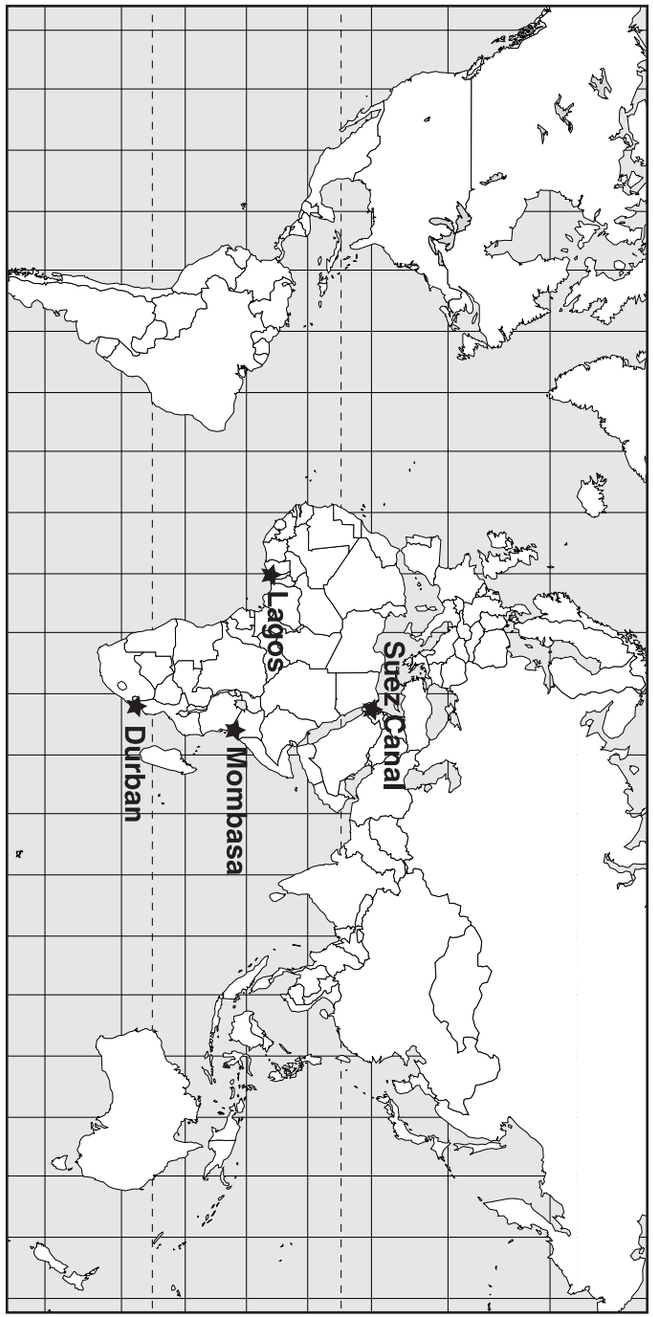
Yokohama, Japan
Lat./ Long.: 35°27' N, 139°38' E

Time Zone: GMT + 9
Currency: Yen (Y); 1Y = 100 sen
Language: Japanese
Climate: Seasonal. Rainy in the summer, especially during July.
Shore Leave: Shore leave is allowed for up to three days. You need a shore landing pass from the local immigration official.
Telephone Country Code: 81 Long-Distance Code: 0
City Code: 45
Police: 110 Fire/Ambulance: 119
Maritime Safety Agency, Yokohama (Coast Guard): (45) 201-4522
Apostleship of the Sea: (45) 662-1871 ✝
Missions to Seamen, Stella Maris, Deutsche Seemannsmission, Flying Angel Club: (45) 662-2231 ✝
Norwegian Government Seamen's Service:
United Seamen's International Service Center: (45) 623-2231
Yokohama International Seamen's Hall: (45) 681-2358
ITF: (45) 201-7172 or 623-5693

Ports of Africa

The ports selected here are in Egypt, Nigeria, Kenya, and South Africa.

Durban, South Africa
Lat./ Long.: 29°53' S, 31°00' E
Time Zone: GMT + 2
Currency: Rand (R); 1R = 100 cents
Languages: English, Afrikaans
Climate: Mild, warm.



Ports of Africa

Shore Leave: Shore leave is allowed. You are advised to carry some photo identification.
Telephone Country Code: 27 Long-Distance Code: 0
City Code: 31
Police: 310-2714 Fire: 62333 or 4502222 Ambulance: 62333
Seafarers' Center at Bayhead: (31) 466-1326/7 †
International Sailors' Society: 113 Umbilio Road, Durban P.O. Box 18148 Dalbridge 4014 Tel: 3014380
Deutsche Seemannsmission: (31) 254-953 †
Flying Angel Chaplaincy and Missions to Seamen:
ITF: (031) 257 318/319

Lagos, Nigeria
Lat./ Long.: 6°27' N, 3°24' E
Time Zone: GMT + 1
Currency: Naira (N); 1N = 100 kobo
Languages: English, Hausa, Yoruba, Ibo, Fulani
Climate: Warm year-round.
Health: Do not drink the tap water.
Shore Leave: Shore leave is allowed after clearance by Health and Immigration authorities.
Telephone Country Code: 234 City Code: 1
Police/Fire/Ambulance: 199
Apostleship of the Sea
Seafarers' Club: (1) 587-1357
Maritime Workers' Union of Nigeria: (1) 87-01-17/19

Mombasa, Kenya
Lat./ Long.: 4°4' S, 39°40' E
Time Zone: GMT + 3
Currency: Kenya shillings (KSh); 1 KSh = 100 cents
Languages: English, Kiswahili (Swahili)

Climate: Tropical; humid and hot. There are two rainy seasons: October–November and March–May.
Health: Tap water everywhere but in Nairobi is unsafe! Train travel is unsafe because of poor maintenance and safety standards.
Shore Leave: Shore leave is allowed for all crew members. You must have a shore pass from the Port Authority. Shore leave for crew members from socialist countries is restricted to Mombasa Island.
Telephone Country Code: 254 City Code: 11
Police: 567-444 Fire: 1333 Ambulance: 33
Apostleship of the Sea, P.O. Box 85656 †
Deutsche Seemannsmission:
Missions to Seamen: (11) 312-817 or 226-152 †

National Seamen's Union of Kenya, P.O. Box 96132, Mombasa. Tel.: (11) 31 28 17
Dockworkers' Union, P.O. Box 98207, Mombasa. Tel.: (11) 49 14 27 and 49 14 90

Suez Canal/Port Said, Egypt
Lat./ Long.: 31°15' N, 32°19' E
Time Zone: GMT + 2
Currency: Egyptian pound (E£), 1E£ = 100 piasters
Languages: Arabic, English
Climate: Desert. Hot, dry summers; mild winters.
Health: Do not swim or walk barefoot along the Nile River. The Nile contains the bilharzia parasite. Do not eat undercooked meats, which can transmit Rift Valley fever (RVF).
Shore Leave: Shore leave is allowed. You will need a shore pass, which the agent usually obtains for you.

Customs: You must declare all valuables, jewelry, and electronic items brought into Egypt.
Other: Drug enforcement is very strict. The death penalty may be imposed for smuggling marijuana, hashish, opium, LSD, and other illegal drugs.
Telephone Country Code: 20 Long-Distance Code: 0
City Codes: Suez: 62; Port Said: 66
Missions to Seamen, The Church of the Epiphany: (66) 221-617
Norwegian Government Seamen's Service: (66) 224-706
General Trade Union of Maritime Transport: (2) 93-03-05/(2) 91-77-76

Part 3 The Sea and Regulations

Chapter 7

The Sea Environment

SEA DYNAMICS

Ocean water is always moving. It is pulled by the moon's gravity (tides) and is affected by the earth's spinning movement. It is blown by the winds. It evaporates and is replenished by rainfall and fresh water from rivers and streams.

In the tropical Atlantic, the ocean is evaporating faster than it is being replenished with rainwater, hence it is becoming saltier.

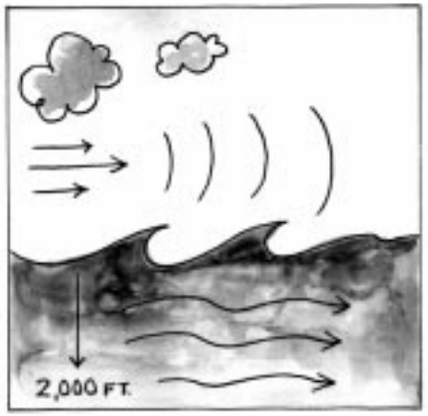
The ocean currents and temperatures play a crucial part in determining weather on both the sea and the land. For more on weather, see chapter 9, p.171.

Convection Currents

Convection currents carry warm surface water away from the equator toward the poles. The water then cools and sinks to great depths before flowing back toward the equator.

Deepwater Currents

Even though the ocean waters are constantly moving, the extent of this motion is unseen, because it is happening far below the surface. The cool waters from the polar regions sink and flow toward the equator. The waters from the polar regions are very dense, because they are very cold and have high salt content. When ice forms on the surface of the water



in the polar regions, it is almost salt free. So the remaining water underneath becomes saltier. The dense polar waters sink all the way to the ocean floor. The path these deep, cold currents take is frequently dictated by the shape of the ocean floor. Underwater ridges and trenches channel the currents. The North Atlantic deepwater current, for example, carries high-saline/water all the way to the South Atlantic. These deepwater currents move slowly, at only a fraction of the speed of wind-driven surface currents. These deep currents are important because they are the only currents that move water between ocean basins. These currents also carry mineral deposits from the ocean floor.

Stirred by the Wind

Winds that blow strongly in the same direction for extended periods of time, such as trade winds, push the ocean surface waters. (See chapter 9 for more on trade winds.) The surface waters pull on the deeper waters. The ocean is affected by the winds as far down as 2,500 feet (763 meters). These wind currents carry water toward the continents, where it is deflected by the land and forced to flow along the coast.

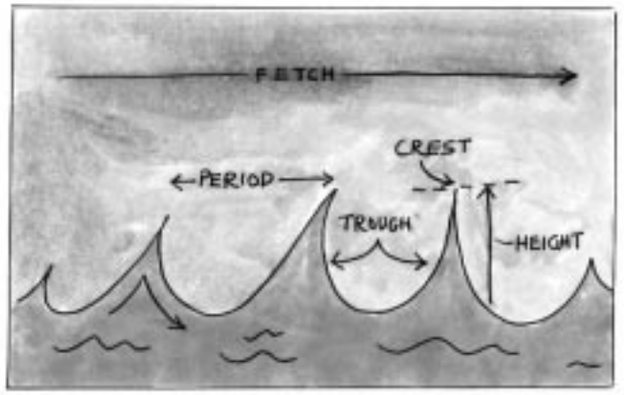
Coriolis Force

The spinning movement of the earth creates a force that affects both ocean currents and wind currents. It affects the direction of wind, the rotation of storms, and the direction of whirlpools. This so-called Coriolis force pushes clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere. The Coriolis force is responsible for water forming a circular pattern when it flows into a drain. The Coriolis force is also responsible for creating the spiraling winds in a hurricane or waterspout.

Large-Scale, Wind-Driven Currents: Gyres

The major wind-driven surface currents follow circular paths around each of the major ocean basins. Three elements combine to create this pattern: the wind, the Coriolis force, and the continents (which act as dams). The groups of currents that make up a circle are called *gyres*. The gyres circulate water in circular patterns that move water clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere.

The currents that make up a gyre do not all have the same speed. The currents that flow along the western margins of an ocean basin are narrower, and the water-flow rate is much faster. The Gulf Stream current on the western edge of the Atlantic flows at approximately 9 kilometers per hour, while the Canary current on the eastern edge of the Atlantic flows at approximately 1 kilometer per hour. The currents bring nutrients from the coastal waters into the deeper waters. Many marine animals follow these currents.



WAVES

All waves are created by the wind pushing on the water except those created by earthquakes.

The surface of the sea responds to pressure changes created by the wind and becomes rippled. If the wind persists from the same direction, the ripples grow into larger waves. Very large waves need time and distance to form. A very large wave cannot form in an enclosed bay, because there is not enough space for it to travel in one direction and grow.

Waves can travel long distances—thousands of miles. When the wave travels, it is energy that is traveling—not water. The water that makes up a wave travels up and down, but it does not travel horizontally with the wave.

WAVE TERMS

Fetch — the distance that a wave has traveled in a constant direction

Period — the time between two wave crests

Trough — the trench between waves

Crest — the wave top

Height — the vertical distance between wave trough and crest

DEEPWATER ENVIRONMENT

Ocean basins account for 42 percent of the oceans' underwater floor. These areas are called the *abyssal plains*, are covered with sediments more than 30 feet (9 meters) deep.

There are also underwater hills and mountains, called *seamounts*. They are more than 3,300 feet (1,000 meters) tall and are actually underwater volcanoes. It is estimated that the Pacific Ocean contains about 10,000 seamounts.

Living things are present everywhere in the ocean, including the deepest seas. Most fish exist in the top 100 feet (31 meters). The fish are most plentiful where currents bring up deeper and more mineral-rich water. There are fewer fish in deeper water because there is less sunlight.

In some deepwater areas, underground volcanoes release chemicals that contain sulfur and provide nutrients for deep-sea marine creatures. While oceans are full of life close to the surface, you'll find the greatest variety of marine animals far below. Most of the bony fish found in the deep sea are only a few centimeters long, although some squid and oarfish can exceed 50 feet (15 meters) in length.

COASTAL ENVIRONMENT

The coastal shelves currently make up about 10 percent of the total ocean area. The sea floors on the continental shelves are made of the same materials as the adjoining land.

The water above the continental shelves is shallow (less than 450 feet, or 135 meters) and of nearly constant depth. This water has excellent sunlight penetration, is full of plant and fish nutrients, and is well mixed. It is a prime environment for many marine plants and animals. The plants and animals that live here are highly adaptable. Coastal waters warm up during the day and cool off at night. They also warm during the summer. The salinity of coastal waters changes with the flow rates of rivers that empty into the ocean.

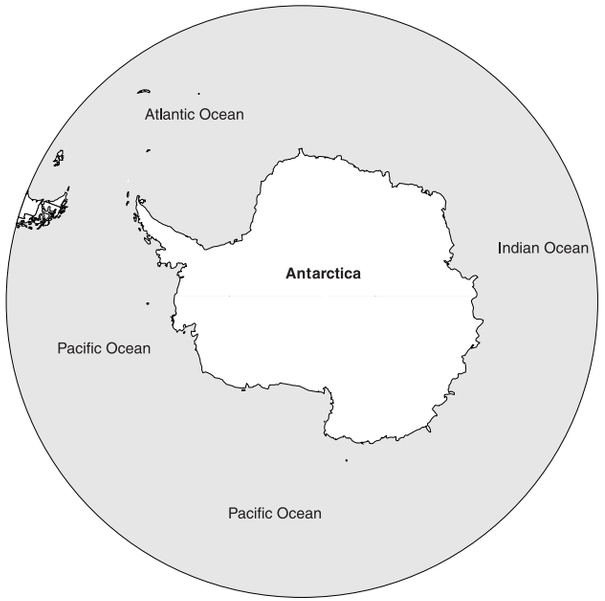
The continental slopes are the areas just beyond the continental shelves. The layer of water just above the sea bottom

is murky. It contains sediment and microscopic marine animals that filter out much of the sunlight. The sea floor here has many hollows, crevices, and canyons. In these dark spaces live starfish, sea urchins, and flounder. This environment is very rich with marine life. Today, the coastal habitats are the most endangered. They suffer from pollution and from overfishing.

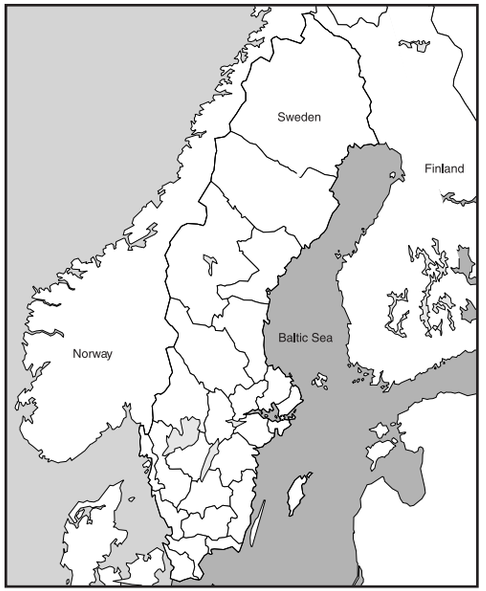
ESPECIALLY VULNERABLE BODIES OF WATER

Several bodies of water are especially vulnerable to pollution because of their ecological conditions and their traffic patterns. These "Special Areas" require extra care to protect them from pollution damage.

Antarctic



The continuous cooling, sinking, and mixing of water in the Antarctic create an environment where nutrients are plentiful at all depths. During the short summer, the surface layer of water is exposed to sunlight 24 hours a day. Phytoplankton (simple aquatic plants) bloom, and zooplankton (simple aquatic animals) multiply. The dominant species is krill—food for penguins, flying birds, seals, fish, and whales. Baleen whales migrate to the Antarctic during the summer, and each baleen whale consumes approximately 850 liters of krill each day.



Baltic Sea

The Baltic Sea is a portion of the North Atlantic that separates the Scandinavian countries from the northern coast of Europe. Two long gulfs—the Gulf of Finland and the Gulf of Bothnia—extend from the northern and eastern sides of the

Baltic Sea. The Baltic Sea is relatively shallow and well mixed. Rainfall and runoff from rivers exceed evaporation. The water has low salinity, high levels of nutrients and dissolved oxygen, and plenty of sunlight. These are favorable conditions for many marine animals, including seals, porpoises, fish, and birds.

About nine million birds (approximately 30 species) use the Baltic Sea as a wintering area. The very large concentration of seabirds in the Baltic Sea heightens the environmental risks associated with petroleum shipping in this region during the winter. A single oil spill could kill a large portion of the European seabird population.

The first convention for protecting the Baltic Sea marine environment was signed in 1974. Another convention was signed in 1992. These conventions address all sources of marine pollution, including land-based discharges, ship discharges, and air pollution. The administering body is the Helsinki Commission (HELCOM). The conventions also require the member nations to establish port facilities for the reception of residues of oil, harmful substances other than oil, sewage, and garbage.

Black Sea

The Black Sea is of immense importance to the nations of Bulgaria, Georgia, Romania, Russia, Turkey, and Ukraine. The Black Sea is used for fishing, mineral extraction, tourism, and trade. Unfortunately, it has also been used for disposal of land wastes. It is linked to the Aegean and Mediterranean seas by the narrow Bosporus Strait, the Sea of Marmara, and the Dardanelles. The water exchange between

the Mediterranean and the Black Sea is minuscule. It takes hundreds of years for water in the lowest layer of the Black Sea to be replenished with Mediterranean water. Many, many years ago (possibly centuries), the dissolved oxygen in that lowest layer was consumed, and today no plants or animals live in that lowest layer of the Black Sea.

The Black Sea is fed by many rivers that carry many nutrients, so the surface layers are full of life. The Black Sea's watershed covers about one-third of Europe. (The watershed is the land area that contains streams and rivers that ultimately feed a sea.) Fertilizers and sewage from this immense area find their way into the Black Sea, where they become nutrients for phytoplankton. In recent years, too many such nutrients have reached the Black Sea.

The Black Sea environment is now in crisis, but that situation should improve thanks to the Black Sea Environmental Program (BSEP) formed by Bulgaria, Georgia, Romania, Russia, Turkey, and Ukraine in 1993. These nations are developing and implementing uniform laws to prevent Black Sea pollution.

Mediterranean Sea

The Mediterranean Sea is approximately five times the size of the North Sea. It has an average depth of almost 5,000 feet (1,500 meters), which is about half the depth of the Atlantic. The Mediterranean is located in an area that is warm and does not receive much rainfall.

The Mediterranean Sea has a unique mixing pattern. Because its evaporation is greater than the water replenishment from rivers, the surface waters of the Mediterranean

gradually become more saline. As this happens, the surface waters become more dense and sink. Near the sea bottom, the currents flow from east to west, as high-saline water pushes into the Atlantic. Near the surface, the primary currents are from west to east, as ocean water moves in to replace the water that has evaporated. These surface waters that come from the Atlantic are low in nutrients. The river waters do contain nutrients, but these waters sink and move back toward the ocean. The Mediterranean is not very productive for fishing.

When sewage wastes are pumped into the Mediterranean from cities on land, they disperse poorly and settle into the basins. The bacteria that decompose the sewage use up dissolved oxygen, which further hurts the fish population.

In 1976 the United Nations organized a Conference of

Mediterranean Governments. These nations agreed to work together to combat pollution from oil and other harmful substances. They established the first Regional Oil Combating Centre in Malta.

Persian/Arabian Gulf

The Persian/Arabian Gulf is an arm of the Indian Ocean lying between Iran and the Arabian Peninsula. It is about 220 miles across, 520 miles long, and very shallow. The average water temperature is 36°C (96°F). The Persian Gulf contains the warmest ocean water on earth. The Gulf is connected to the Gulf of Oman and the Arabian Sea by the Strait of Hormuz.

The Persian Gulf is home to porpoises, narwhals, and about 200 species of fish.

Red Sea and Gulf of Aden

The Red Sea is located between the continents of Africa and Asia. It is also located between two of the earth's plates, which are moving away from each other and causing the Red Sea to grow slowly. The Red Sea widens 1 to 4 centimeters per year. Running down the center of this sea is a mountain ridge containing active volcanoes that are adding rich sediments to the sea bottom. These sediments contain iron, zinc, copper, and traces of lead, silver, and gold.

The Red Sea is connected to the Mediterranean Sea by the Gulf of Suez and the Suez Canal. It is connected to the Gulf of Aden (Indian Ocean) in the south by the Strait of Bab al-Mandab. Like the Mediterranean, the Red Sea is located in a warm, dry region, so high evaporation rates cause the surface water to become more salty. The Red Sea is the saltiest sea on earth.

Sargasso Sea—Womb for Eels

The Sargasso Sea is located in the center of the North Atlantic Ocean, between 20° N and 30° N and 48° W and 65° W. The Sargasso Sea does not receive any river water. It is the saltiest area of the Atlantic Ocean. The currents that make up the North Atlantic gyre encircle this sea. The currents bring into the Sargasso Sea millions of tons of sargassum weed, along with the animals that attach themselves to these weeds.

The Sargasso Sea is believed to be the only spawning ground for all the eels that find their way to both the U.S. coastal waters and the European coastal waters. Eels need warm ocean water of moderate depth to spawn. The Sargasso Sea is one of the few places in the world with the right spawning conditions for them. The ocean floor in this area is a nice,

round basin that retains water and allows it to warm up. The newly hatched eels are called *leptocephali.* They look more like fish than eels. They take about three years to reach the coastal waters, where they acquire their eel shape.

North American Great Lakes

The five North American Great Lakes—Erie, Huron, Michigan, Ontario, and Superior—lie in both Canada and the United States. They were formed by glaciers at the end of the most recent ice age, approximately 18,000 years ago. They are not seas. They are freshwater lakes. Together, they have an area of 94,710 square miles (222,637 square kilometers). They provide drinking water to millions of people. Because of their large size, they have much in common with seas. They are connected to the Atlantic Ocean by the St. Lawrence Seaway.

There are regulations on the handling of ballast water that apply only to the North American Great Lakes. These regulations are designed to protect the marine wildlife in these lakes from nonindigenous species. The regulations are part of the Nonindigenous Aquatic Nuisance Prevention and Control Act.

Estuaries and Inland Areas

Estuaries are bodies of water that are partly river and partly ocean. When the ocean is at low tide, fresh water flows down the estuary to the sea. When the ocean is at high tide, seawater flows from the ocean up the estuary. Estuaries are relatively shallow and filled with nutrients. They are the nursery area for many species of fish. About 75 percent of the fish caught by commercial fishermen off the coast of North America spend a portion of their lives in estuaries. Each estuary is different, and the salinity in all estuaries changes daily with the tides.

The salinity varies widely among estuaries since some are fed by small rivers and some by large rivers. The marine life varies from estuary to estuary. Usually there are only a few

different species in each estuary, because only highly adaptable species can survive where temperature and salinity are changing constantly. But those species are large in number because the estuary is so full of nutrients.

Many ports are built on estuaries, so prevention of pollution is especially important. Pollutants can be very damaging because these areas are breeding grounds for fish and the pollutants may remain trapped in the estuary for long periods.

Chapter 8

What is Pollution?

WHAT IS POLLUTION?

Pollution refers to any harmful substances or heat released into the marine environment by people. The harmful substances can be solids, liquids, or gases.

Where Does Marine Pollution Come From?

In 1990 the United Nations estimated that 77 percent of the marine pollution, for that year, was land-based pollution. The waterborne land-source pollution was 44 percent and the airborne land-source pollution was 33 percent. The United Nations also estimated that marine-based pollution was responsible for the remaining 23 percent of the total marine pollution. Marine-based pollution is pollution from marine transportation, marine dumping, and offshore facilities.

POLLUTION TYPES

There are thousands of items that pollute our ocean. We classify them in four pollution groups: garbage, sewage, chemicals, and oil.

Garbage

Why is garbage a problem?

Garbage from ships and cities has been dumped into the sea for many years. The amounts were relatively small and a generation ago garbage dumping was not seen as a problem. Today, the situation is very different. Most nations have curtailed disposal of land-generated garbage into the sea and there are many restrictions on the dumping of ship-generated garbage.

A major reason for the garbage-dumping restrictions is the growing use of plastics that are nonbiodegradable. When plastics are thrown into the sea, they can stay there for many

years. These plastics kill. The ocean is filled with fish that are not fussy about their diet. Many fish eat anything that floats, including bits of plastic. These plastic pieces stay inside the fish and cause the fish to feel full. The fish then starves to death.

Thousands of marine animals, including birds, sea turtles, seals, and whales, die each year when they become tangled in plastic trash.

Plastic trash is also a menace to ships. Plastic debris becomes trapped on propellers and in seawater intakes.

Who Regulates Garbage Dumping in International Waters?

The fifth annex to MARPOL 73/78 regulates the disposal of garbage generated at sea. These regulations went into force on 31 December 1988. See chapter 11 p201 for more information on the regulations. The most important rules are:

Total ban on the disposal of plastics anywhere in the sea.

Severe restrictions on discharges of garbage from ships into coastal waters and "Special Areas." These special bodies of water are: the Mediterranean Sea, the Baltic Sea, the Black Sea, the Red Sea, the Gulfs area, the Gulf of Aden, the Antarctic (oil; Annex I); Baltic Sea

and Black Sea (liquid chemicals; Annex II); Baltic Sea, Mediterranean Sea, Black Sea, Red Sea, Gulfs area, North Sea, Antarctic, wider Caribbean region (garbage; Annex V); and the Baltic Sea as a sulphur emissions control area (air pollution; Annex VI).

Sewage

Why is sewage a problem?

Sewage is the major cause of two serious and related environmental problems: algae blooms and eutrophication.

Sewage contains the nutrients nitrogen and phosphorus, which cause the single-celled plants called algae to multiply rapidly. When the algae population grows and multiplies, it consumes dissolved oxygen needed by the fish. Fish kills usually accompany algae blooms. The blooms of algae float on the water surface, and reducing sunlight penetration. Some algae contain poisons. When these algae are consumed by shellfish, the shellfish in turn become poisonous to humans.

Eutrophication is an aging process that begins when large quantities of nutrients are added to a body of water. First, plant growth is overstimulated. The plants are algae, seaweed, and grasses. Then, fish disappear because there is no dissolved oxygen. Next, a sediment layer composed of dead plants accumulates on the sea floor. The sediment gives off poisonous hydrogen sulfide gas. Over time, the water body fills in and becomes marshland. Sewage from coastal communities has caused eutrophication in many coastal waters.

Who Regulates Sewage Dumping in International Waters?

Sewage disposal from vessels is already regulated or banned in many coastal waters. The fourth annex to MARPOL 73/78 covers sewage disposal in international waters. This annex is not yet in effect, but it will go into effect when 15 major nations ratify it.

When the Annex IV regulations take effect:

Ships will not be permitted to discharge sewage within four miles of the nearest land unless they have in operation an approved onboard treatment plant.

Between 4 and 12 miles from land, sewage must be disinfected before discharge.

Chemicals

Why are chemicals a problem?

There are many kinds of chemicals. Some are nutrients that can cause algae blooms. Some kill fish by removing dissolved oxygen from the water. Some change the water's pH. Some are poisonous.

Marine chemical pollution can be divided into two types. First, there is chemical pollution from chemical supplies. These chemicals are extremely poisonous to marine animals. Second, there is pollution from bulk chemical cargoes. These

chemicals find their way into the marine environment during sloppy loading and unloading operations, or during ship emergencies such as collisions and groundings.

Crew safety and the prevention of accidental pollution are very closely related. Any breach in the integrity of the vessel endangers the safety of the crew as well as the environment.

What are the dangerous chemical supplies?

Some examples of chemicals used on board ships are cleaners, degreasers, paint solvents, paints, and boiler-water additives. *Use these products with care.* Some of these products have safety warnings and require you to use protective equipment. *All of these products are marine pollutants.* Never dump leftover products, or product containers, overboard.

What is being done to reduce pollution from chemical cargoes?

The vessels that carry bulk chemicals are complex. Safety precautions have to be built into the ship and the ship's equipment. Seafarers need training on using the safety equipment and on the chemicals. In 1972 the IMO developed the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (the BCH Code). As of 1986, all chemical tankers are required to be built according to that code.

Annex II of MARPOL 73/78, which entered into force in April 1987, describes requirements for vessels carrying liquid chemical cargoes. These vessels should have an International Pollution Prevention Certificate for Carriage of Noxious Liquid Substances in Bulk (INLS).

The IMO also developed Standards of Training, Certification, and Watchkeeping (STCW) in 1978 and expanded them in 1995. These regulations require shipowners to give seafarers extensive training on all safety equipment and on the chemicals being transported. See chapter 11 for more information on STCW 95 requirements.

What Are the Most Common Chemical Cargoes?

Some common chemical cargoes are sulfur, fertilizers, petrochemicals, liquefied natural gas, caustic soda solutions, and sulfuric acid. Chemical pollution occurs when tankers carrying these chemicals collide with another vessel or with a structure, or are grounded.

What are "dangerous goods"?

"Dangerous goods" are hazardous cargoes. These cargoes are marked with the IMO Dangerous Goods (IMDG) label or placard. See chapter 16 p.301 for more information on hazardous cargoes and the IMDG labeling system.

What is a "noxious liquid"?

"Noxious liquid" means a hazardous *liquid* cargo carried in bulk.

What is a "harmful substance"?

"Harmful substance" means any hazardous, noxious, or other substance that causes pollution if introduced into the sea. The substance may be a solid, liquid, or gas.

Oil

Why is oil a problem?

In terms of quantity, the most serious pollution threat is from oil. Oil kills two ways. First, oil is toxic for several days to many forms of marine life. Second, oil slicks prevent sunlight from penetrating the water, thereby killing plant and animal species that require sunlight.

Seabirds are killed in large numbers by oil spills. Bird feathers normally trap air and help a bird to float. They also keep the bird warm. When a bird lands on or dives through an oil slick its feathers become coated with the oil. The bird frequently dies from exhaustion after struggling to keep afloat and keep warm. The bird can also die from ingesting oil when it attempts to clean its feathers.

What Are the Oil Discharge Regulations?

MARPOL contains some amendments that aim to reduce the number of oil spills from tankers. The 1983 MARPOL amendments ban the carriage of oil in the forepeak tank—the ship's most vulnerable point in a collision. The 1992 amendments require new tankers to be fitted with double hulls, or an alternative design approved by IMO. The 1992 amendments apply to all tankers ordered after 6 July 1993. The amendments are phased in for existing ships, beginning in 1995. See chapter 11 for more information on the regulations.

Another treaty designed to help governments combat major oil-pollution incidents became international law on 13 May 1995. The treaty is the International Convention on Oil Pollution Preparedness, Response, and Cooperation (OPRC). It was adopted in November 1990 by a conference convened by the IMO.

The treaty requires an Oil Pollution Emergency Plan for:

Oil tankers of 150 gross tons and above

Other ships of 400 gross tons and above

Offshore installations

Seaports where there is a risk of pollution

WAYS TO PREVENT POLLUTION

Planned Operations with Potential for Creating Pollution

All planned operations should have procedures that are written and discussed before starting. Safety and environmental concerns should be discussed jointly by crew and officers before the operation begins. The recommendations provided here are general guidelines only.

Disposal of Oil Residues from Oily Bilges and Slop Tanks

DO

Use port facilities for oily bilge and slop-tank waste.

Properly maintain and use oil/water separator to remove oil from bilge waste when in international waters away from any coasts.

Only discharge to the sea during daylight hours, and watch for an oil sheen.

Shut off discharge pump if oil sheen is visible.

Maintain equipment in engine room so that oil leakage and drainage into bilge are minimized; for example, do not overfill oil reservoirs.

DON'T

Allow solvents or detergents to get into bilge or slop water. They interfere with oil/water separator operation.

Discharge slop tank if contents have emulsified or foamed. Emulsions can be separated by a slow heating of the slop tank.

Discharge bilge waste in "Special Areas" (see chapter 7).

Discharge bilge waste if oil/water separator or monitor is not working.

Bypass discharge monitor for regular discharges. *(In a flood emergency, the pump shutoff function of the discharge monitor may be bypassed to keep the bilge pumps running. The monitor should still be recording.)*

Disposal of Garbage

DO

Use port facilities for garbage and recyclables.

Recycle.

Follow ship procedures for separating plastics, food wastes, recyclables, and other garbage types.

Dispose of excess packaging before bringing items on board.

DON'T

Allow plastics or packing materials to go overboard.

Throw anything overboard on your own. All discharges must be approved by officers and properly logged.

Discharge non-food/non-plastic garbage larger than 25 millimeters within 12 nautical miles of shore or within a Special Area.

Discharge food waste smaller than 25 millimeters within three nautical miles of shore outside Special Areas, or within 12 miles of shore inside Special Areas.

Discharge food waste larger than 25 millimeters within 12 nautical miles of shore anywhere.

Tank-Cleaning Operations and Ballasting Operations

DO

Use port facilities for oily ballast water when available.

Use oil/water separators for oily ballast water when more than 12 nautical miles from shore.

Slow discharge pumping rate as oil/water interface is approached.

DON'T

Take on ballast water into any tank that has not been cleaned.

Bypass oil/discharge monitoring equipment.

Disposal of Residues and Noxious Materials from Chemical Tankers

DO

Use port reception facilities.

Know MARPOL limits for chemical residue being handled.

Know hazard information about chemical residue being handled.

Transferring Liquid Cargoes or Fuels

BEFORE STARTING—DO

Have a safety briefing. Discuss hazards and safety equipment.

Have suitable absorbent materials available on deck.

Plug deck scuppers.

Have portable emergency transfer pump ready.

Close all sea valves and overboard valves.

Establish communication between off-loading vessel and on-loading vessel. Arrange an emergency stop signal.

DURING PUMPING—DO

Check the sea regularly for signs of leaks.

Ensure good communication between people on deck and people in cargo control room.

Leave enough ullage in cargo tanks for line drainage and thermal expansion.

DON'T

Top off tanks at full loading rate. Go slowly.

Disconnect hoses before they have drained. Remember to vent them so they can drain.

Machinery Operations with Potential to Pollute

Some pieces of machinery can cause pollution when they malfunction. If you are assigned to engine-room watch, be familiar with all the machinery and know the possibilities for oil pollution that can come from internal equipment problems. Here are some examples:

All air compressors carry over a trace of oil into the compressed air receiver. This oil is removed by a coalescing filter. An air compressor with worn or incorrect seals can carry over large quantities of oil. The oil will then overwhelm the filter and be drained out with the condensed moisture in the air-cooler section of the air compressor.

Oil coolers and heat exchangers can pollute if oil seeps through a tube leak to the water side.

Oil can carry over into an inert gas scrubber and be discharged with the scrubber discharge.

ADDITIONAL SOURCES OF INFORMATION

Guerrini, Francesco, *The Great Book of the Sea: A Complete Guide to Marine Life.* Courage Books, Philadelphia, 1993.

Managing Oily Waste and Garbage from Ships. U.S. Coast Guard, Marine Environmental Protection Division, 1994.

Parker, Henry S., *Exploring the Oceans.* Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1985.

United Nations Links to Environmental Treaties: http://www.unep.ch/

Chapter 9

Weather

Weather is something we like to talk about and something for which we wish we could plan better. In most places on earth, the weather is constantly changing, and we are constantly guessing what tomorrow's weather will be.

This section describes two phenomena you can use to predict the weather: *wind* and *atmospheric pressure.* This section also describes two types of violent storms you might encounter at sea: *waterspouts* and *tropical revolving storms* (hurricanes, typhoons, cyclones).

WIND

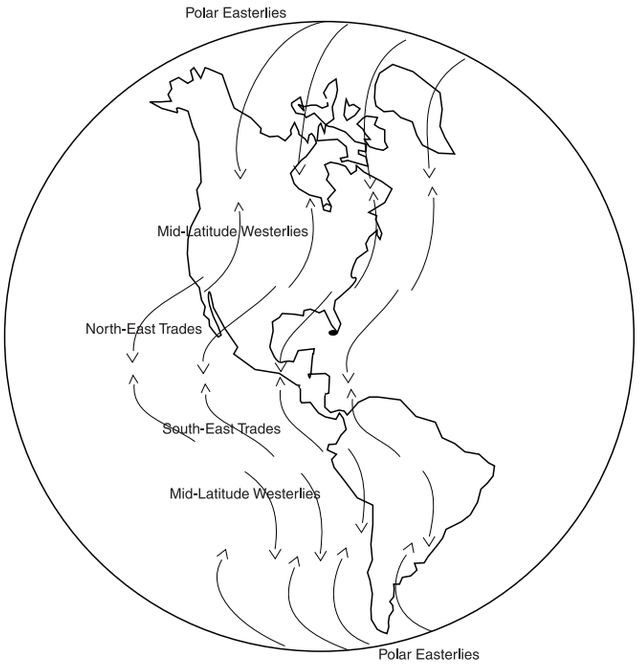
There are some things about weather that are remarkably constant. One of these is general wind directions. Usually, the steady winds blow from the same direction. This is because some underlying causes of wind do not change:

The earth and the air at the equator are warmer than at the poles. This creates an air circulation pattern. Warm air rises and blows toward the poles whereas cooler air sinks and blows toward the equator.

The earth rotates from west to east, dragging the air with it as it rotates.

The Coriolis force changes wind direction. This force, generated by the spinning movement of the earth, also affects the currents. For more information on the Coriolis force, see chapter 7 p139.

The three underlying causes of wind direction combine to create the earth's normal wind pattern, as shown here:



Here is a summary of the earth's wind zones:

The Intertropical Convergence Zone (ITCZ), also called Equatorial Convergence Zone, is a belt of converging trade winds and rising air that encircles the earth near the equator. Its precise location changes from day to day. It lies slightly in the Northern Hemisphere when it is summer in that hemisphere. It lies slightly in the Southern Hemisphere when it

is summer there. Low-level northeasterlies from the Northern Hemisphere and southeasterlies from the Southern Hemisphere meet here. The rising air produces frequent thunderstorms and heavy rainfall. When the surface air is calm the regular winds are very light and are called the *doldrums*.

The *Tropical Zones* extend from the ITCZ to the tropics of Cancer and Capricorn. In the Northern Hemisphere, the winds in this zone are called the northeast trade winds. In the Southern Hemisphere, the winds in this zone are called the southeast trade winds.

One *Midlatitude Zone* lies to the north of the tropic of Cancer. The other Midlatitude Zone lies to the south of the tropic of Capricorn. The normal winds in these zones blow from the west and are called the changeable westerlies. In the Southern Hemisphere, these winds are also called the Roaring Forties.

The *Polar Wind Zones* surround the North and South Poles. The winds near the North Pole blow from the northeast. The winds near the South Pole blow from the southeast. These winds are called the easterlies.

In many locations, local geographical features (usually mountains) channel airflow into very predictable winds that have names. The table below lists some of these.

BORA	Cold northeasterly across the Adriatic Sea.
BURAN	Cold northeasterly over central Asia.
CHINOOK	Warm, dry westerly in North America just east of the Rocky Mountains.
ETESIAN	Summer winds that blow from the north across the Aegean Sea.
KHAMSIN	Dry, dusty southerly in Egypt. The same wind in Sudan is called the *Haboob*.
LESTE	Hot, dry southerly in North Africa. The same wind in Spain is called the *Leveche*.
LEVANTER	Humid easterly that causes storms near the Strait of Gibraltar.
MISTRAL	Cold, dry northerly over the Mediterranean coast of France and northwestern Italy.
PAMPERO	Squally southwesterly that brings cold weather to Argentina and Uruguay.
SIROCCO	Hot, dry southerly from northwestern Africa that picks up moisture over the Mediterranean and brings cloudy weather to Italy and France.

ATMOSPHERIC PRESSURE

Atmospheric pressure, also called barometric pressure, is the force per unit area exerted by an atmospheric column (that is, the weight of the entire column of air above the specified area). The air is composed of several gases that have mass and weight. The weight of the atmosphere is different in dif-

ferent locations. The atmospheric pressure decreases as you go higher on a mountain because the air decreases. The small variations in pressure largely determine the wind and storm patterns of the earth. The atmospheric pressure changes when air temperature or humidity changes. Cold, dry air is heavier than warm, dry air. Dry air is heavier than moist air. Steam rises because water vapor is lighter than air.

The atmospheric pressure can change dramatically when tropospheric winds pump additional air into or out of a section of the atmosphere. Violent storms can form in these areas of low pressure.

Interpreting Barometer Readings

We use a barometer to detect changes in atmospheric pressure. Barometer readings tell us the nature of the new air mass blowing toward us. The barometer calculates atmospheric pressure by measuring the distance that a column of mercury (Hg) moves when the weight of the atmosphere pushes on it. That is why barometer readings have traditionally been recorded in inches or millimeters. Today, most weather maps and weather forecasts give atmospheric pressure in millibars (mb). A millibar is a metric unit of pressure.

Normal Atmospheric Pressure	29.92 inches Hg	760 mm Hg	1010 mb

When new air masses and weather systems move into an area, the barometer reading will change. Below are guidelines for interpreting changes in barometer readings.

Falling Barometer

When the fall is from normal and the temperature and humidity are rising—expect rain.

When the fall is sudden and there is wind—expect more severe wind.

When the fall is faster than 0.04 inch per hour (1.35 mb/hr)—expect heavy winds.

Rising Barometer

When the rise is from normal and the temperature and humidity are falling—expect less precipitation and winds.

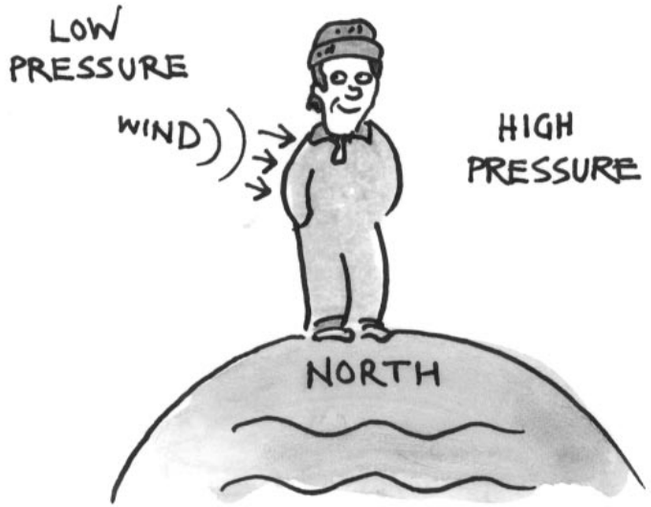
When the rise is from below normal (about 29.5 inches/749 mm/996 mb)—expect less wind or less precipitation.

When the rise is from very low (29 inches/737 mm/979 mb)—expect strong winds.

A very rapid rise—expect unsettled weather.

Buys Ballot's Law

If you stand with your back to the wind in the Northern Hemisphere, low pressure is to your left and high pressure is to your right. The reverse is true in the Southern Hemisphere.



WATERSPOUTS

Waterspouts are very violent wind storms with a very recognizable funnel cloud. They are similar to tornadoes, and when they move over land they become tornadoes. In the North Atlantic Ocean, waterspouts usually appear between May and October. They form over the warm waters of the Gulf of Mexico and the Florida Straits. Waterspouts often form in groups, and groups of waterspouts often form around hurricanes.

Waterspouts have these characteristics:

They have very powerful spiraling winds with a maximum wind speed of about 150 mph.

They do not last long; their average duration is 15 minutes.

They move very fast. Their average speed is 20 mph. Maximum speed is about 50 mph.

The center of the waterspout is an area of extreme low pressure, possibly as low as 23 inches/580 mm/ 780 mb.

When the waterspout's funnel tip drops down and touches the sea surface, it sucks the sea upward—pulled by the partial vacuum that exists inside the funnel.

TROPICAL REVOLVING STORMS

Tropical revolving storms (TRS) are a special type of violent windstorm—the most destructive type of storm. They form in the tropics around areas of low pressure, and when they have reached full strength, they have wind speeds of 100 knots or more. They have great masses of clouds that spiral into the low-pressure center. They bring very heavy rain. They are not as violent as a tornado or waterspout, but they

cover huge areas of the sea with their high winds and rains and last for days. The winds of a TRS often cover a circular area more than 500 miles in diameter.

Tropical revolving storms are known by several names, including:

Typhoon or cyclone, in Asia

Tropical cyclone or *baguio*, in the Philippines

Willy-willy or williwaw, in Australia

Hurricane, in North America

Tropical revolving storms form in a region just north of the equator (from 5°N to 30°N) or just south of the equator (from 5°S to 30°S), when the ocean is warmer than usual. The water needs to be 80°F/26.7°C. (In 1995 the sea-surface temperature in this area of the North Atlantic was 82.4°F/28°C. There were 19 hurricanes and tropical storms that year.) The TRS season for each hemisphere is late summer to early fall, because that is when the sea is the warmest. There are four conditions needed to produce a hurricane:

Diverging winds in the high troposphere, creating an area of low pressure

Hot, humid air in the lower layers of the atmosphere

Warm sea-surface temperature

Correct latitude to produce cyclical winds

Hurricanes that form in the North Atlantic usually travel southwest, then west, and then northwest. If they reach the latitudes of westerly winds, they turn northward. The average speed for an Atlantic hurricane is about 12 mph. This speed increases when the hurricane turns and moves northward. The average life of a hurricane is nine days. During that lifetime, it travels about 2,600 miles.

The first sign of a hurricane is the storm swell. These are giant waves that travel at 30 mph or more. They can be seen 400 to 500 miles ahead of the hurricane. The swell waves have a lower frequency, or beat, than regular waves. There are approximately four swells per minute. (There are usually seven to eight regular waves per minute.) The barometric pressure also falls as a hurricane comes closer. It reaches its lowest point in the eye of the hurricane, where it is about 25 inches/635 mm/846 mb.

BEAUFORT SCALE

The Beaufort Scale is used to approximate the wind speed from the wind's effect on the sea.

Beaufort Number	Wind Speed (knots)	Wind Speed (knots per hour)	Description
0	<1	<1	CALM Sea like a mirror.
1	1 - 3	1 - 5	LIGHT AIR Small ripples.
2	4 - 6	6 - 11	LIGHT BREEZE Small wavelets.
3	7 - 10	12 - 19	GENTLE BREEZE Large wavelets. Crests break. Glassy foam.
4	11 - 16	20 - 28	MODERATE BREEZE Small waves.
5	17 - 21	29 - 38	FRESH BREEZE Moderate waves. Chance of some spray.
6	22 - 27	39 - 49	STRONG BREEZE Large waves. Extensive foam crests. Probably some spray.
7	28 - 33	50 - 61	MODERATE GALE (OR NEAR GALE) Sea heaps up. Foam from breaking waves is blown in streaks.
8	34 - 40	62 - 74	FRESH GALE (OR GALE) Moderately high waves. Foam is blown in well-marked streaks.
9	41 - 47	75 - 88	STRONG GALE HIGH WAVES. Dense foam streaks along wind direction. Crests of waves topple and roll over.
10	48 - 55	89 - 102	WHOLE GALE (OR STORM) Very high waves. Whole surface of sea becomes white. Tumbling of the sea becomes shocklike. Visibility is affected.
11	56 - 63	103 - 114	STORM (OR VIOLENT STORM) Extremely high waves large enough to hide a small ship. Everywhere the edges of the wave crests are blown to froth. Visibility is affected.
12 - 17	64 and above	117 and above	HURRICANE The air is filled with foam and spray. Sea is completely white with spray. Rolling of the sea is heavy and shocklike. Visibility is very seriously affected.

WEATHER TERMS

Air mass. A large body of air that is moving across land or water and has about the same temperature and humidity. Air masses have properties similar to the part of the earth surface from which they came. Air masses that form over the desert are warm and dry. Air masses that form over the ocean have high humidity.

Atmospheric pressure. The weight of the atmosphere directly above a piece of earth. This force is also called *barometric pressure.*

Climate. The average weather for an area. It includes the average temperatures and the average rainfall and snowfall over many years.

Forecast. A prediction of what the weather will be. It is usually based on wind speed, air temperature, air humidity, and atmospheric pressure.

Front. The boundary between a mass of warm air and a mass of cool air. The expected weather along the front is layer-type clouds, fog and drizzle, poor visibility, and calm or steady winds. In a *warm front,* warm air is replacing cooler air. The expected weather contains cirrus clouds. In a c*old front,* cool air is replacing warmer air. The expected weather contains stratocumulus clouds. Cold fronts generally move faster than warm fronts.

Frontal zones. Narrow zones within which the temperature changes quickly. These zones usually indicate rain or snow and strong winds.

Gale. A strong wind that is less violent than a hurricane but stronger than a stiff breeze. It ranks from 7 to 10 on the Beaufort Scale.

High. An area of high pressure. In general, a high is a region of fair weather, except at its outer edges, where there are fronts.

Hurricane. A strong tropical cyclone storm with heavy rain that covers a large area, has winds over 74 mph, and forms over the ocean in the ITCZ (see below). It measures 12-17 on the Beaufort Scale.

Intertropical Convergence Zone (ITCZ). A region in the Atlantic Ocean where the northeast and southeast trade winds converge and could become tropical systems.

Isobar. A line drawn on a weather chart through points of equal barometric pressure.

Low. An area of low atmospheric or barometric pressure. A low comes before a storm. The faster the barometric pressure falls, the more severe the storm is likely to be.

Storm surge. A surge of water that crashes on shore as a result of the churning by a hurricane. This is usually the most dangerous part of the storm.

Swell. A very large wave that is the first sign of an approaching hurricane or typhoon. Swell waves are taller and farther apart than regular waves. They come at a frequency of about four waves per minute.

Tornado. A strong windstorm with funnel-shaped clouds that are sometimes called *funnel clouds.* Tornadoes that form over water are called *waterspouts.*

Tropical cyclone. A huge storm that forms in an area of low atmospheric pressure and has spiral winds of 74 mph or more. It is also called a *hurricane* in the Northern Hemisphere and a *typhoon* in the Southern Hemisphere.

Tropical depression. A storm that forms in an area of low atmospheric pressure and has winds of less than 39 mph.

Tropical storm. A storm that forms in an area of low atmospheric pressure and has spiral winds between 39 and 73 mph.

Tropical storm (hurricane) warning. An advisory stating that a tropical storm (hurricane) is imminent within 24 hours.

Tropical storm (hurricane) watch. An advisory stating that a tropical storm (hurricane) might occur within 36 hours.

Trough. An elongated area of low pressure where poor weather is expected.

Typhoon. A huge storm that forms in an area of low atmospheric pressure and has spiral winds of 74 mph or more. It is also called a *tropical cyclone.*

ADDITIONAL SOURCE OF INFORMATION

Hardy, Ralph, *Teach Yourself Weather,* NTC Publishing Group, Lincolnwood, IL, 1996.

Chapter 10

Navigation

The process of finding your way from one place to another is called navigation. This chapter provides a simple introduction to navigational methods. It also provides an introduction to navigational instruments and charts.

There are four basic ways to navigate at sea: coastal navigation, dead reckoning, electronic navigation, and celestial navigation. *Coastal navigation* is used when the ship is near the coastline or in a channel and uses landmarks and man-made "aids to navigation". The other navigation methods are used in the open water, where there are no landmarks. *Dead reckoning* means calculating the ship's position from logged data concerning ship headings and speed. *Electronic navigation* uses signals transmitted by land-based radio systems and by satellites. *Celestial*

navigation requires extensive knowledge of the positions of the sun, moon, and stars and is being used less and less.

Large vessels generally use all forms of navigation, although dead reckoning and celestial are becoming less important as electronic navigation becomes more reliable.

COASTAL NAVIGATION

A navigator steers the vessel while visually observing such landmarks as lighthouses, beacons, buoys, and prominent rocks and cliffs. Radar and measurements of water depths (called soundings) are also part of coastal navigation. All these features are shown on nautical charts.

The navigator guides a ship largely by the bearings of landmarks. A bearing is the horizontal angle between an object and a reference point. True north is the reference point for true bearings. Bearings are usually measured clockwise, from 000° at the reference point through 360°, and expressed in three digits, as 028°.

The charts for shallow areas contain numerous indications of water depth. These values can be compared with soundings to help determine a ship's position. The soundings come from onboard sonic (or echo) depth finders. Sound transmitted from the ship-mounted instrument is reflected from the ocean floor back to the instrument; it measures the elapsed time and calculates the water depth.

Man-made signals used by the navigator are called *aids to navigation.* They include buoys, day beacons, electronic signals, fog signals, lights, lightships, and radio beacons.

Buoys are floating navigational aids that are anchored. They have colors, shapes, numbers, topmarks, and lights that indicate which side of a buoy a ship should pass when moving in a given direction.

Day beacons are unlit fixed structures in the water. They hold one or more signboards called daymarks. They are only found in waters up to 15 feet deep and are used primarily in channels.

Fog signals are audible signals that provide warning during fog. They are usually a feature of a buoy or light.

Landmarks are prominent buildings, smokestacks, and other structures on the shore, as well as unique land features. They are used as signposts for navigation, but they are not "aids to navigation."

Light stations and *lightships* are maintained along coastlines to warn approaching ships of potential dangers, such as offlying rocks. Most lights are automated and operate in on-and-off cycles.

Radio beacons are transmitters that broadcast a signal to aid navigators at night, in fog, or when they are beyond visible range of the shore.

Ranges or *leads* are pairs of markers that show a pilot when the ship is in the center of a channel. When the ship is in the center of a channel, the two ranges are in a single line.

Around the world there are several different systems for marking buoys. The International Association of Lighthouse Authorities (IALA) governs buoy color and shape for participating nations. There are two IALA systems, IALA-A and IALA-B. The IALA-B system is used by all the nations of North and South America and by Japan, Korea, and the Philippines. The IALA-A system is used by the rest of the world. When you are returning from sea, red buoys should be on the port side of the ship under the IALA-A system; red buoys should be on the starboard side of the ship under the IALA-B system.

Special buoys that mark anchorage and fishnet areas are always yellow.

ELECTRONIC NAVIGATION

When using electronic navigation, the navigator determines a ship's position with the aid of such devices as radar, Loran, and GPS. By showing the positions of nearby vessels and obstructions, radar is also used to avoid collisions.

The electronic instruments use radio waves. To calculate the ship's position, they use the differences in the times of arrival of radio signals sent simultaneously from different known locations. They occasionally use the difference in speed between radio waves and sound waves to calculate the distance between the ship and an object. The navigator can use a radio direction finder (RDF) to determine the bearings of radio transmitting stations on shore. These radio beacons are in lighthouses, lightships, and at prominent points along coasts.

A variety of other electronic systems are in use. Loran (long-range navigation) and Decca are among the most widely known. Radar is also of value, especially for a ship near shore. The global positioning system (GPS), the newest electronic navigation system, uses satellites to relay exact ship locations back to the ship.

A radar unit can "see" through darkness and weather conditions that humans cannot. Using radar, captains can guide their ships safely through a crowded harbor in dense fog. The radar screen shows ships, rainstorms, small islands, coastlines, and prominent landmarks. It can also be used to measure the bearing and distance, so the navigator can determine how close the target will pass and the risk of collision.

A scanning sonar is a device that can look ahead and to the sides of a ship. It gives more information than a simple depth sounder. It gives the navigator a radarlike view of underwater conditions.

A radio direction finder is a radio receiver with a directional antenna that can be rotated. It is used to pick up the signals from radio beacons. There are both MF and VHF radio direction finders.

THE COMPASS

The best-known navigational instrument is the magnetic compass, which has been used at sea for more than 800 years and is still the most important navigational aid.

When you use a compass, you take a reading by noting the degree marking that matches up with the lubber line (a fixed line on the compass that is aligned with the longitudinal axis of the ship), and then you perform calculations to correct that reading. The corrected reading is the true direction.

Why Do Compass Readings Need to Be Corrected?

The compass points in a northerly direction, but it does not point to true north. This is because the compass is a magnet, and:

The magnetic material (iron) in the earth is not evenly distributed, so the north magnetic pole is in a different location from the true north geographical pole. The south magnetic pole is also in a different location from the south geographical pole.

There are geographical features in some locations that disturb magnets.

There are materials on board ships that disturb magnets.

When a magnetic compass is installed on board ship, measurements are made of the error between the compass readings and the true readings. These error values are used to correct all subsequent compass readings. The magnetic disturbances created by unique geographical features are shown on nautical charts, and the direction of the north magnetic pole also appears on nautical charts.

What Are Course, Heading, and Track?

The *course* is the intended direction of the ship's travel. The *heading* is the instantaneous direction in which the ship is

pointing; it may be magnetic or gyro. The *track* is the path that the navigator plans to take.

COMPASS TERMS

Compass rose. The circular diagram found in several places on a nautical chart. It consists of two or three circles with scales. The outer circle is graduated in degrees and is positioned so the zero-degree mark points to true north. The inner circle is also graduated in degrees and is positioned so that the zero-degree mark points toward the north magnetic pole. If there is a third circle, it is graduated in points.

Correcting. The process of converting compass headings to magnetic headings and then to true headings. Magnetic headings are more correct than compass headings, since they do not include the deviation error. True headings are the most correct, since they do not include deviation or variation errors.

Deviation (Dev or D). The angle between the magnetic meridian and the direction of magnetic north, as shown by a compass.

Deviation table. A chart showing the error value for a particular magnetic compass at each heading. Compass-deviation error changes for different headings.

Heading. The direction in which the ship is pointing. It is the angle that the centerline of the ship makes with a reference line. There are three possible reference lines: the direction of true north, the direction of the magnetic meridian, and the direction indicated by the north point of the ship compass. Your "course" and "heading" can be different.

Lubber line. The line marked on the compass cover that, if properly aligned, shows the true direction in which the vessel is pointing.

Points. Named directions, such as east, southeast, and south-southeast. There are 32 points on a compass.

Variation (Var or V). The angle between the magnetic meridian and the geographic meridian. This is the angle between the direction of true north and the direction of magnetic north at a particular location.

NAUTICAL CHARTS

One of the basic tools of the marine navigator is the nautical chart. This is a representation, drawn to scale, of the water and land areas of a particular region of the earth's surface. It emphasizes features that are important to navigators. It includes more information about water bodies than maps do, and it usually contains less information about the land than maps do. Some of the items marked on charts are water

depths, water obstructions, and locations of all aids to navigation. The chart's primary purpose is to give the navigator the information he or she needs to avoid danger. The navigator keeps a graphic record of the ship's progress on the chart. Lines drawn between successive positions marked on the chart indicate at a glance the courses that the ship has followed. The edges of the chart always show markings for latitude and longitude.

LATITUDE AND LONGITUDE

Latitude and longitude are the basis for a system of imaginary lines used to locate any position on the surface of the earth. The lines of latitude run in an east-west direction. The lines of longitude run in a north-south direction.

Each line of longitude is a half-circle that runs from the North Pole to the South Pole, two points through which all lines of longitude pass. There are 360 of these half-circles. The zero line and the 180th line together form a complete circle that, like the equator, cuts the earth into two hemispheres. The half west of the zero line is the Western Hemisphere; the half east of the zero line is the Eastern Hemisphere. Each of the 360 lines of longitude is numbered, but the numbers only go to 180 because they are also labeled with an "E" for east and a "W" for west. One longitude line was chosen by international agreement as the line at zero degrees, or the baseline. It passes through Greenwich, England (United Kingdom). Longitude lines are also called *meridians.* The meridian passing through Greenwich is called the *prime meridian.*

The latitude lines are the set of lines in the earth's grid system drawn around the globe parallel to the equator. There are 89 equally spaced lines to the north of the equator and 89 to the south. The 0° line of latitude is the equator. The north pole is 90°N and the south pole is 90°S. Each latitude line is a circle. The farther a latitude line is from the equator, the shorter it is. The 60th latitude line, for example, is only half as long as the equator. Latitude lines are numbered from 0 at the equator (the latitude baseline) to 89 near the poles. Latitude lines are also called *parallels.*

Lines of latitude are equally spaced. Lines of longitude are not always the same distance apart, because these lines meet at the north and south poles. One degree of latitude is 60 nautical miles. Each degree of latitude or longitude is divided into 60 minutes, and each minute is divided into 60 seconds. A minute of latitude is one nautical mile.

Every place in the world is located at the intersection of a latitude and a longitude. Therefore, any location on the earth's surface can be fixed using the degrees, minutes, and seconds of latitude and longitude.

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Chapter 11

Overview of International Regulations

Because the oceans are so vast, it was once believed they could not be harmed. As we now know well, this is not so. International laws have been developed to protect the seas. International laws have also been developed to protect seafarers. Here is an introduction to the major international laws regulating sea pollution and seafarer safety and training. Major IMO and ILO regulations are summarized in this section of the book. These regulations are subject to change. Before acting on them, consult up-to-date sources as well as your ship's procedures. Many regions of the world are subject to additional regional and national regulations.

THE INTERNATIONAL MARITIME ORGANIZATION (IMO)

The IMO is a specialized agency of the United Nations. It develops instruments that define international standards on topics related to maritime safety and pollution control.

THE IMO IS LOCATED AT

4 ALBERT EMBANKMENT

LONDON SE1 7SR, UNITED KINGDOM

Here are some of the IMO conventions:

Safety Conventions

1960 and 1974, Safety of Life at Sea (SOLAS)

1966, Load Lines

1972, International Regulations for Preventing Collisions at Sea (COLREG)

1972, Safe Containers

1976, International Maritime Satellite Organization (INMARSAT)

1978, Standards of Training, Certification, and Watchkeeping for Seafarers (STCW)

1979, Maritime Search and Rescue

Environmental Conventions

1954, Oil Pollution

1973, Prevention of Pollution from Ships (MARPOL)

1990, Oil Pollution Preparedness, Response, and Cooperation (OPRC)

MARPOL

MARPOL 73/78 regulations are developed by the IMO. These regulations aim to prevent pollution of the marine environment by ship discharges. MARPOL covers discharges caused by accidents and operational practices. As technologies change, MARPOL regulations are updated with amendments. The information here is only an overview. Before making any environmental decision, consult the current procedure for your vessel.

MARPOL 73/78 places requirements on both ports and vessels. Ports are required to provide reception facilities for garbage, tank washings, bilgewater, and ballast.

Ports are also required to have a contingency plan for cleaning up major spills within the port area.

The port contingency plan for major spills includes:

Information on towage, patrol boats, traffic control

Means of action to contain the spill: oil booms, recovery vessels, vacuum trucks, transport barges

Vessels are required to:

Control discharges to the sea of all harmful substances

Stow all harmful substances wisely

Maintain records on operations involving harmful substances

MARPOL regulations apply to five types of substances that are harmful to the environment. The regulations are grouped in five annexes, each of which deals with a different category of harmful substances.

Annex	Category of Harmful Substance
I	Oils: Crude, fuel, diesel, lubricating, waste, sludge
II	Noxious liquids carried in bulk
III	Harmful substances carried in packages
IV	Sewage
V	Garbage

Annex I Highlights

Vessels must carry and maintain an Oil Record Book for recording all operations involving oil.

Most discharges must be made above the waterline. Exceptions include discharges from segregated ballast tanks (SBT) and dedicated ballast tanks (DBT). Some noxious liquids must be below the waterline.

Oil discharges are completely prohibited in "Special Areas." These areas include the Mediterranean Sea, the Black Sea, the Baltic Sea, the Red Sea, the Persian Gulf, the Gulf of Aden, the Antarctic, and the North American Great Lakes.

All oil tankers must have working pollution-control equipment, including slop tanks, oil-water interface detectors, and oil discharge control systems.

To discharge oil/water waste from machinery spaces:

Vessel must be proceeding en route.

Vessel must not be in a Special Area.

Oil content must be less than 15 parts per million (ppm).

Tankers built after 1978 with capacities of 20,000 DWT or more must have segregated ballast tanks (SBT). Tankers built between 1975 and 1978 must have SBT if they have capacities of 70,000 DWT.

New oil tankers must be built to resist damage by collision and stranding, which might lead to an oil spill.

Some vessels are required to have an Oil Pollution Prevention Plan. Included vessels are oil tankers of 150 gross tons and above, and all other vessels of 400 gross tons and above.

Oil cannot be carried in the forepeak tank.

Annex II Highlights

Vessels must carry and maintain a Cargo Record Book. All operations involving noxious liquid cargoes are recorded in this book.

Noxious liquid substances are divided into five categories for the purpose of discharge regulations: Category A, Category B, Category C, Category D, and Appendix III—listed in order from most hazardous to the marine environment (Category A) to least hazardous to the marine environment (Appendix III).

Tank washings from cargo tanks for some noxious liquids must be discharged to appropriate reception facilities. This includes all washings from tanks carrying Category A substances and all washings from tanks carrying Category B and C substances that are "high viscosity" or "solidifying."

No matter how small the concentration of a noxious liquid, no dis-

charge can be made within 12 miles of land or in water that is shallower than 80 feet (25 meters).

Chemical tankers must follow the rules described in the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code).

Annex III Highlights

Packages containing harmful substances must be appropriately labeled and stowed following the IMO Dangerous Goods Code (IMDG). They must also be marked with the Marine Pollutant mark shown here:

"Packages" are freight containers, portable tanks, drums, etc.

Annex IV Highlights

The only sewage that can be discharged within four miles of land is sewage that has been processed by an approved onboard sewage plant.

Ships must have a sewage storage tank and pipeline with standard shore connection.

Ports must have sewage reception facilities.

Annex V Highlights

Vessels must carry and maintain a Garbage Record Book listing all operations involving garbage discharge. For the purpose of this record book, garbage is divided into categories:

---

1. Plastics
2. Floating dunnage
3. Ground-down domestic waste
4. Domestic waste that is not ground down
5. Food waste
6. Incinerator ash

Vessels larger than 400 gross tons must have a Garbage Management Plan (GMP) with written procedures for:

1. Collecting garbage

2. Storing and processing garbage

3. Disposing garbage

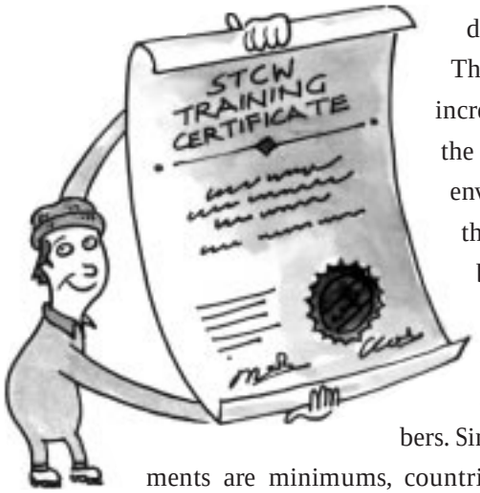
Plastic dumping is completely banned. Plastic cannot be dumped into any sea!

Annex V Special Areas include Annex I Special Areas plus the North Sea and the Caribbean Sea.

Summary of Discharge Restrictions in MARPOL 73/78, Annex V

Area (Distances are from shore.)	**Food Wastes**	**Trash: Nonplastic**	**Plastic**
0 - 3 nm	No discharge	No discharge	No discharge
3 - 12 nm	No discharge unless ground to pieces smaller than 1 inch	No discharge unless ground to pieces smaller than 1 inch	No discharge
12 - 25 nm	Discharge permitted	Discharge permitted except for materials that float	No discharge
> 25 nm	Discharge permitted	Discharge permitted	No discharge
> 50 nm	Discharge permitted	Discharge permitted	No discharge
Special Areas	No discharge	No discharge	No discharge

INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION, AND WATCHKEEPING FOR SEAFARERS (STCW)



STCW regulations are developed by the IMO. These regulations aim to increase safety for seafarers, the ship, and the marine environment. Some ways that STCW does this are by stipulating minimum training standards and minimum rest requirements for crew members. Since the training requirements are minimums, countries can (and often do) require higher standards. Before making any safety decision, consult the current procedures for your vessel.

The information here is an overview of the 1995 amendments to STCW. They are subject to change.

Company Responsibilities Under STCW 95

Ensure that each seafarer has an appropriate training certificate.

Ensure that the ship is manned according to the safe-manning requirements of the flag state.

Maintain training and medical fitness records for seafarers.

Provide ship familiarization training to seafarers when they are assigned to a ship.

Ensure that the ship crew is adequately trained to handle safety and environmental emergencies.

Seafarer's Responsibility

When assigned to a ship, take full advantage of all familiarization training and training materials, including videos and posters. If there is any equipment or procedure with which you are unfamiliar, notify your supervisor.

Familiarization Training

Familiarization training includes:

Ship procedures for communicating safety issues

Explanation of safety information symbols, signs, and alarm signals

Ship procedures for man overboard, fire or smoke detected, fire and abandon-ship alarms

Identification of muster and embarcation stations and emergency escape routes

Locations of life jackets and

instruction on their use

Procedures for proper use of fire extinguishers

First aid

Procedures for opening and closing weather-tight and watertight doors

Required Familiarization Training for Tanker Crews

Familiarization training covers the properties of the liquid cargo carried, including:

Vapor pressure and temperature relationship; flash-point, lower flammability limit, auto-ignition temperature, and other related fire-safety information

Chemical symbols and structures for chemical cargoes carried

Acute and chronic toxicity limits

Human health hazards associated with cargo and with inert-gas systems

How to use safety equipment, including oxygen-deficiency indicators, toxic gas indicators,

self-contained breathing apparatus (SCBA), personal protective equipment (PPE), resuscitators, and rescue equipment

Unwanted reactions that can occur in chemical cargo and the subsequent dangers to ship structures and personnel

Procedures to prevent unwanted reactions, such as inert gas systems; Water padding; drying agents and monitoring techniques; antistatic measures; ventilation; and cargo segregation

Importance of compatible materials

Hazards to the environment from the release of oil, chemical, or gas

Pollution prevention: spill reporting and shipboard spill-containment procedures

Required Familiarization Training for Crew on Engineering Watch

Use of internal communication systems

Escape routes from machinery spaces

Engine-room alarms, including fire alarms

Location of, and proper use of, all firefighting equipment and damage-control equipment located in the machinery spaces

Safety precautions

STCW 95 Minimum Rest Requirements for Watch Personnel

You should expect to have at least 10 hours of rest in any 24-hour period. The rest may be divided into no more than two periods, and one of the periods must be at least 6 hours.

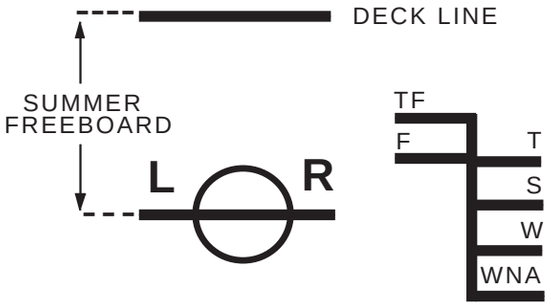
YOU CAN OBTAIN AN UPDATED VERSION OF STCW REQUIREMENTS BY CONTACTING **THE CENTER FOR SEAFARERS' RIGHTS.**

When operating conditions require it, the 10-hour rest may be shortened to 6 hours, but this may not be done for more than two days, and you must be given 70 hours of rest in each seven-day period.

STCW 95 Certificate Requirements

STCW 95 also specifies the required training for many seafarer certificates. Major requirements for some of those certificates are listed in the following table. All requirements are subject to change. The International Safety Management Code (ISM) requires that every ship have a shore-based person in charge of ship management who can answer all safety and STCW questions. If your shipowner participates in the ISM program, this person's name and phone number should be available to you. Direct your questions about STCW first to your supervisor and then to the designated shore-based person.

INTERNATIONAL CONVENTION ON LOAD LINES



The first international conference on load lines was held in 1966. Load-line regulations are updated by adding amendments.

To protect a ship from being overloaded, limitations are placed on a ship's draft. These limitations take into account the hazards present in different ocean zones during different seasons.

All assigned load lines must be marked amidships on each side of the ship, with the marking for the deck line.

TF: Tropical freshwater line; F: Freshwater load line; T: Tropical load line; S: Summer load line; W: Winter load line

The Convention also contains safety regulations for doors, free ports, and hatchways.

INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA (COLREG)

COLREG regulations were developed by the IMO in 1972 and became mandatory in 1977. They form the international "Rules of the Road." (Nations can adopt local rules for navigating in their own coastal and inland waterways.) The COLREG regulations aim to prevent ship collisions by:

Separating the vessels traveling in one direction from the vessels traveling in the opposite direction by developing traffic lanes for congested areas

---

Establishing procedures for meeting, crossing, and overtaking.

Establishing standards for signal lights, horns, and shapes

There are 38 rules in the COLREG regulations; the information here is only an overview.

In general, a vessel must keep clear of any vessel with less maneuverability. For example, power-driven vessels must stay clear of sailing vessels and vessels engaged in fishing.

Every vessel must maintain a lookout by sight and hearing as well as by appropriate instrumentation.

Every vessel must travel at a "safe" speed that allows enough time to take actions needed to prevent collisions.

A vessel traveling in a narrow channel or fairway keeps as far as she safely can to the channel or fairway edge on her starboard side. Sailing vessels and vessels smaller than 65 feet (20 meters) shall not impede the passage of larger ships. No vessel shall cross a narrow channel when doing so would impede the safe passage of another vessel.

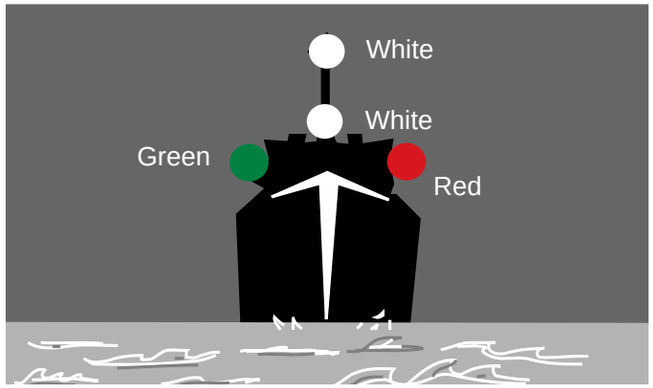
Sailing vessels and vessels smaller than 65 feet (20 meters) shall not impede the passage of a power-driven ship traveling in a traffic lane. Vessels should try to avoid crossing traffic lanes, but when they do have to cross, they should do so at a right angle to the traffic flow.

When two power-driven vessels are approaching each other head-on, they should each alter their course to starboard.

This allows the vessels to pass on the port side of the other.

Vessels communicate with each other using signals: horn or whistle, bell, gong, and light and flag signals. When a vessel does not understand the intentions of another vessel, or disagrees with the intentions of another, it sounds the danger signal: five or more short blasts.

LIGHTS AND SHAPES

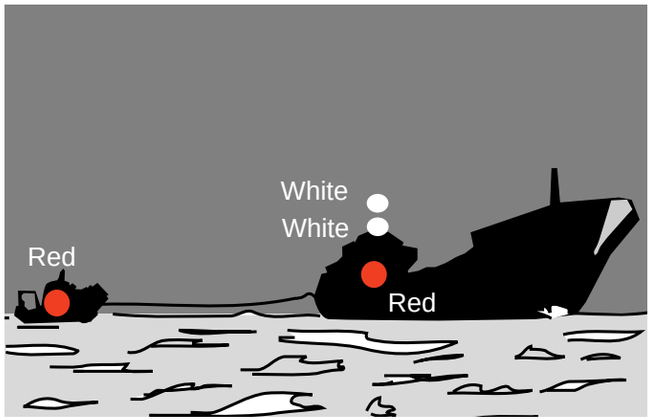


At Night

The masthead light, sidelights, stern light, towing light, and flashing light are operated in all weather from sundown to sunup. They are also operated from sunup to sundown when visibility is restricted.

POWER-DRIVEN VESSEL

When a power-driven vessel is underway, it displays two masthead lights.



Vessel Is Towing

When a power-driven vessel is towing, it displays two masthead lights in a vertical line, sidelights, stern light, and towing light above the stern light. It also displays a diamond shape if the length of the tow exceeds 200 meters.

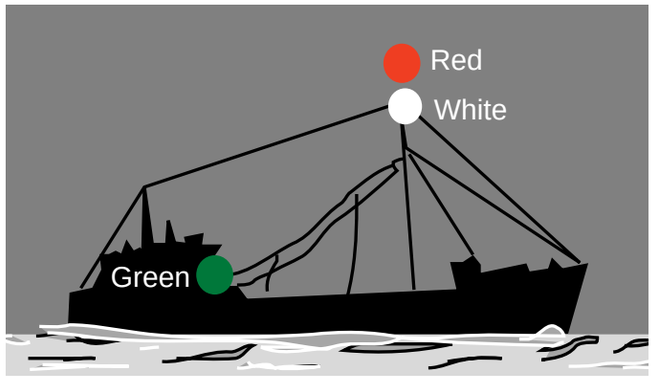
Vessel Constrained By Her Draft

A vessel constrained by her draft displays three all-round red lights in a vertical line, in addition to the lights normally displayed by a power-driven vessel.

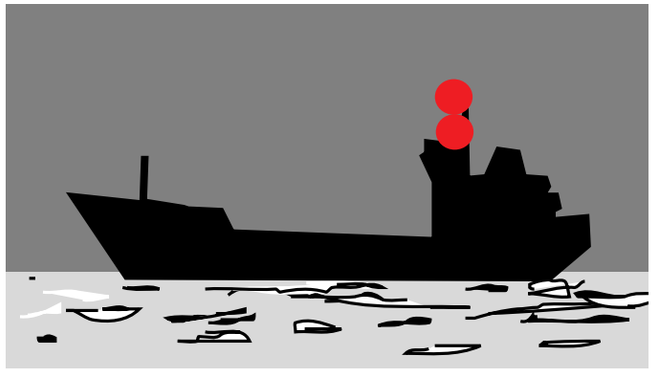
Fishing Vessels

A fishing vessel engaged in trawling displays two all-round lights in a vertical line. The upper light is **green** and the lower light is **white**. It may also display the shape consisting of two cones with their apexes together in a vertical line. If the fishing vessel is moving, it also displays sidelights and a stern light.

A fishing vessel *not* engaged in trawling displays two all-round lights in a vertical line. The upper light is **red** and the lower light is **white**. It may also display the shape consisting

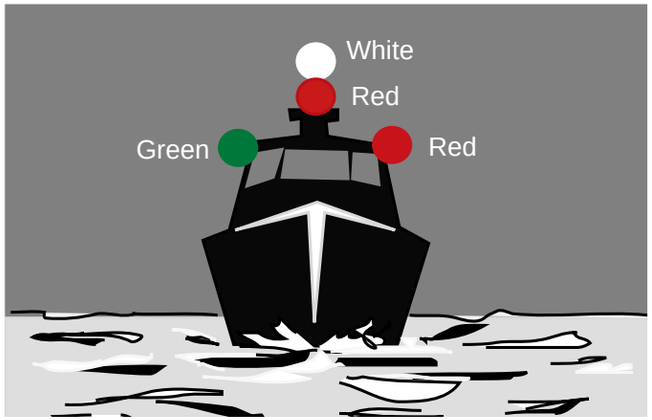


of two cones with their apexes together in a vertical line. If the fishing vessel is moving, it also displays sidelights and a stern light.



Pilot Vessel

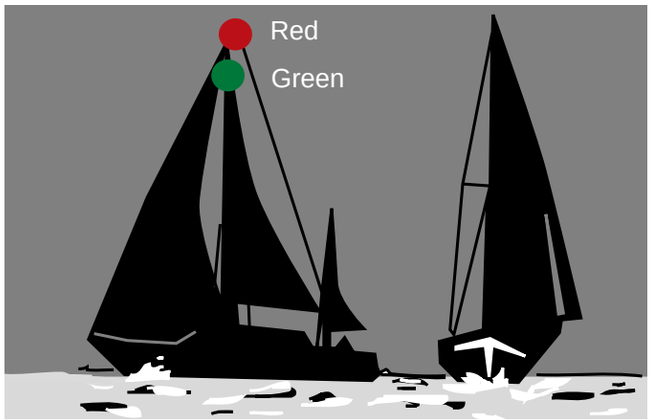
A pilot vessel engaged in pilotage duty displays two all-round lights in a vertical line at or near her masthead. The upper light is **white** and the lower light is **red**. If the pilot vessel is moving, it also displays sidelights and a stern light.



Sailing Vessel

A sailing vessel that is traveling displays sidelights and a stern light. On her masthead she displays either a combined lantern or two all-round lights. The combined lantern is only used on sailing vessels shorter than 20 meters. When using two all-round lights, the upper light is **red** and the lower light is **green**.

These rhymes are helpful for remembering meanings of lights:



Red over white – Fishing at night

White over red – Pilot ahead

Red over green – Sailing machine

Distress Signals

These signals should be used only when a vessel is in distress and in need of assistance:

Gun or other explosive signal fired at one-minute intervals

Continuous foghorn

Rockets or shells throwing red stars

...---... (SOS) in Morse code

"Mayday" sent by radiotelephone

Square flag with a ball above or below it

Flames on vessel (as from a fire in an oil barrel)

Rocket parachute flare or hand flare emitting a red light

Smoke signal giving off orange

smoke
Slowly and repeatedly raising and lowering arms outstretched to each side
Radiotelegraph or EPIRB (emergency position-indicating radio beacon) signal
Approved signals transmitted by GMDSS (Global Marine Distress and Safety System) equipment and survival-craft radio transponders
Orange-colored canvas with a black square or circle that can be seen from the air

SAFETY OF LIFE AT SEA (SOLAS)

The first Safety of Life at Sea Conference was held in 1960. The regulations from this conference are called SOLAS 60. Regulations from the conference held in 1974 are called SOLAS 74. As technologies change, the SOLAS regulations are updated by adding amendments. The information here is only an overview of SOLAS regulations and amendments. Before making any safety decision, consult the current procedure for your vessel. On any vessel, all lifesaving equipment must be in working order at all times.

Required Regular Ship Inspections

SOLAS Safety Construction Certificate every 60 months
SOLAS Safety Equipment Certificate every 24 months
To meet safety requirements of the flag state

Instructions (Poster, Booklet, or Video) Must Be Provided For:

Fire-protection system
Lifesaving appliance
Lifesaving signals
Survival-craft operation

Fire-Protection System

Every ship must have a fixed fire-main system for supplying water for firefighting to every part of the ship.
Crude-oil tankers must have fixed deck foam and inert gas systems.

Highlights for Dangerous Cargoes

All packages containing dangerous goods must be clearly marked with the proper shipping name for the product and

the corresponding four-digit United Nations identification number. The International Maritime Organization (IMO) Dangerous Goods Code (IMDG) is used to identify the dangers. For information on the IMDG Code, see chapter 16.

Ships carrying dangerous cargo must comply with the safety requirements in SOLAS 74 regulation II/2-54 and chapter VII. The regulations require:

- Fixed fire-detection and fire-alarm systems
- Water spray systems
- Ventilation systems
- Bilge-pumping requirements
- Personal protective equipment (PPE)
- Portable fire extinguishers
- Survival craft with radio transponders, as well as fire-protection systems (if on oil tankers) or SCBA (if on chemical tankers)

Rescue

- Rescue boats are required on all cargo ships.

TABLE OF LIFESAVING SIGNALS

Landing signals for the guidance of small boats with crews or persons in distress

	MANUAL SIGNALS	LIGHT SIGNALS	OTHER SIGNALS	SIGNIFICATION
DAY	**Vertical** motion of a white flag or of the arms	or firing of a green star signal	or code letter **K** given by light or sound-signal apparatus	**This is the best place to land**
NIGHT	**Vertical** motion of a white light or flare	or firing of a green star signal	or code letter **K** given by light or sound-signal apparatus	

A range (indication of direction) may be given by placing a steady white light or flare at a lower level and in line with the observer

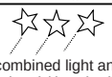
DAY	**Horizontal** motion of a white flag or of the arms extended horizontally	or firing of a red star signal	or code letter **S** given by light or sound-signal apparatus	**Landing here highly dangerous**
NIGHT	**Horizontal** motion of a light or flare	or firing of a red star signal	or code letter **S** given by light or sound-signal apparatus	
DAY	1 **Horizontal** motion of a white flag, followed by 2 the placing of the white flag in the ground and 3 by the carrying of another white flag in the direction to be indicated	1 or firing of a red star signal vertically and 2 a white star signal in the direction towards the better landing place	1 or signalling the code letter S (...) followed by the code letter R (.–.) if a better landing place for the craft in distress is located more to the right in the direction of approach 2 or signalling the code letter S (...) followed by the code letter L (.–..) if a better landing place for the craft in distress is located more to the left in the direction of approach	**Landing here highly dangerous. A more favorable location for landing is in the direction indicated**
NIGHT	1 **Horizontal** motion of a white light or flare 2 followed by the placing of the white light or flare on the ground and 3 the carrying of another white light or flare in the direction to be indicated	1 or firing of a red star signal vertically and a 2 white star signal in the direction towards the better landing place	1 or signalling the code letter S (...) followed by the code letter R (.–.) if a better landing place for the craft in distress is located more to the right in the direction of approach 2 or signalling the code letter S (...) followed by the code letter L (.–..) if a better landing place for the craft in distress is located more to the left in the direction of approach	

TABLE OF LIFESAVING SIGNALS

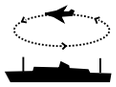
Signals to employed in connection with the use of shore life saving apparatus

	MANUAL SIGNALS	LIGHT SIGNALS	OTHER SIGNALS	SIGNIFACATION
DAY	 Vertical motion of a white flag or of the arms	 or firing of a green star signal		**In general; affirmative Specifically; rocket line is held - tail block is made fast - man is in the breeches buoy - haul away**
NIGHT	 Vertical motion of a white light or flare	 or firing of a green star signal		
DAY	 Horitzontal motion of a white flag or of the arms extended horizontally	 or firing of a red star signal		**In general; negative specifically; slack away - avast hauling**
NIGHT	 Horitzontal motion of a white light or flare	 or firing of a red star signal		

Replies from lifesaving stations or maritime rescue units to distress signals made by a ship or person

DAY		 Orange smoke signal	 Or combined light and sound signal (thunder-light) consisting of 3 single signals which are fired at intervals of approximately 1 minute	**You are seen. Assistance will be given as soon as possible.**
NIGHT		 White star rocket consisting of 3 single signals which are fired at intervals of approximately 1 minute		**Repetition of such signal shall have the same meaning.**

Signals used by aircraft engaged on search and rescue operations to direct ships towards an aircraft, ship or person in distress (procedures performed in sequence by an aircraft)

 1) Aircraft circles the surface craft at least once.	 2) Aircraft crosses the surface craft course close ahead at low altitude opening and closing the throttle or changing the propeller pitch.	 3) Aircraft heads in the direction in which the surface craft is to be directed.	**The aircraft is directing a surface craft towards an aircraft or surface craft in distress.** **Repetition of such signal shall have the same meaning.**
 Crossing the surface crafts wake at close astern at low altitude opening and closing the throttle or changing the propeller pitch.			**The assistance of the surface craft is no longer required.** **Repetition of such signal shall have the same meaning.**

Ships must respond to distress signals and assist people requiring rescue.

Governments must provide search-and-rescue capabilities for responding to ships in distress near their coasts.

Lifesaving signals are used during rescue operations. Ships must carry an illustrated table showing these signals.

Communications

The Global Marine Distress and Safety System (GMDSS) requires:

Vessels to have at least two ways to send distress messages.

Vessels to have a way to receive weather and navigational warnings.

INTERNATIONAL SAFETY MANAGEMENT CODE (ISM)

The International Safety Management Code (ISM) is a collection of requirements intended to increase safety on board ships and decrease pollution from ships. The ISM code requires:

Operations procedures that address safety and pollution issues.

Shipboard pollution training and drills.

Head-office training and participation in ship drills.

A designated person in the head office to handle all questions from seafarers concerning safety or pollution.

THE INTERNATIONAL LABOUR ORGANIZATION (ILO)

The International Labour Organization is a United Nations specialized agency that deals with labor issues affecting all workers but it periodically convenes maritime sessions to handle labor issues relating to the maritime industry. At the 84th Maritime Session, held in 1996, there were members representing 85 maritime nations, shipowners, and trade unions. The ILO is a unique international organization because it allows shipowners and trade unions to participate in discussions and to vote. Most international organizations allow participation from shipowners, trade unions, and other organizations, but they only allow government representatives to vote.

The ILO formulates conventions that are binding on every nation that signs them. These conventions are frequently referred to by their convention number. The most significant ILO maritime convention is number 147: Merchant Shipping (Minimum Standards) Convention, enacted in 1976.

THE INTERNATIONAL LABOUR OFFICE IS LOCATED AT

4, ROUTE DES MORILLONS, 1211

GENEVA 22, SWITZERLAND

The ILO also provides nonbinding recommendations to member states.

Major ILO Maritime Conventions

23—Repatriation of Seamen Convention, 1926

55—Shipowners' Liability (Sick and Injured Seamen) Convention, 1936

71—Seafarers' Pensions Convention, 1946

73—Medical Examination (Seafarers) Convention, 1946

108—Seafarers' Identity Documents Convention, 1958

134—Prevention of Accidents (Seafarers) Convention, 1970

145—Continuity of Employment (Seafarers) Convention, 1976

146—Seafarers' Annual Leave with Pay Convention, 1976

147—Merchant Shipping (Minimum Standards) Convention, 1976

163—Seafarers' Welfare Convention, 1987

164—Health Protection and Medical Care (Seafarers) Convention, 1987

165—Social Security (Seafarers) Convention (Revised), 1987

166—Repatriation of Seafarers Convention (Revised), 1987

ILO 147: Merchant Shipping (Minimum Standards) Convention

Convention 147 was designed to protect the health and safety of seafarers, to safeguard their rights, to improve the efficiency of navigation, and to enhance measures for environmental protection. Convention 147 requires nations to investigate any serious marine casualty involving ships under their flags.

Convention 147 requires nations to put in place minimum acceptable standards for all ships registered under their flag and calling at their ports.

Convention Subject	Typical Minimum Standard
MEDICAL EXAMS AND MINIMUM AGE	Medical certificates less than two years old should be available for inspection for every crew member. All crew members should be at least 14 years of age.
CONTRACT	Each seafarer should have an employment contract that conforms to the laws of the flag state and that specifies: • The time period covered by the contract • Rights and obligations of the seafarer and the shipowner • The name of the vessel or vessels on which the seafarer will serve • The seafarer's job title or titles • Quantity of provisions that will be given to the seafarer • Wage amount • Annual leave • Conditions under which employment may be terminated
OFFICER QUALIFICATIONS	Master, Chief Engineer, and Chief Mate should hold appropriate certificates. On tankers, officers responsible for cargo handling should have documents showing they have had the proper training and experience with tanker operations.
Convention Subject	**Typical Minimum Standard**
FOOD	Food and water should be adequate in quantity and quality. Galley and food-storage areas should be cleaned and well maintained. Refrigeration systems should be working.
CREW ACCOMMODATIONS	Accommodations should be clean, habitable, and not used for cargo or equipment. Each crew member should have one berth and adequate sanitary facilities. Wash areas should have both cold fresh water and hot fresh water.

ACCIDENT PREVENTION	• Gangway should be in good condition. • Decks and holds should be well lit and free of slipping and tripping hazards. • Electrical equipment should be maintained and properly enclosed. • All spaces where people work or pass should be properly lit and ventilated. • Any hold deeper than 1.5 m (~6 ft.) should be equipped with a fixed access ladder.
	• Fire-prevention and firefighting equipment must be present and in working order. • Survival and rescue craft should conform to SOLAS regulations.
	• Personal protective equipment (PPE) should be on board, adequate in number, and stored properly in specially marked, accessible lockers (unless each crew member is issued his or her own equipment).
SICKNESS AND INJURY BENEFITS	Shipowner is required to provide medical care and lodging until recovery or until repatriation.
REPATRIATION RIGHTS	Shipowner will pay repatriation costs if you are terminated for reasons beyond your control, such as injury or shipwreck. The shipowner will also pay repatriation costs when you finish the full term of your employment as stated in your contract.
TRADE-UNION RIGHTS	Seafarers have a right to join trade unions. There should be in place a grievance procedure acceptable to both shipowner and union for handling seafarers' complaints.

The minimum acceptable standards that nations must implement cover the following areas:

Safety and health

Social Security

Hours of work

Manning

Living and working conditions

Compliance with SOLAS

Compliance with MARPOL

Convention 147 allows member states to ensure that all foreign ships entering their ports comply with the minimum acceptable standards developed according to convention requirements. The port states ensure compliance with their minimum standards by carrying out inspections called Port State Control inspections. The convention subjects that can be enforced are shown below:

PORT STATE CONTROL INSPECTIONS

The Port State Control inspections are made by inspectors working for the port nation's government. Phone numbers for some of the government agencies responsible for Port State Control are included in Part II of this book.

Not every ship is inspected. The port state develops criteria for deciding which ships to inspect. If a ship is inspected, that alone is not a suggestion that something is wrong. Port states routinely conduct random inspections of foreign ships in their ports.

A Port State Control agency can receive a complaint concerning ship conditions from a crew member, a professional body, an association, a trade union, or any person with an interest in the safety of the ship. Port chaplains will make a complaint to the Port State Control agency if they hear of hazardous conditions on any ship. Upon receiving a complaint, the Port State Control agency will conduct an inspection.

When a condition is found that is clearly hazardous to safety and health, the inspector can detain the ship in port until repairs are made. The inspector also makes a report of his findings and sends the report to the ship's flag state and to the Director-General of the ILO. When a condition is found that is not a threat to safety or health, yet is a violation of the ILO 147 convention, it is reported to the ship master.

Here are some examples of ship conditions that might cause a Port State Control inspector to detain a ship:

Dangerous lack of protective guards on machinery

Severely deteriorated ladders, stairs, or railings

Insufficient first-aid equipment

Inoperable toilet facilities

Infestation of food supply by rodents

Contamination of drinking-water supply

ADDITIONAL SOURCES OF INFORMATION

United Nations links to environmental treaties.
Web site: http://www.unep.ch/

International Maritime Organization (IMO), 4 Albert Embankment, London SE1 7SR, United Kingdom. Tel.: (44) (171) 587-3210; Web site: http://www.imo.org/

IMO Maritime Safety Circulars (MSC): MSC.47 (66) SOLAS

ILO Publications, International Labour Organization (ILO), CH-1211 Geneva 22, Switzerland. Free catalog of publications available. Tel.: +41.22.799.7301; e-mail: pubvente@ilo.org
United States Coast Guard. Web site:
http://www.uscg.mil/dotinfo/uscg/welcome.html

United States Coast Guard, Marine Safety and Environmental Protection. Web site:
http://www.uscg.mil/hq/g-m/gmhome.htm

International Convention for the Safety of Life at Sea (SOLAS). U.S. Dept. of Transportation, Coast Guard, COMDTINST M16210.2, 1974. Available from U.S. Government Printing Office (see below).

Managing Oily Waste and Garbage from Ships. U.S. Coast Guard, Marine Safety and Environmental Protection Division, 1994. Available from U.S. Government Printing Office (see below).

U.S. Government Printing Office, Washington, DC 20402. Tel.: (1) (202) 512-1800. Fax Watch Document Request System: (1) (202) 512-1716. Web site:
http://www.access.gpo.gov/

HELMEPA, 5, Pergamou Street, Nea Smirni 171 21, Athens, Greece. Tel.: (30) (1) 9343088, 9341233, or 9326277. Fax: (30) (1) 9353847. E-mail: helmepa@ath.forthnet.gr
or access Web site: http://www.helmepa.gr/

United States Coast Guard's Port State Control Examinations, HELMEPA, 1997. Information available at Web site: http://www.helmepa.gr/en/helmepa.html or
http://www.helmepa.gr/en/training/training.html

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Part 4
The Ship

Chapter 12

Ship Talk

A merchant ship is usually officially identified and described by some or all of the following characteristics:

Name

Nationality or port of registry

Official number

Call sign

Type

Principal dimensions

Ship tonnage

Draft

Propulsion _____

Cruising speed _____

Classification society _____

NAME

A ship is identified by the name given by its owners. When a ship is sold, the new owners may rename it. To avoid fraud and misidentification, there are strict laws regarding ship names and name changes. The name is registered and is displayed on the ship's bows and at the stern.

NATIONALITY

Ships are registered in "ports of registry," and their nationality is the nationality of that port. For example, if a ship is registered in London it's nationality of a ship is British.

OFFICIAL NUMBER

When a ship is first registered, it is given an official number, such as 203451.

SIGNAL LETTERS OR CALL SIGN

Two or more ships can have the same name, but no two ships can have the same signal letters. These signal letters are usually a block of four letters and figures—for example, MQKM—assigned when the ship is registered. The letters identify the ship for all radio communications.

PRINCIPAL VESSEL TYPES

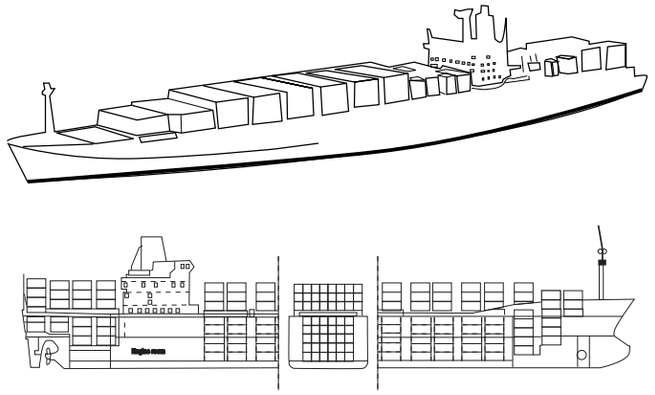
Cargo ship—Break bulk cargo—Freighter. A ship that carries packaged goods (general cargo) in its cargo holds. Most cargo ships have at least two decks. The cargo is loaded and unloaded using shipboard derricks (booms) or cranes and cargo nets, pallets, and barrel slings.

Chemical tanker. A ship with a single-deck hull that is designed to carry liquid chemicals in bulk.

Combination carrier. A tanker designed to carry oil and solid cargoes in bulk. An ore/bulk cargo/oil combination carrier is called an "OBO."

Container ship. A ship with a single-deck hull and specially constructed holds for stacking containers. Special shore-side lifting gear is required to load, stow, and discharge the containers.

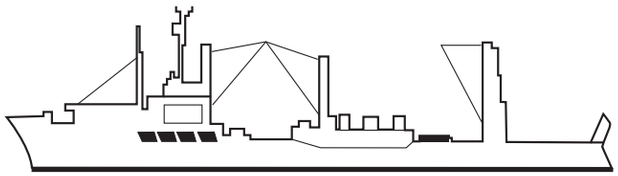
Dry bulk carrier. A ship with a single-deck hull, topside ballast tanks, and holds specifically designed for loose dry cargo, such as grains.



CONTAINER SHIP

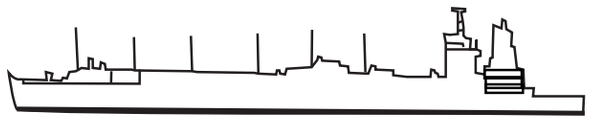
Fishing. A ship designed for catching fish. There are many types, including seiner, tuna clipper, drifter, troller, and trawler. Care must be exercised when passing a fishing vessel, which is difficult to maneuver. When these vessels are engaged in fishing, they use long lines or nets that may extend as much as several miles.

LASH ("Lighter Aboard Ship") A ship that carries cargo loaded in barges or lighters.



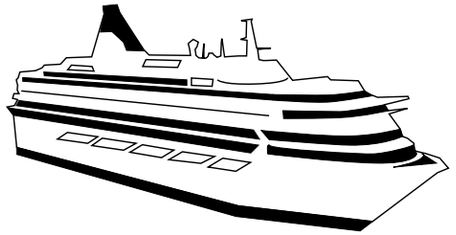
FISHING VESSEL

LNG tanker. A ship with a single-deck hull that is designed to carry liquefied natural gas (LNG).

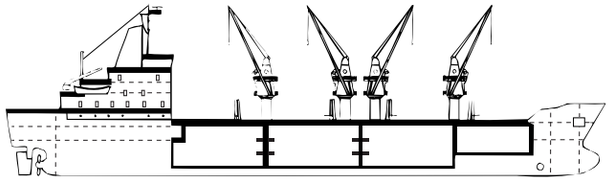


LNG TANKER

Passenger. A ship designed with multideck hull and superstructure appropriate for carrying passengers.



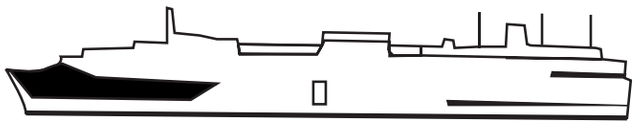
PASSENGER SHIP



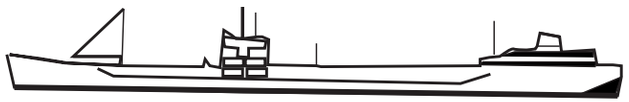
REFRIGERATED CARGO SHIP

Refrigerated cargo (reefer). A ship with a multideck hull and insulated refrigerated holds for perishable cargoes such as fruit, meat, and fish. Most reefers are also equipped to carry reefer containers.

Roll-on/roll-off (ro/ro). A multideck ship carrying vehicles that can be driven on and off using movable ramps. The vehicles are driven to the desired deck through a series of internal ramps. Many ro/ros are used as passenger ferries, transporting people and their cars.



ROLL-ON/ROLL OFF SHIP



TANKER SHIP

Tanker. A ship with a single-deck hull that is designed to carry oil or other liquid products in bulk. The hull is divided into tanks by longitudinal and transverse bulkheads. The product is loaded and discharged through a system of pipelines running through the bottom of the tanks. Products are transferred from ship to shore piping using flexible hoses and steel loading arms called chicksans. Tankers come in many sizes and designs. Some common tanker types are:

Handy or small-size tankers have deadweights from 6,000 to 37,000 tons. They carry refined oil products such as fuel oils or lubricants.

Medium-size tankers have deadweights between 37,000 and 160,000 tons. They usually carry crude oil.

VERY LARGE CRUDE OIL CARRIER

Very large crude-oil carrier (VLCC) have deadweights of 250,000 to 270,000 tons.

Ultra-large crude carriers (ULCC) have deadweights of approximately 400,000 tons.

PRINCIPAL DIMENSIONS

The principal dimensions of a ship are:

Length overall

Length between perpendiculars

Moulded breadth

Moulded depth

SHIP TONNAGE

Ton is a unit of mass when used to describe cargo, but when it is used to describe the size of a ship, it is a unit of volume. The "ton" used to describe a ship's size is also called a "register ton." This ton is equal to 100 cubic feet (or 2.83 cubic meters) of cargo capacity.

"Register tonnage" is the entire capacity of a ship, including cargo space and other spaces such as crew accommodations, ship's stores, and machinery spaces.

Deadweight tonnage is the number of tons (of cargo water and fuel) needed to bring the ship to its Plimsoll line.

DRAFT

The vertical distance from the bottom of the keel to the waterline.

PROPULSION

The type of engine used for propelling the ship is its propulsion.

CRUISING SPEED

The cruising speed is the top speed at which a ship is designed to be operated on a sustained and continuous basis.

CLASSIFICATION SOCIETY

Many of the regular required ship inspections are performed by classification societies, which are companies with experienced staffs of surveyors and engineers. The reputable classification societies have excellent worldwide reputations. A shipowner hires a classification society to arrange and supervise ship inspections as well as to make recommendations for repair. The classification societies ensure that the ship complies with safety standards and requirements.

NAVIGATIONAL VOCABULARY

The language spoken on board a ship is usually the national language of the crew. When crew members are of several nationalities, a common language is used for navigation purposes, and that common language is English.

Here are some maritime terms that all seafarers need to know in English. This is not the complete navigational vocabulary. Onboard terms are included here; words and phrases used in external communications (radio communications) are not included here. Seafarers with radio responsibilities should have the full vocabulary, which is available in

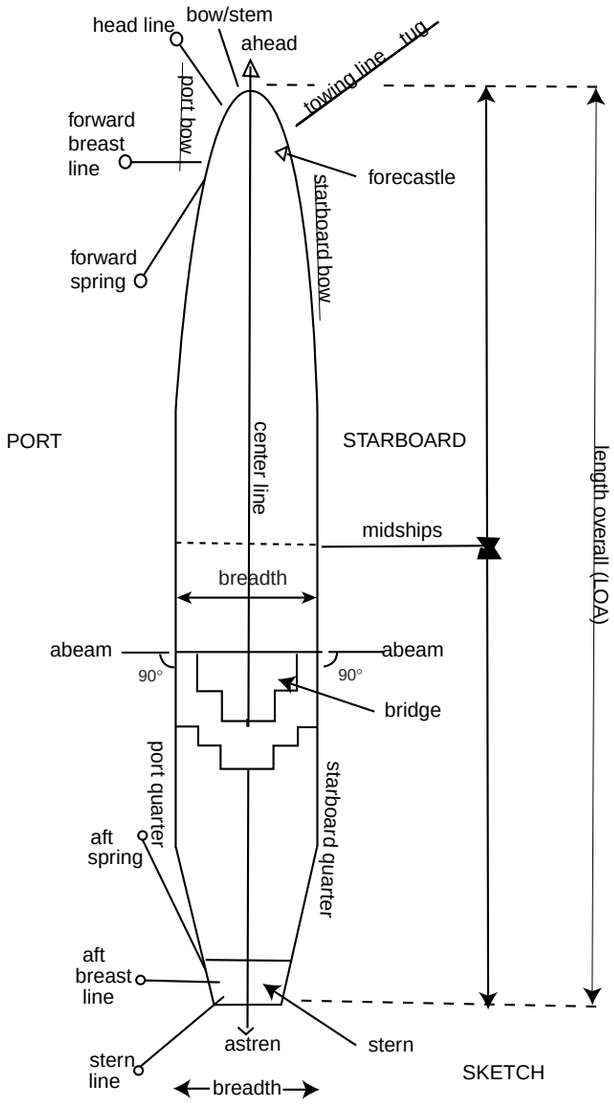
IMO pamphlet 985 85.20.E: *Standard Marine Navigational Vocabulary.*

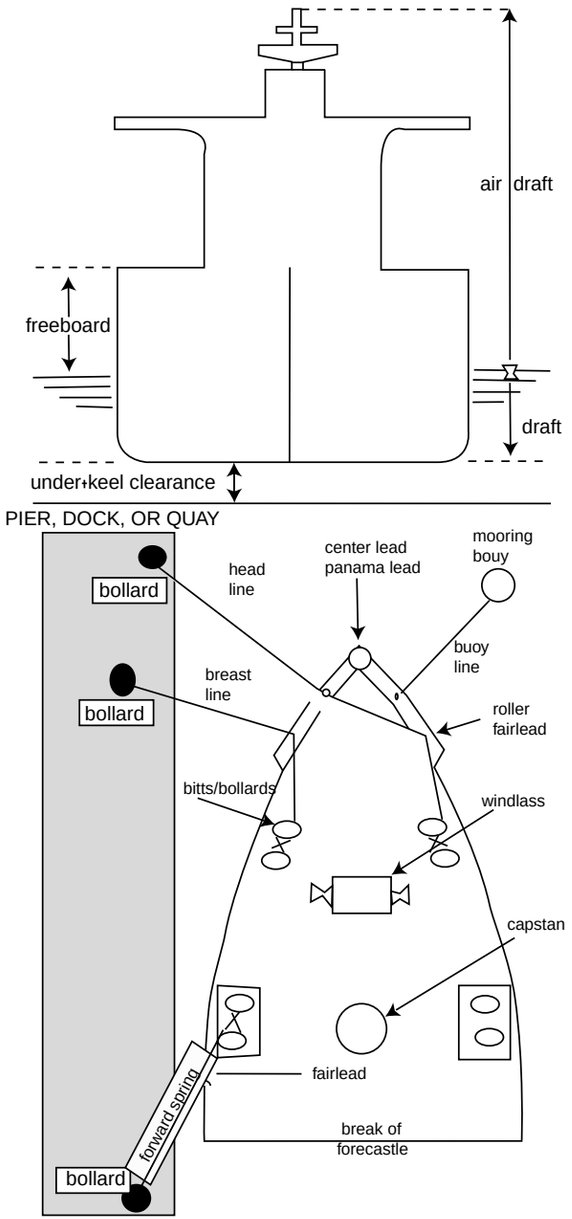
Standard Wheel/Helm Orders

Ease to five	Reduce amount of rudder to 5º and hold.
Hard aport	Rudder to be held fully over to port.
Hard astarboard	Rudder to be held fully over to starboard.
Midships	Rudder to be held in fore-and-aft position.
Port five	5º of port rudder to be held.
Port twenty	20º of port rudder to be held.
Starboard five	5º of starboard rudder to be held.
Starboard twenty	20º of starboard rudder to be held.
Steady	Stop swing as rapidly as possible.
Steady as she goes	Steer a steady course on the compass heading indicated at the time of the order.

Standard Engine Orders

Dead slow astern	Engine should be run at RPM set in ship's orders.
Emergency full ahead	Engine should be run at RPM set in ship's orders.
Finished with engines	Movement of engines is no longer required.
Full ahead	Engine should be run at maximum RPM for ahead propulsion.
Full astern	Engine should be run at RPM set in ship's orders.
Half ahead	Engine should be run at RPM set in ship's orders.
Half astern	Engine should be run at RPM set in ship's orders.
Slow ahead	Engine should be run at RPM set in ship's orders.
Slow astern	Engine should be run at RPM set in ship's orders.
Stand by engine	Engine-room personnel fully ready to maneuver.
Stop engines	No engine RPM.





Directions

Abaft	Toward the stern of the ship
Abeam	At right angles to the ship's fore-and-aft line
Aft	Near or toward the stern of the ship
Ahead	Forward
Astern	Backward
Athwartship	Crossing the ship from port to starboard
Fore-and-aft	Imaginary line running the full length of the ship from bow to stern
Forward	Near or toward the bow of the ship
Go below	under the main deck
Go topside	on or above the main deck
Inboard	Toward the ship centerline
Leeward	Away from the wind; the sheltered side
Midship	Middle of the ship

Outboard	Away from the ship centerline
Port	To your left, when you are facing the bow of the ship
Starboard	To your right, when you are facing the bow of the ship
Windward	Anything in the same direction as the wind

Parts of the Ship

Afterpeak tank	Tank at the stern. It is usually used for carrying fresh water or ballast. It is also used to trim the ship.
Ballast	Weight added to a ship to balance her topside weight or to keep her lower in the water when carrying light loads
Bilge keels	Long narrow fins attached to the outside of the hull on both sides of the ship to stabilize her
Bridge	Room from which the ship is navigated
Bulkhead deck	The uppermost deck to which the watertight bulkheads are carried

Bulkheads	Walls that provide reinforcement, strength, or safety
Cargo spaces	All spaces used for cargo, including tanks, and the trunks leading to those spaces
Collision bulkhead	Strong bulkhead on the after side of the forpeak tank
Compartment	Room formed by watertight bulk heads and doors
Crow's nest	A lookout station located on a mast
Decks	Floors
Double bottom	The space between the hull and the watertight floor. Double bottoms help prevent cargo-hold leaks when a vessel hull is damaged.
Forecastle deck	Partial deck located above the main deck and at the bow of the ship
Forepeak tank	Tank at the bow. It is usually used for carrying fresh water or ballast. It is also used to trim the ship.
Frames	Major crossbeams running perpendicular to the keel

Half deck	Partial deck located between two full decks
Holds	Watertight compartment formed by watertight bulkheads
Hull	Shell or body of a ship
Keel	The "backbone" of the ship; the lowest structural timber/beam of a ship. All of the ship's framework is built up from the keel.
Lifelines	Light wire ropes located on weather decks that can be grabbed for support
Machinery spaces	Spaces that contain propulsion machinery
Mack	A tower that encloses the ship stack and mast on some modern ships
Overheads/Deckheads	Ceilings; undersides of the decks above you
Partitions	Walls that form compartments but do not provide structural support
Passageways	Corridors

Platform deck	Partial deck below the lowest full deck
Poop deck	Partial deck located at the stern of the ship
Propeller guards	Steel braces above the propellers that prevent the propellers from striking a dock, pier, or other ship
Ro/ro cargo spaces	Spaces that are not subdivided in any way. Vehicles can be driven into these spaces.
Stem	Bow or foremost part of the ship
Sternpost	Major vertical stud/column attached to the keel in the aft of the ship
Watertight doors	Doors that, when closed, prevent water from entering a compartment
Watertight hatches	Hatches that, when closed, prevent water from entering a hold
Weather deck	A deck exposed to the weather from above and from at least two sides

Ship Reference Terms

Draft	A vertical measurement from the waterline to the keel bottom
Freeboard	A vertical measurement from the waterline to the weather deck
In trim	The ship is level, with no difference between forward and aft draft measurements.
Plimsoll line	Internationally agreed-upon reference line marking the loading limit for cargo ships (also known as International Load Line)
Trim	Difference between the forward draft measurement and the aft draft measurement
Waterline	The line where the hull meets the surface of the water

ADDITIONAL SOURCE OF INFORMATION

Standard Marine Navigational Vocabulary, IMO publication 985 85.20.E, International Maritime Organization, 1985.

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Chapter 13

General Ship Safety

Any work around machinery can be dangerous. So can any work on deck. You can make your job safer by thinking about safety as you work. Here are some safety reminders:

GENERAL REMINDERS

Wear your hard hat, safety glasses, and safety shoes.

Do not wear loose clothing or jewelry.

Keep your work area well lit.

Follow ship procedures for cleaning up spills.

Use correct tools.

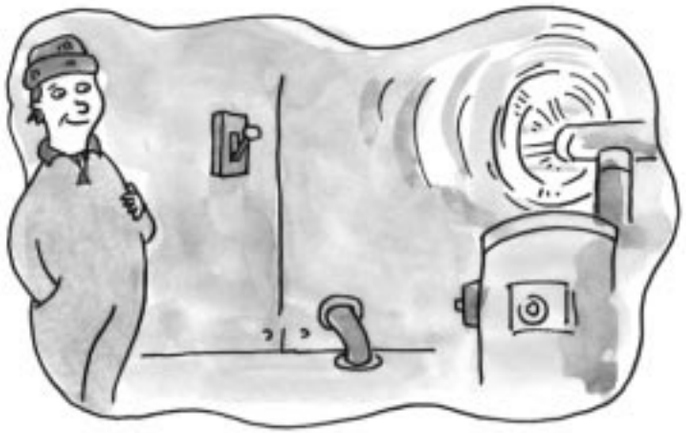
Know ship procedure for "holding off" or "tagging out" equipment.

Do not perform maintenance work unless equipment is properly "held off."

PREVENTING INJURIES

Stay away from rotating machinery parts. Close all machinery covers and guards.

Prevent hand injuries by wearing gloves and watching for places where fingers can become pinched.



PREVENTING BURNS

Be careful with batteries. The acid electrolyte causes serious burns.

CHECK DIESEL-ENGINE COOLANT LEVELS ONLY WHEN ENGINE IS OFF AND COOLANT HAS COOLED.

Wear appropriate engine-room clothing. Your shirt or coveralls should have long sleeves.

Remember that high-pressure steam is invisible. (Only low-pressure steam that contains water droplets is white.) Protect yourself from invisible steam leaks by wearing long sleeves and canvas gloves. Repack steam-valve packing regularly.

PREVENTING FIRES AND EXPLOSIONS

Always have a fire extinguisher available, and know how to use it.

Keep all fuels and lubricants stored properly.

Return unused lubricants and solvents to secure storage area.

Do not allow oil to drip or spill onto hot machinery.

Do not let oil and grease build up on machinery.

Store oily rags and other combustible materials in proper containers.

Do not smoke in no-smoking areas.

ADDITIONAL SOURCE OF INFORMATION:

Code of Safe Working Practices for Merchant Seamen, UK Department of Transport and HMSO. Available from HMSO Publication Centre: P.O. Box 276, London SW8 5DT, United Kingdom. Tel.: (44) (171) 873-9090; Fax: (44) (171) 873-8200.

Chapter 14

Ship Systems

Your ship is your workplace and your home. You are dependent on it, and it is dependent on you. Here is an introductory overview of some major ship systems. When you receive your familiarization training, you should receive a similar introduction specific to your vessel. The major systems described here are the propulsion, power, heating, steering, and electrical systems. You should also receive an introduction to the ground-tackle, pollution-prevention, hull-piping, cargo-handling, and navigation systems.

PROPULSION, POWER, AND HEATING SYSTEMS

Most vessels use diesel engines for propulsion. *Diesel*-propelled vessels have a large diesel engine joined with a transmission to the propeller shaft. A different diesel, usually called the auxiliary diesel, is coupled to an electric generator. The exhaust gases from either diesel may be piped to a waste-heat boiler. The waste-heat boiler takes advantage of the heat left over in the diesel exhaust and uses it to heat water. The boiler also has a burner that supplies additional heat. The boiler produces steam for driving pumps, for heating the fuel oil, and for heating accommodations.

Some vessels are *diesel-electric*. These vessels use a large diesel engine to drive an electric generator. An electric motor is then used to drive the propeller shaft.

Some vessels are powered by *gas turbines.* The gas-turbine design is fuel-efficient. The gas turbine drives an electric generator and supplies heat to a waste-heat boiler.

Some vessels are *steam powered.* On these vessels, large boilers produce high-pressure steam that is piped to steam turbines. One steam turbine is coupled to the propeller shaft. Another steam turbine is coupled to an electric generator. As steam passes through each row of blades on a steam turbine, heat energy in the steam is transformed into mechanical energy, and the steam pressure decreases. There are several extraction points on the turbine where steam is taken to drive pumps and to supply steam for heating.

On all vessels, the propulsion, power, and heating systems are intertwined, but the way they are interlinked will vary from ship to ship. On some ships, boilers, gas turbines, and diesels will share the same fuel. On other ships, they will have separate fuels. On most ships having both gas turbines and boilers, the combustion air and the flue gas systems will be combined. It is important to know how the systems are interrelated and this should be covered in your familiarization training.

STEERING SYSTEMS

A vessel is steered using the steering wheel on the bridge, the rudder in the ship's stern, and the ship's propellers. The wheel is part of the controlling mechanism for the steering system. The steering system also includes:

Skegs

Rudder

Steering "engine"

Propeller and its driver

A skeg is a fixed, nonmoving stern attachment. A rudder is a movable stern attachment. Both skegs and rudders are surfaces against which water can push. The force beating against the ship is proportional to water pressure and surface area. A larger force exists when a larger rudder is used. A ship with a large rudder can make a tighter turn.

The ship is also steered with its propeller. The rudder action controls movement to the left or right. Propeller action controls fore-and-aft movement.

ELECTRICAL SYSTEM

Every ship has a primary electrical system and a backup system. The primary system usually includes:

Generator or alternator

Buses and circuits

Transformers

Breakers, disconnects, links, and fuses

Relays

Electrical power is generated in the generator or alternator. It travels from the generator leads through the main generator breaker to the generator transformer. The transformer ensures that the output voltage is that specified for the main *bus* or *bus bar*. A bus or bus bar is a large copper, copper-nickel, or aluminum bar. This bar can carry very large electrical currents—larger currents than can be carried by cables. In most ships, this bus will be located behind other electrical equipment so that it cannot be touched accidentally.

You should know the location of the main bus bar as well as other electrical hazards. Never perform any maintenance

operation on or near this bus bar when it is energized. You do not have to touch the bus bar, or any other piece of high-voltage equipment, to receive a harmful electrical shock. Electricity can jump from a high-voltage source. You just have to be too close to it. The accompanying chart shows distances that one U.S. power company recommends for safety around high-voltage equipment.

AC Voltage in Kilovolts (KV)	Amount of Space Needed Between You and Energized Equipment	
2 to 15	2 ft.	61 cm
15.1 to 35	2 ft. 4 in.	71 cm
35.1 to 46	2 ft. 6 in.	76 cm
46.1 to 72.5	3 ft.	91 cm
72.6 to 121	3 ft. 4 in.	102 cm
138 to 145	3 ft. 6 in.	107 cm
161 to 169	3 ft. 8 in.	112 cm
230 to 242	65 ft.	152 cm

You have the right to be shown proof that any piece of electrical equipment is de-energized before you are directed to work on it. You should assume that all cables, wires, and equipment are energized unless they are proved to be "dead."

Numerous disconnect switches connect feeders with the main bus bar. These disconnect switches are used to energize or isolate a feeder circuit. In the closed position, the circuit is energized, or "alive." In the open position, the circuit is iso-

lated, or "dead." Each circuit also has a circuit breaker, which performs the same function as a fuse. It opens the circuit if the current flow exceeds the rating for the circuit. Circuit-breaker operation is automatic. A circuit breaker receives a signal to open when a protection relay senses an overcurrent condition. Relays are equipment protection devices and can be dangerous. Relays come in four types: overcurrent, undercurrent, overvoltage, and undervoltage. They sense the current or voltage in a circuit using the same technology employed in transformers. They have electrical coils where electricity is induced. The voltages induced in relay coils can be very high.

GROUND TACKLE

All of the equipment used for anchoring a vessel is collectively called *ground tackle.* This includes the anchors, anchor cables and chains, connecting fittings, and anchor windlasses. Anchors are stored in the hawsepipes when not in use. The anchor chain runs from the anchor through the hawsepipe, around riding chocks, over the windlass gipsy, and down into the chain locker, where it is stored.

The windlass is a machine used to hoist the anchor. It can be driven by an electric, hydraulic, or steam motor. It has a wheel with sprockets, and the anchor chain passes over it much like a bicycle chain passes over a bicycle gear. The wheel with sprockets is called a gipsy. The gipsy can be disengaged from the windlass, allowing the windlass to be used for heaving in mooring lines.

On the same windlass shaft as the gipsyhead is the drum end or capstan. *Drum end* and *capstan* are both terms for the drum around which the mooring lines are wound. A drum end has a horizontal shaft, while a capstan is on a vertical shaft.

POLLUTION PREVENTION SYSTEMS

Most oceangoing vessels are required to be equipped with pollution-prevention equipment. This equipment includes:

Separators for separating oil from waste waters

Bilge alarms

Slop tanks and sludge tanks

Save-alls, moats, and oil pans around oil equipment

Oil/water interface detectors

Cargo monitors

Shore-connection piping

Trash-handling systems

Sewage treatment plant and holding tanks

Oily-water separators are used to separate oil from both bilgewater and ballast water. The separators are usually dedicated either to the bilgewater or to the ballast water. Separators are part of a system that also includes suction and discharge piping, recirculation piping, oil (OCD) sensors and alarms, freshwater supply, and a slop tank. On ships built before 6 July 1993, 100 ppm separators may be used until 8 July 1998. On most ships, 15 ppm separators are required. An oil concentration of 15 ppm is the lowest amount of oil that most people can see. If you can see an oil sheen on a sample of water, you know that it contains at least 15 ppm of oil.

Slop tanks and sludge tanks are important pieces of equipment. They use time and gravity to remove water from oil mixtures. They also hold oily wastes until they are discharged to shore reception facilities or incinerated. For ships smaller than 400 gross tons, these tanks can be the only equipment for handling oily waste.

Oil/water interface detectors establish where the water layer ends and the oil layer begins inside separators and inside tanks. The detectors usually use several probes inserted through a tank cover that has had holes drilled and threaded in it to accept the probes. Each probe extends to a different

depth. A signal is generated in a probe when the probe tip is submerged in water, because water is conductive. The detector receives the signal from the probe(s) and sends a signal to an alarm. When the detector is on an oily-water separator, it sends signals to relays that shut down the water-discharge pump before the oil drain cycle begins.

Shore-connection piping exists on ships to transfer oily-water wastes, cargo-tank cleaning wastes, and sewage wastes to shore reception facilities.

POLLUTION TERMS

Accidental Pollution. Pollution that results from ship collisions or groundings.

APHIS. Animal and Plant Health Inspection Service. This is a special waste category defined by the U.S. Department of Agriculture. It includes all waste derived from fruit, vegetables, meat or anything that has come in contact with these products. In the United States, this garbage needs to be offloaded under the supervision of an APHIS inspector, and given to an approved waste-management company.

Bilge alarm. An instrument that measures the oil content of oily mixtures from the machinery-space bilges and from fuel tanks that carry ballast. This instrument sounds an alarm at the permissible-discharge upper limit (usually 15 ppm).

Bilge monitor. An instrument that measures and records the oil content of oily mixtures from the machinery-space bilges and from fuel tanks that carry ballast.

Cargo monitor. An instrument that both measures and records the oil content of cargo residues from cargo tanks.

COA. Certificate of Adequacy. This is a certificate issued to a port when the port demonstrates that it has adequate reception facilities for waste.

Coalescer. A piece of equipment that contains a bed of inert material with lots of surface area. Small oil drops are attracted to the surface, and many small drops combine there to form larger drops.

Comminuter. Grinding or pulverizing machinery used for garbage.

COW. Crude oil washing. This procedure eliminates the formation of oily-water mixtures during cleaning of cargo tanks.

Discharge. Any liquid leaving the ship, either on purpose or inadvertently.

Effluent. Any liquid being pumped off the ship.

INLS. International Pollution Prevention Certificate for Carriage of Noxious Liquid Substances in Bulk. This certificate is issued by the marine administration of the flag state after completion of a comprehensive survey of the ship and its tanks, instrumentation, and safety equipment.

IOPP. International Oil Pollution Prevention Certificate. This certificate is issued by the marine administration of the

flag state after completion of a comprehensive survey of the ship and its pollution-control equipment.

ISPP. International Sewage Pollution Prevention Certificate. This certificate is issued by the marine administration of the flag state after completion of a comprehensive survey of the ship and its sewage-control equipment.

Marine pollutant. Any substance that has a harmful effect on the marine environment. All substances that are hazardous to humans are marine pollutants. Some other substances that are marine pollutants are plastic, detergents, and oils.

MARPOL. An IMO convention addressing ship-generated pollution.

OCD. Oil content detection and alarming instrument. It is usually mounted on the oily-water separator. It measures oil concentration by measuring the degree of scattering in an infrared light beam when the light beam passes through a water sample. This term is used by equipment manufacturers.

ODM. Oil discharge and monitoring equipment This term is used by the IMO.

Oil. In the context of pollution, an oil is a petroleum product in any form, or a liquid chemical similar to an oil. Vegetable oils and animal oils are not polluting oils.

Oily mixture. A mixture with any oil content, including bilge slops, oily wastes, oil residues, oily ballast water, and washings from cargo oil tanks.

OPRC. Oil Pollution Preparedness, Response, and Cooperation. The IMO requires ports to have an OPRC plan for responding to oil spills.

SPAR. The Convention on the Protection of the Marine Environment of the North East Atlantic, 1992. This convention replaced the 1972 Oslo Convention.

PPM. Parts per million concentration unit. It is equal to 1 milligram per kilogram (mg/kg).

Refuse. Garbage.

SBT. Segregated ballast tanks.

Sheen. The shiny, glistening appearance that oil has when it is spread in a thin layer.

Slop tank. A tank that receives the oily discharge of an oily-water separator.

Sludge tank. A tank that receives the watery sludge from a fuel-oil centrifuge.

Ullage. Measured from the surface of a liquid in a tank to a fixed reference point, ullage is the depth of the unused space left in the tank.

HULL PIPING SYSTEMS

The major piping systems found in ships are:

Ballasting

Compressed air

Drainage

Fire main

Flushing

Fresh water

Fuel oil

Sprinkling

Ideally, the piping for each of these systems is painted a different color to make it easily identifiable.

When piping is not painted an easily identifiable color, take time to learn how to recognize piping belonging to each system. Piping throughout a particular system should have the same type of joints and use similar valves. Where piping for two different systems looks similar, the systems must be properly labeled.

CARGO-HANDLING EQUIPMENT

There are many kinds of specialized equipment used to lift and maneuver containerized cargo. Specialized training is required to learn the equipment operation and the signals used by crane operators. If you are not involved with cargo operations, stay clear of the area while items are being hoisted.

SOME CARGO-HANDLING TERMS

Block. Pulley.

Derrick. Large spar fixed on board ship with a pivot at its lower end and a topping lift, guy pendants and whip at its upper end. It is used like a crane to hoist objects. On some ships, the derricks are called booms.

Drum. The portion of a winch around which rope is wound.

Guy pendant. The rope or tackle used to control the side-to-side movement of a derrick. Each derrick has two guy pendants.

Line. Natural or synthetic rope.

Marline. Natural rope made from tarred hemp.

Purchase. A mechanical system that uses pulleys to increase pull.

Rope. Wire rope is usually called rope; natural rope is called line.

Sheave. The turning wheel inside a block or pulley that holds the rope.

Tackle. This term can refer to the ropes between two pulleys of a purchase or it can describe the whole purchase (rope and pulleys).

Winch. A mechanical device driven by steam or electricity with a drum that is used to heave in rope.

DO'S AND DON'TS FOR USING NATURAL ROPE

If line becomes chafed or damaged, cut and splice it. A good splice is safer than a damaged section.

Don't lubricate natural lines.

Apply loads slowly and carefully.

Keep bitts, chocks, and cleats in smooth condition to minimize abrasion.

DO'S AND DON'TS FOR USING SYNTHETIC ROPE

Don't use square knots when bending together or securing synthetic ropes. Synthetic rope is more slippery than natural rope, and a square knot will not hold.

Do use natural-rope tattle tails when using synthetic lines so that you can see when the synthetic lines are stretched to near their safe working load (SWL) limit.

Rope Fiber Type	Rule for Estimating Breaking Strength (BS) in Tons. Circumference (C) is in Inches. (For synthetic rope, the SWL is from 1/15 to 1/5 of the breaking strength, or BS.)
Natural	BS = C/3
Nylon (Nomex)	BS = C2
Polyester (Terylene, Dacron)	BS = 0.9 C2
Acetate (Courlene, Fiber C)	BS = 0.7 C2

DO'S AND DON'TS FOR USING WIRE ROPE AND WIRE SLINGS

Don't use a kinked sling for lifting.

Never pull the kink out of wire rope by pulling on both ends of the rope.

Do remove kinks by untwisting the kink and pounding the kink flat with a wooden mallet.

Place pads over sharp edges of items being hoisted so that slings are not cut.

Don't let the eyes of slings overlap on the whip or crane hook. Shackle the two eyes together.

Lubricate wire rope and slings before placing them in storage.

Discard wire rope that is rusty.

Causes of Wire Rope Failure

Using wrong size or type

Dragging rope over obstacles

Lubricating improperly

Overriding or cross winding on drums

Improperly attaching fittings

Exposure of wire to excessive heat

Permitting wire to untwist

Allowing grit to penetrate the strands

Subjecting the wire to continuing overloads

Kinking

NAVIGATION AND COMMUNICATION SYSTEMS

Navigation Systems

Among the navigational equipment found on vessels are:

Gyrocompasses

Radar

Electronic navigational equipment

The *gyrocompass* is a compass that always points to true north. It is easier to use than a magnetic compass. A magnetic compass points to the magnetic north pole, which is different from true north.

Radar systems are used to detect collision hazards and to obtain position information in dense fog. The radar transmitter/receiver sends out and detects radio waves. It measures the time it takes for the radio waves to bounce off an object and come back to it. The radar unit calculates distances from these time measurements.

Electronic navigation equipment senses the vessel's position by communication with a land-based station or a satellite station. There are several land-based systems around the world, including Loran-C, Omega, and Decca. There are also several satellite systems, including INMARSAT and GPS. GPS is an American system that replaces NAVSAT.

Communication Systems

The Global Marine Distress and Safety System (GMDSS) is now required on most vessels. You have probably seen alarm clocks that are also radios, or tape players that are also CD players and radios. It is now common practice to enclose many electronic devices within a single housing. That is what has been done with the GMDSS. The GMDSS enclosure contains electronic navigation equipment, several kinds of radios, and a special telephone called a DSC (Digital Selective Calling). The components found inside the GMDSS on your ship depend on what region of the world your ship usually operates in. The components are chosen so that there will be two ways to send emergency distress messages. The GMDSS and satellite links make worldwide communication possible, and the ship communication range is no longer restricted to the former radio range of approximately 200 miles.

GMDSS distress messages are received by Rescue Coordination Centers on shore. These centers are part of the GMDSS system. Two satellite systems are also a critical part of the GMDSS system. They are INMARSAT and COPAS-SARSAT. INMARSAT is a multi-application satellite system used for telecommunications, navigational purposes, and relay of distress messages. COPAS-SARSAT is a single-appli-

cation satellite system. It receives distress messages from emergency position-indicating radio beacons (EPIRBs). Both INMARSAT and COPAS-SARSAT relay the distress messages to the Rescue Coordination Centers.

ADDITIONAL SOURCES OF INFORMATION

Noel, John V., *Knight's Modern Seamanship,* 18th ed., John Wiley & Sons, New York, 1997.

Training Ship Patriot State Engineering Manual, Massachusetts Maritime Academy. Manual available at Web site: http://www.mma.mass.edu/campus/tsps/manual/

Chapter 15

Fire Safety

Many of your ship's rules have been instituted to prevent fires. Fire prevention should be part of almost every ship operation. The information provided here is an overview of fire prevention and firefighting topics. If you understand how fires start and spread, you will know how to prevent them. Every seafarer is encouraged to learn as much as possible about fire prevention.

STCW 95 (see chapter 11) requires that officers in charge of the engine room have formal training in fire safety every five years at a shore-based firefighting school. Fire-prevention training is also required for all officers and all ratings employed on tankers. This training is usually part of the tanker familiarization course.

FIRE TRIANGLE

To burn, a fire needs three elements: fuel, heat, and oxygen. *You can extinguish a fire, or prevent a fire, by removing one of the three things that form the sides of the fire triangle.*

Remove the Fuel

You can prevent fires by maintaining equipment so there are no oil leaks, and by storing flammable liquids and gases correctly.

If the fire is consuming leaking fuel, you can extinguish the fire by valving out a section of piping so as to remove the fuel source.

Remove the Heat

Most combustible materials can burn only when they are warm enough to give off flammable vapors. Cool these materials and the fire will die. Removing heat is the way we most often extinguish fires; this usually involves cooling the fire with a fire hose using a fog spray.

You can prevent fires by knowing and maintaining appropriate equipment temperatures and by storing combustible materials away from surfaces that get hot.

Remove the Oxygen

A fire needs oxygen. If a small fire occurs in the galley, cover the fire with a pot lid. Or use a CO^2 (carbon dioxide) or dry-powder fire extinguisher to smother the fire. Larger fires can be smothered with foam or sand.

A fixed CO^2 system is used to remove the oxygen and suffocate a fire in a closed hold or compartment. Inert gases are used in cargo holds carrying flammable or explosive materials.

GOOD HOUSEKEEPING

You can prevent fires by keeping the ship and all its equipment well maintained and clean. When you store combustible materials properly, you are preventing fires by removing the fuel side of the fire triangle. When you maintain and clean electrical equipment, you prevent equipment malfunctions that generate intense heat, so you are removing the heat side of the fire triangle.

Smoking and Cooking

Careless use of smoking materials leads to fires, so *do not smoke:*

Where a "No Smoking" sign is displayed

When flammable cargo is being transferred

Within 50 feet of a portable tank

In the engine room

Poorly maintained galley equipment can lead to cooking fires. To prevent fires:

Maintain the exhaust blower above the cooking range. It prevents fires by cooling the gases flowing through the exhaust plenum.

Clean the exhaust filters often. Filters trap grease and oil that will catch fire if the flue temperature climbs too high.

Welding and Flame Cutting

Careless use of welding equipment and acetylene torches is extremely dangerous. Follow all safety procedures when performing these tasks. Be aware that:

The intense heat generated can sometimes cause a fire in a nearby compartment. Remove combustible materials and maintain a fire watch in all affected compartments.

Sparks generated during burning operations can land many meters away. Do not perform burning operations on deck on windy days. Use fire blankets to protect gratings, so sparks do not fall on crew and equipment beneath you.

Paints, coatings, and rubber linings can emit toxic fumes. Metal surfaces that have coatings or linings should never be welded or cut with a torch.

Welding and flame-cutting operations should not be performed on or near tanks used to store flammable or explosive liquids until the tanks are drained, purged with live steam or inert gas, and monitored for combustible gases.

No one should perform any hot work (welding or flame cutting) without permission from the commanding officer.

CLASSES OF COMBUSTIBLES

There are four types of flammable materials. Different firefighting equipment is used for each type.

Class A

Class A materials are materials made from wood, natural fabrics, or paper. Class A fires are fought with water. A Class A fire extinguisher is filled with water under pressure. It works well on small Class A fires, but it is useless on other fire types. The Class A pressurized-water fire extinguisher has only a Class A symbol on it. This fire extinguisher is often silver-colored. For a large Class A fire, use a fire hose.

Warning: Never use a Class A fire extinguisher on an electrical fire. You could receive an electrical shock.

Class B

Class B fires involve such materials as oils, greases, paints, alcohol, flammable gases, and plastics. A Class B fire may begin in the engine room, where spilled oil contacts hot surfaces. It may occur when equipment bearings overheat and ignite the lubricant. Class B fires also can occur in the galley and in the cargo hold.

There are three kinds of Class B fire extinguishers: foam, dry chemical (sometimes called PKP), and carbon dioxide. These fire extinguishers are marked with the Class B symbols. (Some of them are also marked with the Class C symbols.)

Class C

Class C fires occur on or near live, energized electrical equipment. These fires may occur when:

Combustible materials are located close to electrical wiring with damaged insulation.

Electric radiators and electric hot plates are used improperly.

Oil is allowed to drip on wiring in a plastic conduit.

Electrical panel boards, switches, or breakers are not well maintained.

Electric transformers are overloaded.

Electric generator or motor bearings catch fire.

For electrical fires, you must only use an extinguisher with a nonconducting agent. It must have the Class C symbol. There are three kinds of Class C fire extinguishers: dry chemical (PKP), carbon dioxide (CO^2), and halon. These fire extinguishers are all marked with the Class C symbol. (Some are also marked with the Class B symbol.) The CO^2 fire extinguisher is the "first choice" for extinguishing fires inside electric panel boards and breaker compartments. It does not leave any residue.

When possible, turn off the electric power.

Class D

Class D fires involve metals that can burn. These metals include magnesium, sodium, potassium, titanium, and aluminum. When they burn, they produce extremely dangerous, high-temperature fires that must be suffocated. Only one type of fire extinguisher can be used on a Class D fire—a dry-powder type. Dry powder is different from dry chemical. The dry-powder extinguisher has a gas cartridge attached to its side. The cartridge contains either nitrogen or carbon dioxide gas—a propellant. To operate the extinguisher, hold the discharge nozzle securely with one hand. Open the gas cylinder by pressing down firmly on the puncture lever with your other hand. Spray the burning surface with the dry powder, covering it with a thick layer of the powder. The objective is to suffocate the fire. Class D dry powder also comes in drums and can be applied with a shovel. Sand can also be used to suffocate a Class D fire. Or a water hose with a fog nozzle can be used to cool the air and surfaces near the fire and to produce a cloud of steam that suffocates the fire.

Do not spray water directly on the metal because many combustible metals react with water. Burning magnesium reacts with water to form explosive hydrogen gas. This metal also generates a flame so bright that it can cause permanent damage to your eyes. Do not look directly at a Class D fire. If possible, wear welder's goggles or a face shield.

Class D fires can occur:

On a steamship, in the air-heater baskets if an air-heater overheats

In personal cooking gadgets containing metal-coated electrical coils

In cargo holds containing powdered aluminum, titanium, or magnesium

Typical Combustible Materials and Appropriate Extinguishing Agents

Fire-extinguisher choices are listed in order of preference. The best choice is given first.

Material	Class	Extinguishing Agents
WOODWORK, BEDDING, AND CLOTHES	A	Fixed water-sprinkling system Fire hose with any nozzle positionFoam Dry chemical CO^2
PAINTS, SOLVENTS, AND OTHER FLAMMABLE LIQUIDS	B	CO^2 (fixed system) Foam Dry chemical Halon (fixed system)
GASOLINE	B	Foam CO^2 Dry chemical
FUEL OIL, JP-5, DIESEL OIL, KEROSENE	B	Foam (AFFF) Dry chemical High-velocity fog CO^2
ELECTRICAL EQUIPMENT	C	CO^2 Halon High- or low-velocity fog Dry chemical
MAGNESIUM ALLOYS	D	Dry powder Sand Low-velocity fog

FIXED FIREFIGHTING EQUIPMENT

Water Sprinkler Systems

Sprinkler systems are usually found in crew accommodations, passageways, public spaces, and vehicular decks on ro/ro vessels and ferries. Sprinklers can only extinguish Class A fires. They help limit the spread of all fires by cooling the fire, and they protect people who are using passageways as escape routes. Sprinkler systems are automatic. Each sprinkler head has a "fusible link" made of solder. It is designed to melt at a prescribed temperature and activate the sprinkler head. Note: Sprinkler heads should never be painted, as the paint can insulate the fusible links and interfere with their operation.

Fire-Main System: Hoses and Nozzles

Every vessel has a fire-main system. It supplies salt water for fire protection to every part of the ship. The fire-main system has pumps, piping, control valves, hoses, and nozzles. It also has a shore connection on each side of the ship.

The fire-main system delivers water to fire stations throughout the ship. The fire stations each have a control valve, a hose connection and a hose rack with a fire hose and nozzle. The preferred nozzle is a combination nozzle. It is opened by pulling a lever toward your body after you are properly holding the hose. Never use the lever to pick up the hose. When you pull the lever halfway back, the nozzle delivers the water in a high-velocity fog. When you pull the nozzle all the way back, the water is delivered in a steady, continuous stream.

A fire station may also contain a low-velocity fog applicator. This applicator is used for Class C (electrical) fires and Class

D (metal) fires. Do not use it unless you have been trained for it. Never use a regular water stream or a high-velocity fog on an electrical or metal fire. The wrong water stream could cause you to be electrocuted if you are fighting an electrical fire. The wrong water stream could cause hydrogen gas to be generated if you are fighting a metal fire.

Foam Systems

Foam systems are usually found in boiler rooms, machinery spaces, and pump rooms. Foam is excellent for fighting Class B fires. *Foam is a conductor, however, and should not be used on Class C (electrical) fires.* The foam floats on the surface of flammable liquids. It fights the fire four ways:

It smothers the fire, preventing air from mixing with fuel vapors.

It suppresses flammable vapors.

It separates existing flames from the fuel surface.

Because it is mostly water, the foam cools the fuel.

There are several types of foam and there are several ways to mix each foam type. You need to receive special training for the foam systems found on your ship.

The common foam types are:

Aqueous film-forming foam (AFFF)

Chemical foam

Mechanical foam

Each of these foams is made from a foam concentrate. Never combine different types of foam concentrate.

Carbon Dioxide (CO^2) Systems

Carbon-dioxide systems are found in cargo spaces, pump rooms, generator rooms, storage spaces for paints and solvents, and galley ranges. CO^2 extinguishes a Class B or C fire quickly and leaves no residue. CO^2 is stored in cylinders as a liquid. It is discharged through very wide nozzles, where it expands into a gas. The CO^2 gas is heavier than air. It covers the fire and suffocates it. The CO^2 gas in the quantity delivered by a fixed system is dangerous to crew members. It displaces oxygen that you need to breathe and temporarily interferes with the way oxygen is normally absorbed in your lungs.

A fixed CO^2 system has to be manually activated from a control station outside the compartment where the CO^2 will be released. The Carbon Dioxide Warning Alarm must be sounded first. If you hear this alarm, evacuate immediately.

Halon Systems

Halon systems can be found in many of the same shipboard locations as CO^2 systems. This includes machinery spaces, turbine enclosures, and pump rooms. Halon is a colorless, odorless gas. When the halon reacts with the flames, it can turn toxic.

Halon systems have audible alarms that warn crew members when the system is about to be discharged. When you hear a halon alarm, leave the compartment immediately. Halon is very effective for extinguishing fires. It extinguishes fires quicker than any other agent. There is no reason for you to try to fight a fire on equipment protected by a halon system. Most important is to evacuate immediately when you hear the alarm.

SELF-CONTAINED BREATHING APPARATUS (SCBA)

Self-contained breathing apparatus (SCBA) should be stored in a specially marked cabinet or locker. SCBA equipment is also stored near cargo holds containing toxic materials.

You must have training in the proper use of this equipment. This training should include actual use of the SCBA equipment. You must know which respirator size correctly fits your clean-shaven face. To wear the SCBA equipment, you must be healthy. You cannot have any respiratory disease or heart ailment.

SCBA equipment is used in places where there is not enough oxygen to support life or where there is a toxic material in the air. When worn correctly, the SCBA delivers clean air to your face mask so you can breathe. Improper use of SCBA equipment can cause serious injury or death.

A SCBA air cylinder contains a 15- to 45-minute supply of air. Some models supply more than others. If you are working and breathing hard, you will use up the air faster than when you are breathing normally. The regulator, mounted on your belt, controls the airflow rate. An alarm sounds

when about a seven-minute supply remains. When you hear that alarm, you must leave the dangerous environment and find fresh air immediately.

After using a SCBA, follow your ship's procedures for replacing used air bottles and cleaning the respirator. The SCBA equipment is always stored ready for use, with full air bottles.

An air-line breathing apparatus (ABA) is similar to a SCBA. It also supplies clean air to your respirator. The air line is a long hose connected to a bank of air cylinders and to a regulator on your belt. The ABA allows you to work in a dangerous environment for a longer period of time than the single-cylinder SCBA. Some SCBA systems are "dual-purpose," meaning that they work with either an air line or a portable air cylinder.

Make sure you fully understand how your SCBA or ABA equipment operates before you use it. Be certain that you recognize the low-pressure alarm. Make sure you also know the procedure for bypassing the regulator in case it fails.

SAFETY NOTE

If your clothes catch on fire, do not run, which fans the flames. Lie down and roll up in a blanket, coat, or any object that will smother the flames. If nothing is available to smother the flames, roll over slowly and use your hands to beat out the flames.

ADDITIONAL SOURCES OF INFORMATION

Marine Fire Prevention, Firefighting and Fire Safety, U.S. Department of Commerce, Maritime Administration (available from U.S. Government Printing Office).

Code of Safe Working Practices for Merchant Seamen, UK Department of Transport and HMSO (available from HMSO Publication Centre).

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Chapter 16

Hazardous Cargo

Hazards are of three general types: physical, health, and environmental. Physical hazards include fire, explosion, and chemical-reaction hazards. These hazards threaten both the ship and the crew.

Health hazards include toxic, carcinogenic, biohazard, asphyxiant, and skin-irritant hazards. You should know how to protect yourself from these hazards.

Environmental hazards include materials hazardous to the atmosphere and to marine life.

Many dangerous materials present more than one hazard. Most materials that present health hazards also present environmental hazards. And most solvents present both health and fire hazards.

Some cargoes are hazardous only under certain conditions. If those conditions can be avoided by refrigerating the cargo, or by placing the cargo in an inert atmosphere, the cargo becomes relatively safe.

Some materials that we usually think of as harmless can become dangerous when they are transported in bulk. Some of these items are:

- Calcined pyrites
- Charcoal
- Coal
- Direct reduced iron (Dri)
- Direct reduced iron briquettes
- Ferrophosphorous
- Ferrosilicon
- Fluorspar (calcium fluoride)
- Lime (unslaked) (calcium oxide, quicklime, Dolomitic quicklime)
- Magnesia (unslaked)
- Metal sulfide concentrates

- Petroleum coke
- Pitch prill, prilled coal tar, pencil pitch
- Sawdust
- Silicomanganese
- Tankage
- Vanadium ore
- Wood chips
- Wood-pulp pellets

The materials listed are hazardous only when carried in bulk. They might, for example, reduce the oxygen content of a cargo space or they could be prone to self-heating, as occurs with wood chips.

All hazardous cargoes can be transported safely. To transport hazardous cargoes safely:

- Store hazardous cargo in appropriate containers
- Maintain proper temperature, humidity, and inert atmosphere conditions

Know cargo properties

Use personal protective equipment (PPE)

Have procedures for responding to cargo releases

HAZARDOUS CARGO STORAGE

Cargo shipped in packages or containers must be in containers that do not split open during routine handling. These containers:

are constructed of material compatible with the cargo

are large enough to accommodate liquid expansion from temperature increases

are marked with the technical name for the cargo and appropriate IMDG labels

have a container packing certificate

Cargo shipped in bulk will be shipped in tankers designed to carry that cargo. The tankers should comply with the International Code for the Construction and Equipment of

Ships Carrying Dangerous Chemicals in Bulk (IBC Code). Before loading any bulk cargo, the ship master will obtain—usually from the shipper—the physical and chemical properties of the cargo. If you work on a tanker, you should be given familiarization training covering the properties of the cargo as well as the ship systems for monitoring and protecting the cargo.

CARGO PROPERTIES

Containerized cargo is marked with the IMDG label or placard. It is also marked with its proper technical name and the United Nations identification number (UN number), when there is one.

The container is also marked with IMDG labels for secondary hazards. The labels should provide enough information for you to know how to handle the cargo safely. If inadequate information is provided on the labels, ask your supervisor for a cargo information sheet. (On U.S. ships, the information sheets are called Material Safety Data Sheets, or MSDS.)

The IMDG label indicates the class in which the cargo belongs and it gives a picture symbol to indicate the primary hazard (explosive, flammable, toxic, etc.). If the cargo presents a secondary hazard, then a second label with the second picture symbol is also on the container.

IMDG Class, Hazards, Safety Information, and Symbols

CLASS 1 – EXPLOSIVES
Hazards: Explosion, Fire
Safety Information: Explosives are divided into five subclasses and 13 compatibility groups. Do not store explosives from two different compatibility groups together.

CLASS 2 – GASES
CLASS 2.1 – FLAMMABLE GASES
CLASS 2.2 – NONFLAMMABLE GASES
CLASS 2.3 – POISONOUS GASES
Hazards: All untied gas cylinders present a "rocket" hazard. All gases except oxygen can displace the air that you need to breathe. Fire and explosion hazards for Class 2.1. Toxic, carcinogenic, and asphyxiation hazards for Class 2.3. Many gases are harmful to the environment.
Safety Information: Secure cylinders in storage racks. Keep valve covers on cylinder valves. Keep cylinders away from heat. Read Cargo Information Sheet for safety information specific to the gas in the cylinder.
Symbols:

CLASS 3 – FLAMMABLE LIQUIDS
CLASS 3.1 – LOW-FLASH-POINT GROUP (FLASH POINT < -18˚C cc)
CLASS 3.2 – INTERMEDIATE FLASH-POINT GROUP (FLASH-POINT > -18%C cc AND < 23˚C cc)
CLASS 3.3 – HIGH-FLASH-POINT GROUP (FLASH POINT > 23˚C cc)
Hazards: Fire and explosion hazards. Class 3.1 is the most flammable. These liquids may also present inhalation, asphyxiation, and carcinogenic hazards. All Class 3 liquids are marine pollutants.
Safety Information: Do not use low-flash-point solvents in a confined or unventilated space. Protect skin with gloves and eyes with goggles. Consult Cargo Information Sheet for respirator and SCBA information.
Symbol:

IMDG Class, Hazards, Safety Information, and Symbols

CLASS 4 – FLAMMABLE SOLIDS OR SUBSTANCES
CLASS 4.1 – FLAMMABLE SOLIDS
CLASS 4.2 – SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION
CLASS 4.3 – SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES.
Hazards: Fire hazard. Easily ignited by sparks, flames, and friction. This class also covers substances that are self-reactive and that may explode if not diluted sufficiently. Class 4.2 substances can undergo spontaneous combustion. Some are more likely to do so when wetted with water or in contact with moist air. Some also give off toxic gases if involved in a fire. Class 4.3 substances emit flammable gases when in contact with water.
Safety Information: Consult Cargo Information Sheet for respirator and firefighting information.
Symbols:

CLASS 5 – OXIDIZING SUBSTANCES (AGENTS) AND ORGANIC PEROXIDES
CLASS 5.1 – OXIDIZING SUBSTANCES (AGENTS)
CLASS 5.2 – ORGANIC PEROXIDES
Hazards: Fire and explosion hazard. Decomposition may produce toxic or flammable gases. Some organic peroxides can be particularly dangerous to the eyes.
Safety Information: Wear goggles or face shield to protect eyes. Wear gloves and sleeve protectors to protect skin. Consult Cargo Information Sheet for respirator and SCBA information. The fire hazard can be reduced by storing many of these materials under water.
Symbols:

IMDG Class, Hazards, Safety Information, and Symbols

CLASS 6 – TOXIC AND INFECTIOUS SUBSTANCES
CLASS 6.1 – TOXIC SUBSTANCES
CLASS 6.2 – INFECTIOUS SUBSTANCES
Hazards: Poison hazard. Class 6.1 substances: pesticides and insecticides, chloroform, cyanides, strychnine, tear gas, and other toxic materials. Class 6.2 includes substances

containing living microorganisms. Most Class 6 materials are marine pollutants.
Safety Information: Consult Cargo Information Sheet for respirator and SCBA information. Also protect skin with gloves, sleeve protectors, coveralls. For biohazards, follow the advice of local public-health authority.
Symbol:

CLASS 7 – RADIOACTIVE MATERIALS
Hazards: Radioactive materials are divided into three categories, depending upon radiation levels, category I (white) being the least dangerous. The labels for categories II and III are printed in yellow. All Class 7 materials are marine pollutants.
Safety Information: Protect yourself from radioactive rays with "shielding" and "distance." Put partitions of steel (shielding) between you and the radioactive cargo.
Symbol:

CLASS 8 – CORROSIVES
Hazards: These materials can cause serious injury from chemical burns. They can cause serious damage if they get in your eyes. Some give off irritating, poisonous, or harmful vapors. Some are flammable or give off flammable gases under certain conditions. Many class 8 materials are marine pollutants.

IMDG Class, Hazards, Safety Information and Symbols

Safety Information: Wear thick rubber gloves, coveralls, sleeve protectors, goggles/face shield. Wear thin gloves inside the rubber gloves so that your hands remain protected while you are taking off the other PPE. Consult Cargo Information Sheet for respirator and SCBA information.

IMDG Class, Hazards, Safety Information, and Symbols

Symbol:

CLASS 9 – MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES
Hazards: Products of this class include aerosols, some ammonium-nitrate fertilizers, asbestos, and substances like plastics that are marine pollutants.
Safety Information: Consult Cargo Information Sheet for safety information.
Symbol:

PROTECTING YOURSELF WITH PPE

IF A DANGEROUS CARGO PRESENTS A HEALTH HAZARD, YOU CAN KEEP IT FROM HARMING YOU BY REMEMBERING, "IF THE CHEMICAL CAN'T GET INSIDE OF YOU, IT CAN'T HARM YOU." THERE ARE ONLY FOUR WAYS FOR HAZARDOUS SUBSTANCES TO INVADE THE HUMAN BODY.

Absorption through the skin

Entering through the eyes

Inhalation through the nose and mouth

Ingestion

There is personal protective equipment (PPE) for the first three routes of entry. To avoid the fourth route—ingestion of harmful substances—do not eat or smoke while you are working with or near hazardous materials. Wash your hands and face thoroughly when you finish working with hazardous materials.

Never smoke within 50 feet of a tank containing any of these hazardous materials.

PROCEDURES FOR RESPONDING TO CARGO RELEASES

A release is a spill, leak, or venting of a dangerous material. Normally, the cargo is stored properly and releases do not occur. When releases do occur, respond using emergency procedures (EmS). If you are the one to discover a release, retreat first and report your discovery. Then follow ship procedures. Never assume a release of a hazardous substance is small enough to clean up by yourself. You will not be helping anyone if you become injured.

Here are some points to remember:

Be prepared by having PPE conveniently located and in good condition.

Know how to wear and use all PPE.

Only perform tasks you have been trained to perform.

Do not perform dangerous tasks alone.

Most dangerous cargoes present more than one hazard. Accidents often occur when secondary hazards are forgotten or overlooked.

HAZARDOUS-CARGO TERMINOLOGY

It is important to know the terms used to describe hazardous cargoes and their properties.

Terms and Abbreviations Used by the International Maritime Organization (IMO)

BC Code. Code of Safe Practice for Solid Bulk Cargoes.

BCH Code. Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

CDG. Carriage of dangerous goods.

DG. Dangerous goods.

DL. Dangerous liquids.

EmS. Emergency Procedures for Ships Carrying Dangerous Goods.

HNS. Hazardous and noxious substances.

IBC. Intermediate bulk container.

IBC Code. International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

ICS. International Chamber of Shipping.

IGC Code. International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk.

IMDG Code. International Maritime Dangerous Goods Code. IMO system of dividing dangerous cargoes into nine classes according to the type of hazard and labeling the containers with hazard labels.

MFAG. Medical First Aid Guide for Use in Accidents Involving Dangerous Goods. This book is published by the IMO and the World Health Organization (WHO).

MHBs. Materials hazardous in bulk. These materials are hazardous only when they are carried in bulk, because they might, for example, reduce the oxygen content of a cargo space or be prone to self-heating, as is the case with wood chips.

MSC. IMO's Maritime Safety Committee.

NOS. Some dangerous goods are not listed by name in the IMDG Code and therefore will have to be shipped under a generic name/entry, or "Not Otherwise Specified."

OOW. Officers of the watch.

UN number. United Nations identification number.

Terms Used On Cargo Information Sheets and Material Safety Data Sheets

Carcinogenic. Capable of causing cancer.

Ceiling limit. The maximum amount of a toxic substance that is allowed in the air you breathe. If the concentration of a toxic substance is higher, you must wear a respirator.

Combustible. Material that can burn.

Concentration. Amount of one substance within another substance.

Decomposition. The materials to which a substance is converted by sunlight, heat, time, or digestion.

Density. Mass of substance per unit volume.

Dermal. Route through the skin.

Evaporation rate. Time required for a mass of liquid to vaporize.

Flammable. A material that catches fire easily.

Flammable or Explosive limits. There are two explosive limits for every flammable vapor. The lower explosive limit is the minimum concentration of fuel vapor in air that will explode if heat is added. The upper explosive limit is the concentration of flammable gas above which the gas is not explosive. In general, nearly pure gas mixtures are not explosive.

Flammable limits. See *Explosive limits.*

Flash point. This term applies to flammable liquids or fuels. It is the temperature at which, when enough fuel vapor is present, it will catch on fire. The temperature is given as a value °C cc. The "cc" means "closed cup" and refers to the test method used for determining the flash point.

Ignition temperature. The lowest temperature at which a substance will catch on fire and continue to burn.

Inflammable. This term means the same as *Flammable.*

LC50. Lethal concentration: the amount of a toxic vapor that causes death to 50 percent of the rats, or similar test animals, exposed to it.

LD50. Lethal dose: the amount of a toxic material that must be eaten by a rat, or similar test animal, to cause death 50 percent of the time.

mg/kg. A way of expressing a dose of toxic material ingested by a person or animal. The dose is expressed as milligrams (mg) of toxic substance per kilogram (kg) of animal mass.

mg/m^3. A way of expressing a concentration of a substance in air. The concentration is expressed as milligrams (mg) of substance per cubic meter (m^3) of air.

Mutagenic. A substance that is capable of affecting the way cells grow. All mutagenic substances are considered *suspect carcinogens.*

NIOSH. Abbreviation for the National Institute for Occupational Safety and Health, a health and safety research organization belonging to the U.S. Department of Labor. NIOSH develops standards for respirators and establishes ceiling limits and TLVs.

Odor threshold. The lowest concentration of a substance vapor that can be smelled.

OSHA. Abbreviation for the Occupational Safety and Health Administration of the U.S. Department of Labor. OSHA establishes and enforces safety and health standards for U.S. workplaces.

Oxidizer. A material that will cause combustible material to burn even when no oxygen is present.

pH. A measure of how acidic or caustic a material is, on a scale of 1 to 14.

ppm. A unit of concentration: parts per million.

Reactivity. A measure of a substance's ability to change either by breaking down or by reacting with another substance, such as oxygen or water.

Routes of entry. Ways that a toxic material can enter the body. The ways include absorption through the skin, absorption through the eyes, ingestion through the mouth, and inhalation through the nose and mouth.

Solubility. The maximum amount of a substance that can be dissolved in a solvent such as water. This amount changes with temperature.

Solvent. The material in which substances dissolve. The most common solvent is water. Other solvents are alcohol, acetone, methyl ethyl ketone (MEK), etc.

STEL. Abbreviation for short-term exposure limit. This is a maximum concentration of a toxic substance allowed in a

work place during an excursion or "spike." Any temporary spike should be less than 15 minutes.

Suspect carcinogen. A substance that could cause cancer, but has not been proven to do so.

Teratogenic. A substance that can cause birth defects.

TLV. Abbreviation for Threshold Limit Value, the concentration of a hazardous substance in workplace air that is considered safe. If the measured concentration of a substance is higher than this amount, you need to wear an appropriate respirator.

Toxic. Can cause either acute or chronic injury. Toxic means poisonous.

Vapor. Gas given off by a solid or liquid.

Vapor density. A description of a vapor's "weight" compared to air. A vapor with a density greater than 1 is heavier than air. This vapor is hard to disperse and will accumulate in low areas. A vapor with a density of less than 1 is lighter than air and will disperse rapidly.

Volatility. A description of how quickly a substance vaporizes.

ADDITIONAL SOURCES OF INFORMATION

IMO Maritime Safety Committee Circulars:

MSC/CIRC 487 Confined Space Hazards

MSC/CIRC 663 Form for Cargo Information Sheet

MSC/CIRC 665 Duties of Chief Mates and Officers of the Watch (OOW) at loading and discharging ports

MSC/CIRC 666 Cargo Operations Form

MSC/CIRC 667 Safe Practices on Board Bulk Carriers

Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG). This book, published by the IMO and the WHO, is required on board all ships carrying a SOLAS certificate.

Part 5

Appendices

Appendix 1:
Measurement Conversions

LENGTH

1 kilometer (km) =	1,000 meters (m) = 0.6213 statute mile (mi) = 0.540 nautical mile (nm)
1 meter (m) =	100 centimeters (cm) = 39.37 inches (in) = 3.28 feet (ft) = 1.09 yards (yd) = 0.547 fathom
1 millimeter (mm) =	1000 microns (µ) = 0.3937 inch (in)
1 micron (µ) =	0.001 millimeter (mm) = 0.00003937 inch (in) = 0.03937 mil
1 mil =	0.001 inch (in) = 25.4 micron (µ)
1 statute mile (mi) =	1609 meters (m) = 1.609 kilometers (km) = 5,280 feet (ft)
1 nautical mile (nm) =	1.151 statute miles (mi) = 6,076 feet (ft) = 1,852 meters (m)
1 fathom =	1.8288 meters (m) = 6 feet (ft)

AREA

1 square kilometer (km^2) =	1,000,000 m2 = 247 acres = 0.3861 sq mi (statute) = 0.292 sq mi (nautical)
1 square meter (m^2) =	10,000 cm^2 = 10.76 ft^2 = 1.196 yd^2
1 square centimeter (cm^2) =	100 mm^2 = 0.155 in^2
1 square yard = 0.8362 m^2 =	9 ft^2
1 square foot = 0.0929 $m^2$2 =	144 in^2
1 acre = 160 square rods =	4,047 m^2 = 0.4047 hectare = 43,560 ft^2

VOLUME

1 cubic meter (m^3)	= 1000 liters (l)	= 35.3 ft^3
1 cubic centimeter (cm^3 or cc)	= 1 milliliter (ml)	= 0.061 in^3
1 barrel of oil	= 42 US gallons	= 0.159 m^3
1 typical chemical drum	= 55 US gallons	=0.2082 m^3
1 US gallon	= 0.8327 UK gallon	=0.003785 m^3
1 US quart	= 0.25 US gallon	=0.9463 liter (l)
1 US pint	= 0.5 US quart	=0.4732 liter
1 US fluid ounce (fl oz)	= 0.03125 quart	=29.57 milliliters (ml)
1 ton of vessel volume	= 100 cubic feet	

SPEED

1 knot	= 0.51 meter per second (m/s)	= 1.151 statute miles per hour (mph)	= 1 nautical mile per hour (nm/hr)
1 kilometer per hour (kph or km/hr)	= 0.277 (m/s)	= 0.909 ft/s	= 0.55 knot
1 meter per second (m/s)	= 3.281 (ft/s)	= 1.944 knots	
1 statute mile per hour (mph)	= 1.609 (km/hr)		
1 nautical mile per hour (nm/hr)	= 1.853 (km/hr)	= 1 knot	
1 revolution per minute (RPM)	= 0.1047 radian/second		

ENERGY AND POWER

1 kilowatt hour (kwh)	= 3.6 Mega Joule (MJ)	= 0.0341 Therm	= 2647 ft-lb
1 British thermal unit (BTU)	= 252 calories (cal)	= 778.2 ft-lb	= 1055.1 J
1 BTU/lb-˚F	= 1 cal/g-˚C	= 4186.8 J/kg-˚K	
1 BTU/hr	= 0.293 watt (W)		
1 horsepower (hp)	= 746 W	= 2544.1 BTU/hr	

Appendix 2: Sea Distances

DISTANCES BETWEEN PORTS IN NAUTICAL MILES

Ark	Arkhangelsk, Russia
Aba	Abadan, Iran
Bue	Buenos Aires, Argentina
Pun	Punta Arenas, Chile
Cap	Cape Town, South Africa
Rot	Rotterdam, Netherlands
Gib	Gibraltar, UK
Sin	Singapore
Hon	Hong Kong
Sue	Suez Canal
Los	Los Angeles, CA, USA
Syd	Sydney, Australia
Mon	Montreal, PQ, Canada
Van	Vancouver, BC, Canada
New	New Orleans, LA, USA
Vla	Vladivostok, Russia
Nor	Norfolk, VA, USA
Wel	Wellington, New Zealand
Pan	Panama Canal
Yok	Yokohama, Japan

	Ark																		
Bue	8115	Bue																	
Cap	8050	3779	Cap																
Gib	3225	5298	5174	Gib															
Hon	6961	10677	6961	8384	Hon														
Los	8770	7265	6385	7288	6380	Los													
Mon	4270	6441	7149	3177	11564	6117	Mon												
New	5730	6237	7290	4572	10628	4346	3055	New											
Nor	4400	5824	6790	3305	11017	4735	1697	1504	Nor										
Pan	5820	5390	6465	4340	9238	2912	3117	1403	1823	Pan									
Aba	8502	8786	5189	8452	5321	10574	8620	9814	8524	9573	Aba								
Pun	9243	1434	4346	6352	9708	5865	3763	5362	5755	3937	9386	Pun							
Rot	1950	6366	6242	1371	8758	7755	3289	4848	3430	4790	6620	7391	Rot						
Sin	10195	7322	5704	6994	1460	7867	10171	11627	10317	10548	3865	9482	8338	Sin					
Sue	5255	9376	5275	2007	6395	9287	5276	6571	5379	6340	3305	8373	3287	4941	Sue				
Syd	13485	7248	6503	10228	4312	6511	10864	9107	9496	7717	7422	5150	11586	4306	8233	Syd			
Van	9900	8341	10843	8418	5800	1146	7260	5465	5861	4021	10943	7004	8847	7018	8418	6844	Van		
Vla	13195	11385	8513	10018	1639	4991	11036	9175	9564	7785	6878	9861	11362	3053	9287	5104	4378	Vla	
Wel	12370	6067	6781	10684	5153	5859	9708	7938	8327	6550	8344	4350	11685	5216	9124	1203	6500	5800	Wel
Yok	13085	10903	8429	9921	1564	4839	11463	9114	9504	7725	6839	9259	11261	2832	7835	4330	4280	937	5034

DISTANCES BETWEEN PORTS IN DAYS IF STEAMING RATE = 15 KNOTS

Ark	Arkhangelsk, Russia
Aba	Abadan, Iran
Bue	Buenos Aires, Argentina
Pun	Punta Arenas, Chile
Cap	Cape Town, South Africa
Rot	Rotterdam, Netherlands
Gib	Gibraltar, UK
Sin	Singapore
Hon	Hong Kong
Sue	Suez Canal
Los	Los Angeles, CA, USA
Syd	Sydney, Australia
Mon	Montreal, PQ, Canada
Van	Vancouver, BC, Canada
New	New Orleans, LA, USA
Vla	Vladivostok, Russia
Nor	Norfolk, VA, USA
Wel	Wellington, New Zealand
Pan	Panama Canal
Yok	Yokohama, Japan

	Ark																		
Bue	23	Bue																	
Cap	23	11	Cap																
Gib	9	15	15	Gib															
Hon	20	31	20	24	Hon														
Los	25	21	18	21	18	Los													
Mon	12	18	20	9	33	17	Mon												
New	16	18	21	13	30	12	9	New											
Nor	13	17	19	9	31	14	5	4	Nor										
Pan	17	15	18	12	26	8	9	4	5	Pan									
Aba	24	25	15	24	15	30	25	28	24	27	Aba								
Pun	26	4	12	18	28	17	11	15	16	11	27	Pun							
Rot	6	18	18	4	25	22	9	14	10	14	19	21	Rot						
Sin	29	21	16	20	4	22	29	33	29	30	11	27	24	Sin					
Sue	15	27	15	6	18	27	15	19	15	18	9	24	9	14	Sue				
Syd	39	21	19	29	12	19	31	26	27	22	21	15	33	12	24	Syd			
Van	28	24	31	24	17	3	21	16	17	11	31	20	25	20	24	20	Van		
Vla	38	33	24	29	5	14	32	26	27	22	20	28	32	9	27	15	13	Vla	
Wel	35	17	19	31	15	17	28	23	24	19	24	12	33	15	26	3	19	17	Wel
Yok	37	31	24	28	4	14	33	26	27	22	20	26	32	8	22	12	12	3	14

Appendix 3: Clothing-Size Equivalents

MEN'S SHIRT SIZES

Letter	US Chest	US and UK Neck	Europe
S	36-38	14-14½	36-37
M	39-41	15-15½	38-39
L	42-44	16-16½	41-42
XL	45-47	17-17½	43-44
XXL	48-52	18-18½	

MEN'S SUIT SIZES

US and UK	Europe
Chest	
34	44
36	46
38	48
40	50
42	52
44	54
46	56

MEN'S SHOES

US	UK	Europe
6	4½	39
7	5½	40
8	6½	41
9	7½	42
10	8½	43
11	9½	44
12	10½-11	46

LADIES' SHOES

US	UK	Europe
4	21/2	34
5	31/2	35
6	41/2	351/2-36
7	51/2	37
8	61/2	38
9	71/2	39
10	81/2	40

LADIES' BLOUSES, DRESSES, AND COATS

US			UK	Europe
Letter	Misses'	Women's		
S	4-6	32-34	34-36	38-42
M	8-10	34-36	36-38	40-44
L	12-14	36-38	38-40	42-46
XL	16-18	38-42	42-44	46-50
XXL	20	42-44	44-46	48-52

Appendix 4: Languages

USEFUL PHRASES

Here are some phrases in English, French, and Spanish that will be useful when you are in port, on the telephone, traveling, and ordering food.

Telephone Phrases

English: May I use the telephone, please?
French: Est-ce que je peux téléphoner, s'il vous plaît?
Spanish: ¿Puedo usar el teléfono, por favor?

English: It is a local call.
French: C'est une communication locale.
Spanish: Es una llamada local.

English: This is a long-distance call.
French: C'est une communication de longue distance.
Spanish: Es una llamada de larga distancia.

English: Could you get me 018 43 46 09 37 12 (zero eighteen forty-three forty-six zero nine thirty-seven twelve), please?
French: Je voudrais le 018 43 46 09 37 12 (zéro dix-huit quarante-trois quarente-six zéro neuf trente-sept douze), s'il vous plaît?
Spanish: ¿Por favor, me podría conectar al número zero diez y ocho cuarentaitres cuarentaiseis zero nueve treintaisiete doce?

English: You gave me the wrong number.

French: On ne m'a pas donné le bon poste.
Spanish: Me dió un número equivocado.

English: I want to make an international call.
French: Je voudrais téléphoner à l'étranger.
Spanish: Quiero hacer una llamada internacional.

English: Could you give me directory assistance, please?
French: Pourriez-vous me passer les renseignements, s'il vous plaît?
Spanish: ¿Conecteme con informaciones, por favor?

English: What number are you calling?
French: Quel numéro demandez-vous?
Spanish: ¿Qué número está llamando?

English: Please replace the handset and try again.
French: Raccrochez et recomposez le numéro.
Spanish: Por favor cuelgue el telefono e intente de nuevo.

English: The number you are calling is busy. Please try again later.
French: Toutes les lignes de votre correspondant sont occupées. Veuillez rappeler ultérieurement.
Spanish: El numero que esta llamando está ocupado. Por favor intente de nuevo más tarde.

Travel Phrases

English: I would like to to know the schedule of trains to Lille.
French: Je voudrais connaître l'horaire de trains vers Lille.
Spanish: ¿A qué hora sale el tren para Lille?

English: Where can I get a bus to the city?
French: Où peux-je prendre un bus pour aller en ville?
Spanish: 1. ¿A dónde puedo tomar un bus para el centro?
2. ¿A dónde puedo tomar un bus para el centro de la ciudad?

English: How far is it to the city?
French: A quelle distance sommes-nous du centre ville?
Spanish: ¿Está lejos de aquí el centro de la ciudad?

English: Is it far from here?
French: Est-ce loin d'ici?
Spanish: ¿Está lejos de aquí?

English: Yes, it is about four kilometers.
French: Oui, à peu près quatre kilomètres.
Spanish: Sí, son como cuatro kilometros.

English: Is this the way to the port?
French: Est-ce la direction du port?
Spanish: ¿Es éste el camino para el puerto?

English: Is there a good hotel here?
French: Y'a-t-il un bon hôtel ici?
Spanish: ¿Hay un buen hotel aquí?

English: What is the charge for my room?
French: Quel est le prix de ma chambre?
Spanish: ¿Cuánto cobran por mi cuarto?

English: How much does it cost? Or, What is the price?
French: Quel est le prix?
Spanish: ¿Cuánto cuesta?

English: Where can I change my money?
French: Où peut-on changer de l'argent?
Spanish: ¿A dónde puedo cambiar dinero?

English: What is the exchange rate?
French: Quel est le cours du change?
Spanish: ¿Cuál es la tasa de cambio?

English: You have given me the wrong change.
French: Vous m'avez donné un change erroné.
Spanish: Me ha dado un cambio incorrecto.

English: Where is the restroom?
French: Où sout la toilette, s'il vous plaît?
Spanish: ¿A dónde está el servicio sanitario?

Miscellaneous Phrases

English: Do you mind if I smoke?
French: Ça vous dérange si je fume?
Spanish: 1. ¿Puedo fumar?
2. ¿Le molesta si fumo?

English: Thanks.
French: Merci.
Spanish: Gracias.

English I am sorry.
French: Excusez-moi.
Spanish: 1. Lo siento.
2. Discúlpeme.

English: I am very angry.
French: Je suis très faché.
Spanish: 1. Estoy muy enfadado.
2. Estoy muy enojado.

English	French	Spanish
Food Terms	**Termes de cuisine**	**Términos de cocina**
broiled	rôti, grillé	a la parrilla
steamed	cuit à la vapeur	al vapor
without salt	sans sel	sin sal
sauce on the side	la sauce à part	la salsa aparte
rare	saignant	poco cocinado
medium	à point	medio cocinado/media cocinada*
breakfast	petit déjeuner	desayuno
lunch	déjeuner	almuerzo
dinner, supper	diner, souper	comida, cena
Fish		
fish	poisson	pescado
shrimp	crevette	1. camarónes 2. langostinos
shellfish	coquillages	mariscos
herring	hareng	arenque
lobster	homard	langosta
oyster	huître	ostra
cod	morue	bacalao

**Use masculine (-o) or feminine (-a), depending on gender form of food.*

Meat		
beefsteak	bifteck	biftec
ham	jambon	jamón
chicken	coq, poulet	pollo
turkey	dinde	pavo
liver	foie	higado
veal	veau	ternera
mutton	mouton	carnero
pork	porc	cerdo puerco
bacon	lard	tocino
lamb	agneau	cordero
Vegetables and Fruit		
vegetable	légume	verdura
fruit	fruit	fruto
tomato	tomate	tomate
apple	pomme	manzanna
orange	orange	naranja
potato	pomme de terre	papas
potato chips	pommes de terre frites	papas fritas
mashed potatoes	pommes de terre purées	puré de papas
beans	flagolés	frijoles, porstos
salad	salade	ensalada
peas	petits poids	arvejas
Bread		
bread	pain	pan
toast	toast, pain grillé	pan tostado
sandwich	sandwich	sandwich

pastry dessert	patisserie	postre, masas
cake	gâteau	bollo, torta

Drinks

tea	thé	té
coffee	café	café
water	eau	agua
skim milk	lait écrémé	leche descremada
milk	lait	leche
dry white wine	vin blanc sec	vino blanco seco
beer	bière	cerveza
juice	jus	jugo

Other

ice	glace	hielo
salt	sel	sal
pepper	poivre	pimienta
jam	confiture	mermelada, dulce de ...
butter	beurre	mantequilla, manteca
cheese	fromage	queso
custard	flan	flan
egg	oeuf	huevo
soup	potage	sopa
the check	l'addition	la cuenta

Numbers

	English	French	Spanish
1	one	un	uno
2	two	deux	dos
3	three	trois	trés
4	four	quatre	quatro
5	five	cinq	cinco
6	six	six	séis
7	seven	sept	siete
8	eight	huit	ocho
9	nine	neuf	nueve
10	ten	dix	dies
11	eleven	onze	once
12	twelve	douze	doce
13	thirteen	treize	trece
14	fourteen	quatorze	catorce
15	fifteen	quinze	quince
16	sixteen	seize	dieciséis
17	seventeen	dix-sept	diecisiete
18	eighteen	dix-huit	dieciocho
19	nineteen	dix-neuf	diecinueve
20	twenty	vingt	veinte
30	thirty	trente	treinta
40	forty	quarante	cuarenta
50	fifty	cinquante	cincuenta
60	sixty	soixante	sesenta
70	seventy	soixante-dix	setenta
80	eighty	quatre-vingts	ochenta
90	ninety	quatre-vingt-dix	noventa
100	one hundred	cent	cien
1000	one thousand	mille	mil

Appendix 5: World Time Zones

The local time at any location depends on its position on the globe. The world is divided into 24 time zones. The width of each time zone is about 15 degrees of longitude. By international agreement, the line of longitude running through Greenwich, England, was adopted as the prime meridian. The time in this zone is called Greenwich Mean Time (GMT).

An adjustment to standard time, called daylight saving time, is used by some countries to conserve fuel by reducing the need for artificial light in the evening hours. During daylight saving time, clocks are set to one hour later than the standard time.

To find the standard time in any of the countries and regions below, add the number shown to the Greenwich Mean Time (GMT). Add an additional hour if the country uses daylight saving time.

Country	+ GMT
Argentina	-3
Australia	
East coast	10
West coast	7
Bahrain	3
Belgium	1
Belize	-6
Bolivia	-4
Brazil	3
Burma. *See* Myanmar	
Canada	
East coast	-4
West coast	-8
Chile	-4
Colombia	-4
Costa Rica	-6
Cyprus	2
Denmark	1
Ecuador	-5
Egypt	2
El Salvador	-6
Fiji	12
Finland	2
France	1
French Antilles	-4
French Polynesia	-10
Germany	1
Ghana	0
Greece	2
Guam	10
Guatemala	-6
Guyana	-3

Country	+ GMT
Haiti	-5
Honduras	-6
Hong Kong	8
Iceland	0
India	5.5
Indonesia	7
Ireland	0
Israel	2
Italy	1
Ivory Coast	0
Japan	9
Kenya	3
Liberia	0
Luxembourg	1
Malaysia	8
Malta	1
Mexico	-6
Morocco	0
Myanmar	7
Netherlands	1
Netherlands Antilles	-4
New Zealand	12
Nicaragua	-6
Nigeria	1
Norway	1
Oman	4
Panama	-5
Papua New Guinea	10
Paraguay	-3
Peru	-5
Philippines	8
Portugal	0
Romania	2

Country	+ GMT
Russia	
St. Petersburg, Murmansk	2
Nordvik	7
Khabarovsk, Pugachev, Vladivostok	9
Uelen	12
Saudi Arabia	3
Singapore	8
South Africa	2
South Korea	+9
Spain	1
Sri Lanka	5.5
Suriname	10
Sweden	1
Switzerland	1
Taiwan	8
Tanzania	3
Thailand	7
Tunisia	1
Turkey	2
United Arab Emirates	4
United Kingdom	0
United States	
Alaska	-10
East coast	-5
West coast	-8
Uruguay	-3
Venezuela	-4
Vietnam	8
Yemen	3
Yugoslavia	1

Appendix 6:
Flags and Ensigns

Algeria

Antigua and Barbuda

Argentina

Australia

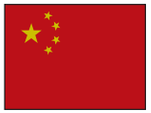
Bahamas

Bahamas: Merchant Ensign

Brazil

Canada

China



Cyprus

Denmark (DIS)

Egypt

Germany, Bundesrepublik Deutschland

Great Britain, England, United Kingdom

Great Britain, United Kingdom: Red Ensign

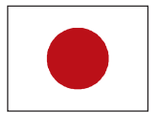
Greece

Hong Kong

India

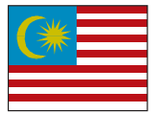
Italy

Japan



Liberia

Malaysia



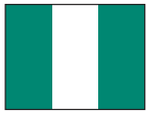
Malaysia: Civil Ensign

Malta

Malta: Civil Ensign

Marshall Islands

Nigeria



Norway (DIS), Norge

Panama

Philippines

Portugal

Russian Federation

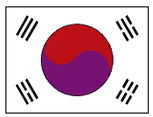
Saint Vincent and the Grenadines

Singapore

Singapore: Civil Flag

Singapore: Merchant Flag

South Korea, Republic of Korea



Taiwan

Turkey

United States of America

Vanuatu

Sources

We used many sources to compile this handbook. The written ones, including Internet sources, are listed below.

Seafarers' Rights

Workbook for Port Chaplains and Ship Visitors on Seafarers' Rights, Seamen's Church Institute of New York and New Jersey, 1996.

World Religions

Compton's Encyclopedia, Compton's New Media, 1995.

Prayers and Hymns

Occasional Ministries, Chaplain Corps., U.S. Navy, 1985.

Prayers for the Coast Guard, U.S. Coast Guard.

Today's Missal, Vol. 64, No. 9, Oregon Catholic Press, Portland, Oregon, 1997.

Smuggling, Piracy, and Stowaways

"Guidelines on the Allocation of Responsibilities to Seek the Successful Resolution of Stowaway Cases," *IMO Circular 43*, IMO London, Jan. 1996.

"Piracy and Armed Robbery," Merchant Shipping Notice M.1517, United Kingdom Department of Transport. Available from Room G3 Spring Place, 105 Commercial Road, Southampton S01 0Z0, United Kingdom.

Piracy and Armed Robbery Against Ships, Special Report, ICC International Maritime Bureau. Web site: http://www.iccwbo.org/pub/

"Piracy and Other Crimes," *IMO News*, March 1993.

Stevenson, Douglas, "Don't Get Caught Smuggling Drugs," 1997. Available from Seamen's Church Institute of New York and New Jersey, 241 Water St., New York, New York 10038.

First Aid

Hill, Patricia, *Emergency Medical Procedures for the Home, Auto and Workplace*, 2nd ed., Prentice-Hall Press, New York, 1990.

Student Workbook for Multimedia Standard First Aid, American Red Cross, 1981.

Disease Prevention

Bearden, Bill, *The Bluejackets' Manual*, 21st ed., Naval Institute Press, Annapolis, Maryland, 1990.

The Family Doctor, 4th ed., Creative Multimedia Corp., 1996.

Health Information for International Travel, U.S. Dept. of Health and Human Services, Centers for Disease Control, -CDC -ATSDR Science Corner. Web site: http://atsdr1.atsdr.cdc.gov:8080/cx.html

"Health Tips (Malaria)," TravelInfo Southern Africa, Travel & Trade Publishing. Document available at Web site: http://rapidttp.com/travel/healthm.html

"Statement on Travellers and Sexually Transmitted Diseases," *Canadian Medical Association Journal,* 1995; 152:1826–1828. Statement available at Web site: http://www.cma.ca/cmaj/vol-152/1826e.htm

Taubes, Gary, "A Mosquito Bites Back," *The New York Times Magazine,* August 24, 1997.

Travel Health Information and Referral Service. Web site: http://www.travelhealth.com/genguide.htm

Ports

A Safe Trip Abroad, pamphlet, U.S. Department of State.

Bellwood, Peter, "Ancient Seafarers," *Archaeology* 50, no. 2 (March–April 1997). Available at Web site: http://www.he.net/~archaeol/9703/etc/specialreport.html

Guide to Port Entry, Shipping Guides Limited, Surrey, England, 1996.

International Christian Maritime Association, 2/3 Orchard Place, Southampton SO14 3BR, United Kingdom. Tel.: [+44 (0) 1703] 336111. Member directory available at Web site: http://dialspace.dial.pipex.com/town/drive/xzy86/page6m.htm

Travel Warnings & Consular Information Sheets, U.S. Department of State. Available at Web site: http://travel.state.gov/travel_warnings.html

Veracruz. Web site: http://www.umich.edu/~proflame/texts/mirror/veracr.html

World Atlas, The Software Toolworks, Inc., Novato, California, 1990.

The Sea Environment

The Black Sea Environmental Programme (BSEP). Statement available at Web site: http://europa.eu.int/comm/dg1a/tacis/contract_info/interstate/env2.htm

Encyclopedia of Environmental Science, 2nd ed., McGraw-Hill, New York, 1980.

The Environmental State of the Baltic Sea, October 1996, The Baltic and International Maritime Council (BIMCO). Web site: http://www.helcom.fi/

The Great Book of the Sea: A Complete Guide to Marine Life, Courage Books, Philadelphia, 1993.

Grolier Multimedia Encyclopedia, CD-ROM, Grolier Electronic Publishing, Danbury, Connecticut, 1998.

Parker, Henry S., *Exploring the Oceans*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1985.

The Random House Atlas of the Oceans, Random House, New York, 1991.

United Nations Environment Programme (Web links to environmental treaties): http://www.unep.ch/

Pollution in the Ocean Environment

Managing Oily Waste and Garbage from Ships, U.S. Coast Guard, Marine Safety and Environmental Protection Division, 1994.

Prevention of Marine Pollution: Guidelines for Tank Vessel Personnel, Mobil Shipping and Transportation Company, Fairfax, Virginia.

Safer Ships, Cleaner Seas, HMSO, London, 1994.

United States Coast Guard, Marine Safety and Environmental Protection. Web site:
http://www.uscg.mil/hq/g-m/gmhome.htm

Weather

Hardy, Ralph, *Teach Yourself Weather,* NTC Publishing Group, Lincolnwood, Illinois, 1996.

Stevens, William K., "Storm Warning: Bigger Hurricanes and More of Them," *The New York Times*, June 3, 1997.

Tobin, *Wallace E., Mariner's Pocket Companion,* Naval Institute Press, Annapolis, Maryland, July 1996.

Navigation

Maloney, Elbert S., and Chapman, Charles F., *Chapman Piloting: Seamanship & Small Boat Handling,* 62nd ed., Hearst Books, New York, 1996.

International Laws

Annual Review 1996/1997, International Chamber of Shipping.

"Basic Facts About IMO," *Focus on IMO,* IMO, London, January 1996.

"Center Update," Center for Seafarers' Rights, New York, September 1989.

"Currents," Center for Seafarers' Rights, New York, Spring 1994.

"IMO: The International Maritime Organization," *Focus on IMO*, IMO, London, February 1992.

IMO: What It Is; What It Does; How It Works, pamphlet, IMO, London.

International Convention for the Safety of Life at Sea, U.S. Dept. of Transportation, Coast Guard, COMDTINST M16210.2, 1974.

International Convention for the Safety of Life at Sea, IMO, London, 1986.

Maritime Labour Conventions and Recommendations, ILO, Geneva, Switzerland, 1988.

MARPOL: How To Do It, IMO, London, 1993.

"MARPOL 73/78," *Focus on IMO,* IMO, London, October 1995.

MARPOL 73/78: The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978, October 1995. Available from Web site: http://www.imo.org/imo/focus/intro.htm

The Oxford Companion to Ships and the Sea, Peter Kemp, ed., Oxford Paperbacks, Oxford, UK, 1988.

STCW 95, IMO, London, 1996.

"Summary of IMO Conventions," *Focus on IMO,* IMO, London, May 1996.

Ship Talk

Standard Marine Navigational Vocabulary, IMO, London, 1985.

Ship Systems

Bearden, Bill, *The Bluejackets' Manual,* 21st ed., Naval Institute Press, Annapolis, Maryland, 1990.

General Instructions Governing Work on System Electrical Equipment, Consolidated Edison Company of NY, 1982.

Heli-Sep Oily Water Separator, World Wide Systems, Inc., Irvine, California.

Noel, John V., *Knight's Modern Seamanship,* 18th ed., John Wiley & Sons, New York, 1997.

The Oxford Companion to Ships and the Sea, Peter Kemp, ed., Oxford Paperbacks, Oxford, 1988.

Turbulo Separator Operating Instructions, Blohm and Voss AG, Hamburg, Germany.

Signage

IMDG Code, Pub. 306/95, IMO, London.

Seton Identification Products. Web site: http://www.seton.com

U.S. Code of Federal Regulations, Title 46 (46 C.F.R.).

Fire Safety

Bearden, Bill, *The Bluejackets' Manual,* 21st rev. ed., Naval Institute Press, Annapolis, Maryland, 1990.

Marine Fire Prevention, Firefighting and Fire Safety, U.S. Department of Transportation, Maritime Administration.

Hazardous Cargoes

"IMO and Dangerous Goods at Sea," , IMO, London, May 1996.

NIOSH Pocket Guide to Chemical Hazards, U.S. Dept. of Health and Human Services, Centers for Disease Control, 1985.

Flags

Flags of the world can be found at the following Web site: http://www.crwflags.com/fotw/flags/

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Bibliography

Basic Facts About IMO. (1996, January). *Focus on IMO*, London: International Maritime Organization.

The Black Sea, The Black Sea Environmental Programme, (1997). [Website]. http://europa.eu.int/comm/dg1a/tacis/contract_info/inter-state/ev2.htm.

Bearden, B. (1990). *The Bluejackets' Manual*, (21st. Edition), Annapolis, Maryland: United States Naval Institute.

Bellwood, P. (1997). *Ancient Seafarers*. Archaeological Institute of America, [Website]. http://www.he.net/~archael/9703/etc/specialreport.html

Bruckheim, A. (1991). *The Family Doctor*, [CD-ROM]. Creative Multimedia Corp.

Compton's Encyclopedia (1995). [CD-ROM] Cupertino, CA: Compton's New Media and KidSoft, L.L.C.

DOS/CA: *Travel Warnings & Consular Info Sheets*, (1998). US State Dept. [Website]. http://travel.state.gov/travel_warnings.html

Encyclopedia of Environmental Science, second edition (1980). McGraw Hill.

The Environmental State Of The Baltic Sea, (October. 1996). The Baltic and International Maritime Council, BIMCO, [Website]. http://www.helcom.fi/.

Flags of the World, [Website]. http://www.crwflags.com/fotw/flags/.

General Instructions Governing Work on System Electrical Equipment, (1982). New York: Consolidated Edison Company of NY, Inc.

Guerrini, F. (1993). *The Great Book of the Sea*, A complete Guide to Marine Life, Philadelphia, PA: Courage Books.

Guide to Port Entry,1995/96 edition (1995). Surrey England: Shipping Guides Limited.

Hardy, Ralph, (1996). Lincolnwood, IL: *Teach Yourself Weather*, NTC Publishing Group.

Health Information for International Travel, (1998). US Dept. Of Health and Human Services, Center for Disease Control, -CDC-ATSDR Science Corner, http://atsdr1.atsdr.cdc.gov:8080/cx.html.

Heli-Sep Oily Water Separator, (1997). [Brochure]. Irvine, California: World Wide Systems, Inc.

Hill, P. (1990). *Emergency Medical Procedures for the Home, Auto and Workplace,* (2nd Edition). New York: Prentice Hall Press.

ICMA Directory, (1998). Southampton, UK: International Christian Maritime Association.

IMDG Code, Publication: 306/95, London: International Maritime Organization

IMO And Dangerous Goods At Sea. (1996, May). *Focus on IMO*, London: International Maritime Organization.

IMO: The International Maritime Organization. (1992, February). *Focus on IMO*, London: International Maritime Organization.

IMO, What it Is; What it Does; How it Works, [pamphlet]. London: International Maritime Organization.

International Convention for The Safety of Life at Sea, (1974). [US Regulation]. US Coast Guard COMDTINST M16210.2.

International Convention for The Safety of Life at Sea, (1986). [International Treaty]. London: International Maritime Organization.

Kemp, P. (1988). *The Oxford Companion to Ships and the Sea*, Oxford University Press.

Maloney, E. S. (1985). *Chapman Piloting: Seamanship and Small Boat Handling*, Hearst Marine Books.

Managing Oily Waste and Garbage from Ships, (1994). US Coast Guard, Marine Environmental Protection Division.

Marine Fire Prevention, Firefighting and Fire Safety, US Department of Commerce Maritime Administration.

Maritime Guide 1998, (1998). London: Lloyd's Register of Shipping.

Maritime Labour Conventions and Recommendations, (1988). Geneva, Switzerland: ILO.

MARPOL - How to do it, (1993). London: International Maritime Organization.

MARPOL 73/78, (1995, October). *Focus on IMO*, London: International Maritime Organization, London: International Maritime Organization

MARPOL 73/78: *The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978*, (1995, October). [International Treaty]. [Website]. http://www.unep.ch/.

Multimedia Encyclopedia, (1992). [CD-ROM]. Novato, CA: Grolier Electronic Publishing and Software Toolworks, Inc.

NIOSH Pocket Guide to Chemical Hazards, (1985). US Dept. Of Health and Human Services, Centers for Disease Control.

Noel, J. V. (Ed.) (1997) *Knights Modern Seamanship*, seventeenth edition, New York: Van Nostrand Reinhold.

Occasional Ministries, (1985). Chaplain Corp., US Navy.

Parker, H. S. *Exploring the Oceans*, (1985). Englewood Cliffs, NJ: Prentice-Hill, Inc.

Piracy and Armed Robbery Against Ships, (1997 July). Special Report, International Chamber of Commerce, IMB.

Piracy and Other Crimes. (1993 March). *IMO News*.

Prayers for the Coast Guard, (undated). US Coast Guard.

Prevention of Marine Pollution, Guidelines for Tank Vessel Personnel, (undated). Fairfax, VA: Mobil Shipping and Transportation Company,

Safer Ships, Cleaner Seas, Report of Lord Donaldson's Inquiry into the prevention of pollution from Merchant Shipping, (1994). London: HMSO.

Seton Identification Products, (1998).[Website]. http://www.seton.com/catalogue/Outdoor_OSHA_Signs.html.

Standard Marine Navigational Vocabulary, (1985). London: International Maritime Organization.

Statement on Travelers and Sexually Transmitted Disease, (1998). Canadian Medical Association Journal 1995; 152:1826-1828, Health Canada - Public Health Information, [Website]. http://hwcweb.hwc.ca/hpb/lcdc/.

STCW-95, (1996). London: International Maritime Organization.

Stevens, W. (1997, June 3). Storm Warning: Bigger Hurricanes and More of Them. *The New York Times*.

Stevenson, D. (Ed.) (1996). *Workbook for Port Chaplains and Ship Visitors on Seafarers' Rights*, Seamen's Church Institute of NY and NJ Institute of New York and New Jersey.

Stevenson, D. (1997). *Don't Get Caught Smuggling Drugs*, Stevenson.

Student Workbook for Multimedia Standard First Aid, (1981). American Red Cross.

Summary of IMO Conventions. (1996, May). *Focus on IMO*, London: International Maritime Organization.

Taubes, G. (1997). A Mosquito Bites Back. *The New York Times Magazine*. August 24, 1997.

The Random House Atlas of the Oceans, (1991). New York: Random House.

A Safe Trip Abroad, (Revised: 1996, August). [Pamphlet] Washington, DC: US Department of State.

T.S. Patriot State Engineering Manual, (1995). Massachusetts, MA: Massachusetts Maritime Academy. [Website]. http://www.mma.mass.edu/campus/tsps/manual/.

Tobin, W. *Mariner's Pocket Companion*, (1998). Annapolis, MD: Naval Institute Press.

Today's Missal, (1997). Portland OR: Oregon Catholic Press,

Travel Health Information and Referral Service, (1998). [Website]. http://www.travelhealth.com/genguide.htm

Travel Information - Southern Africa - Health Tips - Malaria, (1998). [Website]. http://rapidttp.com/travel/healthm.html

Turbulo Separator Operating Instructions, (1997). Hamburg, Germany: Blohm and Voss AG.

US Code of Federal Regulations, 46 CFR Shipping, (1985). Washington DC: Federal Register National Archives and Records Administration.

USCG Marine Safety Environmental Protection, (1998). [Website]. http://www.dot.gov/dotinfo/uscg/hq/g-m/gmhome.htm.

Veracruz, (1995). Monterrey Mexico: Mexico Online. [Website]. http://www.umich.edu/~proflame/texts/mirror/veracr.html.

World Atlas, (1990). [CD-ROM]. Novato, California: The Software Toolworks, Inc.

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