Illustrated for Easier Comprehension!!

Guidelines for Safe Navigation

The Maritime Technology Promotion Center

About This Brochure

This brochure, offering guidelines for safe navigation, is designed for maritime officers in training and new recruits. What factors are the causes of what kinds of accidents? . . . Citing specific examples and using a number of illustrations, this brochure explains in an easy-to-understand way the possible causes of and circumstances for marine accidents as well as preventive measures. Please keep your ship's break room or other conspicuous public area of your workplace stocked with copies of this brochure so that you can refer to it as necessary.

A special MEMO section is provided at the end of each chapter, allowing you to jot down your personal experiences, key points you have noticed, and your own countermeasures. In this way, you can make your own original version of these "Guidelines."

Adopting and adapting these Guidelines to your own circumstances will make them more effective when it comes to preventing marine accidents and ensuring a safe voyage for you and your fellow crewmembers.

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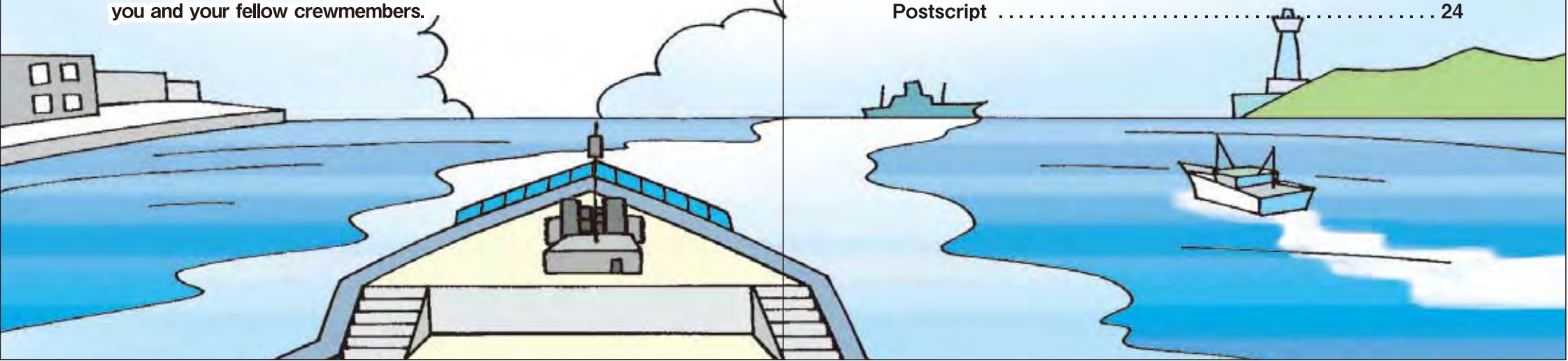


Foreword

Safety and protection of the environment–top priorities

Ensuring a safe voyage is a mission of utmost importance for each and every seaman not just because it means protecting our irreplaceable lives, property and the natural environment. Ensuring a safe voyage should also be borne in mind for the sake of your families, friends and sweethearts who await your safe return.

Despite your caution, however, situations that endanger your voyage can be encountered at any time – stormy weather and congested waterways are only two of the many factors you face. No one wants to be the cause of or be involved in a marine accident, and everyone is expected to do their best to ensure a safe voyage. To our regret and contrary to our sincere efforts, however, it seems unlikely that marine accidents will ever be completely eliminated.

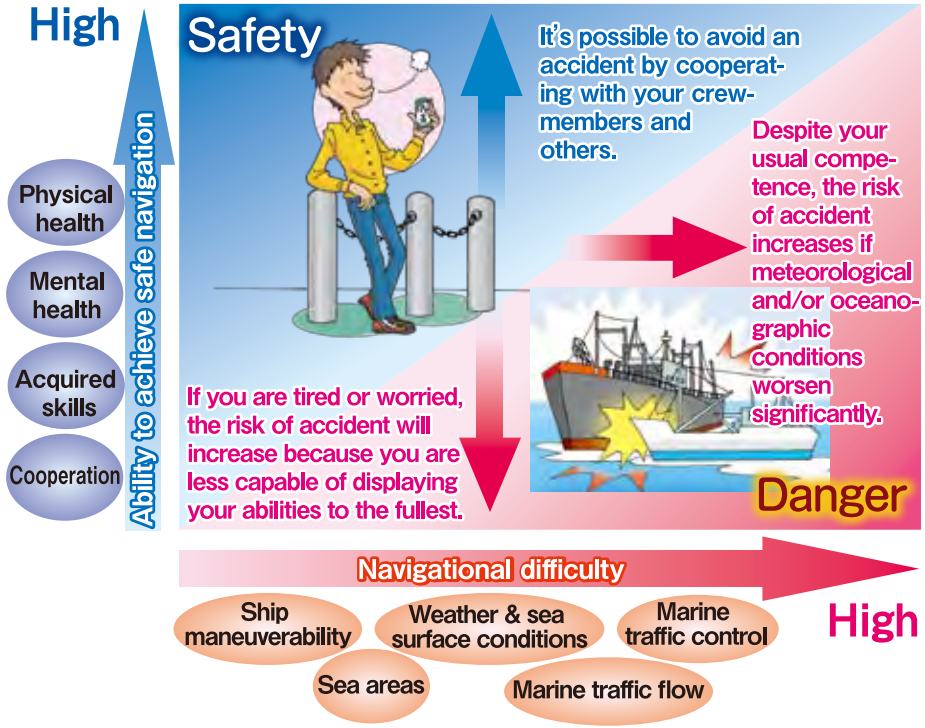
What is necessary, what should be done to ensure safety in any situation?

What can we do?

The figure below describes the interrelations between “external factors” and “human factors” when it comes to achieving safe navigation. The horizontal axis indicates the degree of “navigational difficulty” in terms of ship maneuverability as well as “environmental factors” such as the shape of the sea area, meteorological and oceanographic effects and marine traffic flow. The vertical axis indicates the degree of “ability to achieve safe navigation” in terms of seamen’s “physical health” and “mental health,” useful “skills acquired” and “collaboration” among crewmembers and other experts.

Suppose that you are normally competent enough to operate your ship safely. When you are physically tired or wracked with worry, however, the risk of causing an accident increases. Even if you are professionally competent and your physical condition is good, the risk of causing an accident increases as “navigational difficulty” increases.

To avoid an accident, it is vital that you maintain good physical and mental health, and acquire the necessary skills and knowledge and then reinforce them. Furthermore, it is often possible to avoid accidents by working closely with your crewmembers and others even when external environments such as weather and sea surface conditions have worsened significantly.



Guidelines for Safe Navigation

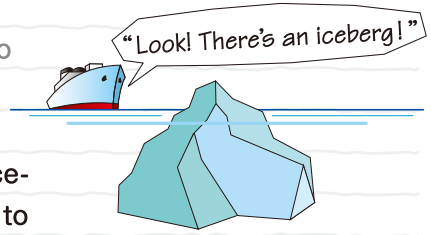
Let's take a look,

chapter by chapter, at the factors that cause accidents!

– Column –

"An iceberg is actually the tip of a massive submerged obstacle."

Most accidents are not due to a single factor, but rather a series of factors. To eliminate the risk of an iceberg (= accident), you need to address and resolve each problem one at a time.



Chapter 1

Physical health

– Maintaining good physical condition –

Fatigue and fevers due to a cold can reduce our mental acuity, making it is difficult to make the right decision. Insufficient sleep and heavy drinking have the same effect.

Let's consider a marine accident caused by a seaman who fell asleep, examining its causes and background factors, and working out preventive measures.

Asleep on watch

Deck officer A engaged in cargo operations without a break after coming off navigational watch duty. When cargo operations were over, he was assigned to navigational watch duty again. He became sleepy and fell asleep, causing the ship to ground.

Background factors

- Navigational watch duty was followed in succession by cargo operations after port entry.

- During A's navigational watch, few vessels were encountered, and monotony can lead to drowsiness.

- Both navigational watch duty and cargo operations required A to stand up for extended periods of time.

Causes

- Lack of sufficient sleep.
- Long periods of time working on his feet made him very tired.
- Monotonous watchkeeping led to a lack of tension and, as a result, A became drowsy despite efforts to remain awake.

Preventive measures

- Learn effective ways to take a rest, and nap as necessary.
- Ventilate the bridge and/or move your body to shake off sleepiness. Diverting the mind, such as by having a cup of tea, is also effective.
- Enhance attentiveness by checking nautical instruments and/or "confirmation by pointing and hailing aloud to each instrument."
- Start up the sleep prevention device.
- Insert a break or nap time when engaging in a task that requires many hours of work. Resting at regular intervals is also effective.

Summing up

If your physical condition is good, then your brain and body are active, enabling your work to advance smoothly.

Let's check the following points once again:

- Are you getting more than 6 hours of sleep every day? (When it's impossible to get 6 hours of uninterrupted sleep, are youcompen sating for this by taking naps?)
- Are you resting so that fatigue won't accumulate?
- Are you practicing "pointing and hailing aloud" for confirmation?
- Are you eating a well-balanced diet?
- Are you maintaining your health by taking proper exercise, receiving regular health checkups, and so on?
- Are you not drunk?
- Are you not using medicine that makes you drowsy?
- Do you have a collaborative setup for distributing work loads so that the burden does not concentrate on a particular person?

We advise you to maintain your physical health at all times so that you can answer "Yes" to all the check points listed above.

MEMO

Chapter 2

Mental health

– Maintaining drive and presence of mind –

Awaken suddenly by the shout of "Fire!," someone rushed outside holding his pillow under his arm, obsessed by the idea that he must save something. As this joke indicates, when faced with an unexpected situation, we tend to panic and lose the ability to make proper decisions. The same can happen when we are on a voyage. Likewise, hastiness, misconception and lack of vitality can weaken our judgment and ability to sense danger, resulting in a major accident.

To ensure a safe voyage, it is vitally important to maintain "presence of mind." At the same time, you should also maintain your "drive" to acquire knowledge and techniques on an ongoing basis because such an attitude will allow you to cope with any situation that may arise.

In this chapter, let's look at an example of a close call that resulted from panic, examine its causes and background factors, and work out preventive measures.

Panic leads to a close call

Deck officer A had little practical experience, having just acquired his seamanship competency certificate; still puzzled about how to handle his vessel, he found himself surrounded by a number of ships. He noticed one of the surrounding ships issuing signals, and immediately fell into a panic, mistakenly calling the Chief Engineer instead of the Captain, causing a loss of precious time. Suspecting an imminent emergency, the Captain rushed to the bridge and narrowly avoided a collision.

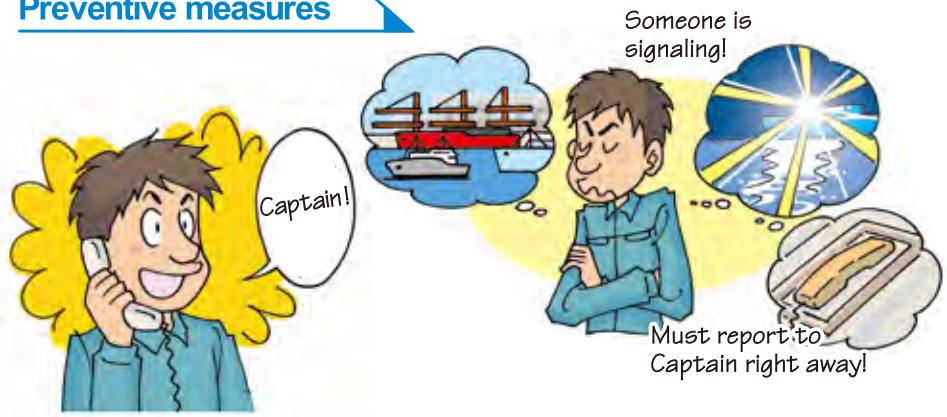
Background factors

- Deck officer A had little watchkeeping experience in congested waters.
- The number of converging vessels increased.
- A nearby ship repeatedly issued flashing signals.

Causes

- Despite lack of watchkeeping experience in congested waters, officer A waited too long to ask for support.
- In a panic, A could not prioritize and was unable to initiate evasive ship handling.
- Noticing flashing signals from the opposite ship, A fell into a panic and failed to take a timely action by calling the wrong person.

Preventive measures



- Report to the Captain immediately whenever you encounter uncertainty while on duty.
- Keep an open mind by listening to your seniors about their experiences and by conducting image training on an ongoing basis to prepare for emergencies.
- Prioritize watchkeeping tasks beforehand.
- Never feel ashamed when listening to the opinions of others. Make it your rule to get answers for your questions as soon as possible.

Summing up

If you maintain presence of mind, you'll naturally be able to display your abilities to the fullest.

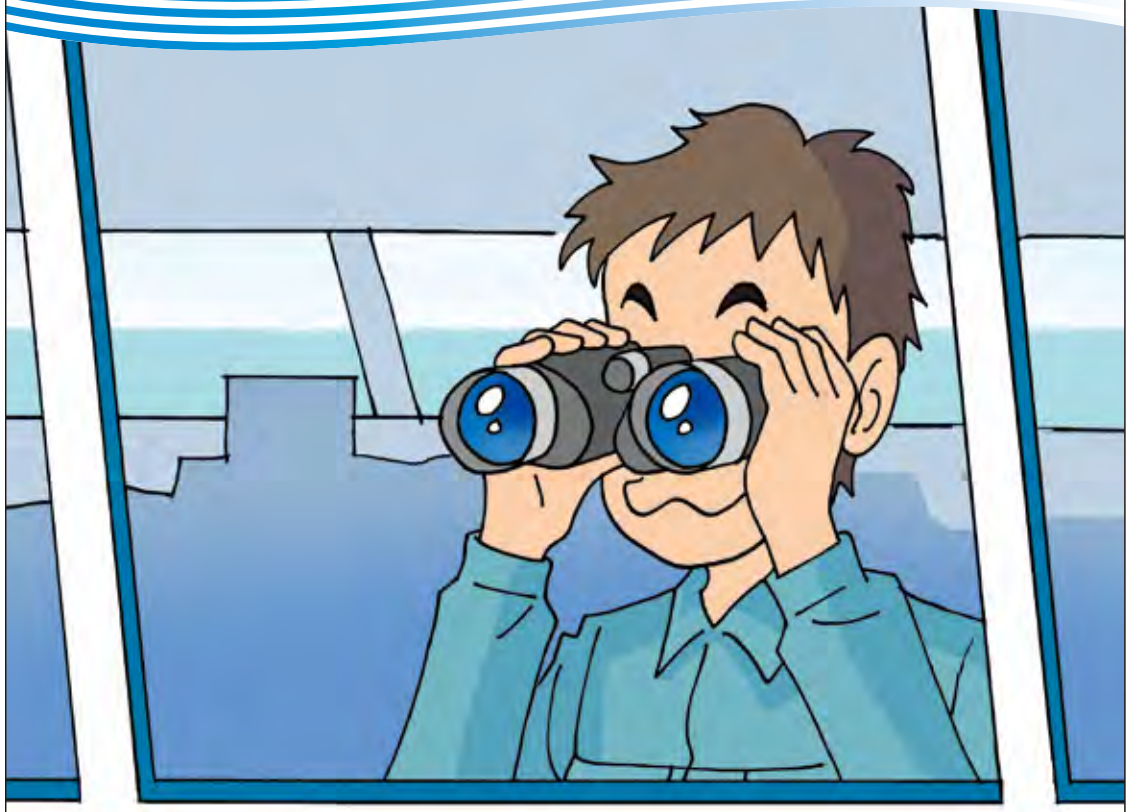
Let's check the following points once again:

- Are you reporting to the Captain whenever you encounter uncertainty while on duty?
- Do you prioritize your tasks beforehand?
- Do you make it a rule to check important matters from every possible angle? Repeatedly?
- Do you listen to your seniors about their rich experiences?
- When you have questions or difficulty making a judgment, do you ask nearby crewmembers for advice without hesitation?

We advise you to maintain your mental health at all times so that you can answer "Yes" to the above points.

MEMO

Chapter 3 Skills

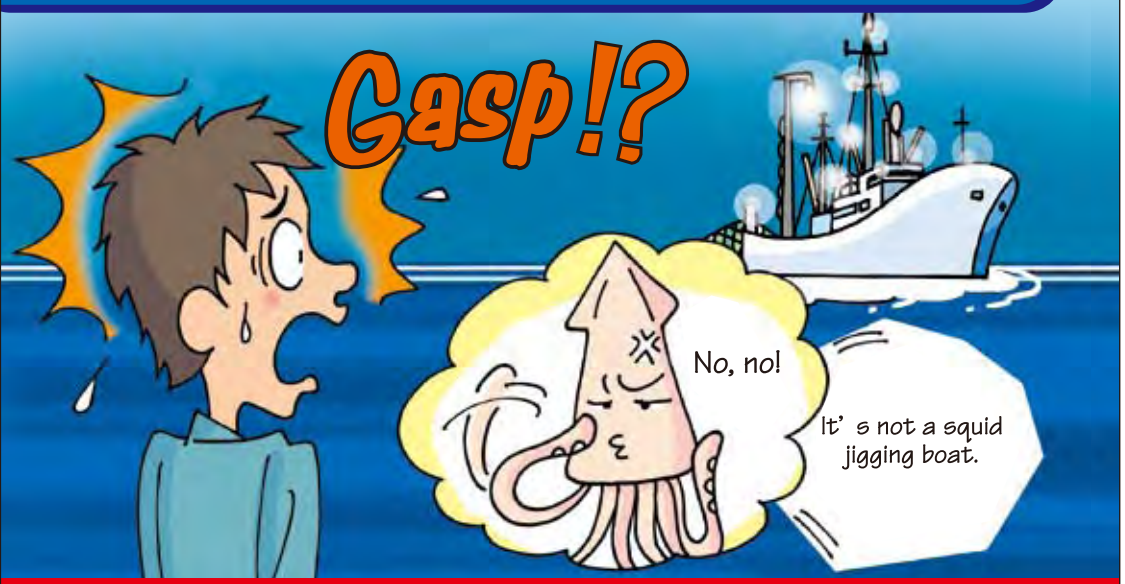


– Acquisition of useful skills and knowledge –

It is often said that the more experienced one becomes in one's duties, the more cautious one's attitude. This is because experience has allowed one to acquire skills and knowledge sufficient to anticipate possible danger. To ensure a safe voyage, it is essential that you are armed with basic skills and knowledge – and that you have the ability to apply them to the variety of situations that may arise.

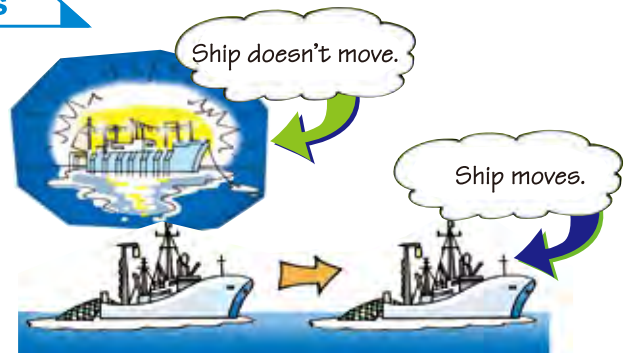
In this chapter, let's look at an accident that resulted from a newly recruited officer's lack of knowledge, examine its causes and background factors, and work out preventive measures.

Lack of knowledge was the cause



Newly recruited deck officer A, while on watch duty on board a cargo ship, mistook a round haul netter for a squid jigging boat. Based on this mistake, he attempted to let his ship pass by the opposite ship at close range. This resulted in a collision and many casualties.

Background factors

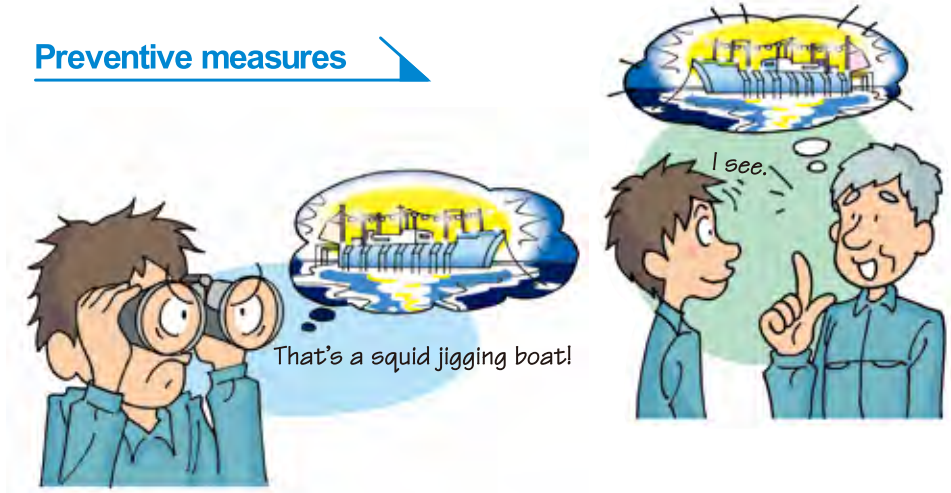


- Experienced in navigating this sea area during the squid fishing season, deck officer A had no experience in same area during the round haul netting season.
- Deck officer A had no knowledge of round haul netting, in which the fishing boat moves.

Causes

- Deck officer A didn't obtain information about this sea area beforehand.
- Lacking knowledge of round haul netting, he mistook the opposite ship for a squid jigging boat.
- Because squid jigging boats normally do not move when fishing, he attempted a close-range pass of the opposite ship.

Preventive measures



- Always try to gather information and acquire knowledge.
- Grasp information carefully and accurately, and talk to yourself to ensure you haven't erred or arrived at the wrong conclusion.
- If you are inexperienced, proactively examine the characteristics of the targeted sea area, or ask experienced senior crewmembers for advice.

Summing up

Strive to acquire useful skills that apply to your actual duties.

Let's check the following points once again:

- Are you on the alert to grasp the surrounding situation accurately in order to avoid misjudgment?
- Do you fully understand the role you play and the skills required?
- Do you have a habit of gathering information in your daily life?
- Does your attitude allow you to learn from experienced people?
- Are you striving to acquire skills and knowledge by learning or practicing on the job?

We advise you to hone your skills at all times so that you can answer "Yes" to all of the above points.

MEMO

Chapter 4 Cooperation

– Establishing favorable human relationships –

No one can operate a ship alone; mutual trust and cooperation among fellow crewmembers are indispensable. A safe voyage is possible only when favorable communication among crewmembers, in the form of mutual understanding and encouragement, is maintained.

In this chapter, let's look at an accident that resulted from a lack of communication, examine its causes and background factors, and work out preventive measures.

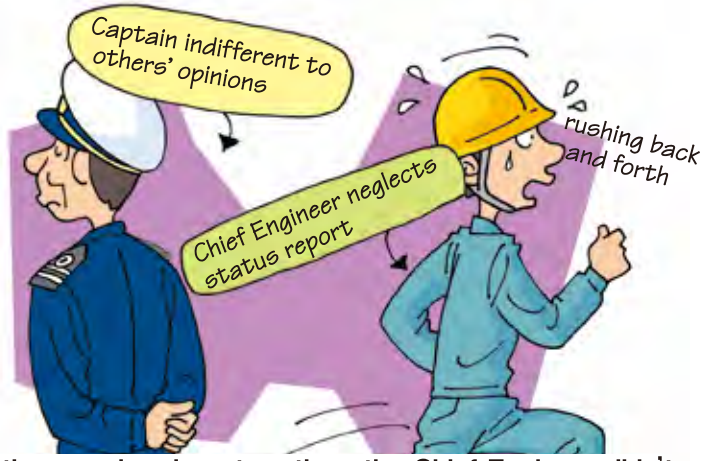
An accident due to lack of communication

As the passenger ship under Captain A's command left the wharf, an abnormality with the main engine remote control unit was found, forcing the ship to return to port to check the unit in question. As the unit resumed functioning simply by restoring the power supply, the ship left the wharf again even though Chief Engineer B had not conducted a thorough investigation of the cause and did not report this matter to the Captain. Very soon the remote control unit became uncontrollable again, causing the ship to collide with the wharf.

Background factors

- Pressing need to meet the scheduled departure time.
- After Chief Engineer B restored the power supply, the unit returned to normal.
- When a similar trouble had occurred in the past, the unit always returned to normal.
- Captain A allowed his ship to leave port without first confirming the details of the unit in question.

Causes



- Worried about the pressing departure time, the Chief Engineer didn't thoroughly inspect the trouble.
- Chief Engineer mistook the case as a trifle not worthy of bringing to the Captain's attention, so details of the trouble went unreported.
- The Captain didn't confirm why and how the trouble occurred.
- The ship's engineers had always responded to similar trouble with makeshift solutions.

Preventive measures

- Do not ignore machinery trouble or the questions it raises, but pursue them until improvements are made.
- Share information on all navigational trouble with the Captain and other crewmembers.
- Makeshift responses may lead to accidents.
  Consciously seek proper solutions.
- With Safety First always in mind, be bold enough to halt unreasonable ship operations.

Summing up

A safe voyage can be achieved through teamwork.

Let's check the following points once again:

- Do you value daily conversations with other members on board?
- Do you frequently practice "Reporting, Liaising, Consultation"?
- Do you share opinions and questions with other crewmembers and cooperate with them to solve problems?
- When it comes to problems, are you seeking proper solutions?
- Does your corporate culture places greater emphasis on safety than schedules?

We advise you to enhance your communication ability so that you can answer "Yes" to all the check points listed above.

MEMO

Chapter 5

Environments

– Taking action after clearly grasping surrounding conditions –

The way you drive a car naturally changes with the prevailing weather conditions. Even when taking your usual route, driving on a rainy day demands higher levels of attentiveness and techniques, especially in curves. When it comes to navigation, the ship's external environment can change rapidly due to meteorological and oceanographic factors, marine traffic flow and ship operating schedules, among others. Therefore, high skill levels are required when handling a ship in severe environments. To ensure a safe voyage, it is essential that you try to accurately anticipate environmental changes and take prudent action accordingly.

In this chapter, let's consider an accident that resulted from rough weather, examine its causes and background factors, and work out preventive measures.

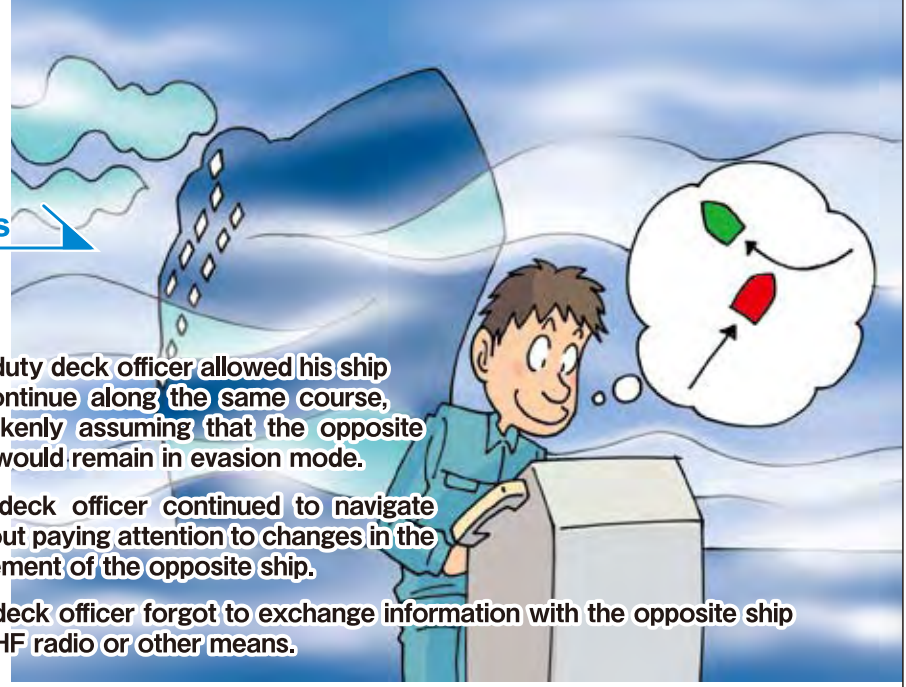
Rough weather caused this accident

While running at a low cruising speed through dense fog, the duty deck officer detected on the radar screen a ship conducting evasive maneuvers (decelerating and altering course). Assuming that the opposite ship would remain in evasion mode, the duty officer allowed his ship to continue on its course. The opposite ship suddenly came in sight and collided with his ship.

Background factors

- The fog was so dense that the duty officer could hardly see his ship's bow.
- While running at a low cruising speed, it was difficult to closely monitor movements of the opposite ship by radar alone.

Causes



- The duty deck officer allowed his ship to continue along the same course, mistakenly assuming that the opposite ship would remain in evasion mode.
- The deck officer continued to navigate without paying attention to changes in the movement of the opposite ship.
- The deck officer forgot to exchange information with the opposite ship by VHF radio or other means.

Preventive measures

- Take the safest way possible – such as stopping the engine – when you suspect trouble ahead.
- Continue to exchange information so you can grasp sudden changes in a situation as soon as possible.
- Effectively identify the current situation by taking advantage of multiple means of communication.

Summing up

Navigation under severe environments requires information gathering that can compensate for the adverse conditions, as well as a cautious mindset that can ensure a safe voyage.

Let's check the following points once again:

- By using radio, TV, fax, etc., are you keeping yourself well updated on weather and oceanographic conditions?
- Do you make it a rule not to proceed until all questions or uncertainties have been resolved?
- Are you taking advantage of radio, ARPA, etc.?
- Are you abiding by traffic laws and ready to take collaborative actions geared to your traffic environment?

We advise you to become able to grasp your current environment so that you can answer "Yes" to all the check points listed above.

※ARPA: Automatic Radar Plotting Aid

MEMO

Postscript

Having read this brochure, we believe you now understand the basics about the causes of accidents and the necessary countermeasures. However, please remember that the examples cited in this brochure are only a few of the countless actual cases. The root causes of accidents can be found anytime, anywhere. We sincerely hope that you will stand up to potential accidents and strive to ensure safe navigation. Safety is an enduring theme and something we must pursue at all times. We also hope that you will further develop your initiatives for safe navigation as you accumulate experience in the years to come.

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