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When you have finished reading this issue, please pass it on.

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Cover

The machine part which hit the lower lefthand corner of these safety glasses would have left more than a nick if it had hit an eye instead. This month's issue has two articles on eye protection. The first one begins on page 40.

New Booklet Outlines OSHA Services

Employers and employees interested in safety and health training, grants, expert consultation, and voluntary worksite safety and health programs can get details on assistance from the Department of Labor's Occupational Safety and Health Administration in a new booklet.

"OSHA: Safety and Health Is Our Middle Name" outlines OSHA's efforts to encourage and enable workers and employers to develop and maintain effective safety and health programs on their own initiative. The booklet describes the following programs:

- **OSHA Training Institute** - Located in the Chicago suburb of Des Plaines, Illinois, the Training Institute offers six safety and health courses for the public, all tuition-free. Three cover safety and health in general industry, two are designed for the construction industry, and one is designed to develop the participant's ability to meet the criteria for a "Competent Person" established in OSHA's maritime standards.

- **New Directions** - Grants awarded under this program provide "seed money" to enable organizations to develop staff, skills, and services to become resource centers for safety and health training. Labor organizations, employer associations, educational institutions, and other nonprofit organizations add their own funds to the grants to develop safety and health training materials and programs for employers and/or employees. This program was developed in response to the Occupational Safety and Health Act of 1970, in which Congress mandated that employees and employers be educated in the recognition, avoidance, and prevention of unsafe and unhealthful working conditions. With initial support from OSHA, grantees can educate the workers and employers they serve, hire technical staffs which can recognize potential hazards, and disseminate safety and health knowledge throughout workplaces in a way OSHA alone could never achieve.

- **Onsite Consultations** - Available free to employers who request it, the consultation program provides expert advice on eliminating safety and health hazards in the workplace and developing effective safety and health programs to prevent injury and illness. Primarily targeted for smaller businesses, the onsite safety and health consultation program is completely separate from the OSHA inspection effort. Information is kept confidential, and the program involves no citations or penalties. It does require an advance commitment from the employer to correct any serious hazards found by the consultant, however. Offered in every state except Louisiana, the service is delivered by state governments or private sector contractors using well-trained professional staffs. The onsite consultants help businesses recognize hazards in the workplace, suggest general approaches or options for solving a safety or health program, identify the kinds of help available if the business needs further assistance, and provide the business with a written report summarizing findings.

- **Voluntary Protection Programs** - The Star, Praise, and Try programs are designed to recognize and reward employers who demonstrate a commitment to workplace safety and health beyond the requirements of OSHA standards. The programs are intended to supplement OSHA's enforcement effort by identifying for exemption from OSHA inspection those establishments with the best safety and health records so that OSHA inspectors can concentrate on other establishments where serious hazards exist.

Single copies of the brochure "OSHA: Safety and Health Is Our Middle Name," OSHA 3076, are available free from OSHA Publications, N-4101, Frances Perkins Bldg., Third St. and Constitution Ave., NW, Washington, DC 20210; tel.: (202) 523-9667 or 523-9655. An addressed mailing label should be included with the request. ↕

A Blind Spot in Safety Programs

Eye injuries, most of which could be prevented, cost the nation hundreds of millions of dollars every year and cause untold suffering.

Bill Frank was at his job operating an industrial grinder in a Chicago factory when the grinding wheel cracked and flew into pieces. A large chunk struck his face with terrible force. At that moment Bill Frank's world blacked out forever. "If there is one thing in my life that I'm ashamed of, it's how dumb I was that day," he says in a voice so sorry and angry that the injury might have happened last week, not 17 years ago. Even now Bill Frank is upset with himself because he had a pair of industrial safety glasses--in his hip pocket.

Robert Ardoin was repairing marine equipment at the Marine Corps Recruit Depot in San Diego when a broken bit of a screw flew up directly at his right eye. Fortunately, Ardoin was wearing safety glasses at the time. The glasses broke, but his eyes were untouched.

A recent Gallup poll revealed that blindness is second only to cancer in people's lists of what they fear most.

The lesson Bill Frank learned from his injury is one that hundreds of thousands of workers have learned from bitter experience. Eye injuries in the workplace are a major national health hazard: an estimated 1,000 such injuries are sustained every working day. As Robert Ardoin showed, however, these injuries can be avoided. Experts in industrial safety believe that at least 9 out of every 10 workplace eye injuries could be prevented with little trouble or expense to workers or their employers. In fact, of all parts of the body that can be hurt at work, the eyes are one of the easiest to shield.

Facts and figures

How many people have vision impairment?

Nearly one million Americans have lost some degree of sight as a result of injuries. Injuries account for 40,000 cases of impaired vision each year.

How many are blind?

Some 19,400. The rate of blindness from eye injuries is 9 per 100,000 population. An estimated 1,500 persons lose their sight each year from injuries, which account for 3 percent of all new cases of blindness.

How many persons suffer an eye injury each year?

An estimated 1.3 million persons.

Use of personal safety equipment is every bit as important today as it was in December 1939, when this poster appeared in the Safety Bulletin *of what was then the Marine Department of Standard Oil Company of California. (Reprinted courtesy of Chevron Shipping Company)*

Safety glasses designed with side shields offer ample protection to most workers. These come with either corrective lenses or non-corrective, "plano," glasses that cost as little as $4.00.

If employers were aware of the full costs to them of a worker eye injury, the numbers of incidents would probably decline sharply. And if workers acknowledged the true risks they run of damaging their eyes, they might be inclined to don protective eyewear.

Computing the total amount that eye accidents cost the nation is a process safety experts can only "guesstimate," using assorted national and state statistics. In 1980, for example, five percent of all on-the-job injuries were to the eyes, according to the National Safety Council. Eye injuries account for one percent of the total national bill of $33 billion for on-the-job injuries. This amounts to $300 million for medical bills, compensation, and production time lost as a result of eye injuries. By other measurements the true cost is much higher, and of course no measurement of dollar outlays can begin to measure the pain and anguish caused by eye injuries and blindness.

Many eye injuries have repercussions and so incur indirect costs. Examples of such indirect costs are legal fees and judgments and the costs of finding and training workers to replace those injured. Experts say that indirect costs can be as high as five or six, or even ten, times the direct costs, depending on the circumstances.

There are two situations which contribute to eye injuries: 1) many companies do not have a comprehensive eye safety program, and 2) many company eye programs are not effectively implemented. In April 1980, the Labor Department published data indicating that a shocking number of programs were ineffective. At least three out of five workers who suffered impact injuries or chemical burns to the eye were, the Labor Department found, not wearing safety glasses at the time of the accident. In about three-quarters of these cases workers believed that protective eyewear was not required by the situation, meaning that either management failed to notify them or they failed to deduce the risks to the eye from the work environment. In many of the accidents where safety glasses were worn, the type of eye protection chosen was inadequate to prevent injury.

Some authorities believe a "macho" attitude assumed by some workers subverts proper eye safety. There is a tendency for workers, par-

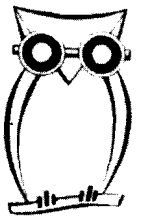
KISS YOUR EYES GOODBYE!

If you don't protect them, you might as well throw them away.

That's exactly what thousands of American workers did this year by being casual about eye protection on the job.

1,000 eye injuries occur during each working day of the year. 90% of these industrial injuries were preventable.

Don't be a casualty of carelessness! Protect your eyesight . . . at work and at home.



For more information about preventing industrial eye accidents, write:

National Society to Prevent Blindness
and Its Affiliates
79 Madison Avenue, New York, NY 10016

Too much air

The editor of Ships' Operational Safety's LIFELINE *reports:*

We just met a man coming out of a machine shop. He had a large white gauze patch over one eye. We inquired how he had managed to achieve this dubious distinction. "Just blowing out a small motor with air . . . it blew a chip of steel from the work bench into my eye."

"How many pounds of air were you using?"

"About 90 pounds."

This is entirely too much air pressure. There are reducers on the market to reduce line pressure to a reasonable amount. Besides, one always must assume that chips, dust, and small particles are going to fly when air is used, and goggles that completely cover the eyes must be worn.

The same man also told me, "This is the first time in 15 years I've been doing this that anything happened." He was lucky this time. He's 30 now; at this rate, by the time he's 60, he may lose the sight in both eyes.

ticularly young men, to look upon risk taking as manly and safety practices as unmanly. This, plus the fact that younger workers are not used to wearing safety glasses, may explain why so many more injuries to the eye happen to younger workers. The implications of this are clear. Eye safety programs must be "sold" to both young and older workers.

There are no magic panaceas, according to Charles K. Klein, Director of Safety for New-

Questions on eye safety

Q: Are there really about 1,000 industrial eye injuries every working day?
A: Yes, and over 90 percent of them are needless and preventable.

Q: Is it difficult to get used to wearing eye protection?
A: No, but it is difficult to get used to partial or total blindness.

Q: Will wearing safety glasses weaken or ruin eyesight?
A: No, but an accident will.

Q: . . . Even if worn for a full workday?
A: No, not even if worn 24 hours a day.

Q: Do safety lenses weigh much more than other lenses?
A: No. Actually, there is only a few grams' difference in weight.

Q: My job isn't very hazardous—should I use eye protection?
A: Yes. Plenty of eye injuries result from a fellow worker's operation.

Q: Can anyone prove that safety eyewear does prevent eye injuries and blindness?
A: Yes. Eye protection has saved the sight of over 74,000 Wise Owl members.

Q: Is "double" eye protection ever needed?
A: Yes. For example, a face shield over safety glasses is often advisable.

Q: Can vision correction be worked into either safety or impact-resistant glasses?
A: Yes. Protective lenses can be either corrective or plano (non-corrective).

Q: What's the best thing to flush chemicals out of the eye?
A: Water. Use plenty of water immediately--force eyelids open if necessary. Check for contact lenses, which trap chemicals. Remove them before flushing is started.

Q: Are "minor" eye injuries dangerous?
A: Yes. Blindness can result from almost any eye injury.

Michael Huber's safety glasses--Photo by Harry C. Butt

Someone who can attest firsthand to the value of safety glasses is Wise Owl Club member Michael Huber, a toolroom attendant in the electronics shop at the Coast Guard's shipyard in Curtis Bay, Maryland. Huber was working at a metal-punching machine one day, cutting metal tags to be used for marking cable for a ship. In the middle of a stroke, a pin which held parts of the machine together snapped and flew upward, hitting him in the safety glasses. The pin was deflected to his forehead. The result: a cut over the *top* of his eye.

port News Shipbuilding and an instrumental figure in that company's successful safety program. "We used movies, monthly safety meetings, seminars on eye safety for foremen and general foremen, National Safety Council literature mailed to workers' homes quarterly, banners, and posters in many work locations." *(A more detailed article on the Newport News Shipbuilding eye safety program follows.)*

Three characteristics are essential if eye injuries are to be prevented: dedication, commitment, and strict enforcement of the rules. A national eye safety incentive program, the Wise Owl program of the National Society to Prevent Blindness, can help companies reinforce the message of their efforts. The first Wise Owl Club was organized in 1947 as a result of an idea dropped into an employee suggestion box at the St. Louis, Missouri, plant of the American Car and Foundry Company (now known as ACF Industries, Inc.). The employee recommended recognition for workers who actually saved their sight through using protective eyewear at the time of an on-the-job accident. Wise Owl members, who receive a membership certificate, gold owl lapel pin, and hard-hat decal, become models for their peers in the workplace. The club now has some 74,000 members, each of whom has saved the sight of one or both eyes, thanks to his or her protective eyewear. Since the beginning of the program, the cash value of all accidents averted by Wise Owl members has amounted to hundreds of millions of dollars (the average direct cost for a disabling eye injury exceeds $3,000; the compensation award for a lost eye can reach $145,000; the cost in human suffering is, of course, incalculable). Charters for establishing Wise Owl Club chapters are available at no cost from the National Society to Prevent Blindness. There need be no eligible members at the time of application for a charter.

Organizations like the National Society to Prevent Blindness work to preserve vision through programs of community service and public and professional education and research. The fear most people have of blindness can be made productive if it is turned to making people aware of hazards and ways of combating them. Eye safety programs *do* work—and the benefits go beyond even those of saving people's sight. Says Charles Klein of Newport News Shipbuilding, "You don't go *anywhere* in this plant without eye protection. Eye injuries are the easiest to prevent. If you can get the eye message across, you'll find workers being much more aware of many other safety needs."

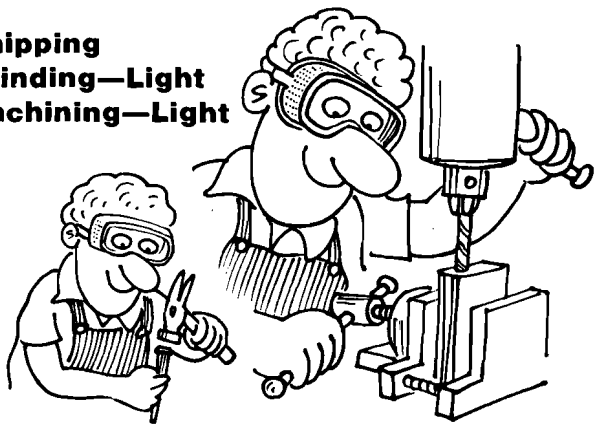
The National Society to Prevent Blindness, which provided most of the material for this article, was founded in 1908 and is the oldest voluntary health agency nationally engaged in the prevention of blindness. It is supported entirely by voluntary contributions. Information on how to prevent accidents or how to establish a Wise Owl Club chapter is available from the Society at its headquarters at 79 Madison Avenue, New York, New York 10016. ↓

Opposite: Some activities call for protection greater than that afforded by street-wear-type safety glasses. Workers should use the type of eye protection which will provide the most protection against the potential hazard. (Reprinted courtesy of Chevron Shipping Company)

SAFETY GOGGLES

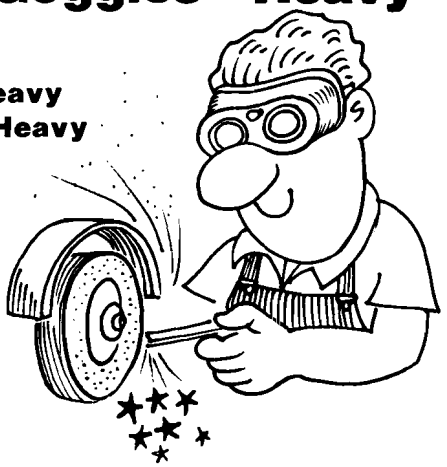
Impact Goggles—Light

Chipping
Grinding—Light
Machining—Light



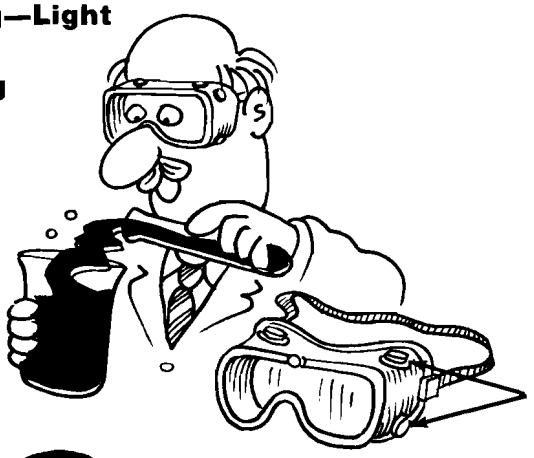
Impact Goggles—Heavy

Chipping
Grinding—Heavy
Machining—Heavy



Dust or Chemical Goggles

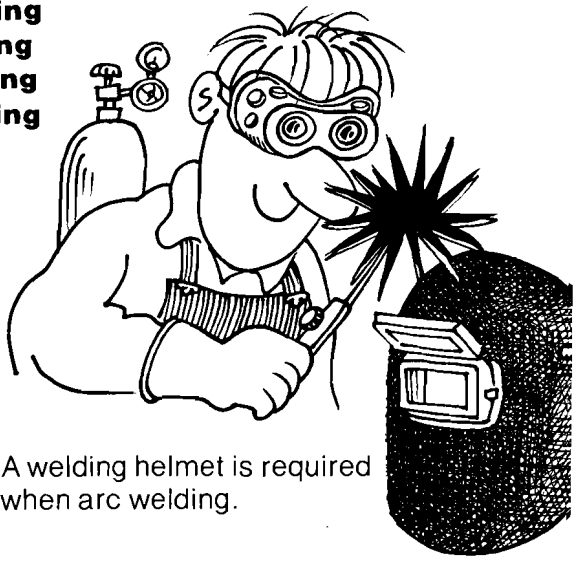
Chipping
Grinding—Light
Machining—Light
Chemical handling



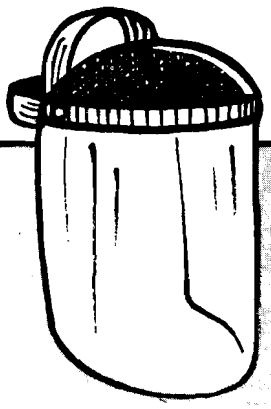
Baffles

Welding Goggles

Gas—Welding
—Cutting
—Brazing
—Burning



A welding helmet is required when arc welding.



Face Protection

Face shields should be used to protect the face and neck from flying particles, sprays of hazardous liquids, splashes of molten metal, and from hot solutions. Face shields should *never* be worn as eye protection, but proper eye protection should always be worn in conjunction with face shields.

430-455 O - 84 - 2

Impact-resistant lenses—or safety glasses?

While eyeglasses used by the general public and safety glasses worn by industrial workers may look alike, the similarity ends right there; the difference in the two types of spectacles is considerably more than meets the eye.

That ordinary lenses can shatter into eye-destructive slivers is well known. Even the impact-resistant lenses now required by Federal edict for all streetwear eyeglasses and sunglasses provide less than the protection afforded by industrial safety glasses.

All industrial safety lenses must be at least 3 millimeters in thickness and capable of withstanding the impact of a 1-inch-diameter (2.4 oz.) steel ball dropped 50 inches onto the horizontal upper surface. (Streetwear protective lenses--for which no thickness requirement is specified—are impact tested with a lighter-weight 5/8-inch-diameter steel ball.) Safety lenses of industrial strength are required by an American National Standards Institute code to be mounted in slow-burning frames designed to securely hold the lenses under heavy impact. These important safety features are not required in frames used for impact-resistant lenses for streetwear.

Since optimum eye safety derives not from protective lenses alone or from just a safety frame but from a proper combination of the two, the superiority of safety glasses built to the ANSI industrial standard is unquestionable.

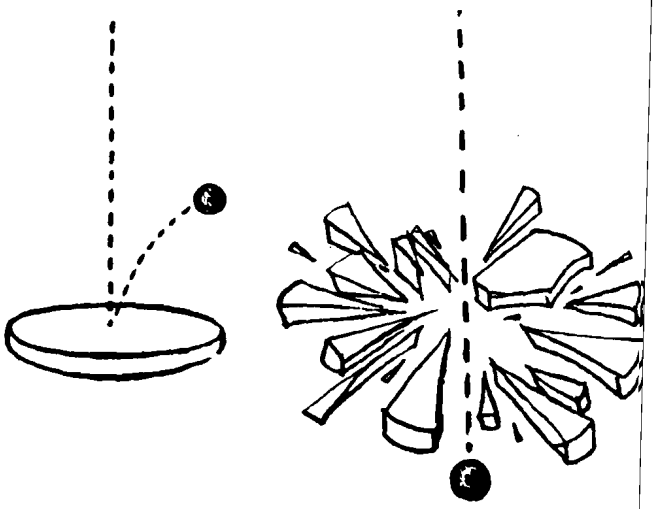
Industrial-quality safety eyewear must be distinctively marked with the manufacturer's individualized symbol. Without such markings or special test equipment it is impossible to distinguish between optimum-quality safety lenses and impact-resistant lenses of lesser strength. The importance of identifying safety eyewear was underscored by the Occupational Safety and Health Act regulations, which reference the American National Standards Institute Z87 code for protective devices for the eyes and face in industry.

Impact-resistant lenses which satisfy current Federal requirements for eyeglasses and sunglasses to be used by the general public do not comply with either OSHA or ANSI requirements; their use in industry as safety eyewear should be prohibited.

An additional word of caution: contact lenses do not provide eye protection in the industrial sense; their indiscriminate use in industrial settings--even when approved by professional prescribers, who may not be sufficiently informed about the eye hazards of various occupations—is inadvisable. When special circumstances do allow for the wearing of contact lenses by industrial workers, the use of conventional safety eyewear of ANSI Z87-code quality should be mandatory. Additional recommendations on controlling the use of contact lenses in the industrial environment are available from the National Society to Prevent Blindness.

Good eye health practice would rule against the sharing of protective eyewear, just as it would dictate the need to periodically sanitize all safety eyewear.

Complete specifications covering the manufacture, testing, use, and maintenance of industrial safety eyewear are detailed in a document entitled "American National Standard Practice for Occupational and Educational Eye and Face Protection, Z87.1-1979," or later revisions thereof. Copies of this and other industrial standards are available for a fee from the American National Standards Institute, 1430 Broadway, New York, New York 10018. ‡



Shipbuilding is a labor-intensive industry that embraces every type of manufacturing process and trade skill. Unfortunately, with so much diversity, shipbuilding has the potential for all types of injuries, especially eye injuries.

Protection

Charles Klein makes a note to himself after speaking to a shipyard employee. He routinely inspects the shipyard, surveying the effectiveness of the eye safety program and incorporating suggestions for improving it.

The Eyes Have it at Newport News Shipbuilding

by Charles K. Klein

In 1977, despite a company-wide safety program, there were 222 lost-time eye injuries at Newport News Shipbuilding and Dry Dock Company. A multitude of jobs such as chipping, grinding, abrasive blasting, and needle-gun cleaning figured in these injuries. Since there was no way to completely eliminate the potential hazards associated with such jobs, management realized that existing safety requirements had to be made even more strict. What was needed was a serious, get-tough glasses and eye protection program.

The program instituted by Newport News Shipbuilding consisted of four elements: 1) selecting the proper type of safety glasses, 2)

Charles Klein is Director of Safety for Newport News Shipbuilding. This shipyard, with its 29,000 employees and 475-acre plant, is the largest in the world. Mr. Klein is also a member of the Eye Safety Committee of the National Society to Prevent Blindness and represents the National Safety Council in matters concerning the American National Standards Institute Z87 code for protective devices for the eyes and face in industry.

setting standards and rules, 3) enforcing the standards and rules, and 4) maintaining an effective plan for equipment sanitation and replacement.

Selecting the Proper Type of Safety Glasses

The standard safety glasses worn in the shipyard are industrial safety glasses with cup side shields. They not only meet the American National Standards Institute (ANSI) requirement but also look industrial. This avoids any confusion between streetwear glasses and work glasses. Employees who wear prescription glasses may either wear goggles over them or buy industrial prescription safety glasses. The shipyard provides both plano (non-corrective) safety glasses and cover goggles. Prescription safety glasses are available at the shipyard's authorized optical supplier, where the employee receives a discount. The company also contributes the cost of a pair of planos toward the purchase. Every employee, without exception, must wear appropriate eye protection.

Setting the Rules

Excluding the office areas, the entire shipyard is considered an industrial production area. This makes setting rules plain and simple: it is mandatory that all employees protect themselves with safety glasses or cover goggles whenever they are not in an office. Rigid enforcement of this policy has made the program the success it is today.

Enforcing Shipyard Standards

An aggressive employee awareness program continues at Newport News Shipbuilding. To stress the importance of safety glasses and emphasize that use of them is mandatory, the company holds safety meetings and makes use of bulletins, handouts, banners, posters, billboards, and other message media. The Safety Department's high visibility throughout the yard continually reinforces safety consciousness, and safety engineers help enforce the rules. Formal reprimands and possible termination are the consequences for those who fail to comply.

Support from all levels of management is necessary for the success of any comprehensive safety program, regardless of program design or employee enthusiasm. This support does not mean simply approving or paying lip service to a program. Management must openly embrace a safety program and declare it to be a vital part of the organization. Top management provides the impetus. Newport News Shipbuilding has declared its commitment to safety, making management largely responsible for the safety program's effectiveness. Each manager is well aware of this responsibility, authority, and accountability.

Every supervisor is responsible for worker safety. This includes preventing eye injuries by ensuring that employees wear proper eye protection. The supervisor also has the authority to initiate appropriate disciplinary procedures against all violators of the safety rules.

The safety performance of each manager is evaluated along with his production and other aspects of performance. As a result, safety performance evaluation plays a part in determining raises, promotions, and even continuation of employment.

Employees are aware that the eye safety regulations at Newport News Shipbuilding are for their own protection and that disciplinary action will follow if a violation occurs. Both the employee and the employee's supervisor are involved in the disciplinary process that results from a safety violation. They are verbally notified, and written documentation of the incident is placed in their personnel records. Employees who persist in violating the rules are ultimately let go. Fortunately, the process usually does not get this far.

Maintaining Effective Equipment Sanitation and Replacement

Safety-glass cleaning stations are conveniently located in every work area in the shipyard. Each station contains a bottle of cleaning disinfecting solution, lens wiping tissues, and a receptacle for discarding the tissues. Replacements for damaged safety glasses are available at several toolroom locations.

The results of Newport News Shipbuilding's safety-glass program have been astonishing. In the first year of its implementation the number of lost-time eye injuries dropped from 222 to 71, a 68 percent reduction. The number of accidents continues to decline.

In 1981 the program had reduced the annual lost-time eye injuries to 15. In 1982 there were 11. This is a decrease of 95 percent over 5 years. These statistics show that you can greatly reduce accidents and eye injuries if you have both a well-enforced program and top management's commitment to program strategies and objectives. ‡

Watchkeeping

If a ship is to operate safely, its machinery must function reliably. The loss of steering or a change in speed resulting from equipment failure may imperil life and property not only on the ship with the equipment problem but on any ships in the vicinity. The role of the engineering watch is critical in ensuring that all machinery and systems operate properly.

This is the third in a four-part series on watchkeeping adapted from the International Maritime Organization's International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW). Part 1 covered the navigational watch; part 2 covered the in-port watch for deck officers; this month's installment focuses on the engineering watch underway and at unsheltered anchorages; part 4 will deal specifically with the engineering watch in port.

The STCW Convention will go into effect for signatory nations in April 1984. Since the United States has not yet ratified the Convention, the principles elaborated in the articles **are only recommendations and should not be seen as regulations or policy.** However, U.S. mariners who enter ports of signatory nations will be required to comply with the Convention's provisions, and all licensed mariners should familiarize themselves with the guidelines and the STCW Convention.

The regulatory proposal for a new U.S. licensing structure (described in detail in the February 1983 issue of the *Proceedings* and published in the Federal Register on August 8, 1983) was developed with an eye to harmonizing its provisions with those of the STCW wherever possible.

The engineering watch . . .

STCW
Regulation III/1
Basic Principles to be Observed in Keeping an Engineering Watch

1. Parties shall direct the attention of ship owners, ship operators, masters, chief engineer officers, and watchkeeping personnel to the following principles, which shall be observed to ensure that a safe engineering watch is maintained at all times.

2. The term "watch" is used in this Regulation to mean either a group of personnel composing the watch or a period of responsibility for an engineer officer during which his physical presence in the machinery space may or may not be required.

3. The basic principles, including, but not limited to, the following, shall be taken into account on all ships.

4. General

(a) The chief engineer officer of every ship is bound, in consultation with the master, to ensure that watchkeeping arrangements are adequate to maintain a safe watch. The following criteria, inter alia, shall be taken into account when the composition of the watch, which may include appropriate engine room ratings, is decided:

(i) type of ship;

(ii) type and condition of the machinery;

(iii) special modes of operation dictated by factors such as weather, ice, contaminated water, shallow water, emergency conditions, damage containment, or pollution abatement;

(iv) qualifications and experience of the watch;

(v) the need to ensure the safety of life, ship, cargo, and port and protection of the environment;

(vi) international, national, and local regulations;

(vii) the desirability of maintaining the normal operations of the ship.

(b) Under the direction of the chief engineer officer, the engineer officer in charge of the watch shall be responsible for the inspection, operation, and testing, as required, of all machinery and equipment in his charge. The engineer officer in charge of a watch is the chief engineer officer's representative, and his primary responsibility, at all times, shall be the safe and efficient operation and upkeep of machinery affecting the safety of the ship.

(c) The chief engineer officer shall, in consultation with the master, determine in advance the needs of the intended voyage, taking into consideration the requirements for fuel, water, lubricants, chemicals, expendable and other spare parts, tools, supplies, and any other requirements.

5. Operation

(a) The engineer officer in charge of a watch shall ensure that the established watchkeeping arrangements are maintained. Under his general direction, engine room ratings, if forming part of the watch, shall be required to assist in the safe and efficient operation of the propulsion machinery and the auxiliary equipment.

(b) At the commencement of the engineering watch, the current operational parameters and condition of all machinery shall be verified. Any machinery not functioning properly, expected to malfunction, or requiring special service shall be noted along with any action already taken. Plans shall be made for any further action if required.

(c) The engineer officer in charge of the watch shall ensure that the main propulsion plant and auxiliary systems are kept under constant surveillance, that inspections are made of the machinery and steering gear spaces at suitable intervals, and that appropriate action is taken to remedy any malfunction discovered.

(d) When the machinery spaces are in the manned condition, the engineer officer in charge of the watch shall at all times be readily capable of operating the propulsion equipment in response to needs for changes in direction or speed. When the machinery spaces are in the periodic unmanned condition, the designated duty engineer officer in charge of the watch shall be immediately available and on call to attend the machinery spaces.

(e) All bridge orders shall be promptly executed. Changes in direction or speed of the main propulsion unit shall be recorded, except where the authorities in a country determine that the size or characteristics of a particular ship make such recording impracticable. The engineer officer in charge of the watch shall ensure that the main propulsion unit controls, when in the manual mode of operation, are continuously attended under standby or maneuvering conditions.

(f) The engineer officer in charge of the watch shall not be assigned or undertake any duties which would interfere with his supervisory duty with respect to the main propulsion system and its ancillary equipment, and he shall ensure that the main propulsion system and auxiliary equipment are kept under constant surveillance until he is properly relieved.

(g) Due attention shall be paid to the maintenance and support of all machinery, including mechanical, electrical, hydraulic, and pneumatic systems, their control apparatus and associated safety equipment, all accommodation service systems equipment, and the recording of stores and spare gear use.

(h) The chief engineer officer shall ensure that the engineer officer in charge of the watch is informed of all preventive maintenance, damage control, or repair operations to be performed during the watch. The engineer officer in charge of the watch shall be responsible for the isolation, bypassing, and adjustment of all machinery under his responsibility that is to be worked on and shall record all work carried out.

Under his general direction . . .

(i) Before going off duty, the engineer officer in charge of the watch shall ensure that all events related to the main and auxiliary machinery are suitably recorded.

(j) To avoid any danger to the safety of the ship and its crew, the engineer officer in charge of the watch shall notify the bridge immediately in the event of fire, impending actions in machinery spaces that may cause reduction in the ship's speed, imminent steering failure, stoppage of the ship's propulsion system, or any alteration in the generation of electric power or similar threat to safety. This notification, where possible, shall be accomplished before changes are made in order to afford the bridge the maximum available time to take whatever actions are possible to avoid a possible marine casualty.

(k) When the engine room is put in a standby condition, the engineer officer in charge of the watch shall ensure that all machinery and equipment which may be used during maneuvering is in a state of immediate readiness and that an adequate reserve of power is available for steering gear and other requirements.

6. Watch requirements

(a) Every member of the watch shall be familiar with his assigned watchkeeping duties. In addition, every member shall have with respect to his ship:

(i) knowledge of how to use appropriate internal communication systems;

(ii) knowledge of escape routes from machinery spaces;

(iii) knowledge of engine room alarm systems and the ability to distinguish between the various alarms, especially the ability to recognize the CO_2 alarm;

(iv) knowledge of where to find and how to use the firefighting equipment in the machinery spaces.

(b) The composition of an underway watch shall, at all times, be adequate to ensure the safe operation of all machinery affecting the operation of the ship, in either automated or manual mode, and be appropriate to the prevailing circumstances and conditions. The following, inter alia, shall be taken into account:

(i) the need to provide adequate supervision, at all times, of machinery affecting the safe operation of the ship;

(ii) condition and reliability of any remotely operated propulsion and steering equipment and its controls, control location, and the procedures involved in placing it in a manual mode of operation in the event of breakdown or emergency;

(iii) location and operation of fixed fire detection, fire extinction, or fire containment devices and apparatus;

(iv) use and operational condition of auxiliary, standby, and emergency equipment affecting the safe navigation, mooring, or docking operations of the ship;

(v) steps and procedures necessary to maintain the condition of machinery installations in order to ensure their efficient operation during all modes of ship operation;

(vi) any other demands on the watch which may arise as a result of special operating circumstances.

(c) At any unsheltered anchorage the chief engineer officer shall consult with the master to determine whether or not to maintain an underway watch.

7. Fitness for duty

The watch system shall be such that the efficiency of the watch is not impaired by fatigue. Duties shall be so organized by the chief engineer officer that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.

8. Protection of the marine environment

All engineer officers and engine room ratings shall be aware of the serious effects of operational or accidental pollution of the marine environment and shall take all possible precautions to prevent such pollution, particularly within the framework of relevant international and port regulations.

STCW
Resolution 2

Recommendation on Operational Guidance for Engineer Officers in Charge of an Engineering Watch

Introduction

1. This Recommendation contains operational guidance of general application for the engineer officer in charge of

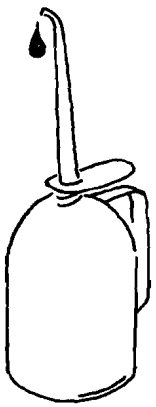
(a) an engineering watch underway (Part I);

(b) an engineering watch at an unsheltered anchorage (Part II).

2. The chief engineer officer should supplement the operational guidance as appropriate.

3. Every engineer officer in charge of the watch should appreciate that efficient performance of his duties is necessary in the interests of safety of life and property at sea and the prevention of pollution of the marine environment. The term "watch" is used in this Recommendation to mean either a group of personnel composing the watch or a period of responsibility for an engineer officer during which his physical presence in the machinery space may or may not be required.

4. This operational guidance, including, but not limited to, the following, shall be taken into account on all ships.



Part I
Engineering Watch Underway

General

5. The engineer officer in charge of the watch is the chief engineer's representative, and his primary responsibility, at all times, is the safe and efficient operation and upkeep of machinery affecting the safe operation of the ship. He should ensure that at all times bridge orders relating to changes in speed or direction of operation are immediately implemented.

6. The engineer officer in charge of the watch should ensure that the established watch-keeping arrangements are maintained. Under his general direction, engine room ratings, if forming part of the watch, should assist in the safe and efficient operation of the propulsion machinery and auxiliary equipment.

7. The engineer officer in charge of the watch should keep the main propulsion plant and auxiliary systems under constant supervision until properly relieved. He should also ensure that adequate tours of the machinery and steering gear spaces are made for the purpose of observing and reporting equipment malfunctions or breakdowns, performing or directing routine adjustments, taking care of required upkeep, and seeing to any other necessary tasks.

8. The engineer officer in charge of the watch should direct other members of the watch to inform him of potentially hazardous conditions which might adversely affect the machinery and jeopardize the safety of life or the ship.

9. The engineer officer in charge of the watch should ensure that the machinery-space watch is supervised and arrange for substitute personnel in the event of the incapacity of any watch personnel. The watch should not leave the machinery spaces unsupervised in a manner which would prevent the manual operation of the engine room plant or throttles.

10. The engineer officer in charge of the watch should take the action necessary to contain the effects of damage resulting from equipment breakdown, fire, flooding, rupture, collision, stranding, or other cause.

. . . inform him of potentially hazardous conditions . . .

11. The engineer officer in charge of the watch should ensure that all members of the watch are familiar with the number, location, and types of firefighting equipment and damage control gear, their use, and the various safety precautions to be observed.

12. The engineer officer in charge of the watch should be aware of potential hazards in the machinery spaces which could cause injury and should be able to administer first aid.

13. The engineer officer in charge of the watch should continue to be responsible for machinery-space operations, despite the presence of the chief engineer officer in the machinery spaces, until the chief engineer officer informs him specifically that he has assumed that responsibility and this is mutually understood.

Taking over the watch

14. The engineer officer in charge of the watch should not hand over the watch to the relieving engineer officer if he has reason to believe that the latter is not capable of carrying out his duties effectively, in which case he should notify the chief engineer officer accordingly. The relieving engineer officer of the watch should satisfy himself that the members of his watch are fully capable of performing their duties effectively.

15. The relieving engineer officer should not take over the watch until he has examined the engine room log and checked that it is in accordance with his own observations.

16. Prior to taking over the watch the relieving engineer officer should satisfy himself regarding, at least, the following:

(a) standing orders and special instructions of the chief engineer officer relating to the operation of the ship's systems and machinery;

(b) nature of all work being performed on machinery and systems, personnel involved, and potential hazards;

(c) level and, where applicable, condition of water or residues in bilges, ballast tanks, slop tanks, reserve tanks, fresh water tanks, and sewage tanks and

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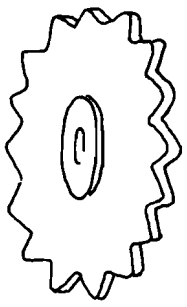
special requirements for use or disposal thereof;

(d) condition and level of fuel in the reserve tanks, settling tank, day tank, and other fuel storage facilities;

(e) special requirements relating to sanitary system disposals;

(f) condition and mode of operation of the various main and auxiliary systems;

(g) where applicable, the condition of monitoring and control console equipment and knowledge of which equipment is being operated manually;



(h) where applicable, the condition and mode of operation of automatic boiler controls such as flame safeguard control systems, limit control systems, combustion control systems, fuel supply control systems, and other equipment related to the operation of steam boilers;

(i) potentially adverse conditions resulting from bad weather, ice, or contaminated or shallow water;

(j) special modes of operation dictated by equipment failure or adverse ship conditions;

(k) reports of engine room ratings relating to their assigned duties;

(l) availability of firefighting appliances.

Periodic checks of machinery

17. It is the responsibility of the engineer officer in charge of the watch to periodically inspect the machinery in his charge. In such inspection he should verify that

(a) main and auxiliary machinery, control systems, indicating panels, and communication systems are functioning satisfactorily;

(b) steering system and all associated gear is functioning satisfactorily;

(c) water level is properly maintained in the boiler and heat exchanger equipment;

(d) engine or boiler exhausts indicate good combustion characteristics and soot has been blown where applicable;

(e) condition of the bilges with respect to water level and contamination is satisfactory;

(f) various piping, including control and machinery systems piping, is free of leaks, functioning properly, and being adequately maintained, with special attention being given to pressurized oil piping.

Engine room log

18. Before going off duty, the engineer officer in charge of the watch should ensure that all events related to the main and auxiliary machinery which have occurred during the watch are suitably recorded.

The engine room log . . .

Navigation in congested waters . . .

Preventive and repair maintenance

19. The engineer officer in charge of the watch should cooperate with any engineer officer in charge of maintenance work during all preventive maintenance or damage control operations or repairs. This would include but not necessarily be limited to

(a) isolating and bypassing machinery to be worked on;

(b) adjusting the remaining plant to function adequately and safely during the maintenance period;

(c) recording, in the engine room log or other suitable document, the equipment worked on, the personnel involved, the safety steps taken, and by whom they were taken for the benefit of relieving engineer officers and for record purposes;

(d) testing and putting into service, where necessary, the repaired machinery or equipment.

20. The engineer officer in charge of the watch should ensure that any engine room ratings who perform maintenance duties are available to assist in the manual operation of machinery in the event of automatic equipment failure.

Bridge notification

21. The engineer officer in charge of the watch should bear in mind that changes in speed resulting from machinery malfunction or loss of steering may imperil the safety of the ship and life at sea. The bridge should be immediately notified in the event of fire, impending actions in machinery spaces that may cause reduction in the ship's speed, imminent steering failure, stoppage of the ship's propulsion system, or any alteration in the generation of electric power or similar threat to safety. This notification, where possible, should be accomplished before changes are made in order to afford the bridge the maximum available time to take whatever actions are possible to avoid a potential marine casualty.

Navigation in congested waters

22. The engineer officer in charge of the watch should ensure that all machinery involved with the maneuvering of the ship can immediately be placed in manual modes of operation upon notification that the ship is in congested waters. The engineer officer should also ensure that an adequate reserve of power is available for steering and other maneuvering requirements. Emergency steering and other auxiliary equipment should be ready for immediate operation.

Navigation during restricted visibility

23. The engineer officer in charge of the watch should ensure a permanent air or steam pressure for fog sound signals. He should be ready to respond to any bridge orders and should ensure, in addition, that auxiliary machinery used for maneuvering is readily available.

Calling the chief engineer

24. The engineer officer in charge of the watch should notify the chief engineer officer without delay in the following circumstances:

(i) when engine damage or malfunctions occur which, in his opinion, are such as to endanger the safe operation of the ship;

(ii) when malfunctions occur which, in his opinion, may cause damage or breakdown of propulsion machinery, auxiliary machinery, or monitoring and governing systems;

(iii) in emergencies or in situations when he is in doubt as to what decision to make or measures to take.

25. In addition to complying with the requirement to notify the chief engineer officer in the foregoing circumstances, the engineer officer in charge of the watch should not hesitate to take immediate action for the safety of the ship, its machinery, and its crew where circumstances require.

Watchkeeping personnel

26. The engineer officer in charge of the watch should give the watchkeeping personnel all appropriate instructions and information which will ensure the keeping of a safe watch. Routine machinery upkeep, performed as incidental tasks as a part of keeping a safe watch, should be set up as a regimen of the watch routine. Detailed repair maintenance involving repairs to electrical, mechanical, hydraulic, pneumatic, or applicable electronic equipment throughout the ship should be performed with the cognizance of the engineer officer in charge of the watch and chief engineer. These repairs should be recorded.

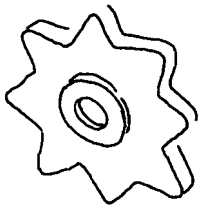
Part II
Engineering Watch at an Unsheltered Anchorage

When a ship is at anchor in an open roadstead or any other virtually "at sea" condition, the engineer officer in charge of the watch should ensure that

(a) an efficient watch is kept;

(b) periodic inspection is made of all operating and standby machinery;

(c) main and auxiliary machinery is maintained in a state of readiness in accordance with orders from the bridge;

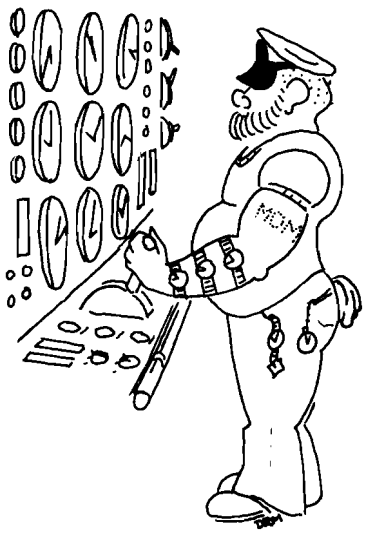


(d) measures are taken to protect the environment from pollution by the ship and that applicable pollution regulations are complied with;

(e) all damage control and firefighting systems are in readiness.

We would like to reiterate that the practices enumerated here were taken from international regulations and recommendations, not U.S. laws or regulations.

Questions and comments regarding the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, should be directed to LCDR George N. Naccara, U.S. Coast Guard (G-MVP-3), Washington, DC 20593; tel. (202) 426-2240. ↕



Watch requirements . . .

Special thanks to Coast Guard Photojournalist Dale R. Miller for the tongue-in-cheek illustrations

Retraction/Modification

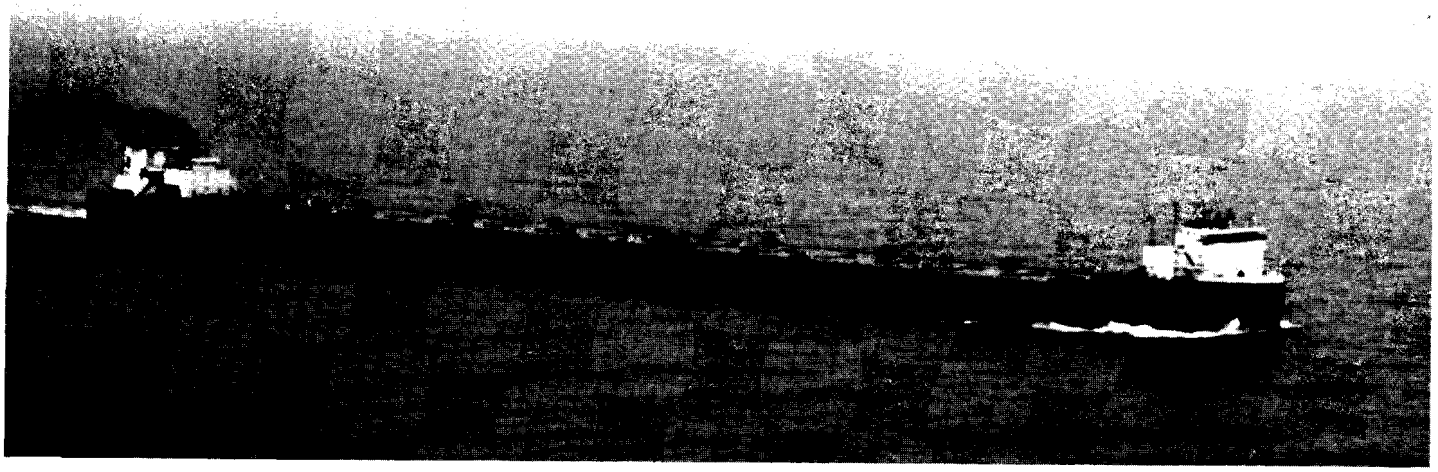
The announcement of the availability of the report "An Analysis of Full Scale Measurements on M/V STEWART J. CORT during the 1979 and 1980 Trial Programs" appearing in the October/November 1983 issue of the *Proceedings* contained background information that was technically incorrect and out-of-date. A corrected version of the article follows.

Stresses on Great Lakes Ore Carriers Studied

The Coast Guard has been publishing a series of reports on research into the longitudinal strength standards of Great Lakes ore carriers. The latest report, an analysis of springing and wave-induced stress on the M/V STEWART J. CORT, covers three years of research efforts to adapt two wave measurement systems and collect and analyze data. Among the subjects covered were how well the magnitude of springing stresses can be predicted analytically, how springing and wave-induced stress combine to form extreme stresses, and how the results of the research might be used to improve present-day construction standards. The new GL strength standard, in fact, adopted in 1978 by Canada and the United States, was a result of the joint efforts of several parties (the governments of Canada and the United States, two major classification societies, several universities, and almost all U.S. and Canadian Great Lakes ship owners), all of whom participated in the research program and shared in its funding.

The work presented in the report includes a numerical simulation of the springing and wave-induced stresses and verification of the simulation's reliability. The findings match the actual ship response with the theoretical response.

Copies of this report, "An Analysis of Full Scale Measurements on M/V STEWART J. CORT during the 1979 and 1980 Trial Programs," can be obtained from the National Technical Information Service (NTIS), Springfield, Virginia 22161. Persons interested in ordering a copy should specify Coast Guard Report No. CG-D-25-82, Accession No. AD A127226. ↓



Because of their unusually large length-to-depth ratios, Great Lakes ore carriers like the M/V STEWART J. CORT provide a ready-made laboratory for studying springing vibratory stresses.

1984 International Ice Patrol Service

In February or March 1984, depending on iceberg conditions, the International Ice Patrol will commence its annual service of guarding the southeastern, southern, and southwestern limits of the regions of icebergs in the vicinity of the Grand Banks of Newfoundland. Reports of ice in this area will originate from passing ships and from flights by Ice Patrol aircraft. Twice each day, the Ice Patrol will broadcast a bulletin and a daily radiofacsimile chart containing ice information to inform ships of the extent of this dangerous region. Broadcasts of the Ice Patrol Bulletin will be made as indicated below:

BROADCAST STATION	TIME OF BROADCASTS (GMT)	FREQUENCIES (kHz)
SITOR ICE BROADCAST		
Coast Guard Communication Station Boston/NIK	0018 1218	5320, 8502 8502, 12750
CW BROADCASTS		
Coast Guard Communication Station Boston/NIK (Best to follow SITOR best)	0050 1250	5320, 8502 8502, 12750
Canadian Forces Station Mill Cove/CFH	0130, 1330	438 (Off-air 1200-1600 second Thurs each month) 4255 (2200-1000) 6430 Continuous 8697 Continuous 12726 (1000-2200) 16926.5 On request 22397.5 On request
Navy LCMP Broadcast/NMN/NAM NAR/NRK/AOK/GXH/NGD Driver, VA/NMN	0800-0900 1500-1600 1600-1700 2100-2200	8090 Continuous 12135 Continuous 16180 Continuous 20225 (1200-2359)
Thurso, Scotland/GXH	same times	7504.5 Continuous 12691 (0800-1900) 3724 (1900-0800)

BROADCAST STATION	TIME OF BROADCASTS (GMT)	FREQUENCIES (kHz)
Keflavik, Iceland/NRK	same times	5167 (1900-0800)
Key West, Florida/NAR	same times	5870 Continuous 25590 (1200-2359)
Rota, Spain/AOK	same times	5917.5 Continuous 7705 Continuous
NEA Makri, Greece/NGD	same times	4623 Continuous 13372.5 (0800-1900)
RADIOFACSIMILE BROADCASTS		
Coast Guard Communication Station Boston/NIK	1600	8502, 12750 (+400 Hz)
Canadian Forces Station Mill Cove/CFH (Primarily sea ice in Gulf of St. Lawrence and North. Limits of icebergs sometimes given)	0000, 2200	122.5 Continuous (Off air 1200-1600 second Thursday each month) 4271 (2200-1000) 6330 Continuous 9890 Continuous 13510 (1000-2200)
Radio Station Bracknell, United Kingdom/GFE (Eastern North Atlantic Sea Ice Observations)	1413	2618.5 (1800-0600 Oct 1-Mar 31 1900-0500 Apr 1-Sep 30) 4782 Continuous 9203 Continuous 14436 Continuous 18261 (0600-1800 Oct 1-Mar 31; 0500-1900 Apr 1-Sep 30)
SPECIAL BROADCASTS Canadian CG Radio Station St. John's/VON	As required when icebergs are sighted outside the limits of ice between regularly scheduled broadcasts and as necessary prior to the commencement and after the close of the official Ice Patrol season	478 Preceded by International Safety Signal (TTT) on 500 kHz
USCG vessel when on International Ice Patrol duty	When in the vicinity of ice in periods of darkness or fog	2670 Preceded by International Safety Signal (SECURITE) on 2182 kHz

Reports of Ice, Sea Surface Temperatures, and Weather

All ships may assist in the operation of the International Ice Patrol by reporting all sightings of ice (instructions below). When reporting ice, please include the following information:

POSITION
SIZE AND SHAPE OF ICEBERG
CONCENTRATION OF ICE (FOR SEA ICE, IN TENTHS)
THICKNESS OF ICE (FOR SEA ICE, SPECIFY IN FEET OR METERS)

When reporting icebergs to the Ice Patrol, please use the following categories:

DESCRIPTIVE NAME	HEIGHT (feet)	(meters)	LENGTH (feet)	(meters)
Growler	(G) less than 4	less than 1	less than 20	less than 6
Small Iceberg	(S) 4 - 50	1 - 15	20 - 200	6 - 60
Medium Iceberg	(M) 51 - 150	16 - 45	201 - 400	61 - 122
Large Iceberg	(L) more than 150	more than 45	more than 400	more than 122

SHAPE	TYPE DESCRIPTION
Blocky	(B) Steep sides with flat top. Very solid. Length-height ratio less than 5:1.
Tilted Blocky	(V) Blocky iceberg which has tilted to present a triangular shape from the side.
Drydock	(K) Eroded such that a large U-shaped slot is formed with twin columns. Slot extends into or near waterline.
Pinnacled	(P) Large central spire or pyramid.
Dome	(D) Large, round, smooth top. Solid-type iceberg.
Tabular	(T) Flat-topped iceberg with length-height ratio greater than 5:1.

In addition to ice reports, the Ice Patrol needs sea surface temperature and weather reports to predict the drift and deterioration of ice and plan aerial patrols. Please make these reports to the Ice Patrol every 6 hours when within latitudes 40 N to 52 N and longitudes 39 W to 57 W. Ships with one radio operator may prepare the reports every 6 hours and hold them for transmission when the radio operator is on watch. When reporting, please include the following:

SHIP POSITION, COURSE, SPEED, VISIBILITY, AIR AND SEA SURFACE TEMPERATURE, WIND DIRECTION, AND SPEED.

It is not necessary to make the above weather report if the ship is making routine weather reports to METEO WASHINGTON.

How to Report Conditions

Report ice sightings, weather, and sea surface temperature to Commander, International Ice Patrol—COMINTICEPAT GROTON CT—through U.S. Coast Guard Communication Stations or, if unable to work these stations, Canadian Coast Guard Radio Station St. John's/VON. Make these reports in accordance with the following chart. Note that direct printing radio teletype (SITOR) is available through USCG Communication Stations Boston (NMF/NIK) and Portsmouth (NMM).

CALL	LOCATION	BANDS GUARDED DAY	NIGHT	FREQUENCY
NMF NIK	USCG Communication Station, Boston, MA	500 kHz	500 kHz	427/472 kHz
		DIRECT PRINTING RADIO-TELETYPE SELCALL 1.01095 (Assigned frequency shown)		
		*4176.0 kHz	*4176.0 kHz	4355.5 kHz
		*6292.0 kHz	*6292.0 kHz	6500.0 kHz
		8349.5 kHz	8349.5 kHz	8710.5 kHz
		12503.0 kHz	12503.0 kHz	13083.0 kHz
		+16666.0 kHz	+16666.0 kHz	17203.0 kHz
		++22198.0 kHz	++22198.0 kHz	22567.0 kHz
		SSB VOICE FREQUENCIES (Carrier frequency shown)		
		6200.0 kHz	6200.0 kHz	6506.4 kHz
NMN	USCG Communication Station, Portsmouth, VA	500 kHz	500 kHz	466 kHz
		CALLING FREQUENCIES (Channel 4-5-6)		
		8 MHz	8 MHz	8465.0 kHz
		12 MHz	12 MHz	12718.0 kHz
		16 MHz	16 MHz	16976.0 kHz
		DIRECT PRINTING RADIO-TELETYPE SELCALL 1.01097 (Assigned frequency shown)		
		*4172.0 kHz	*4172.0 kHz	4351.5 kHz
		*6258.0 kHz	*6258.0 kHz	6496.0 kHz
			8357.0 kHz	8718.0 kHz
		12504.5 kHz	12504.5 kHz	13084.5 kHz
		16673.5 kHz		17210.5 kHz
		*22205.5 kHz	*22205.5 kHz	22574.5 kHz
		SSB VOICE FREQUENCIES (Carrier frequency shown)		
		1200-0200 GMT	0200-1200 GMT	
			4 MHz	4430.7 kHz
		6 MHz	6 MHz	6508.4 kHz
		8 MHz	8 MHz	8767.4 kHz
		12 MHz		13115.2 kHz
VON	Canadian Coast Guard Radio Station, St. John's, NFLD	500 kHz	500 kHz	478 kHz

*Available upon request
+1000-2000Z, Apr 1-Sept 30
++1000-2000Z, Oct 1-Mar 31

Vessels equipped with MARISAT may send messages at their own expense to COAST GUARD NYK (TELEX NO. 126831).

The Ice Patrol Office in Groton, Connecticut, can be reached by telephone throughout the season. Also, a 24-hour Ice Patrol watch is maintained in New York. The numbers are:

(203) 445-8501 (Ice Patrol Duty Officer, Connecticut) or
(212) 668-7055 (Coast Guard Operations Center, New York).

Gulf of St. Lawrence Information

From (approximately) December to late June, the Canadian Ministry of Transport provides sea ice information services for the Gulf of St. Lawrence as well as the area of the Strait of Belle Isle from longitude 58-00 W to 66-30 W. Ships may obtain ice information by contacting Ice Operations Officer, Dartmouth, Nova Scotia, via any east coast Canadian Coast Guard radio station. Details of the services are available from the Ice Operations Office, Marine Services Information Center, Ministry of Transport, P.O. Box 1013, Dartmouth, Nova Scotia. Telephone: (902) 426-5664 or 5665. TELEX: 019-22625.

Supplementary Ice Information

Supplementary information on ice conditions and navigational warnings for the Strait of Belle Isle, the coast of Newfoundland, and the Grand Banks can be obtained by contacting the Canadian Coast Guard radio stations St. Anthony/VCM, Comfort Cove/VOO, St. Lawrence/VCP, or St. John's/VON.

Warnings

1. In spite of the best efforts of the Ice Patrol, icebergs have drifted and may drift unnoticed into the usual shipping routes in the area of the Grand Banks. The positions of icebergs in the Ice Bulletin are computed at 12-hour intervals. However, after about 5 days without an iceberg's having been resighted, the positions estimated by driftings are unreliable. The Ice Bulletin indicates the dates of iceberg sightings.

2. In general, icebergs approaching and to the south of latitude 48 N appear in the Ice Bulletin. In the event there are large numbers of icebergs south of 48 N, the Ice Bulletin will carry the positions of only those icebergs near the limits of ice and isolated icebergs.

3. Careful tests by the Ice Patrol have proved that radar cannot provide positive assurance of iceberg detection. Since sea water is a better reflector of radar signals than ice, an iceberg or growler inside the area of sea return on the radar scope may not be detected. The average range of radar detection of a dangerous growler or very small iceberg, if such bergs can be detected by radar at all, is only 4 miles. While radar remains a valuable aid for ice detection, its use cannot replace the traditional caution exercised by mariners in the vicinity of the Grand Banks while transiting south of the estimated limits of all known ice.

Comments

The Ice Patrol earnestly solicits comments, particularly concerning the effectiveness of the times and frequencies of radio transmissions. Please mail facsimile charts received at sea to Commander, International Ice Patrol, Avery Point, Groton, Connecticut 06340. Please indicate the frequency used and position of the ship when it received the broadcast.

Keynotes

The Coast Guard published the following items of general interest in the Federal Register between November 17, 1983, and December 15, 1983:

Final rules:

CGD11-83-105	Special Local Regulations; Lake Havasu Classic Regatta (published November 25)
CGD13 83-04	Drawbridge Operation Regulations; Lake Washington, Washington (November 25)
CGD 79-013	Identification, Boat Hull Numbers; editorial correction to final rule published September 9 (November 28)
CCGD 8-82-19	Anchorage Regulations; Lower Mississippi River (November 29)
CGD7 83-16	Special Local Regulations; Pompano Beach 21st Annual Christmas Boat Parade (December 1)
CGD7 83-17	Special Local Regulations; Coors/Winterfest Classic; vicinity of Las Olas Bridge, Florida (December 1)
CGD 1-83-04	Drawbridge Operation Regulations; Kennebunk River, Maine (December 8)
CGD 08-83-06	Drawbridge Operation Regulations; Lavaca River, Texas (December 8)
CGD13 83-05	Drawbridge Operation Regulations; North Fork, Willapa River, Washington (December 8)
CGD 75-124a	Pollution Prevention; Implementation of Outstanding MARPOL 73/78 Provisions; editorial corrections to final rule published October 6 (December 8)
CGD3 83-037	Drawbridge Operation Regulations; Harlem River, New York (December 15)
CGD 81-092	Electrical and Fuel System Standards; Miscellaneous Amendments (December 15)

Notices of proposed rulemaking (NPRMs):

CGD3 82-034	Drawbridge Operation Regulations; South River, New Jersey (November 17)
CGD 83-008	Guide Clearances for Bridges Across Navigable Waters of the United States; supplementary notice of proposed adoption of construction guidelines for the clearance space to be left under bridges (November 25)
CGD3 83-042	Drawbridge Operation Regulations; Schuylkill River, Pennsylvania (November 28)
CGD1-83-4R	Boston Harbor, Boston, Massachusetts; Safety Zone Regulations (November 28)
CGD 83-028	Inland Navigation Rules: Implementing Rules (December 8)

CGD7 83-14 Drawbridge Operation Regulations; New Pass, Sarasota County, Florida; request for comments and notice of public hearing (December 8)

Notices:

CGD 83-063 Rules of the Road Advisory Council; notice regarding applications for membership (November 17)

Comments or requests for copies of rulemakings or notices should be directed to the Marine Safety Council at the following address:

Commandant (G-CMC)
U.S. Coast Guard
Washington, DC 20593
Tel.: (202) 426-1477

Comments may be delivered to the Marine Safety Council office, Room 4402 at Coast Guard Headquarters, 2100 Second Street, SW, Washington, DC, between the hours of 9:00 a.m. and 4:00 p.m. Monday through Friday. Comments will also be available for inspection or copying during those hours.

* * *

Final rule:

Electrical and Fuel System Standards (CGD 81-092)

This final rule, published on December 15, 1983, amends the Electrical and Fuel System Standards in Subparts I and J of Part 183 of Title 33 of the Code of Federal Regulations which apply to boats having gasoline-powered engines for propulsion or electrical generation.

The Coast Guard reviewed its regulations governing construction standards for the manufacture of recreational boats with an eye to reducing the burden of existing regulations while ensuring that an adequate level of safety was maintained. On the basis of the review, the Coast Guard and its National Boating Safety Advisory Council agreed, subject to a continued evaluation of how these changes affect boating safety, that unless a specific requirement significantly contributed to boating safety, it would be eliminated. The amendments contained in this final rule repeal and revise those regulations found to be unnecessary.

While these changes will, for the most part, relieve the regulatory burden on recreational boat manufacturers, the change to §183.460(a) (the section on ungrounded output conductors from storage batteries) is expected to increase the cost of compliance for some manufacturers who are not currently complying with voluntary standards.

Notice of proposed rulemaking (NPRM):

Inland Navigation Rules: Implementing Rules (CGD 83-028)

In late 1985 the Western Rivers, as defined by Inland Rule 3, will be connected by the Tennessee-Tombigbee Waterway to several rivers currently governed by the Inland Rules for non-Western Rivers. CGD 83-028 would enhance navigation safety and regional consistency by extending certain Western Rivers provisions of the Inland Rules to these waters.

The Coast Guard's NPRM, published December 8, 1983, specifies certain waters upon which Rules 9(a)(ii) (navigation in a narrow channel), 15(b) (right of way for ascending and descending vessels), and 24(i) (lights to be displayed during towing or pushing) of the Inland Navigational Rules Act of 1980 would be made applicable. This proposal was unanimously endorsed by the members of the Towing Safety Advisory Committee at its October 27, 1983, meeting.

The proposal is open to public comment until March 7, 1984.

Actions of the Marine Safety Council

The Marine Safety Council did not meet during the month of December. ‡

Chemical of the Month

Sulfur Dioxide: SO_2

Synonyms:	sulfurous acid anhydride

Physical Properties

boiling point:	$-10^{\circ}C$ ($14^{\circ}F$)
freezing point:	$-76^{\circ}C$ ($-104^{\circ}F$)
vapor pressure at $20^{\circ}C$ ($68^{\circ}F$):	greater than 3 atmospheres

Threshold Limit Values (TLV)

Time Weighted Average:	2 ppm; 5 mg/m^3
Short Term Exposure Limit:	5 ppm; 10 mg/m^3

Flammability Limits in Air

Sulfur dioxide is nonflammable.

Densities

liquid (water = 1.0):	1.363
vapor (air = 1.0):	2.264

Identifiers

U.N. Number:	1079
CHRIS Code:	SFD

Wine lovers, take note: it is this issue's Chemical of the Month, sulfur dioxide, you have to thank for keeping the bacteria, molds, and unwanted yeasts in must under control during winemaking. Beer drinkers, too, have cause to be grateful: sulfur dioxide prevents nitrosamines (known carcinogens) from forming during the malting-process phase of beermaking.

The other uses to which sulfur dioxide is put are almost too numerous to mention. The bulk of what is used each year goes toward the production of sulfuric acid *(see Chemical of the Month, January/February 1981).* Sulfur dioxide is also an important chemical in the food industry, where it serves as a fumigant, a preservative, and a bleach. In water treatment plants, sulfur dioxide is used to remove excess chlorine from drinking water after disinfecting and oxidation operations. It is used for the same purpose in sewage treatment. Sulfur dioxide is also used in the petroleum and refining industries, mineral recovery, kaolin clay ("China clay") processing, and agriculture.

There are three predominant methods of producing sulfur dioxide. The most common way, and the most prevalent in North America, is to burn sulfur *(see Chemical of the Month, September/October 1981).* The other two methods are combustion of pyrite, or iron sulfide, and recovery of the sulfur dioxide that forms as a byproduct of chemical and smelting operations.

Sulfur dioxide is marketed in two grades, the commercial grade and the refrigeration grade. Both grades are 99.98% sulfur dioxide. It is the maximum moisture content that differentiates the two. The commercial grade has an allowable moisture content of 100 parts per million (ppm), or .010%. This type of sulfur dioxide is unsuitable for use in refrigerating machines; the refrigeration grade is limited to a moisture content of no more than 50 ppm, or .005%.

Sulfur dioxide has its bad side. It is one of the two most common air pollutants of modern industrial societies, the other being oxides of nitrogen. These two chemicals are converted in the atmosphere to sulfuric acid and nitric acid, from which the so-called "acid rain" comes.

At room temperature, sulfur dioxide is a colorless gas with a characteristic pungent, "choking" odor. The gas is a severe irritant of the eyes, mucous membranes, and skin. Its irritant properties are due to the rapidity with which it forms acid on contact with moist membranes. The gas will cause burning of the eyes and tearing, coughing, and chest tightness. It may cause severe breathing difficulties, and a person exposed to high concentrations may stop breathing. Liquid sulfur dioxide may cause eye burns with loss of vision and skin burns.

In the event of an emergency, the following first-aid measures should be taken:

Eye exposure - If liquid sulfur dioxide or strong concentrations of sulfur dioxide gas get into the eyes, the eyes should be washed immediately with large amounts of water, the

lower and upper lids being lifted occasionally during the washing. Medical attention should be sought immediately. Contact lenses should not be worn by persons working with this chemical.

Skin exposure - If liquid sulfur dioxide gets on the skin, the contaminated area should be flushed immediately with water. If the chemical penetrates the clothing, the clothing should be removed and then the skin flushed with water. If irritation persists or burns are present after the skin is washed, medical attention should be sought immediately.

Breathing - A person who breathes in large amounts of sulfur dioxide will be overcome; he should be moved to fresh air at once. If breathing has stopped, artificial respiration should be performed. The person should be kept warm and at rest and should receive medical attention as soon as possible.

Sulfur dioxide is regulated by the U.S. Coast Guard as a Subchapter O commodity for bulk carriage on board tank barges and gas ships. In its package form, it is governed by the U.S. Department of Transportation's regulations for Nonflammable Gases. The International Maritime Organization regulates carriage of sulfur dioxide in the IMO Gas Carrier Code, which allows for its transport on "new" liquefied gas ships only. Sulfur dioxide is found on page 2113 of the International Maritime Dangerous Goods (IMDG) Code, and it is assigned a Hazard Class of 2.3.

Cargo and Hazards Branch
Marine Technical and
Hazardous Materials Division

The health information in this article was taken from the Occupational Health Guideline for Sulfur Dioxide issued by the U.S. Department of Health and Human Services and the U.S. Department of Labor.

The sound and fury of Arctic icequakes

"It bumps and grinds and tears and squeaks," Peter Stein, a geophysicist at Massachusetts Institute of Technology (MIT) in Cambridge, told a meeting of the Acoustical Society of America in mid-November. He was talking about ice, specifically the ice cap covering the Arctic Ocean. He has coined the forces responsible for the noises "icequakes," not unrelated to their terrestrial counterparts.

Stein and his colleagues in Ocean Engineering at MIT and Woods Hole Oceanographic Institute in Woods Hole, Massachusetts, were studying underwater acoustics in the Arctic Ocean when they noticed the inherent noisiness of the Arctic ice pack. "The background noise level there can be ten times that of the open ocean," Stein said; prompting him to match the noises with the ice cracks that cause them to test for stress buildup in the pack.

Working from a camp pitched on the three-meter-thick pack covering the 4,000-meter-deep Arctic Abyssal Plain, the researchers used a complex array of hydrophones to measure the frequency and propagation of sound waves associated with ice cracking. Like earthquakes, the cracking ice sends out two kinds of waves, compressional and shear. The former travel faster than the latter, and measuring the difference in their arrival rate at a series of stations allows a quake's epicenter to be pinpointed. "The earth's crust floats on magma just like ice floats on water," Stein says. "When I saw all the similarities, I called them icequakes."

The basic science of studying Arctic ice—the material and acoustical physics of pack-ice breaking—has already yielded some practical applications for U.S. Naval and private interests within the Arctic Circle. High-stress ice fractures, the kind that smash ships and topple oil-drilling platforms, are associated with low-frequency sounds.

Diurnal thermal crackling, associated with high-frequency sounds, is generally harmless but can annoy submarine sonar operators. Some ice cracking emits "narrow band" frequencies, as do submarines, which raises the possibility of mistaken identity in submarine detection. Stein hopes his work will help Arctic workers prevent accidents by allowing them to detect the amount of stress the pack is under by monitoring the ambient noises in the Arctic ice.—*M. Wolfe*

Dry Chemical

If dry chemical is used to fight a fire, prompt cleanup may be necessary to prevent a second one.

Most investigations into casualties begin with the question "What did they do wrong?" Sometimes, however, we can learn from a casualty when "they" did not do anything wrong; one such case involves an electrical fire aboard the containership MAUNAWILI.

The ship's personnel responded properly to a fire in the main electrical switchboard which left two men severely burned and the ship dead in the water for three hours. This accident illustrates well that there is more to putting out a fire than grabbing the nearest extinguisher and releasing the extinguishing agent. The incident does not end with the discharging of the fire extinguisher.

The fire began with a routine maintenance problem while the vessel was at sea, traveling from Seattle to Hawaii. The ship's chief engineer, suspecting a problem, asked the chief electrician to check a rheostat in the main switchboard. The chief electrician and the second electrician found the rheostat to be faulty and proceeded to replace the device. They had almost completed this task when they realized that the rheostat was too far to the rear of the control panel for the control rod to reach through the switchboard; this prevented them from attaching the control knob. As they moved the bolts on the rheostat's adjustable legs to bring the rheostat closer to the switchboard, the bus bars exploded in flames. The engine-room personnel, using dry chemical Class ABC portable fire extinguishers, quickly extinguished the flames, but the two electricians suffered first- and second-degree burns over their faces, hands, and lower arms and were incapacitated for over a month.

It should be noted that the electricians' failure to wear protective gear contributed significantly to their injuries. Usually there is not much clearance behind an electrical switchboard, so that if there is a fire it is difficult for someone to escape the flames before being burned. While protective gear will not always prevent injury, the gear may provide time to escape from tight places.

The ship was left dead in the water when the fire caused the generator to trip off the line. Each time the ship's engineers tried to energize the switchboard, the fire reignited and had to be reextinguished; each time this caused the arcing from one bus bar to another to continue down the bus bars in a domino effect. Finally, the engine-room personnel stopped trying to reenergize the switchboard and began cleaning the dry chemical residue from the bus bars.

Since the weather was mild and the ship was in open water, there was no threat to the ship. After personnel finished cleaning the dry chemical residue, they were able to safely reenergize the switchboard. On regaining propulsion, the MAUNAWILI changed course and proceeded to San Francisco. When the vessel was in Air Force helicopter range, the injured crewmen were medevacked for treatment.

The Coast Guard investigators were unable to determine with certainty what caused the casualty, but one suggestion was that the electricians may have dropped a bolt from one of the rheostat's adjustable legs, shorting out the bus bars. No such bolt was found after power was restored, but it may have been discarded in the cleanup. If a dropped bolt was indeed the

cause of the fire, removing it during the clean-up operation prevented the short circuit from recurring when the switchboard was re-energized.

Perhaps the engine-room personnel did not know it, but by removing the dry chemical residue they were saving themselves a great deal of trouble later—and there lies the lesson from this casualty. Dry chemical residues are very corrosive and will damage almost any surface they contact if left on it for a period of time. Once a fire is extinguished, all surfaces should be cleaned immediately; this is especially important with electrical installations, where cleaning before reenergizing circuits is important for safety.

It is worth taking the time to learn a little about dry chemical, since this information has a bearing on its use and cleanup. Dry chemical is not a single chemical or a single chemical mixture but rather a family of powders that are effective against most Class A, B, and C fires. Additives are used to improve storage, flow, and water repellency; in particular, silicones are added by almost all manufacturers. Scientists and engineers do not know just how dry chemical works, but it involves smothering (the heat of the fire causes the dry chemical to release carbon dioxide and water vapor), cooling (the dry chemical uses the heat of the fire to decompose), and radiation shielding (the powdered agent forms a cloud that shields the fuel from the fire). The main effect is believed to be similar to that produced by the Halon extinguishing agents.

Just as with Halons, dry chemical breaks down when heated, and the smaller "pieces" into which it forms are effective in breaking the chain reactions which keep a fire going. These pieces can leave sticky residues. The residues have very little, if any, ability to fight a fire that may reflash, so removing them will not affect the fire situation from that standpoint. A major problem arises from the residues' corrosivity. If left on metals, for example, they will eat away until the metal fails. Similarly, if left on electrical insulation, the residues will eventually destroy the insulation and probably produce a short circuit, and a short circuit can cause the outbreak of a new fire. There is one further problem with dry chemical residues: when very wet, these residues can be electrically conductive, which, again, can lead to short circuits and fires. However, the quantity of water needed for this phenomenon is very large, and it is unlikely that the residues on electrical gear inside a ship would get that wet. Nevertheless, it adds yet another incentive for removing the residues immediately after the fire is extinguished.

The recommended procedure for cleanup is to completely remove all residues. Usually vacuuming will be effective, but if the residues are sticky, hand cleaning may be necessary. Personnel must protect their skin: since the residues corrode metals, mariners should bear in mind what they could do to hands, faces, and eyes. After removing the residues, personnel should wash affected surfaces with a mixture of 60 percent water and 40 percent isopropyl alcohol to dissolve the silicones that are almost always present.

Cleaning up after using dry chemical can be time-consuming—and even destructive: it may be impossible to remove all traces of the dry chemical from some delicate machinery without damaging the machinery. While dry chemical is an excellent fire extinguishing agent, it may not be the best choice for fighting a fire in areas with complex electrical wiring and machinery with very small parts. Fortunately, there are other types of portable fire extinguishers to use, including carbon dioxide and Halon 1211, which do not leave residues.

Whether or not the personnel on the MAUNAWILI were well versed in the properties of dry chemical, their response—cleaning up the residues--was the correct one. Had they not cleaned away the dry chemical residues, the metal surfaces would have slowly corroded and the electrical insulation would have been slowly eaten away. Eventually, there might well have been a short circuit and then a second fire.

This article was written by Alan L. Schneider, a fire protection engineer in the Ship Design Branch of the Coast Guard's Marine Technical and Hazardous Materials Division. ↕

Nautical Queries

The following items are examples of questions included in the Third Mate through Master examinations and the Third Assistant Engineer through Chief Engineer examinations:

DECK

1. All of the following are distress signals under International Rules EXCEPT

A. International Code Signal AA.
B. orange-colored smoke.
C. red flares.
D. the repeated raising and lowering of outstretched arms.

REFERENCE: COMDINST M16672.2, Rule 37

2. The distance that a vessel travels from the time the order is given to put engines full astern until the vessel is dead in the water is known as

A. advance.
B. head reach.
C. stopping distance.
D. transfer.

REFERENCE: Turpin and MacEwen, Merchant Marine Officers' Handbook

3. The arc of an hour circle between the celestial equator and a point on the celestial sphere, measured northward or southward through 90^{o}, is the

A. altitude.
B. declination.
C. latitude.
D. azimuth angle.

REFERENCE: Bowditch, Vol. I, 1977

4. A combustible gas indicator will NOT operate correctly when

A. the hydrocarbon content of the atmosphere is below the upper explosive limit.
B. the atmosphere is deficient in oxygen.
C. the distance between the operator and the compartment to be tested is greater than 50 feet.
D. any of the above are true.

REFERENCE: International Oil Tanker and Terminal Safety Guide

5. Under the IALA Maritime Buoyage System, yellow-colored aids to navigation are used for

A. "junction" buoys.
B. special-purpose aids.
C. mid-channel or fairway aids
D. lateral aids.

REFERENCE: Proceedings of the Marine Safety Council, September/October 1982

ENGINEER

1. If the turbocharger of a four-cycle diesel engine fails to operate, the

A. intake manifold pressure will be high.
B. intake manifold pressure will be unaffected.
C. exhaust temperatures will be high.
D. exhaust temperatures will be low.

REFERENCE: Kates and Luck, Diesel and High Compression Gas Engines

2. After-coolers which cool the air compressed in the turbocharger

A. increase air density.
B. decrease air density.
C. are normally of a dry-tube design to prevent cooling fin corrosion.
D. aid in increasing the overall brake horsepower but at the expense of greatly increased fuel consumption.

REFERENCE: Stinson, Diesel Engineering Handbook

3. According to Coast Guard regulations, a nonmetallic flexible hose used in a nonvital freshwater system operating at 125 psi must be constructed

A. with a self-extinguishing-type covering.
B. with a fiber reinforcement.

C. in short reasonable lengths.
D. all of the above.

REFERENCE: 46 CFR 56.60-25 (c)

4. Evaporator efficiency in a flash-type evaporator is increased by

A. lowering brine discharge density.
B. decreasing the absolute pressure of each stage.
C. increasing saltwater heater temperature.
D. increasing the pressure at the spray pipe.

REFERENCE: Harrington, Marine Engineering

5. Transformer cores are laminated to reduce

A. eddy currents.
B. hysteresis losses.
C. leakage flux.
D. all of the above.

REFERENCE: Lister, Electric Circuits and Machines

ANSWERS

1.C;2.A;3.A;4.B;5.A

ENGINEER

1.A;2.B;3.B;4.B;5.B

DECK

If you have any questions about the Nautical Queries, please contact Commanding Officer, U.S. Coast Guard Institute (mvp), P.O. Substation 18, Oklahoma City, Oklahoma 73169; tel.: (405) 686-4417.

Maritime Licensing, Certification, and Training

The past few years have seen growing Coast Guard encouragement of maritime training. The increase in the number and types of courses recently receiving Coast Guard approval illustrates this. From 1965 to the beginning of 1980, approximately 30 courses received Coast Guard approval. From the beginning of 1980 to mid-1983, approximately 55 courses received Coast Guard approval. This means that in those last 3½ years, almost twice as many courses were approved as in the previous 15. What is going on?

The Coast Guard's philosophy in regard to maritime training has indeed begun a gradual change. Technological advances are partly responsible. Vessels, equipment, and methods have become increasingly sophisticated. For a mariner to remain competent, he or she must keep abreast of new maritime practices.

As manning of vessels has in many cases been cut to the bare minimum, mariners do not have the time to pursue training while underway. The Coast Guard believes that shore-based training can provide experience equal to or greater than experience gained during a normal sea tour. Today's training methods (e.g., simulation) can provide a mariner a quality training experience safely and quickly without the mariner's needing to get underway.

Reinforcing the change in Coast Guard thinking are international agreements and conventions. The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, specifically recommends various training courses and allows the substitution of training for underway time.

Prior to 1980, Coast Guard approvals were granted mostly for courses specifically suggested by law or regulation and held at union schools or on school ships. This situation changed with the development of the new radar observer and proposed tankerman regulations and their provisions for training. Existing schools began expanding their course offerings beyond those implied by law or regulation, and firms whose main business was to provide maritime training began to appear.

The Coast Guard's new philosophy on training has required it to expand the definition of what Coast Guard approval of a course means. Coast Guard approval of a course indicates that the course is required by regulation, that a mariner can take the course instead of an examination, or that the Coast Guard recognizes the importance of the course and will allow graduates to substitute training time for required service time toward licenses and certificates. This latter part of the approval description has evolved in recent years and is one reason why many courses which were previously "just good training" can now obtain the status of Coast Guard-approved.

Arguments against this new training policy seem prompted more by tradition

than practicality. Some mariners feel their licenses will be devalued if the Coast Guard allows mariners to receive sea-time credit for training they get in shoreside facilities. Others feel there is just no substitute for sea time.

The Coast Guard agrees that a specified amount of sea time is essential to ensure that mariners get the experience they need to be competent professionals. However, the Coast Guard also realizes the importance of training—as stated earlier, there is not enough time for quality training on board a ship. By providing an incentive for mariners (sea-time credit) and by ensuring that schools which receive Coast Guard approval are quality training institutions, the Coast Guard hopes to encourage mariners to attend courses and industry to lend its support.

It is in the best interest of mariners and the industry if the provided training is relevant to the current environment. The promise of increased safety and productivity should stimulate industry to apply for Coast Guard approval of its training programs. Industry feedback is the best source of information on the type of training that should be encouraged.

All training relating to operational shipboard activities is encouraged, and Coast Guard approval will be considered for any course that provides quality marine training. (An institution must specifically request approval.) It is not within the Coast Guard's philosophy to include "cram courses" (courses that train students only on how to answer the Coast Guard examination questions) in the approved-course category.

The Coast Guard encourages all quality training institutions with maritime-related courses to apply for Coast Guard approval. To this end, it will assist, where possible, with the development and approval of effective training courses for seafarers proposed by employers, maritime labor organizations, private training facilities, and the Federal and state governments. Coast Guard course approval procedures are set forth in Section 10.30 of Title 46 of the Code of Federal Regulations. In the next issue of the *Proceedings*, we will cover these requirements and application procedures. The Coast Guard hopes its new training philosophy will lead to increased maritime training and, along with it, increased marine safety. ↕

"800 Project" Launched

Last month marked the launching of a nationwide toll-free hotline which will provide America's 12 million boat owners with instant access to up-to-date information on boating courses being offered in their area.

Established and operated by the BOAT/U.S. Foundation for Boating Safety, this toll-free number—(800) 336-BOAT—will connect boaters who have had little or no formal boat handling education or are interested in upgrading their boating skills with hundreds of courses being offered around the country. The "800 Project" will include courses given by the United States Power Squadrons, the United States Coast Guard Auxiliary, and state boating agencies.

After dialing the 800 number, all a caller need do is provide the foundation operator with basic information on the area in which he wishes to take a course. A computer will then match up the caller's needs with the most conveniently located courses.

In addition to providing basic course location information, the 800-Project's computer will supply the caller with a local contact from either the Power Squadron or the Auxiliary.

The BOAT/U.S. Foundation for Boating Safety is a nonprofit, tax-exempt organization which is funded entirely through contributions made by individual boat owners. ↕

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