PROCEEDINGS OF THE
MERCHANT MARINE COUNCIL
UNITED STATES COAST GUARD

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The Merchant Marine Council of the United States Coast Guard

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COUNCIL ACTIVITIES

Public Hearing To Consider Changes In Inspection and Navigation Regulations

The Merchant Marine Council will hold a public hearing on September 20, 1950, commencing at 9:30 a. m., in room 4120, Coast Guard Headquarters, Thirteenth and E Streets NW., Washington 25, D. C., to consider proposed changes in the General Rules and Regulations for the inspection of vessels for all classes of waters, Explosives and Other Dangerous Articles on Board Vessels, Marine Engineering Regulations and Material Specifications, Load Line Regulations, and Tank Vessel Regulations.

The Council will consider all comments of persons having an interest in the revisions summarized below. Copies of the proposed changes in the regulations have been mailed to persons and organizations who had expressed an active interest in the subjects under consideration.

Comments on the proposed regulations are invited and may be submitted in writing for receipt prior to September 19 by the Commandant (MMC), United States Coast Guard Headquarters, Washington 25, D. C., or presented orally or in writing at the hearing. In order to insure thorough consideration and to facilitate checking and recording of comments, it is requested that each suggested rewording of a proposed regulation be submitted on a separate sheet of letter-size paper, showing the section number (if possible) and the specific item number; the proposed change; the reason or basis (if any); and the name, business firm (if any), and the address of submitter.

The proposed agenda will include the following:

ITEM I—Safety of Life on Navigable Waters During Marine Regattas or Marine Parades

It is proposed to rescind the current regulations contained in part 100 of title 33, Code of Federal Regulations, and substitute in lieu thereof new regulations which will define a marine regatta or marine parade as well as

require in certain instances the submission in advance of detailed plans of the proposed marine regatta or marine parade to the Commander of the Coast Guard District in which it is proposed to be held. Under these regulations it will be necessary for the District Commander to advise the sponsoring organization whether or not the marine regatta or marine parade may be held in the location proposed with safety to life on the navigable waters of the United States. The purpose of the revised regulations is to provide a means whereby special regulations may be issued, if necessary, to assure safety of life on the navigable waters immediately prior to, during, and immediately after the marine regatta or marine parade. It will also require that the public be given full and adequate notice of the dates when the marine regatta or marine parade will be held and what navigable waters will be affected.

ITEM II—Vision Requirements for Applicants to Obtain Original Engineer Licenses or Certificates of Service as Qualified Member of Engine Department

It is proposed to amend section 10.02–5 (e) (5) of part 10 (Licensing of Officers and Motorboat Operators and Registration of Staff Officers) in the Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel by deleting the exception granted to applicants with monocular vision. As the exception is very broad and was originally intended to provide a safeguard for an applicant for a license who lost the sight of one eye through accident after obtaining his QMED certificate, it is felt that the present regulation in section 10 02–5 (e) (7), which provides for the granting of exceptions to the vision and other physical requirements in justifiable cases, will take care of most cases arising. In addition, the applicant, if dissatisfied with a ruling of the Officer in Charge, Marine Inspection, may take advantage of the general appeal procedure provided in section 10.02–33. It is also proposed to amend section 12.15–5 (b) of part 12 (Certification of Seamen) by deleting the reference to monocular vision.

ITEM III—Life Preservers for Children on Motorboats or Motor Vessels Carrying Passenegrs for Hire

It is proposed to require that motorboats or motor vessels carrying passengers for hire shall be equipped with an additional number of approved life preservers suitable for children, equal to at least 10 percent of the total number of persons carried. Since motorboats and motor vessels not subject to inspection by the Coast Guard depend solely upon life preservers for protection in case of emergency, it is felt that where small children are carried adequate protection is not afforded where adult life preservers are the only lifesaving equipment required. In order that every motorboat or motor vessel carrying passengers for hire shall be subject to the regulations requiring life preservers suitable for children, it is proposed to amend sections 25.4–1 (a), 26.2–1, and 27.2–1 of the Motorboat Regulations and section 113.45 (a) of the General Rules and Regulations for Vessel Inspection: Rivers.

ITEM IV—Bulk Transportation of Inflammable or Combustible Liquids Having Lethal Characteristics

After the public hearing held May 26, 1949, to consider a complete revision of the Tank Vessel Regulations, the proposed regulations regarding inflammable or combustible liquids having lethal characteristics were referred to an advisory panel of the Merchant Marine Council, composed of prospective shippers and prospective carriers for further study and recommendations. This advisory panel has submitted the proposed regulations for consideration as an interim measure to facilitate the bulk transportation of inflammable or combustible liquids having lethal characteristics and defined as class B or C poison in sections 146.25–3 and 146.25–5 in the Explosives or Other Dangerous Articles on Board Vessels. These regulations have been prepared to specifically facilitate the handling of acetone cyanhydrin. To accomplish this it is proposed to add a new part 39 to the Tank Vessel Regulations and an additional requirement for the warning sign at the gangway when transferring such bulk cargo.

ITEM V—Venting of Cargo Tanks on Tank Vessels Constructed on or After July 1, 1951

As a result of the *Markay* fire on June 22, 1947, the Board recommended that "so-called" closed venting be made a requirement on tank vessels carrying grade A product. The tanker committee of the American Petroleum Institute considered the Board's suggestion and the proposed regulations which will require closed venting on tank ships constructed on or after July 1, 1951. For tank barges constructed on or after July 1, 1951, flame arresters will no longer be permitted in the venting system. It is proposed to add two new sections 32.55–20 and 32.55–25 to the revised Tank Vessel Regulations. In connection with the requirement for closed venting on tank ships which carry grade A liquid product, it is considered necessary to require a method of gaging the level of liquid in the cargo tank without opening ullage holes, cargo hatches, etc. Accordingly, it is proposed to add a new section 32.20–20 regarding "liquid level gaging" on tank ships. In order to assure that the closed venting is in proper condition, it is also proposed to add two requirements to be checked by the senior deck officer on duty when making the inspection prior to transfer of grade A liquid cargo. This will be done by adding two paragraphs to section 35.35–20 (formerly 35.5–5).

ITEM VI—Fire-Extinguishing Systems for Dry Cargo Spaces, Lamp and Paint Rooms, Pump Rooms, Etc., on Tank Ships Constructed on or After July 1, 1951

The American Bureau of Shipping has recently proposed an amendment to this rule which would make a deck operated fixed smothering system mandatory in the case of cargo pump rooms on tank vessels. The Coast Guard concurs in this proposal and, therefore, proposes to add a new section 34.15–40 to the revised Tank Vessel Regulations which will require fire-extinguishing systems for dry cargo spaces, lamp and paint rooms, pump rooms, etc., on tank ships constructed on or after July 1, 1951.

ITEM VII—Revision of Tank Vessel Regulations

After consideration of proposed changes in the Tank Vessel Regulations at public hearings held May 26, 1949, and March 28, 1950, it is proposed to publish a complete revision of the Tank Vessel Regulations and will also include the additional items described in this agenda. This revision of the Tank Vessel Regulations is to be dated July 1, 1951, and the major changes required will apply to tank vessels built or constructed on or after July 1, 1951. It is not possible to furnish copies of the proposed revised Tank Vessel Regulations. However, one copy is available for reading purposes only in room 4104, Coast Guard Headquarters, Washington, D. C. For general information the table of contents showing the old section number and the new section number with headnotes is reprinted in the enclosure. Those sections that have been revised are marked by asterisks. This complete revision will be published as subchapter D—Tank Vessel Regulations in the Code of Federal Regulations, title 46.

ITEM VIII—Solidified Carbon Dioxide (Dry Ice); Use and Transportation of

Due to the occurrence of several accidents resulting in loss of life from the use of carbon dioxide on board vessels, a Navigation and Vessel Inspection Circular No. 2–50, dated 19 April 1950, described the hazards involved and contains recommendations for the carriage of solidified carbon dioxide pending the promulgation of

appropriate regulations. It is, therefore, proposed to add new requirements to sections 146.04–5, 146.07–7, 146.08–6, and 146.27–100 of part 146 of Explosives or Other Dangerous Articles or Substances and Combustible Liquids on Board Vessels.

ITEM IX—Stowage of Inflammable Liquids on Passenger Vessels

In order that the dangerous cargo regulations will agree with the regulations covering the construction or material alteration of passenger vessels in connection with the construction of the overdeck above holds or compartments used for the stowage of inflammable liquids, it is proposed to amend section 146.21–6 (c) by requiring the construction of the overdeck to be in accordance with the requirements in section 144.09 (f) or (g) of the regulations governing the construction or material alteration of passenger vessels.

ITEM X—Sodium Hydrosulfite; Containers for

The Interstate Commerce Commission has adopted changes in the requirements for the containers used in the transportation of sodium hydrosulfite in order to reduce the fire hazard due to spontaneous heating of sodium hydrosulfite when in contact with moisture. In order that Coast Guard regulations will conform with those of the ICC, it is proposed to amend section 146.22–100 to agree with ICC requirements.

ITEM XI—Sodium Sulfide; Packaging and Labeling Requirements

Petitions have been received from a manufacturer and a shipper of sodium sulfide requesting that Coast Guard regulations be revised to agree with the Interstate Commerce Commission regulations covering the transportation of sodium sulfide containing 35 percent or more combined water by weight fused or concentrated but not ground (may be chipped, flaked, or broken) when the material is packed in steel barrels or drums equipped with moisture-tight closures. This amendment is requested in order to eliminate repacking and relabeling of sodium sulfide when transportation by vessel is involved. It is, therefore, proposed to revise the requirements for the labeling and packaging of sodium sulfide to agree with ICC regulations.

ITEM XII—Portable Tank Containers for Certain Corrosive Liquids; ICC Specifications

The Interstate Commerce Commission has established specifications for portable tank containers for certain corrosive liquids. There is no limitation under the ICC requirements for these containers. However, it is felt that these tanks should be limited to a gross weight of not over 8,000 pounds for transportation by water in order that they may be handled by ships' equipment found on board ordinary cargo vessels. In order that Coast Guard regulations will be in agreement with ICC requirements, it is proposed to add to section 146.23–100 of the dangerous cargo regulations requirements for portable tank containers which may be used in the carriage of acetyl chloride; alkaline corrosive battery fluid; alkaline corrosive liquids; N. O. S.; antimony pentachloride; benzoyl chloride; benzyl chloride; caustic potash, liquid; caustic soda, liquid; electrolyte (acid) battery fluid; formic acid; hydrochloric acid; hydrochloric acid mixtures; mixed acid; nitrating acid; phosphorus oxychloride; phosphorus trichloride; pyrosulfuryl chloride; silicon chloride (tetrachloride); sulfur chloride (mono and di); tin tetrachloride, anhydrous; and titanium tetrachloride.

ITEM XIII—Anhydrous Ammonia in Bulk; Safety Relief Valves on Bulk Cargo Tanks

It is proposed to replace the present regulations in section 146.24–16 (i) (1) to (4), inclusive, which require detailed calculations for determining the minimum rates of discharge by

use of Fetterly's Formula and the Standard Orifice Flow Formula by a table establishing required discharge capacities of safety relief valves so that the requirements for safety relief valves on bulk cargo tanks used in the transportation of anhydrous ammonia will be comparable to the requirements for safety relief valves on bulk cargo tanks used in the transportation of liquefied petroleum gas as proposed in the revision to part 38 of the revised Tank Vessel Regulations. The minimum discharge capacity of safety relief valves for various tank sizes will be described in terms of cubic feet per minute of gas. To accomplish this uniformity in requirements it is proposed to amend section 146.24–16 (i) (1) to (i) (4) of the dangerous cargo regulations.

ITEM XIV—Portable Tank Containers for Certain Liquefied Gases; ICC Specifications

The Interstate Commerce Commission has provided specifications for portable tanks which may be used in the carriage of anhydrous ammonia, liquefied carbon dioxide, nitrous oxide, and sulfur dioxide. However, the tanks have been limited to a gross weight of not over 8,000 pounds when used for transportation by water in order that such tanks may be handled by the ships' equipment found on board ordinary cargo vessels. In order to accomplish this, it is proposed to add the ICC specifications under "containers" in section 146.24–100 of the dangerous cargo regulations for anhydrous ammonia, liquefied carbon dioxide, nitrous oxide, and sulfur dioxide.

ITEM XV—Liquefied Petroleum Gas; Transportation of

In order that the Coast Guard regulations for the transportation of liquefied petroleum gas at a pressure not exceeding 250 pounds per square inch at 115° F. will conform to the Interstate Commerce Commission's requirements, it is proposed to insert new requirements for this item and to delete the requirements for liquefied petroleum gas at a pressure not exceeding 200 pounds per square inch at 100° F. in section 146.24–100 of the dangerous cargo regulations.

ITEM XVI—Marine Engineering Regulations and Material Specifications

Several manufacturers and shippers of marine equipment have requested that the marine engineering regulations be revised to agree with the recommendations of the American Society of Mechanical Engineers, the American Standards Association, and the American Bureau of Shipping, as contained in the latest revisions of their codes. To accomplish this as well as other changes desired to bring the regulations up to date with current practices followed by industry, it is proposed to amend the Marine Engineering Regulations and Material Specifications. In order that the threads for all sizes of carbon steel bolting will agree with the A. S. M. E. and A. S. A. Codes, it is proposed to amend section 51.52–60 to require the use of the American standard coarse series threads for all sizes of commercial carbon steel bolting. It is proposed to amend section 52.45–15 (c) so that the requirement will not conflict with section 52.25–10 (g) for determining minimum inner radius of flanged plates in combustion chambers and back connections. In connection with boiler and superheater tubes it is proposed to amend section 52.55–15 (b) by permitting the use of

arc or gas butt welding for the safe ending of boiler or superheater tubes. It is proposed to amend section 52.65–15 (e) (1) by canceling the requirement that the lifting device shall be of such a design that it cannot lock or hold the valve disk in lifted position when the exterior lifting force is released. The current requirement of the A. S. M. E. boiler construction code provides for a hydrostatic test pressure to one and one-half times the maximum allowable pressure for pressure vessels of welded and brazed construction. It is, therefore, proposed to amend section 54.01–40 (a) by reducing the hydrostatic test pressure from two times to one and one-half times the maximum allowable pressure for brazed construction or welded construction. Due to the importance of flexibility in piping design, it is proposed to amend section 55.07–5, regarding design pressures and thickness of pipes by revising paragraph (g) and by placing all these requirements in a new section to be designated 55.07–6. In connection with the valves in class I piping service, it is proposed to amend section 55.07–10 (b) by providing for the use of the breech lock bonnet design as an acceptable alternate to the bolted and pressure seal bonnet type. In order that the bolting requirements will be uniform it is proposed to amend section 55.07–20 by specifying the use of the Coarse Thread Series for commercial carbon steel bolting and by clarifying the requirements for the American standard heavy series nuts for all service use so that the regulations will be in closer agreement with the A. S. M. E. and A. S. A. Codes. It is proposed to cancel paragraphs (a) and (b) of section 55.07–25, regarding the provisions for expansion and contraction in piping systems. In connection with the stresses for piping systems it is proposed to amend section 55.07–30 by eliminating the requirement for assembled preinstallation hydrostatic tests and by reducing the after installation test to not more than one and one-fourth times the maximum allowable pressure. In connection with pumping arrangements and piping systems, it is proposed to clarify the intent of section 55.10–55 regarding the lubricating oil system by requiring low oil pressure trip valves on high speed steam driven machinery such as turbines.

It is proposed to revise the requirements of section 56.05–10, regarding hydrostatic and hammer tests of welding by reducing the top limit on hydrostatic tests to not more than one and one-half times the maximum allowable pressure; omit the hammer or impact test for vessels which have been both stress-relieved and radiographed; and to permit large pressure vessels to be hammer tested when they are empty and not under pressure. These proposed changes are in agreement with the latest A. S. M. E. Boiler Construction Codes. It is proposed to amend section 57.10–15, regarding tests and inspections of boilers and steam piping in service so that the regulations will follow the intent of regulation 8, chapter I, International Conference of Safety of Life at Sea, 1948. It is proposed to amend section 57.15–1, regarding welding repairs to existing boilers and pressure vessels in order to clarify the requirements and to permit some types of repairs presently prohibited. It is proposed to amend section 57.15–25, regarding wrapper sheets by permitting wrapper plates and back heads to be renewed in whole or repaired under certain conditions. In order that uniformity may be obtained in the administration of section 57.10–20 (a), regarding inspection of boiler mountings and attachments, it is proposed to require boiler valves to be removed for examination at least once in every 8 years even though such valves are attached to flanged connections with or without one or more flanged joints intervening between boiler drum and valve.

ITEM XVII—Bulkheads, Subdivisions, and Watertight Integrity of Passenger Vessels

In order to improve the standard of safety for passenger vessels and to eliminate inconsistencies between

the various regulations, it is proposed to amend the Load Line Regulations and the various classes of General Rules and Regulations for Vessel Inspection so that requirements concerning bulkheads, subdivisions, permeability, margin lines, damaged stability, port lights, and openings in watertight bulkheads will be adequately described. It is also proposed to have the regulations consistent with the requirements contained in the Safety of Life at Sea Convention of 1948 insofar as they apply to vessels engaged in foreign trade. It is proposed, therefore, to amend sections 46.30, 46.32, 46.38, and 46.42, of the Load Line Regulations, sections 59.64 and 60.57 of the General Rules and Regulations, Ocean and Coastwise; sections 76.57 and 80.2 of the General Rules and Regulations, Great Lakes; sections 94.56, and 98.2 of the General Rules and Regulations, Bays, Sounds, and Lakes Other Than the Great Lakes; and sections 113.50 and 117.2 of the General Rules and Regulations, Rivers. The proposed amendments will provide a better than one-compartment standard of subdivision for vessels carrying large numbers of passengers. In addition, ferry vessels will have corresponding requirements.

ITEM XVIII—Spray Nozzle Hydrants in Boiler and Machinery Spaces of Ocean and Coastwise Cargo and Passenger Vessels

The requirements for spray nozzle hydrants in the present regulations could be interpreted in two ways. In order to eliminate confusion it is proposed to amend section 61.14 (c) (2) to require spray nozzle hydrants in boiler and machinery spaces on all oceangoing passenger vessels and on all new cargo vessels of more than 1,000 gross tons.

ITEM XIX—Fire-Fighting Equipment on Vessels Using Oil as Fuel

Since several river passenger steamers carry very large numbers of passengers the requirements for fire-fighting equipment in fire rooms on vessels using oil as fuel should be sufficient to take care of any emergency that may arise. It is felt that additional equipment should be furnished in the form of a 40-gallon foam extinguisher or 100 pounds of CO_2 for vessels of more than 750 gross tons as well as an approved carbon dioxide or foam type fixed fire extinguishing system installed in each fire room. It is proposed that the fire-fighting equipment on river vessels using oil as fuel shall be the same as for similar vessels navigating on bays, sounds, and lakes, including the Great Lakes. It is, therefore, proposed to amend section 114.14b of the General Rules and Regulations, Rivers, so that passenger vessels will be fitted with an approved carbon dioxide or foam type system for extinguishing fire in the bilges of each fire room as well as present equipment composed of portable fire extinguishers and sand.

ITEM XX—Lights for Nondescript Vessels on Certain Inland Waters

A request was received concerning the proper lights to be displayed on nondescript vessels, such as pontoons being towed or pushed in the harbors, rivers, or other inland waters of the United States as described in section 80.16 of the Pilot Rules for Certain Inland Waters. At the present time the lights for scows are adequately described, but the lights for other nondescript vessels are not definitely described. It is proposed, therefore, to add a new paragraph (i) to section

80.16 which will require adequate lights for nondescript vessels not otherwise provided for to be the same as for scows.

ITEM XXI—Emergency Squad and Emergency Squad Signals for Passenger Vessels

At the present time the organization of an emergency squad on passenger vessels, where practicable, is left within discretion of the master. In view of the experiences gained from casualties it is felt that the organization of an emergency squad composed of crew members should be mandatory on passenger vessels where it is possible to have one. Accordingly, it is proposed to amend sections 62.18, 78.18, 96.18, and 115.18, regarding station bills, drills, and reports of masters as set forth in the various General Rules and Regulations for Vessel Inspection, to require on passenger vessels when the size of the crew will permit the organization of an emergency squad and permit special emergency squad signals to be used.

ITEM XXII—Care of Lifeboats on Ocean-Going Cargo Vessels

A ship operator has requested that the regulations be revised to permit lifeboats on cargo vessels to be overhauled and painted during the voyage. Under present regulations it is necessary that the annual overhauling and painting of lifeboats be made in port. It is felt that the master should be permitted to perform the lifeboat overhauling and painting required while at sea so long as sufficient lifeboats to accommodate every one on board are still available. Accordingly, it is proposed to amend section 59.10a of the General Rules and Regulations for Vessel Inspection, Ocean and Coastwise, so that overhauling and painting of lifeboats may be done at sea.

ITEM XXIII—Grab Rails for Lifeboats

The present specification for lifeboats for merchant vessels in subpart 160.035 requires that grab rails shall extend approximately two-thirds of the length of the lifeboat on each side. When such lifeboats are stowed under mechanical davits it has become necesary to cut the chocks to such an extent that they are no longer an effective support for the lifeboat. It is felt that the grab rail extending approximately one-half of the length of the lifeboat will comply with the intent of the Safety of Life at Sea Convention of 1948 as well as provide adequate means for use of the grab rails in an emergency. Accordingly, it is proposed to amend section 160.-035-3 (w) (1) of the specification 160.035, Lifeboats for Merchant Vessels, by reducing the required length of grab rails from approximately two-thirds to approximately one-half the length of the lifeboat.

ITEM XXIV—Specifications for Lifeboat Bilge Pumps, Fibrous Glass Life Preservers, and Watertight Sliding Doors

In order to provide for a uniform standard for bilge pumps in lifeboats, it is proposed to add a new specification as subpart 160 044 to subchapter Q—Specifications. This specification covers the oscillating wing-type bilge pump. However, provisions are included for the consideration and approval of other types if they meet the performance and test requirements and are otherwise suitable for use in lifeboats. It is proposed to add a new specification covering the construction of watertight sliding doors as a new subpart 163.001 to subchapter Q—Specifications. This specification will include standards of construction and design found necessary in the manufacture of satisfactory watertight doors and equipment. It is proposed to add a new specification covering life preservers using fibrous glass as a buoyant material as a new subpart 160.005 to subchapter Q—Specifications. This will allow an additional alternate type of life preserver to be used on inspected vessels. Preliminary drafts of these specifications were submitted to certain manufacturers and other interested parties and where possible their comments have been included in the proposed specifications.

FIBER ROPE

How can fiber rope slings be made to last longer?
What are the breaking strengths of various rope sizes?
How can the safe rope size for a tackle be determined?

Reprinted by permission of Stephen Reed, Field Engineer, Plymouth Cordage Co., Plymouth, Mass.

Whenever materials must be handled or lifted, there must be some means of attaching them to a hoisting machine. For low piles, or moving objects from one place to another, modern lift trucks can do the job, but for high lifts, or moving from one unconnected level to another, such as removing material from the hold of a ship, some form of sling or net is required. On rough machines or materials, or for heavy bulk materials which are not easily damaged, metallic slings or containers in some form can be used, but for miscellaneous shapes and sizes or for packages that must be handled with reasonable care, fiber rope is the most satisfactory and safest material to use.

All vegetable rope fibers are composed of a ligno cellulose material and are subject to attack by cellulose digesting micro-organisms. Most of these organisms require favorable conditions of humidity and temperature to thrive. For general purpose use, out of doors, on land, or aboard ship, special treatments are not required as sunlight and the open air humidity is not favorable to the growth of the deteriorating organisms.

For marine work, when the rope is continually under water, or if the rope is stored under warm, damp conditions, specially treated ropes have been developed and should be used.

Construction of a rope has a decided effect on all its properties, especially on tensile strength, the abrasion resisting qualities and handleability. Tensile strength decreases as the hardness increases, while resistance to abrasion is just the reverse. A soft lay rope is the strongest, but it has the least resistance to abrasive wear. Soft ropes handle easily, and therefore distort easily. Greater care must be exercised in their use to prevent damage.

Rope Construction

Ropes are made by combining a number of yarns into a strand, and then three or more of these strands are combined to complete the rope. In the ordinary rope, the strands are twisted to the left, or counter-clockwise, and the rope to the right, or clockwise.

The relation of the twists between the rope and its strands determine what is commonly known as lay. Lay is usually designated as hard, regular or common, medium soft, soft, and extra soft. These terms are all relative and vary somewhat with different manufacturers; but the regular or common lay is the one most used for general purpose work and will be about the same in all brands. This lay has been determined, by long years of use, to be the most satisfactory for the maximum number of uses. This would be the lay obtained commercially unless a special construction were ordered.

Because of its reverse twists, it will be seen that if the rope is untwisted, more twist will be added to the strands, and vice versa. This is a very important consideration, because if

too much turn is removed, or added, to a rope, the proper load distribution on the elements of which it is composed, will be disturbed, and the strength materially affected. Whenever, through use, turn is continually added or deducted from a rope, periodical balancing should be done so that the rope will be maintained as nearly as possible in the condition in which it was originally made. It is the ability to distort easily which makes it possible to coil a rope down.

Rope Slings

As previously stated, rope slings are very important tools in material handling. Slings are of two general types—the single line with an eye splice or thimble in each end, and the endless sling.

The single line with the eye splices in each end or "snorter" can be used by looping it around the load and hanging both ends on the hook, or it can be used by slipping one end through the eye on the opposite end and hoisting by a single part. The first method should never be used with only one sling as there is practically no grip on the load. When used in the second manner on packages of the same size, the wear is always in the same spot, necessitating the discard of the sling when worn in only a very short section even though the ends are continually reversed. Thimbles spliced in the ends materially reduce rope wear.

The double sling can be used as an open loop, by carrying the double sling around the load and putting both loops over the hook, or by slipping one loop through the other, thus making a self-binding sling.

The first two methods should not be used with one sling only. The third method is the most commonly employed and has the advantage over the "snorter" in that the bight does not occur continually in the same spot. When using slings, there are several precautions which must always be followed. Sharp corners must be protected by padding and the angle of the sling to the load should be kept as small as possible. Otherwise, extra tension is put into the rope. Due allowance should be made for the sharp bend over the hook as these all tend to reduce the effective strength of the rope. Figure 1 and table 1 show how rapidly the tension in the rope increases as the angle of the sling over the load increases.

For new rope, a factor of safety of 5 is usually adequate for slings. But because the full tensile strength of the rope is never developed in a sling, its condition should be carefully watched and cuts or deep abrasions either repaired or the sling discarded. It should also be borne in mind that multiplying the number of parts of the sling does not increase the effective strength in proportion. Friction and sharp angles prevent the full utilization of all the parts. No definite percentage can be applied as each load is different, so good judgment and a high factor of safety are necessary to prevent losses.

Wherever possible, ropes should be spliced and not knotted. The short splice will reduce the strength of the rope by only about 5 percent. A well made long splice will retain 90 percent of the strength of the rope, but a knot is only 50 percent efficient. There may be a slight difference in the effectiveness of certain knots, but it is safest to assume that each time a knot is tied, the strength of the rope is cut in half.

Ropes for Tackles

Another very common use for rope is as a fall in a tackle. When used in this manner, the first consideration is to be sure the tackle is properly reeved and it is well to remember that the rope is much stronger than the blocks so that it is the block which limits the load to be lifted.

Tables 2 and 3 show the weight and strength characteristics of common rope sizes and the strength of standard tackle blocks. The proper method of reeving blocks is also illustrated in figure 2.

The mechanical advantage of tackle is determined by the number of multiplications of the fall. Theoretically, the mechanical advantage is indicated by the number of parts to the moving block, but a 10 percent friction factor should be added to the load for each sheave in the assembly. A simple example of figuring the mechanical advantage of any tackle is as follows:

Load to be lifted is 5,000 pounds

Tackle consists of two double blocks—four sheaves, four rope parts at the movable block. Mechanical advantage—four. Friction loss, four sheaves=40 percent. 5,000 pounds+40 percent=7,000 pounds. 7,000 pounds÷4=1,750 pounds. Pull needed on fall—1,750 pounds. Assuming the rope is comparatively new, a safety factor of 5 to 1 is desirable. So 1,750×5=8,750 pounds, the required rope strength. Referring to the rope-size strength table, a 1-inch diameter rope, with a minimum break of 9,000 pounds, is a safe rope size to use.

Table 1.—Safe loads for slings in pounds

Diameter	Safe load for straight pull	Double (2-leg) sling, degree of angle with the horizontal		
		60°	45°	30°
1/2	530	743	612	437
9/16	690	968	797	569
5/8	880	1,234	1,016	726
11/16	980	1,374	1,132	809
3/4	1,080	1,515	1,247	891
13/16	1,300	1,823	1,502	1,073
7/8	1,540	2,160	1,779	1,271
1	1,800	2,525	2,079	1,485
1 1/16	2,100	2,945	2,426	1,733
1 1/8	2,400	3,366	2,772	1,980
1 1/4	2,700	3,787	3,119	2,228
1 5/16	3,000	4,208	3,465	2,475
1 3/8	3,700	5,189	4,274	3,053
1 7/16	4,300	6,311	5,198	3,713
1 1/2	5,200	7,435	6,122	4,373
2	6,200	8,696	7,161	5,115

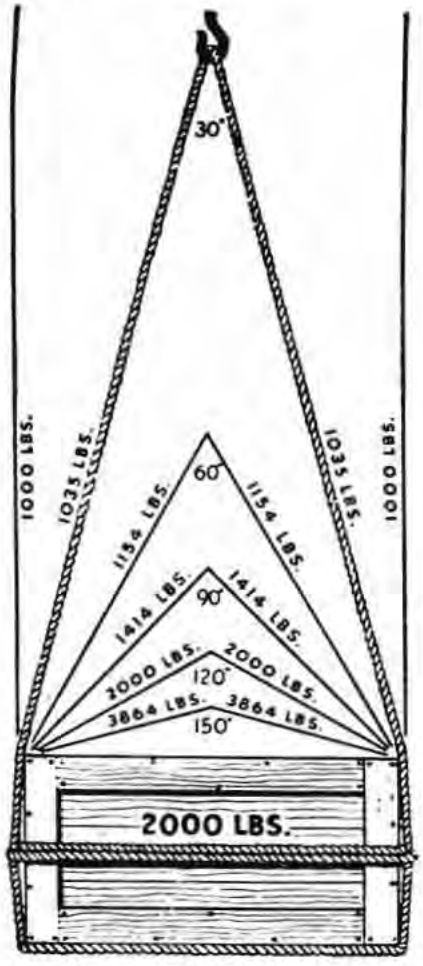


Figure 1. Rope tension increases rapidly as the angle of the sling over the load increases.

Reference to the table on the safe working load for blocks indicates that the 8-inch block regularly used for 1-inch diameter manila rope is not suitable for a 5,000-pound load. A 10-inch shackle block is required, a size regularly built for 1 1/8-inch diameter manila rope.

The safe working load for the blocks should always be checked when tackle is figured, as the rope is usually stronger than the normal sized block.

The choice of the proper factor of safety in tackle depends to a large extent on the experience of the user. With ideal conditions, that is, new high quality rope, proper size blocks, and no shock loading, a factor of safety of five should be used. With old rope, or with unfavorable rope conditions, this factor should be increased.

Care of Rope

While the manufacturer takes every reasonable precaution to safeguard his rope during shipment, carelessness in handling often results in damage. Before starting any important job even with new rope, it should be carefully examined throughout its length for accidental cuts, deep surface abrasions, or acid damage.

Rope is destroyed or deteriorated to an unsafe condition by one or more of the following causes:

External abrasive wear.

Internal wear due to excess bending under load.

Cuts and deep abrasions due to dragging over sharp objects.

Table 2.—Rope sizes, weights, and strengths

Threads	Nominal size circumference (inches)	Diameter (inches)	Weight per 100 feet (net) (pounds)	Length number of feet per pound (feet)	Gross weight approximate for full coil (pounds)	Comparative minimum breaking strengths	
						Federal Specification TR-601a, manila rope (pounds)	Federal Specification TR-631,[1] No. 1, sisal rope (pounds)
6, fine	3/16	3/16	1.40	71.6	50	450	360
6	3/4	1/4	1.92	52.2	50	600	480
9	1	5/16	2.71	36.9	50	1,000	800
12	1 1/8	3/8	3.77	26.5	50	1,350	1,080
15	1 1/4	7/16	5.15	19.4	63	1,750	1,400
18	1 3/8	15/32	6.14	16.3	75	2,250	1,800
21	1 1/2	1/2	7.36	13.6	90	2,650	2,120
24	1 3/4	9/16	10.2	9.8	125	3,450	2,760
27	2	5/8	13.1	7.65	160	4,400	3,520
30	2 1/8	11/16	14.7	6.82	180	4,900	3,920
33	2 1/4	3/4	16.4	6.12	200	5,400	4,320
	2 1/2	13/16	19.1	5.23	234	6,500	5,200
	2 3/4	7/8	22.0	4.54	270	7,700	6,160
	3	1	26.5	3.78	324	9,000	7,200
	3 1/4	1 1/16	30.7	3.26	375	10,500	8,400
	3 1/2	1 1/8	35.2	2.84	432	12,000	9,600
	3 3/4	1 1/4	40.8	2.45	502	13,500	10,800
	4	1 5/16	46.9	2.13	576	15,000	12,000
	4 1/2	1 1/2	58.8	1.70	720	18,500	14,800
	5	1 5/8	73.0	1.37	893	22,500	18,000
	5 1/2	1 3/4	87.7	1.14	1,073	26,500	21,200
	6	2	105.0	.949	1,290	31,000	24,800
	6 1/2	2 1/8	123.0	.816	1,503	36,000	28,800
	7	2 1/4	143.0	.699	1,752	41,000	32,800
	7 1/2	2 1/2	163.0	.612	2,004	46,500	37,200
	8	2 3/8	187.0	.534	2,290	52,000	41,600
	8 1/2	2 7/8	211.0	.474	2,580	58,000	46,400
	9	3	237.0	.422	2,900	64,000	51,200
	9 1/2	3 1/8	264.0	.379	3,225	71,000	56,800
	10	3 1/4	292.0	.342	3,590	77,000	61,800
	11	3 1/2	360.0	.278	4,400	91,000	72,800
	12	4	427.0	.234	5,225	105,000	84,000

Standards: Smaller size of rope are usually ordered by the number of threads, the larger sizes by circumferences. 6-, 9-, and 12-thread ropes are packed in standard 25- and 50-pound coils. All larger sizes are put up in full coils of 200 fathoms—in half coils of 100 fathoms. 1 fathom equals 6 feet.

[1] The figures shown in this column are 80 percent breaking strength of manila rope. Federal Specification TR-631, amendment 2, dated Mar. 15, 1944, permits this minimum breaking strength to be reduced to 75 percent of that of manila.

Table 3.—Suitable working loads for blocks (for manila rope) for regular mortise inside iron strapped blocks

Dimensions (inches)		Suitable working loads					
		With loose side hooks			With shackles		
Length shell (inches)	For diameter rope	Double and single (pounds)	2 doubles (pounds)	2 triples (pounds)	Double and single (pounds)	2 doubles (pounds)	2 triples (pounds)
3	5/8	200	300	400	400	800	1,200
4	1/2	400	550	700	800	1,400	1,800
5	5/8	500	750	1,000	1,100	1,700	2,100
6	3/4	1,000	1,500	2,000	1,600	2,400	3,000
7	7/8	1,500	2,000	2,500	2,000	3,000	3,700
8	1	1,700	2,450	3,200	2,400	3,600	4,400
10	1 1/4	2,600	3,400	4,200	4,000	5,400	6,400
12	1 1/4	3,000	3,750	4,500	5,000	8,000	10,000
		For heavy wide mortise blocks					
6	3/4	1,500	2,000	2,500	1,600	3,000	4,000
7	1	1,700	2,450	3,200	2,000	3,800	4,800
8	1 1/8	2,200	2,900	3,600	2,400	4,700	6,700
10	1 1/4	3,000	3,750	4,500	4,000	7,000	9,000
12	1 1/2	3,600	4,800	6,000	5,000	9,000	12,000
14	1 3/4	4,400	5,700	7,000	6,500	11,000	15,000
16	2	6,000	7,500	9,000	8,000	14,000	18,000

NOTE.—These tables are shown through the courtesy of the Boston & Lockport Block Co. and indicate suitable loads for 1 series of their standard and heavy blocks. These should be used as a guide only in ordering without assuming any responsibility—since the loads will vary between blocks in the manufacturer's line, and between blocks in other manufacturers' lines. Remember, too, that these are suitable working loads for blocks, not rope. Safe working loads for rope are higher than those for blocks.

It is not only the KNOWLEDGE of SAFETY, but also the PRACTICE that counts.

Excess loading—over 75 percent of its breaking strength.

Contact with chemicals.

Bacterial deterioration of the fiber due to improper storage conditions, or the elements.

External abrasion can readily be seen. When the surface threads on small rope are worn about halfway through, the rope should be discarded. With large rope, where there are many inside yarns, the surface, or cover yarns may be severely worn before the strength is dangerously lowered.

Internal wear can be detected by the white powdery residue of the inside fibers. Upon unwinding one yarn from the strand, the worn condition may be detected. Wear of this type is seldom found unless the rope is subject to excessive bending under heavy load. Heavy duty tackles sometimes fail from this cause.

Rope which is dragged over the ground, or is liable to swing against sharp objects should be carefully inspected for surface cuts. Most sudden rope failures may be traced to undiscovered surface cuts. Dragging a rope over the ground may work sand and dirt among the fibers, thus causing severe wear and fiber breakage. Rope with short protruding fibers, especially at the contline, should be viewed with suspicion.

Rope loaded in excess of 75 percent of its breaking strength will be permanently injured. This type of damage may be detected by an examination of the inside threads, which will be wholly or partially broken, depending upon the amount of overload.

Rope which has come in contact with acids or alkali should not be trusted. In most cases, acid turns the fiber a brownish color and the fiber of the contaminated section is weak and brittle. Alkali usually turns the rope yellowish in color. Its action is slower, but it is equally destructive. Animal excretions will destroy cordage. Any unusual discoloration should be regarded with suspicion.

Wet rope should never be stored in a confined space. Proper conditions of humidity and temperature foster the growth of a very destructive bacteria causing the well-known "dry rot." Rope so damaged will have a musty ordor, the fiber will become brownish in color, and its lustre and strength will be destroyed.

Rope exposed to atmospheric conditions will deteriorate about 30 percent in 2 years, due to weathering alone. The loss in strength due to wear must be added to this figure. In general, it is safe to say that rope in continual use will wear out before it is harmed by atmospheric exposure.

Rope continually in the water must be specially treated to resist the attack of the various marine organisms. In some sections these microorganisms are so active that untreated rope will be completely destroyed in 6 months. There is little difference in the rate of deterioration in fresh or sea water.

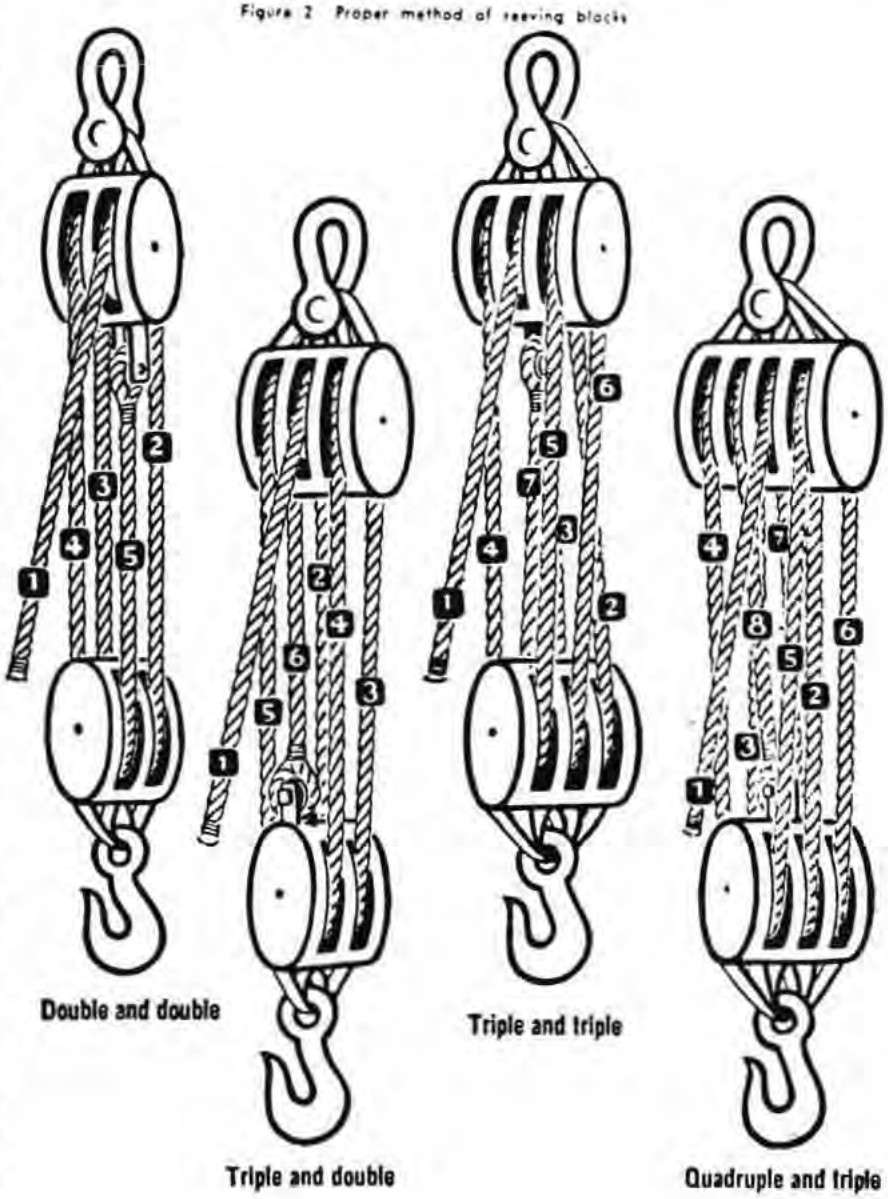
The proper time to discard a rope is very largely a matter of experience. As surface wear increases, the factor of safety should be increased until good judgment says it is no longer safe. Acid damaged ropes should never be trusted.

When ropes are accidentally cut or damaged, they can be spliced with little loss of strength. A well made splice will retain about 90 percent of the rope strength. When increase in size is not objectionable, a short splice will give up to 95 percent efficiency. Most slings are made with a short splice.

Drawings and charts by courtesy of the Plymouth Cordage Co.

In April 1827, the Curacao having departed Antwerp en route to Paramaribo, Dutch Guiana, became the first vessel to cross the Atlantic completely powered by steam.

Figure 2 Proper method of reeving blocks



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WIRE ROPE

How to determine the strength of a sling.
What difference does the core of the rope make?
When should wire rope slings be discarded?

By H. M. Wilson, engineer, Wire Rope Sling Department, American Chain & Cable Co., Inc., Wilkes-Barre, Pa.

Each day industry, as a whole, is becoming more conscious that safety pays. Not only is this true with respect to protection against injury to personnel, but protection to equipment and product as well.

Material handling is acknowledged to be a definite and important part of production. Losses from unsafe or inefficient material handling can easily turn a profit into a loss.

Where material is handled with overhead cranes, slings must be regarded as production tools. Not only safety, but in a measure the efficiency of the production procedure depends upon their proper selection, correct use, and accurate inspection.

Because of the widespread established use of wire rope slings, an understanding of the characteristics of wire rope as a sling material is a necessity to both the safety engineer and the plant superintendent. Only through such an understanding can a sound program of sling safety be obtained.

It is generally recognized that accurate tools are necessary for accurate work. This is true whether you consider the production of machined parts or the setting up of a safety program on wire rope slings.

The value of the most accurate evaluation of plant operating conditions for use in determining the required safety factor is much reduced unless that factor is to be based upon a definitely known sling strength.

Strength of Slings

The high strength of wire rope and its general adaptability to sling use have been proved by industry for years. However, from a safety standpoint it is necessary that in making the sling nothing is done which will unbalance the rope structure and lower its strength.

Unfortunately many of the methods commonly used in sling manufacture involve the complete disarrangement of the wire rope body. Such methods always result in a loss of strength and, since the amount of such loss is subject to serious variation, it is practically impossible to make an accurate determination of the actual strength developed by the sling.

It would seem therefore, that as the starting point for a sling program on wire rope sling there must be a specification of the strength to be developed. The most logical and workable specification would be that the finished sling should develop the full catalog strength of the wire rope from which it is made.

While accurate knowledge of original sling strength is a sound beginning for the safety program, it is also necessary to have assurance that: 1. This strength will be retained under use for a sufficient period to be practical. 2. And that any deterioration in strength will be accompanied by surface indications which can be used to accurately determine the amount of strength lost.

These characteristics are obtained through the specification of the wire rope to be used in the sling. The work done in making a sling is the same regardless of the grade of wire rope employed. Therefore, economy alone would appear to dictate the selection of the strongest rope—improved plow steel. Moreover, since this grade of rope has the greatest resistance to cutting and abrasion, safety also dictates its selection.

What Ropes Are the Most Serviceable?

This necessary resistance to cutting and abrasion can also be increased by considering the individual wire size of the particular rope selected. A rope of 6 by 19 construction will be found to possess the highest strength, greatest resistance to abrasion, and yet have the flexibility desirable for sling use. This is particularly true for ropes up to and including 1 inch in diameter.

For slings larger than 1 inch, the 6 by 19 construction is still indicated where maximum strength and resistance to abrasion are necessary. However, for normal plant use it has been found desirable to change to 6 by 37 for the larger slings, and in these sizes the outer wires are large enough to give adequate resistance to cutting or abrasion.

Through years of experience wire rope users have found that where the wire rope is subjected to crushing or extremely severe operating conditions, one with a steel core gives much more dependable results as well as longer life. This fact has been proved by wire rope manufacturers as well, and is in accordance with their recommendations for selecting wire rope.

This superiority of the steel core over a fiber core is even more pronounced for sling use than for running ropes. The uniform support of the steel core continues under use and there is no such strand displacement as results from the crushing of a fiber core. This continued support protects against a gradual and hidden strength loss resulting from an unbalancing of strand tension and greatly reduces the tendency of the sling to become cranky in use.

After an extended series of tests it has been found that unless a sling made from wire rope with a steel core is actually broken during a lift no subsequent loss in strength results from even a serious overload. Therefore, safe reliance can be made on surface indications in determining the remaining strength of a sling made from this rope.

Sling Retirement

Once slings are secured of known original strength and made from wire rope with the steel core necessary to permit reliance on external indication of strength deterioration, the setting of a safe sling retirement program is not difficult.

It would not be practical to attempt to set a safety factor which would be adequate for all conditions. A factor high enough to take care of the most extreme applications would obviously be excessive for all normal lifts. Practical experience indicates that a 5 to 1 safety factor is adequate for general plant use so long as this is based on a definite sling strength and extends to all parts of the sling including all hooks, links, or other attachments.

It is not recommended that sling deterioration be allowed beyond a loss in strength equal to one safety factor as computed from surface indication. In other words, if the sling is bought with an original factor of safety of five it should be discarded when reduction in strength gives a remaining safety factor of four. If purchased at a 6 to 1 factor it should be discarded when reduced to 5.

Easily applied charts are available for determining the strength loss without any complicated computations. Merely measuring a certain length of the sling and counting the number of broken or cut wires will automatically indicate whether the sling is to be discarded or retained in service.

It must be remembered that this method of determination of the point for discarding a sling is recommended only for slings of definite original strength and made from rope con-

structions given previously in this article.

That it is a highly practical system of sling control, however, has been proved not only by extensive laboratory test, but by records of plants which have used it for a number of years.

SLING CHAINS

What is the effect of impact on chains?
Why are drop forged hooks preferable?
What is an adjustable leg sling?

Published by permission of N. J. Gebert, engineer, American Chain Division, American Chain & Cable Co., Inc., York, Pa.

A sling chain is just as important a piece of material handling equipment as cranes, conveyors, etc., but far too frequently it is accepted as just a piece of chain without sufficient thought being given as to whether it is suitable for the service it is to perform.

The question might justly be asked, "What piece of equipment assumes more responsibility than a sling chain?" particularly when thinking in terms of the unusual flexibility this product offers as well as the heavy and costly loads they carry.

There is no all-purpose chain. Each type has a definite place in industry and there is a grade for practically every conceivable use. Chains are available made from single and double refined wrought iron, carbon steel chain heat treated to 85,000 p. s. i. with Brinell hardness of 180; alloy steel chain heat treated to 125,000 p. s. i. with Brinell hardness of 250; stainless steel, monel metal, and silicon bronze.

The chain made from wrought iron is, of course, welded by the hand forge method whereas steel chain is electrically welded, as to date these heat treatable steels have not been successfully forge welded.

These heat treatable steels have a very narrow temperature range for good and dependable welds, but accurate temperature controls, operating with more than human accuracy on electric welders, have brought these chains into prominence. Manufacturers' catalogues typical of the industry are available, in which will be found chains fabricated of these various materials, and particularly designed to meet almost any ordinary plant conditions.

Do not study only the tensile characteristics of chains, for in trying to obtain one desired feature sometimes other features are lost. We all know that basically hardness resists wear, but watch the impact. Justification of increased cost to obtain certain features can easily be made because of longer life and the greater factor of safety.

Impact conditions caused by faulty hitches, bumpy crane tracks, slipping hook-ups, etc., must be given serious consideration. One must at times sacrifice extra strength to get resistance to impact. Where conditions are standard and well known, a type of chain can be selected from the high or highest tensile series, which will show marked economy in operation with due respect to safety—but where various and adverse conditions of service are met and cannot be corrected, tensile strength and weight can economically be sacrificed for better impact resistance in the softer and more ductile products.

Impact

When considering the harder, more wear-resisting steel chains, we strongly recommend not reducing the chain size. To illustrate what is meant by not reducing the size of the chain when contemplating the conversion from iron to one of these harder steels, we refer you to table I where 1,000 pounds was dropped on a 36-inch piece of chain from a height of 1 foot:

Table I.—**Number of 1,000-pound drops of 1 foot before failure, chain size ½ inch**

Wrought iron	12
Heat-treated carbon steel (85,000 p.s.i.)	51
Heat-treated alloy steel (125,000 p.s.i.)	30

When the load dropped is varied according to the working load limit the picture changes completely as per table II.

As the impact is increased by increasing the height of the drop, the resistance to the shock of the harder materials decreases. It is better not to reduce sizes so that the resistance to impact approaches table I and not table II.

The added load put on the legs of chains by decreasing the angle with the horizontal is well known and need not be repeated here. However, in considering multiple leg slings, three-legged and over, the load will probably never divide evenly. An allowance must be made for this. We have, therefore, found a very good rule to use is: On a three-legged chain, figure the load as though you only had 2½ legs, and for a four-legged chain, figure the load as though you only had three legs.

Design of the Link

Some mention should be made of the danger connected with the careless hookups. Always remember that chains are at their best when used in tension. Loads that cause bending of the links are to be avoided, especially when side welded chains are used. Sling chains welded on the end of the link provide a perfect hinge for the weld and give an additional safety feature, in that no bending in the weld is possible. Short links tend to reduce this hazard but cannot entirely remove it, and actual tests show the marked advantage of the end weld construction when chains are used over sharp corners or protruding objects.

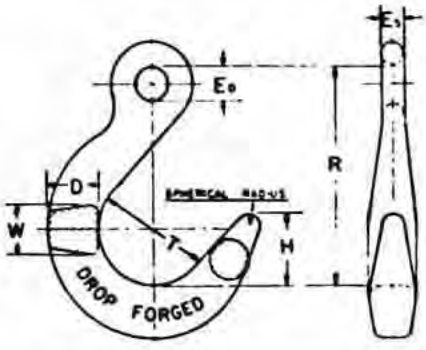
Special Hooks

There are always lifts requiring special hooks where the standard sling or grab hooks will not operate satisfactorily. This is particularly prevalent in foundries where hooks must fit the trunnions on the flasks, and where used for transporting castings. Some of these castings can be lifted satisfactorily only by inserting the point of the hook in a hole in the casting. The point of the standard sling hook is not shaped for this

TABLE II

Chain size ½ inch	Load dropped (pounds)	Number of drops before failure, height of drop in inches		
		3-inch	6-inch	12-inch
Wrought iron	1,380	60 to 65	18 to 20	8 to 10
Heat-treated carbon steel (85,000 p. s. i.)	2,663	140 to 150	24 to 28	10 to 14
Heat-treated alloy steel (125,000 p. s. i.)	4,180	85 to 90	10 to 15	3 to 5

FOUNDRY HOOKS



Size of chain	R	T	E_a	E_o	D	W	H	Spherical radius
½	6⅞	3½	1	¾	1⅛	1½	2¼	⅜
⅝	8 3/16	4	1¼	⅞	1⅜	1¾	2⅝	7/16
¾	9¼	4½	1½	1	2⅛	2	3	½
⅞	10⅜	5	1¾	1⅛	2⅜	2¼	3⅜	9/16
1	11 9/16	5½	2	1¼	2¾	2½	3¾	⅝
1⅛ and 1¼	12⅜	6	2⅜	1⅜	3¼	3	4¼	¾

Figure 2.—Drop forged foundry hooks have points of a definite diameter.

type of loading. Until recently these special hooks were made by hand by a blacksmith and of course dimensions were not accurate, to say nothing of the high cost as compared to a drop forged hook.

To solve this problem a series of hooks were designed and dies made for their manufacture by the drop design wherein throat openings are large enough to fit over the trunnion of the flasks and the point is forged to a definite diameter shown on the drawing as "spherical radius" for fitting into holes in castings when necessary. These hooks are constructed so that when loaded in the bowl they are as strong as the chain and when point loaded they are good for 50 percent of the working load limit of the chain.

Adjustable Leg Slings

There are quite a few objects which are not in balance when lifted or which must be transported at a definite angle. A new adjuster has just come on the market, permitting the length of the legs of the sling to be changed or adjusted with complete safety. Figure 1 shows this adjuster in use. The steel casting fastened to the pear-shaped link is grooved to fit the chain exactly the same as a pocket wheel on a chain hoist holds the chain with no slippage. In use, the chain is hooked on the object and the lift started. If the load is unbalanced and not lifting straight, it is immediately put down and the chain moved over to lengthen one leg and shorten the other. No tools are required and chain can be shifted easily and a safe hitch made.

(Continued on page 129)

NUMBERED AND UNDOCUMENTED VESSELS

The table below gives the cumulative total of undocumented vessels numbered under the provisions of the act of June 7, 1918, as amended (46 U. S. C. 288), in each Coast Guard district by customs ports for the quarter ending 30 June 1950. Generally speaking, undocumented vessels are those machinery-propelled vessels of less than five net tons engaged in trade which by reason of tonnage are exempt from documentation. They are also those motorboats and motor vessels of five net tons and over used exclusively for pleasure purposes which are not documented as yachts or those of less than five net tons which by reason of tonnage, are not entitled to be so documented.

Coast Guard District	Customs Port		Total
1 (Boston)	(4) Boston	15,875	
	(1) Portland, Maine	11,200	
	(2) St. Albans	2,852	
	(5) Providence	4,377	
			34,304
2 (St. Louis)	(45) St. Louis	16,966	
	(12) Pittsburgh	2,400	
	(34) Pembina	83	
	(35) Minneapolis	6,459	
	(40) Indianapolis	4,244	
	(42) Louisville	4,072	
	(43) Memphis (part)	7,903	
	(44) Vacant (Des Moines)	76	
	(46) Omaha (part)	498	
	(47) Denver	2	
			42,703
3 (New York)	(10) New York	48,250	
	(6) Bridgeport	8,693	
	(11) Philadelphia	20,957	
			77,900
5 (Norfolk)	(14) Norfolk	16,156	
	(13) Baltimore	22,870	
	(15) Wilmington, N. C	8,511	
			47,537
7 (Miami)	(18) Tampa (part)	22,657	
	(16) Charleston	1,908	
	(17) Savannah	3,393	
	(49) San Juan	436	
	(51) St. Thomas	83	
			28,477
8 (New Orleans)	(20) New Orleans	19,844	
	(18) Tampa (part)	809	
	(19) Mobile	8,161	
	(21) Port Arthur	3,996	
	(22) Galveston	10,552	
	(23) Laredo	2,050	
	(24) El Paso	6	
	(43) Memphis (part)	76	
			45,494
9 (Cleveland)	(41) Cleveland	14,147	
	(7) Ogdensburg	6,553	
	(8) Rochester	8,677	
	(9) Buffalo	8,207	
	(36) Duluth	4,165	
	(37) Milwaukee	12,493	
	(38) Detroit	28,882	
	(39) Chicago	8,283	
			91,407
11 (Long Beach)	(27) Los Angeles	8,728	
	(25) San Diego	1,737	
	(26) Nogales	97	
			10,562
12 (San Francisco)	(28) San Francisco	20,423	20,430
13 (Seattle)	(30) Seattle	32,643	
	(29) Portland, Oreg	9,702	
	(33) Great Falls	1,043	
	(46) Omaha (part)		
			43,388
14 (Honolulu)	(32) Honolulu	3,417	3,417
17 (Juneau)	(31) Juneau	6,708	6,708
Grand total			452,327

Chain Inspections

Regular inspection of sling chains by competent inspectors is of vital importance and should be followed methodically at intervals. The frequency of inspections will vary with the character of service to which chains are subjected.

This inspection should follow a definite pattern; a suggestion for which is outlined in detail in the 1943 Metals Handbook issued by the American Society for Metals. Many plants, having followed this general procedure, have established enviable records of safety as well as having effected worth-while economies in operating costs.

If defects are revealed by inspection, chains should be tagged or marked in such a manner as to indicate that they are in need of repair or replacement. This practice, if allowed, will serve to prevent the use of faulty chains. When repairs are necessary, return chains to their maker so that they may be properly reconditioned with the same facilities as were used when originally made.

Don't take chances with slings—it doesn't pay.

Pictures by courtesy of the American Chain & Cable Co., Inc.
(Reprinted from Safety Engineering)

LESSONS FROM CASUALTIES

STARTING UP A COLD BOILER

The chief engineer of an American steam vessel read the article "Fire in Air Heater of Boiler" in the February 1950 issue of the Proceedings and forwarded some comments thereon to the Coast Guard.

The Coast Guard felt that the situation referred to in the article and that described in the correspondent's letter were somewhat different as the article referred to a boiler which had been in operation for some time and was temporarily shut down while the letter referred to the starting up of a cold boiler.

The letter, however, contained such a clear description of some of the difficulties met with in starting up a cold plant that permission was requested to publish it in a forthcoming number of the Proceedings. This permission was granted and the letter with certain minor editorial changes follows:

"A very interesting article, "Fire in Air Heater of Boiler," appeared in the February 1950 issue of the Proceedings of the Merchant Marine Council.

"The conclusions drawn were excellent, but the primary cause of air heater fires was not included nor any remedy for it submitted. First, let me quote from the article:

> "It was concluded that the fire was caused by the ignition of an accumulation of soot deposits on the fire side of the air heater tubes, and that these soot deposits were probably saturated with unburned particles of fuel oil * * * that poor cleaning is the basic cause for this accident. Had the tubes been clean no fire would have taken place. * * * The cure for this type of accident is very simple—no soot—no air heater fires."

"My conclusion which I shall endeavour to prove is that air heater fires are caused primarily by excess air when lighting off. Boilers may be clean when lit off and yet burn out the air heater, which was quite frequently witnessed in one shipyard which eventually resorted to the use of Diesel No. 2 fuel in lighting off, and eliminated air heater fires. Now, let us examine the effect of excess air, and why the use of Diesel oil should minimize the chances of fire in the air heater.

"Bunker C fuel oil must have certain conditions present before it will burn properly and completely, and one of them is the radiant heat from the brickwork of the furnace. When lighting off, the brickwork is cold and so is the air supply; the result is poor combustion. Although the fuel temperature may be correct at the supply header, by the time it emerges from the sprayer plate it has considerably cooled due to the low rate of flow through the burner tubing and the burner barrel which is cooled by the cold air supply. The cold air striking the atomized oil cools it further, and the result is that some of the oil burns improperly, forming soot which with some unburned oil is carried by the air to the water tubes and the air heater tubes. Now, the greater the air supply, the more cooling of the burner barrel, and the fuel oil as it emerges from the sprayer plate, and the higher in the boiler will the unburned particles of soot and oil or their mixture be carried.

"The efficiency of combustion and the temperature of the furnace increases hand in hand as also does the velocity of the air and gases through the boiler due to their higher temperature. The soot and oil mixture which is deposited on the lower tubes is finally ignited due to its temperature being raised by the hot gases of combustion and some burning particles of soot or oil being carried upward by the excess air. This fire proceeds up through the boiler and into the air heater which cannot withstand the high temperature as do the water-filled water tubes, and finally burns out.

"Every engineer knows that excess air is inefficient, and yet, why does the fireman or whoever is in charge of lighting off become the victim of it? Due to the combination of cool oil and no radiant heat when lighting off, it is nearly impossible to have a clear stack. The one in charge of the operation takes a look at the smoke indicator and finds it blacked out, increases the air again and again, without realizing that it is excessive, for even excess air will black out the smoke indicator. The result: a burned-out air heater.

"In the case of Diesel oil for lighting off, excess air is seldom encountered. The reason for this lies in the fact that this fuel needs no preheating and depends less on radiant heat for proper combustion. The result is a clearer stack on lighting off which in turn prompts the operator to reduce the air supply.

"In conclusion I'd like to state that to keep air-heater fires at a minimum, keep the air heater clean, the fuel oil temperature 20° higher than that required for atomization when steaming, the air supply at a minimum and judge that not from the smoke indicator, but from a look-see at the stack from the topside. Beware of WHITE SMOKE."

The Coast Guard very much appreciates receiving this letter as it indicates that its articles under the general hearing, "Lessons from Casualties," are read and carefully thought over by at least some seafaring men. Letters of this nature containing comments on the articles in the "Proceedings" whether favorable or critical are welcomed by the Coast Guard. It should be noted that the foregoing letter sets forth the opinions of the writer in regard to lighting off cold boilers and does not necessarily represent the views of the Coast Guard in that connection.

WHAT PRICE HUMAN LIFE?

On May 30, 1950, during midafternoon on a clear day and slightly choppy on Lake Champlain approximately 1,000 feet from shore near Burlington, Vt., a 22-foot utility motorboat, traveling at about 24 miles per hour, collided with and ran over a 14-foot aluminum rowboat that was

anchored. Three men were fishing from the rowboat just prior to the collision.

The operator of the motorboat was traveling toward a specific destination ashore, but was bending over occupying himself with clearing the tangled end of the anchor line, one hand on the boat's steering wheel but with his head below the cowling of the cockpit; the boat proceeding at about 24 miles per hour.

The three men in the anchored rowboat saw the motorboat approaching directly toward them. The two men sitting on the forward and the center thwarts stood up and one commenced waving his arms to attract the attention of the speeding boat. When they saw that a collision was inevitable they dove over the side into the water. The third man remained seated on the stern thwart.

The motorboat struck the rowboat on its port side and ran completely over it. The propeller crossed in the area where the man in the stern thwart was sitting. The rowboat was overturned and the man remaining in the boat was fatally injured. One leg was severed and the other leg badly cut.

The operator of the motorboat circled and stopped to pick up the three men in the water who were clinging to the overturned rowboat still floating. They were rushed ashore where the injured man was taken to the hospital by a waiting ambulance. He died as a result of the injuries received in the collision a short time after arriving at the hospital.

The direct cause of the death of this man, an innocent victim, was apparently extreme negligence in the handling and operation of a motorboat. Further action against the operator will be taken by the United States Department of Justice.

This gruesome casualty is being given wide publicity in boating centers, yacht clubs, marinas, and by means of the United States Coast Guard Auxiliary, through the medium of club papers or publications, local newspapers in the boating columns, and through service publications, with the fervent hope that operators of all boats will realize their responsibility for the safety of others.

In addition to the mental anguish involved, the cost of negligent operation of a motorboat is high. Our readers will recall a young girl who lost both of her legs as the result of an operator deliberately navigating his motorboat in shallow water in her immediate vicinity. Because of his willful negligence, the operator was sentenced to serve 6 months in a Federal prison and to pay a fine of $1,500; the seriously injured girl was awarded $160,000 in damages.

DEATH RIDES THE TILLER

In the early morning hours at the height of the yachting season on a lake in the State of Washington, two pleasure craft, one a cruiser, and the other a sailing sloop, collided, with the loss of one life and the sinking of the sloop. The sloop was hit on the starboard side just about midships, and sank in less than 30 seconds.

At the time of the collision, approximately 2 a. m., there was a southerly breeze, estimated to be 15 to 20 miles per hour. The waters of the lake were choppy, moon and stars obscured, and the visibility estimated to be about 4 miles. The cruiser was on a southeasterly course, proceeding at

an estimated speed of 4 knots, while the sloop was running free (under sail). Prior to the collision a window, which was located alongside the wheel to port in the cabin of the cruiser, had been closed due to the spray then being taken aboard. According to the operator of the cruiser, he struck what he thought was a floating log, later ascertained to be the sloop. He immediately stopped the engines to investigate the damage, when two persons from the sloop climbed aboard the cruiser's bow; stating that a third member of the sloop was missing. When last seen this member had been standing up in the sloop at the stern tending the tiller. All members on board the cruiser had been drinking and were under the influence of intoxicating liquor. None of them deemed themselves drunk, however drunkometer tests administered by the police gave readings well within the range of drunkenness.

It was later determined from witnesses that the side lights of the sloop had been turned on when the vessel set sail from the dock for the pleasure cruise on the lake. There was no way, however, to determine whether the sloop's side lights were operating at the time of the collision. Testimony indicates that a light was burning in the cabin of the sloop which had three 4-inch port holes on each side. However, at the time of the collision the sloop was making an abrupt turn to port; having seen the lights of the motorboat bearing down on her. There were no other vessels within the immediate vicinity.

By dragging operations, the sloop was located and later raised to the surface. Examination revealed that the side lights were mounted about 8 feet aft of the mast on the sides of an 8-inch trunk-type cabin. Had these lights been displayed, there is a strong possibility that the starboard side light would have been obscured to the oncoming cruiser by the position of the sail. This in view of the fact that the light was mounted some 8 feet abaft of the mast and only 3 inches off the deck on the 8-inch trunk-type cabin. It is most likely that a light mounted in such a position would not show an unbroken light over an arc of the horizon of 10 points of the compass while sails were being used.

The facts indicate that liquor, good judgment, and compliance with the ordinary practices of good seamanship do not mix. The operator of the cruiser failed to be alert and to keep a proper lookout while underway in inland waters, which contributed materially to this tragedy. The owner of the sailing sloop flagrantly violated the requirements of the pilot rules in fitting and carrying starboard side lights, at the time of the casualty, in such a way as to be obscured or totally blanked out by the sail to an oncoming vessel.

It is essential that owners of small craft be impressed with the need to observe the pilot rules, which are based on good seamanship and safety for all. Lessons to be learned from this tragedy emphasize again the need to recognize the rights of others. Had the side lights on the sailing sloop been constructed to proper specifications so as to have been visible to the oncoming cruiser, and had the operator of the cruiser been keeping an alert and proper lookout, this needless loss of life and property would never have occurred.

DIESEL ENGINE CASUALTY

A casualty to a Diesel engine which presents some features of interest has recently come to the Coast Guard's attention. The engine in question was a five-cylinder Diesel job.

The cylinders, as is usual, were bolted to the upper half of the crankcase. The method of securing was to insert ¾-inch bolts from the underside of the upper half of the crankcase through the bases of the cylinders. Nuts secured by cotter pins were then screwed to the upper end of these bolts. A few days previous to the casualty in question it was discovered that one of these holding-down bolts had become loosened and was only being held in place by two threads. The cotter pin, of course, was missing. At the time of this discovery the nut was tightened up and the missing cotter pin replaced. At this time the other holding-down bolts were hammer-tested and found tight.

Subsequent to the overhaul discussed in the previous paragraph, the vessel was proceeding in a light condition at sea when a distinct thud was felt. The engine was slowed down and an examination made. No apparent damage was noted and full speed was resumed. Shortly thereafter the thrust block showed signs of heat so the engine was again slowed down and a thorough examination of the engine made. At this time it was discovered that the holding-down bolt described above was missing. The upper crankcase in way of No. 4 cylinder was found cracked and examination of the thrust block showed all holding-down bolts sheared off.

On return to port, the engine was dismantled and it was found that the holding-down bolt between Nos. 3 and 4 cylinders had snapped off just below the nut. The bolt had thereupon dropped into the crankcase where contact with the lower end of the No. 4 connecting rod had caused the damage noted above as well as a wiped crank-pin bearing and bent connecting rod. The investigating officer concluded that the casualty could be attributed to one or more of three possibilities:

(a) The holding-down bolt had cracked when the nut was tightened up in the overhaul described in paragraph 2.

(b) Tightening of the nut had placed the strain of the working of the engine on this particular bolt since the other bolts were not tightened up at this time.

(c) Material fatigue.

The investigating officer recommended that on all engines where for any cause a bolt could drop into the crankcase in the manner described, a support should be placed directly underneath the bolt to prevent such an occurrence. He suggested that this could be done by forming a piece of flat iron or similar material so that it could be secured to the opposite sides of the engine frame.

Welding such a piece of flat iron underneath the holding-down bolts is perfectly possible, of course, and if carefully done would undoubtedly prevent the bolt from dropping into the crankcase in the event of an accident such as happened to this vessel. It has the disadvantage, however, that the bolt could not be removed from the engine without removing the support in question. Whether such supports were installed would, of course, depend on the judgment of the chief engineer.

It is thought that this holding-down bolt had perhaps been stressed beyond the safe point by severe tightening up. There is a tendency among many mechanics to test a nut for tightness by applying a wrench and hammering the wrench or applying a pipe handle for the purpose of exerting extra pressure on the nut. In time this pressure will stress a bolt or stud beyond the safe limit and when any sudden shock occurs, the bolt snaps. It is thought that the foregoing may be the explanation of many fractured bolts, among them certain mysterious losses of propeller blades from built-up propellers. The above method of testing nuts for tightness sometimes called "hardening up" is considered to be poor practice, particularly, when extra heavy hammering or extra length wrench handles are used. It is suggested in the case of engines such as that to which the instant casualty occurred, a moderate degree of force applied to a regular length wrench with a lock washer and cotter key properly inserted would insure that bolts would be properly tightened up without stressing them beyond safe limits.

In this connection it is interesting to note that manufacturers of certain Diesel engines require that the so-called torque wrench be used when their engines are being overhauled. The torque wrench is a tool in which a graduated dial, located in the handle, indicates the pressure being exerted on the nut. The engine manufacturer furnishes a chart giving the correct amount to which each bolt or stud should be stressed, and by means of the torque wrench this correct stress is applied.

"Just one more fish," may result in one "poor fish."

AUTOMATIC STEERING CAN MEAN CARELESS NAVIGATION

Two fishing boats recently involved in a collision again point out the fact that "careless navigation can be quite costly and perhaps tragic." The conditions are extremely different in operating a boat from those of operating an automobile. It is not so simple as getting out of the boat and simply walking away.

Two small fishing vessels which we shall call *A* and *B* were trawling northwest of Destruction Island off the coast of Washington on a recent sunny afternoon. In boat *A* the operator was in the pilothouse keeping lookout. In boat *B* both men of the two-man crew were busily engaged in fishing and icing down and no one was in the pilothouse. Both boats *A* and *B* were proceeding at a moderate rate with automatic steering gear in use. During the fishing operations the operator of boat *A* saw boat *B* coming dangerously close and immediately reversed his engine. This action came too late. Boat *B* did not change its course or attempt to stop and the boats collided. Boat *B* was badly damaged and sank. However, before sinking the two fishermen on the boat were removed without injury.

The automatic steering gear will operate a boat in a determined course, but it does not have eyes to see any obstructions or ability to decide for itself to alter course. While there is generally no objection to the use of automatic navigational equipment, this casualty definitely illustrates that complete reliance cannot and should not be placed upon such equipment to the exclusion of personal attention. Had one of the men of boat *B* been in the pilothouse and maintaining a lookout, there is no doubt this casualty would have been averted and the operators of both boats would not have suffered such a severe financial loss.

The numerous casualties that occur because proper lookouts are not maintained and corrective action taken when required dramatically emphasize the necessity for prudent navigation. Who knows but what "a look in time may save your life."

Amendments to Regulations

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of the Treasury

Part 19—Waivers of Navigation and Vessel Inspection Laws and Regulations

MISCELLANEOUS AMENDMENTS

CROSS REFERENCE: For cancellation of §§ 19.01, 19.05, 19.11, 19.15, 19.21, 19.25, 19.31, 19.33, 19.35, and 19.37, and amendment of § 19.29, see F. R. Doc. 50-5957, Title 46, Chapter I, Part 154, *infra*.

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

Subchapter O—Regulations Applicable to Certain Vessels During Emergency

[CGFR 50-19]

PART 154—WAIVERS OF NAVIGATION AND VESSEL INSPECTION LAWS AND REGULATIONS [1]

MISCELLANEOUS AMENDMENTS

The purpose of the following changes in waiver orders is to reinstate and continue in effect certain waiver orders, including regulations and instructions relating thereto, pertaining to laws and regulations relating to navigation and vessel inspection administered by the Coast Guard and considered necessary in the orderly reconversion of the merchant marine from a wartime to a normal peacetime basis and to cancel those waiver orders no longer considered necessary. These waiver orders are also published as 33 CFR Part 19 and the changes made in 46 CFR Part 154 by this document shall likewise be made in 33 CFR Part 19. Because of the technical character of this continuation of waiver orders, and because of the urgency of providing waiver authority in order to effectuate the orderly reconversion of the merchant marine to peacetime operations, it is found that compliance with the notice of proposed rule making, public rule making procedure thereon, and effective date requirements of the Administrative Procedure Act is impracticable and contrary to the public interest.

By virtue of the authority vested in me as Commandant, United States Coast Guard, by act of March 31, 1947, as last amended by Public Law 591, 81st Congress, 2d Session (61 Stat. 33; 46 U. S. C. Sup. note preceding section 1), the general waiver orders are reinstated with the following amendments prescribed and shall become effective on and after July 1, 1950:

1. Section 154.01 *Description of seaman's wages in shipping articles* is canceled.

2. Section 154.05 *Permitting compliance with routing instructions and orders* is canceled.

3. Section 154.11 *Permitting masters of Great Lakes vessels to approve allotments of seamen* is canceled.

4. Section 154.15 *Cargo vessels equipped with certificates issued by British Ministry of War Transport* is canceled.

5. Section 154.21 *Crew list required* is canceled.

6. Section 154.25 *Certificates and continuous discharge books in shipping of seamen on vessels on the Great Lakes* is canceled.

7. Section 154.29 is amended to read as follows:

§ 154.29 *Continuation in effect of certain waivers, regulations, and instructions effective July 1, 1950.* Pursuant to the authority vested in the Commandant, U. S. Coast Guard, by the act of March 31, 1947, as amended (61 Stat. 33; 46 U. S. C., Sup. note preceding section 1), I hereby find that the reinstatement and continuation of all currently effective waiver orders, including regulations and instructions relating thereto, and affecting laws and regulations relating to navigation and vessel inspection administered by the Coast Guard, are presently necessary in the orderly reconversion of the merchant marine from a wartime to a normal peacetime basis. Accordingly, all such orders, regulations, and instructions are hereby ratified, affirmed and continued in force until modified, superseded, rescinded, or January 15, 1951, whichever first occurs. The waiver order dated June 30, 1949, and published in the FEDERAL REGISTER on July 7, 1949 (14 F. R. 3748), bearing the same section number and title as this order is hereby rescinded.

8. Section 154.31 *Conditional waiver of manning requirements* is canceled.

9. Section 154.33 *Able seamen employed on Great Lakes merchant cargo and tank vessels* is canceled.

10. Section 154.35 *Qualified members of engine department on Great Lakes merchant cargo and tank vessels* is canceled.

11. Section 154.37 *Employment of aliens as unlicensed crew members on subsidized vessels* is canceled.

12. The waiver order dated April 12, 1948, published in the Federal Register dated April 17, 1948 (13 F. R. 2070), identified as CGFR 48-18, and entitled "Able Seamen Employed on Merchant Cargo and Tank Vessels Other Than Great Lakes Vessels" is canceled. (This waiver order was inadvertently omitted from the 1949 edition of the Code of Federal Regulations.)

(61 Stat. 33, 685, Pub. Law 591, 81st Cong.; 46 U. S. C. Sup., note preceding 1)

Conditions regarding cancellation of waiver orders. The cancellation of certain general waiver orders by this document shall not impair the continuing effectiveness of any individual waivers issued under 46 CFR 154.27. No penalty shall be imposed upon a master of a vessel or against the vessel that departed or cleared on

[1] This is also codified in 33 CFR Part 19.

or before June 30, 1950, under any of the terms of the waiver orders canceled by this document upon the vessel's first arrival in a United States port after June 30, 1950. In connection with general waiver orders relating to manning requirements, no penalty of law shall be imposed because of failure to comply with any provision of law or regulation, the waiver of which was made with respect to vessels that engage their crews on or before June 30, 1950, pursuant to such waivers and such relaxations may remain in effect until the termination of the voyage or the period for which the crew was engaged.

Dated: July 5, 1950.

[SEAL] A. C. RICHMOND,
Rear Admiral, U. S. Coast Guard,
Acting Commandant.

[F. R. Doc. 50-5957; Filed, July 10, 1950; 8:49 a. m.; 15 F. R. 4373-7/11/50]

Equipment Approved by the Commandant

APPROVAL OF EQUIPMENT

[CGFR-50-21]

By virtue of the authority vested in me as Commandant, United States Coast Guard, by R. S. 4405 and 4491, as amended, 46 U. S. C. 375, 489, and section 101 of Reorganization Plan No. 3 of 1946 (11 F. R. 7875, 60 Stat. 1097, 46 U. S. C. 1), as well as the additional authorities cited with specific items below, the following approvals of equipment are prescribed and shall be effective for a period of five years from date of publication in the Federal Register unless sooner canceled or suspended by proper authority:

BUOYANT CUSHIONS, NON-STANDARD

NOTE: Cushions are for use on motorboats of classes A, 1, or 2 not carrying passengers for hire.

Approval No. 160.008/436/0, 16" x 18½" x 3" rectangular buoyant cushion, 46 oz. kapok, Dwg. dated May 19, 1950, manufactured by William E. Dunwoody, Box 667, Manasquan, N. J.

Approval No. 160.008/437/0, 14" x 20" x 2" rectangular buoyant cushion, 25 oz. kapok, Dwg. No. LP-2, dated May 26, 1950, manufactured by The Safegard Corp., P. O. Box 66, Station B, Cincinnati 22, Ohio.

(54 Stat. 164, 166; 46 U. S. C. 526e, 526p; 46 CFR 25.4-1, 160.008)

LIGHTS (WATER), SELF-IGNITING (CALCIUM CARBIDE-CALCIUM PHOSPHIDE TYPE)

Approval No. 160.012/1/1, RES-Q-LITE, self-igniting water light (calcium carbide-calcium phosphide type), Dwg. No. A33 dated September 11, 1947, sheets 1 and 2, manufactured by Coston Supply Co., Inc., 31 Water Street, New York 4, N. Y. (Supersedes Approval No. 160.012/1/0, published in the Federal Register July 31, 1947.)

Approval No. 160.012/3/1, SAVE-U-LITE, self-igniting water light (calcium carbide-calcium phosphide type), Assembly Dwg. No. 1, dated November 9, 1949, revised February 15, 1950, manufactured by Automatic Lite Co., 900 North Iris Avenue, Baltimore 5, Md. (Supersedes Approval No. 160.012/3/0, published in the Federal Register July 31, 1947.)

(R. S. 4417a, 4426, 4488, 49 Stat. 1544, 54 Stat. 346 and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 404, 481, 1333, 50 U. S. C. 1275; 46 CFR 33.3-6, 33.3-8, 33.7-1, 33.9-1, 59.52, 59.54b, 59.56, 60.45, 60.47b, 60.49, 76.48, 76.48a, 76.48b, 76.53, 94.53, 113.46)

PACK A LIGHT

LADDERS, EMBARKATION-DEBARKATION (FLEXIBLE)

Approval No. 160.017/4/1, Type 241-A embarkation-debarkation ladder, chain suspension, steel ears, Dwg. No. 241-A, dated February 21, 1950, revised June 7, 1950, manufactured by Great Bend Manufacturing Corp., 151 East Fiftieth Street, New York 22, N. Y. (Supersedes Approval No. 160.017/4/0 published in the Federal Register dated July 31, 1947.)

Approval No. 160.017/5/1, Type 241-B embarkation-debarkation ladder, chain suspension, aluminum ears, Dwg. No. 241-B, dated February 21, 1950, revised June 7, 1950, manufactured by Great Bend Manufacturing Corp., 151 East Fiftieth Street, New York 22, N. Y. (Supersedes Approval No. 160.017/5/0 published in the Federal Register dated July 31, 1947.)

(R. S. 4426, 4488, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 404, 481, 1333, 50 U. S. C. 1275; 46 CFR 59.63, 76.56a, 94.55a, 113.47a)

DAVITS, LIFEBOAT

Approval No. 160.032/92/1, mechanical davit, type 22-31, straight boom, sheath screw, approved for maximum working load of 8,800 pounds per set (4,400 pounds per arm), using not less than 2 part falls. Identified by arrangement Dwg. No. DB-101, Alt. D, dated March 28, 1947, and revised May 19, 1950, manufactured by Marine Safety Equipment Corp., Point Pleasant, N. J. (Supersedes Approval No. 160.032/92/0, published in the Federal Register dated December 2, 1948.)

(R. S. 4417a, 4426, 4481, 4488, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 391a, 404, 474, 481, 1333, 50 U. S. C. 1275; 46 CFR 37.1-4, 59.3, 60.21, 76.15, 94.14, 113.23)

LIFEBOATS

Approval No. 160.035/243/0, 36.5' x 12.5' x 5.33' aluminum motor propelled lifeboat with radio cabin, 142 person capacity, identified by Construction and Arrangement Dwg. No. 36-8, dated Dec. 2, 1948, and revised June 8, 1950, manufactured by Marine Safety Equipment Corp., Point Pleasant, N. J.

Approval No. 160.035/265/0, 24' x 8' x 3.58' aluminum, oar-propelled lifeboat, 40 person capacity, identified by construction and arrangement Dwg. No. 3328, dated Jan. 25, 1950, submitted by Welin Davit & Boat Division of Continental Copper & Steel Industries, Inc., Perth Amboy, N. J.

(R. S. 4417a, 4426, 4481, 4488, 4492, 35 Stat. 428, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 391a, 396, 404, 474, 481, 490, 1333, 50 U. S. C. 1275; 46 CFR 37.1-1, 59.13, 76.16, 94.15, 113.10)

GAS CONSUMING APPLIANCES, LIQUEFIED PETROLEUM

Approval No. 162.020/27/0, Bastian-Morley gas burning hot water heater, Crane-line Champion, Size 20, approved by the American Gas Association, Inc., under Certificate No. 3-537-1.001, for liquefied petroleum gas service, manufactured by Bastian-Morley Co., Inc., La Porte, Ind.

(R. S. 4417a, 4426, 49 Stat. 1544, 54 Stat. 1028, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 391a, 404, 463a, 1333, 50 U. S. C. 1275; 46 CFR 32.9-11, 61.25, 95.24, 114.25)

FIRE INDICATING AND ALARM SYSTEMS

Detect-a-Fire, Type 20, Fire Alarm Thermostat, having temperature ratings of 140° F., 160° F. and 225° F. for use with approved closed-circuit type fire indicating and alarm systems. Approved as affording protection of an area where no point on the overhead is more than 17.5 feet from the thermostat except that, where

beams or girders of over 12 inches in depth are employed, the overhead on each side of the beam or girder shall be considered as separate areas for the purpose of this spacing limitation. Identified by Dwg. No. 20–17120, revision 3, dated June 5, 1950, manufactured by Fenwal, Inc., Ashland, Mass.

Detect-a-Fire, Type 21, Fire Alarm Thermostat, having temperature ratings of 140° F., 160° F. and 225° F. for use with approved open-circuit type fire indicating and alarm systems. Approved as affording protection of an area where no point on the overhead is more than 17.5 feet from the thermostat except that, where beams or girders of over 12 inches in depth are employed, the overhead on each side of the beam or girder shall be considered as separate areas for the purpose of this spacing limitation. Identified by Dwg. No. 21–17121, Rev. 3, dated June 5, 1950, manufactured by Fenwal, Inc., Ashland, Mass.

C–O–TWO Audible-Visual Smoke Detector, Type AVSC–2; Drawing No. A–65117, 24-line maximum cabinet; Drawing No. A–65118, 38-line maximum cabinet; Drawing No. B–60791—Cabinet Dimensions; Drawing No. B–60451–1, Arrangement of Observation Windows, 24-line maximum cabinet; Drawing No. B–60452–1, Arrangement of Observation Windows, 38-line maximum cabinet; Drawing No. A–65067, Arrangement of Blower Box; Drawing No. C–61159–1, System Wiring Diagram; manufactured by C–O–Two Fire Equipment Co., Box 390, Newark 1, N. J.

FIRE PATROL SYSTEM, SUPERVISED

Simplex Watchman's Clock, Stations, and Keys, manufactured by Simplex Time Recorder Co., Gardner, Mass.

(R. S. 4417a, 4426, 4479, 4492, 49 Stat. 1544, 54 Stat. 165, 166, 346, 1028, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 391a, 463a, 472, 490, 526g, 526p, 1333, 50 U. S. C. 1275)

CHANGE IN NAME AND ADDRESS

The name and address of "Publix Distributors, Inc., 99–103 Portland Street, Boston, Mass." has been changed to, "Finn Bros., Inc., 51 Chardon Street, Boston, Mass."; for Approval No. 160.007/88/0 published in the Federal Register of January 12, 1950.

Dated: July 19, 1950.

[SEAL] A. C. RICHMOND,
Rear Admiral, U. S. Coast Guard, Acting Commandant.

[F. R. Doc. 50–6511; Filed, July 24, 1950; 8:50 a. m., 15 F. R. 4751—7/25/50]

ARTICLES OF SHIPS' STORES AND SUPPLIES

Articles of Ships' Stores and Supplies certificated from May 26, 1950, to July 25, 1950, inclusive, for use on board vessels in accordance with the provisions of part 147 of the regulations governing explosives or other dangerous articles on board vessels, are as follows:

The Enequist Chemical Co., Inc., 103 Park Avenue, New York 17, N. Y., Certificate No. 311, dated June 2, 1950. "Ultrex #725."

Oil Specialties and Refining Co., Inc., 18 Bridge Street, Brooklyn 1, N. Y., Certificate No. 312, dated July 12, 1950. "Army and Navy metal polish."

Capitol Chemical Co., 3255 Prospect Avenue NW., Washington 7, D. C., Certificate No. 313, dated June 21, 1950. "Itso (Insect killer extra strength)."

Oil Specialties & Refining Co., Inc., 18 Bridge Street, Brooklyn 1, N. Y., Certificate No. 314, dated June 22, 1950. "Grady's Scouree Paste."

New Process Chemical Co., Inc., 725 Second Street, San Francisco 7, Calif., Certificate No. 315, dated July 18, 1950. "Proco-Met."

FUSIBLE PLUGS

The Marine Engineering Regulations and Material Specifications require that manufacturers submit samples from each heat of fusible plugs to the Commandant for test prior to plugs manufactured from the heat being used on vessels subject to inspection by the Coast Guard. A list of approved heats which have been tested and found acceptable during the period from June 15 to July 15, 1950, is as follows:

The Lunkenheimer Co., P. O. Box 360 Annex Station, Cincinnati 14, Ohio. Heat No. 360.

H. B. Sherman Manufacturing Co., 22 Barney Street, Battle Creek, Mich. Heats Nos. 702, 703 and 704.

AFFIDAVITS

The following affidavit was accepted from June 15 to July 15, 1950:

Todd Shipyards Corp., Seattle Division, Harbor Island, Seattle 4, Wash. Bolts, forgings, flanges, and castings.

Merchant Marine Personnel Statistics

INVESTIGATING UNITS

Coast Guard Merchant Marine Investigating Units and Merchant Marine Details investigated a total of 521 cases during the month of June 1950. From this number, hearings resulted involving 8 officers and 41 unlicensed men. In the case of officers, no licenses were revoked, 3 were suspended, 3 were suspended with probation granted, none were voluntarily surrendered, 1 case was dismissed after hearing and no hearings were closed with an admonition. Of the unlicensed personnel, 3 certificates were revoked, 12 were suspended, 15 were suspended with probation granted, 6 were voluntarily surrendered, 1 was closed with an admonition and 5 were dismissed after hearing.

WAIVERS OF MANNING REQUIREMENTS FROM JUNE 1 TO JUNE 30, 1950

Region	Number of vessels	Deck officers substituted for higher ratings	Engineer officers substituted for higher ratings	Able seamen substituted for deck officers	Ordinary seamen substituted for able seamen	Qualified members of engine department substituted for engineer officers	Wipers or coal passers substituted for qualified members of engine department	Wipers, coal passers or cadets substituted for engineer officers	Ordinary seamen or cadets substituted for deck officers	Total
Atlantic coast										
Gulf coast										
Pacific coast										
Great Lakes										
Total										

NOTE.—In addition, no individual waivers were granted to permit the employment of able seamen holding certificates for "any water—12 months" in excess of the 50 percent authorized by general waiver.

MERCHANT MARINE LICENSES ISSUED DURING JUNE 1950

DECK OFFICERS

		Region								Total	
		Atlantic coast		Gulf coast		Great Lakes and rivers		Pacific coast			
		O	R	O	R	O	R	O	R	O	R
Master	Ocean	14	74	7	21	0	1	7	36	28	132
	Coastwise	7	16	1	2	0	1	1	3	9	22
	Great Lakes	0	0	0	0	1	5	0	0	1	5
	B. S. & L.	9	47	0	1	0	1	4	7	13	56
	Rivers	1	7	1	5	2	8	0	1	4	21
Chief mate	Ocean	14	40	8	17	0	3	9	24	31	84
	Coastwise	0	0	0	0	0	0	1	1	1	1
Second mate	Ocean	10	37	4	20	0	9	8	29	22	95
	Coastwise	0	1	0	0	0	0	0	0	0	1
Third mate	Ocean	140	41	2	18	0	5	4	19	146	83
	Coastwise	0	0	0	0	0	0	0	0	0	0
	Great Lakes	0	0	0	0	0	0	0	0	0	0
Mate	B. S. & L.	3	3	0	1	0	0	1	4	4	8
	Rivers	0	0	0	1	6	4	0	0	6	5
Pilots	B. S. L. & R.	85	92	23	22	21	31	21	38	150	183
Master	Uninspected vessels	0	0	0	0	0	0	1	10	1	10
Mate	Uninspected vessels	0	1	0	0	0	0	0	0	0	1
Total		283	359	46	108	30	68	57	172	416	707
Grand total		642		154		98		229		1,123	

ENGINEER OFFICERS

Steam	Chief engineer:										
	Unlimited	14	120	5	36	0	8	5	66	24	230
	Limited	6	59	0	3	2	29	0	5	8	96
	First assistant engineer:										
	Unlimited	11	36	8	18	1	8	8	24	28	86
	Limited	0	2	1	2	0	9	0	0	1	13
	Second assistant engineer:										
	Unlimited	7	80	5	23	1	11	11	33	24	147
	Limited	0	2	0	0	3	1	0	0	3	3
	Third assistant engineer:										
	Unlimited	167	92	3	14	0	18	6	39	176	163
	Limited	0	1	0	0	0	0	0	0	0	1
Motor	Chief engineer:										
	Unlimited	2	22	2	5	2	10	2	18	8	55
	Limited	8	29	2	11	3	0	3	7	16	47
	First assistant engineer:										
	Unlimited	1	2	0	1	1	0	0	1	2	4
	Limited	3	1	0	0	0	0	2	1	5	2
	Second assistant engineer:										
	Unlimited	2	2	1	3	0	1	2	3	5	9
	Limited	1	0	0	0	0	0	0	0	1	0
	Third assistant engineer:										
	Unlimited	161	91	0	16	0	25	2	38	163	170
	Limited	0	0	0	0	0	0	0	0	0	0
Uninspected vessels	Chief engineer	0	2	0	0	0	0	7	2	7	4
	Assistant engineer	0	0	0	0	0	0	9	0	9	0
Total		383	541	27	132	13	120	57	237	480	1,030
Grand total		924		159		133		294		1,510	

RADIO OFFICERS

Total	31

ORIGINAL SEAMEN'S DOCUMENTS ISSUED MONTH OF JUNE 1950

Region	(1) Staff officer	(2) Continuous discharge book	(3) U. S. merchant mariner's documents	(4) AB any waters unlimited	(5) AB any waters 12 months	(6) AB Great Lakes 18 months	(7) AB tugs and towboats any waters	(8) AB bays and sounds [1]	(9) AB sea-going barges	(10) Lifeboatman	(11) Q. M. E. D.	(12) Radio operators	(13) Certificate of service	(14) Tankerman
Atlantic coast	26	2	669	134	40	----	1	----	----	238	172	5	488	24
Gulf coast	4	2	93	43	6	1	----	----	6	25	31	----	88	18
Pacific coast	16	----	216	47	10	1	----	----	----	43	36	1	185	2
Great Lakes and rivers	7	2	760	16	57	44	----	----	----	45	72	----	737	20
Total	53	6	1,738	240	113	46	1	0	6	351	311	6	1,498	64

[1] 12 months, vessels 500 gross tons or under not carrying passengers.

NOTE.—Columns 4 through 14 indicate endorsements made on U. S. merchant mariner's documents.

A BOAT CAN BE AN INSTRUMENTALITY—

FOR FUN IF
WISELY OPERATED

FOR DEATH IF
CARELESSLY OPERATED

BE CAREFUL BEFORE YOU MAKE YOUR CHOICE!

U. S. GOVERNMENT PRINTING OFFICE: 1950