

SUPERSEDES (BLUE BOOK) INCLUDES
ALL REGULATIONS AND AMENDMENTS.

**Safety
and
Health Regulations
for**

LONGSHORING



June 1966

**U.S. Department of Labor
W. Willard Wirtz, Secretary**

RECEIVED

**Bureau of Labor Standards
Nelson M. Bortz, Director**

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Amendments to these
regulations published in the
Federal Register through
May 21, 1966 are included
in this pamphlet.

Title 29—LABOR

Chapter XIII—Bureau of Labor Standards, Department of Labor

PART 1504—SAFETY AND HEALTH REGULATIONS FOR LONGSHORING

On June 11, 1965, a proposal to amend the safety and health regulations for longshoring under section 41 of the Longshoremen's and Harbor Workers' Compensation Act (33 U.S.C. 941) was published in the *FEDERAL REGISTER* (30 F.R. 7608). Interested persons were provided opportunities to submit data, views, and argument both orally and in writing in regard to the proposals. After consideration of all relevant matter presented, I have decided to and do hereby revise 29 CFR Part 1504 effective June 20, 1966, to read as set forth below.

Signed at Washington, D.C., this 17th day of May 1966.

W. WILLARD WIRTZ,
Secretary.

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AUTHORITY: The provisions of this Part 1504 and Appendix I, issued under R.S. 161, 44 Stat. 1444, as amended, 72 Stat. 835; 5 U.S.C. 22, 33 U.S.C. 941.

Subpart A—General Provisions

§ 1504.1 Purpose and authority.

(a) The Longshoremen's and Harbor Workers' Compensation Act (44 Stat. 1424; 33 U.S.C. 901 et seq.) provides compensation for injuries suffered by employees when they are working for private employers within the Federal maritime jurisdiction on the navigable waters of the United States, including dry docks. Public Law 85-742, 72 Stat. 835, approved August 23, 1958, which amends section 41 of the Longshoremen's and Harbor Workers' Compensation Act, as amended (44 Stat. 1444; 33 U.S.C. 941) requires, among other things, that every employer of the aforementioned employees "shall install, furnish, maintain, and use such devices and safeguards with particular reference to equipment used by and working conditions established by such employers as the Secretary may determine by regulation or order to be reasonably necessary to protect the life, health, and safety of such employees, and to render safe such employment and places of employment, and to prevent injury to his employees." It is the purpose of the regulations of this part to carry out the intent of Public Law 85-742.

(b) Pursuant to Public Law 85-742 the regulations of this part do not make determinations with respect to matters under the control of the United States Coast Guard within the scope of Title 52 of the Revised Statutes and Acts supplementary or amendatory thereto (46 U.S.C. 1-1388, *passim*), including, but

not restricted to, the master, ship's officers, crew members, design, construction, and maintenance of the vessel, its gear and equipment; to matters within the regulatory authority of the United States Coast Guard to safeguard vessels, harbors, ports, and waterfront facilities under the provisions of the Espionage Act of June 15, 1917, as amended (40 Stat. 220; 50 U.S.C. 191 et seq.; 22 U.S.C. 401 et seq.) or to matters within the regulatory authority of the United States Coast Guard with respect to lights, warning devices, safety equipment and other matters relating to the promotion of safety of lives and property under section 4(e) of the Outer Continental Shelf Lands Act of August 7, 1953 (67 Stat. 462; 43 U.S.C. 1333).

§ 1504.2 Scope and responsibility.

(a) The responsibility for compliance with the regulations of this part is placed upon "employers" as defined in § 1504.3 (c) of this part.

(b) It is not the intent of the regulations of this part to place additional responsibilities or duties on owners, operators, agents or masters of vessels unless such persons are acting as employers, nor is it the intent of these regulations to relieve such owners, operators, agents or masters of vessels from responsibilities or duties now placed upon them by law, regulation or custom.

§ 1504.3 Definitions.

(a) The term "shall" indicates provisions which are mandatory.

(b) The term "Secretary" means the Secretary of Labor.

(c) The term "employer" means an employer any of whose employees are employed, in whole or in part, in longshoring operations or related employments, as defined herein within the Federal maritime jurisdiction on the navigable waters of the United States.

(d) The term "employee" means any longshoreman, or other person engaged in longshoring operations or related employments, within the Federal maritime jurisdiction on the navigable waters of the United States, other than the master, ship's officers, crew of the vessel, or any person engaged by the master to load or unload any vessel under 18 net tons.

(e) The term "vessel" includes every description of watercraft or other artificial contrivance used or capable of being used as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

(f) The term "public vessel" means a vessel owned and operated by a government and not regularly employed in merchant service.

(g) For the purposes of §§ 1504.11, 1504.23, 1504.35, 1504.37, 1504.43(f)(2), and 1504.106, the term "barge" means an unpowered, flat bottom, shallow draft vessel including river barges, scows, car-floats, and lighters. For the purposes of these sections the term does not include ship shaped or deep draft barges.

(h) For purposes of §§ 1504.11 and 1504.23, the term "river towboat" means a shallow draft, low freeboard, self propelled vessel designed to tow river barges by pushing ahead. For purposes of these sections the term does not include other towing vessels.

(i) The term "longshoring operations" means the loading, unloading, moving, or handling of cargo, ship's stores, gear, etc., into, in, on, or out of any vessel on the navigable waters of the United States.

(j) The term "related employments" means any employments performed as an incident to or in conjunction with longshoring operations including, but not restricted to, securing cargo, rigging, and employment as a porter, checker, or watchman.

(k) The term "gangway" means any ramp-like or stair-like means of access provided to enable personnel to board or leave a vessel, including accommodation ladders, gangplanks and brows.

(l) The term "bullying" means the horizontal dragging of cargo across a surface with none of the weight of the cargo supported by the fall.

(m) For the purpose of § 1504.12 the term "ship's cargo handling gear" includes that gear which is a permanent part of the vessel's equipment and which is used for the handling of cargo other than bulk liquids, but does not include gear which is used only for handling or holding hoses, handling ship's stores or handling the gangway, or boom conveyor

belt systems for the self-unloading of bulk cargo vessels.

(n) For purposes of the regulations in this part the terms "beam" or "strong-back" mean a portable transverse or longitudinal beam which is placed across a hatchway and acts as a bearer to support the hatch covers.

(o) For the purposes of §§ 1504.23(b) (2) and 1504.106(b) the term "Mississippi River System" includes the Mississippi River from the head of navigation to its mouth, and navigable tributaries including the Illinois Waterway, Missouri River, Ohio River, Tennessee River, Allegheny River, Cumberland River, Green River, Kanawha River, Monongahela River, and such others to which barge operations extend.

(p) For the purpose of § 1504.106(b) the term "Gulf Intracoastal Waterway" means the system of that name extending from St. Marks, Florida to Brownsville and Harlingen, Texas, and including the Pearl River, Tombigbee River, Apalachicola River, Flint River, and such other navigable tributaries to which barge operations extend.

(q) The term "small trimming hatch" means a small hatch or opening, pierced in the tween deck or other intermediate deck of a vessel and intended for the trimming of dry bulk cargoes. It does not refer to the large hatchways through which cargo is normally handled.

§ 1504.4 Penalty.

As provided in Public Law 85-742, any employer who, willfully, violates or fails or refuses to comply with the provisions of the regulations of this part, and any employer or other person who willfully interferes with, hinders, or delays the Secretary or his authorized representative in carrying out his duties under subsection (c) of section 41 of the Act by refusing to admit the Secretary or his authorized representative to any place, or to permit the inspection or examination of any employment or place of employment, or who willfully hinders or delays the Secretary or his authorized representative in the performance of his duties in the enforcement of the regulations of this part, shall be guilty of an offense, and, upon conviction thereof, shall be punished for each offense by a fine of not less than \$100 nor more than

\$3,000; and in any case where such employer is a corporation, the officer who willfully permits any such violation to occur shall be guilty of an offense, and, upon conviction thereof, shall be punished also for each offense by a fine of not less than \$100 nor more than \$3,000. The liability under this provision of Public Law 85-742 shall not affect any other liability of the employer under the Longshoremen's and Harbor Workers' Compensation Act.

§ 1504.5 Variation from the regulations of this part.

As provided in Public Law 85-742, in case of practical difficulties or unnecessary hardships, the Secretary in his discretion may grant variations from the regulations of this part or particular provisions thereof, and permit the use of other or different devices if he finds that the purpose of the regulation will be observed by the variation and the safety of employees will be equally secured thereby. Any person affected by such regulations or his agent, may request the Secretary to grant such variation, stating in writing the grounds on which his request is based. Any authorization by the Secretary of a variation shall be in writing, shall describe the conditions under which the variation shall be permitted, and shall be published as provided in section 3 of the Administrative Procedure Act (ch. 324, 60 Stat. 237), as amended. A properly indexed record of all variations shall be kept in the Office of the Secretary and be open to public inspection.

§ 1504.6 Reference specifications, standards, and codes.

Specifications, standards, and codes of agencies of the United States Government, to the extent specified in the text, form a part of the regulations of this part. In addition, under the authority vested in the Secretary under the Act, the specifications, standards, and codes of organizations which are not agencies of the United States Government, in effect on the date of the promulgation of the regulations of this part, as listed below, to the extent specified in the text, form a part of these regulations:

Convention Concerning the Protection Against Accidents to Workers Loading or Unloading Ships, International Labor Orga-

nization, Convention No. 32 (Revised, 1932). Subpart B, § 1504.12(a).

Underwriters' Laboratories, Incorporated, 207 East Ohio Street, Chicago, Illinois. Subpart G, § 1504.69(d) and Subpart I, § 1504.92(b) (3).

American Standard Safety Code for Head, Eye, and Respiratory Protection, Z2.1-1959. American Standards Association, Incorporated, 70 East 45th Street, New York 17, N.Y. Subpart J, §§ 1504.101(a), 1504.105(a).

§ 1504.7 Notification of accidents resulting in fatalities or serious injuries.

Within 48 hours after the occurrence of an accident causing the death of an employee or resulting in an employee's admission to a hospital as a bed patient, the employer shall file a copy of Bureau of Employees' Compensation Form US-202 (approved by Budget Bureau No. 44-R 887.2) with the Field Safety Consultant of the Bureau of Labor Standards serving the area where the accident occurred (in addition to such filing as is required by 20 CFR 31.3) unless prior thereto and as soon after the accident as feasible the employer has given oral or written notice of the accident to the person in charge of such office in sufficient detail to permit the accident to be identified readily.

§ 1504.8 Amendment of this part.

The Secretary may at any time upon his own motion or upon written petition of any interested person setting forth reasonable grounds therefor, and after opportunity has been given to interested persons to present their views, amend or revoke any of the provisions of this part.

Subpart B—Gangways and Gear Certification

§ 1504.11 Gangways.¹

The employer shall not permit employees to board or leave any vessel, except a barge or river towboat, until the following requirements have been met:

(a) Whenever practicable, a gangway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a substantial straight ladder, extending at least 36 inches above the upper landing surface, and adequately secured against shifting or slipping shall be pro-

¹ See also § 1504.21.

vided. When conditions are such that neither a gangway nor straight ladder can be used, a Jacob's ladder meeting the requirements of § 1504.22 may be used.

(b) Each side of such gangway, and the turntable, if used, shall have a railing with a minimum height of 33 inches measured perpendicularly from rail to walking surfaces at the stanchion, with a mid-rail. Rails shall be of wood, pipe, chain, wire or rope and shall be kept taut at all times. Portable stanchions supporting railings shall be so supported or secured as to prevent accidental dislodgment.

(c) Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the foregoing requirements, except in cases where the vessels' regular gangway is not being used.

§ 1504.12 Gear certification.²

(a) The employer shall not use the vessel's cargo handling gear until he has ascertained that the vessel has a current and valid cargo gear register and certificates which in form and content are in substantial accordance with the recommendations of the International Labor Office, as set forth in Appendix I of this part, and as provided by International Labor Organization Convention No. 32, and which indicates that the cargo gear has been tested, examined and heat treated by or under the supervision of persons or organizations defined as competent to make register entries and issue certificates pursuant to paragraphs (c) and (d) of this section.

(b) Public vessels and vessels holding a valid Certificate of Inspection issued by the U.S. Coast Guard are deemed to meet the requirements of paragraph (a) of this section.

(c) With respect to United States vessels not holding a valid Certificate of Inspection issued by the United States Coast Guard, persons or organizations competent to make entries in the registers and issue the certificates required by paragraph (a) of this section shall be only those persons currently accredited by the Bureau of Labor Standards,

United States Department of Labor, as provided in Part 1505 of this chapter.

(d) With respect to vessels under foreign registry, persons or organizations competent to make entries in the registers and issue the certificates required by paragraph (a) of this section shall be: (1) those acceptable as such to any foreign nation, (2) those acceptable to the Commandant of the United States Coast Guard, or (3) those currently accredited by the Bureau of Labor Standards, United States Department of Labor, as provided in Part 1505 of this chapter.

Subpart C—Means of Access

§ 1504.21 Gangways and other means of access.

(a) The gangway shall be kept properly trimmed at all times.

(b) When a fixed tread accommodation ladder is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.

(c) When the lower end of a gangway overhangs the water between the ship and the dock in such a manner that there is danger of employees falling between the ship and the dock, a net or other suitable protection shall be rigged at the foot of the gangway in such a manner as to prevent employees from falling from the end of the gangway.

(d) If the foot of the gangway is more than one foot away from the edge of the apron, the space between them shall be bridged by a firm walkway equipped with railings with a minimum height of approximately 33 inches with mid-rails on both sides.

(e) Supporting bridles shall be kept clear so as to permit unobstructed passage for employees using the gangway.

(f) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial hand rail approximately 33 inches in height shall be provided between the top of the bulwark and the deck.

(g) Obstructions shall not be laid on or across the gangway.

(h) The means of access shall be adequately illuminated for its full length.

² See also § 1504.51.

(i) Unless the construction of the vessel makes it impossible, the means of access shall be so located that drafts of cargo do not pass over it. In any event loads shall not be passed over the means of access while employees are on it.

§ 1504.22 Jacob's ladders.

(a) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(b) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

§ 1504.23 Access to barges and river towboats.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp meeting the requirements of paragraph (a) of this section or a safe walkway meeting the requirements of § 1504.21(d) shall be provided. When a walkway is impracticable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a walkway nor a straight ladder can be used, a Jacob's ladder meeting the requirements of § 1504.22 may be used: *Provided, however,* That when these requirements cannot reasonably be met, by reason of local conditions, in respect to barges operating on the Mississippi River System, other safe means of access shall be provided.

(c) When a barge, raft or log boom is being worked alongside a larger vessel, a Jacob's ladder meeting the requirements of § 1504.22 shall be provided for each gang working alongside unless other safe means of access are provided.

(d) When longshoring operations are in progress on barges, the barges shall be securely made fast to the vessel, wharf, or dolphins.

§ 1504.24 Bridge plates and ramps.

(a) Bridge or car plates used afloat shall be of adequate strength, equipped with side boards along the space bridged,

well maintained, and secured against movement.

(b) Ramps for access of vehicles to or between vessels shall be of adequate strength, provided with side boards, well maintained and properly secured.

§ 1504.25 Ladders.

(a) There shall be at least one safe and accessible ladder for each gang working in a hatch. However, no more than two such ladders are required in any hatch. An adequate means of gaining a handhold shall be provided at or near the head of each vertical fixed ladder in cases where any coaming or other structural features are such that they cannot serve this purpose.

(b) When any fixed ladder is visibly unsafe, the employer shall prohibit its use by employees.

(c) Straight ladders of adequate strength and suitably secured against shifting or slipping shall be provided as necessary when fixed hold ladders do not meet the requirements of paragraph (a) of this section, except that when conditions are such that a straight ladder cannot be used, Jacob's ladders meeting the requirements of § 1504.22 may be used.

(d) When four inches of clearance does not exist in back of ladder rungs, the ladder shall be deemed "unsafe" for the purpose of this section.

(e) When necessary to obtain access to or from a stowed deckload, ladders or steps of adequate strength, and secured against shifting or slipping, shall be provided: *Provided, however,* That adequate steps formed by the cargo itself will be acceptable when the nature of the cargo and the type of stowage permits. This paragraph does not apply to the circumstances covered by § 1504.54(f).

(f) Portable straight ladders used by employees for any purpose not otherwise specifically covered by this part shall be of adequate strength and lashed, blocked, or otherwise secured against shifting or slipping.

Subpart D—Working Surfaces

§ 1504.31 Hatch coverings.

(a) No cargo shall be loaded or unloaded by a fall or sling at any intermediate deck unless either the hatch at

that deck is safely covered or a secure landing platform of a width not less than that of one section of hatch coverings has been placed across the hatch.

(b) Cargo shall not be landed on or handled over a covered hatch or tween deck unless all beams are in place under the hatch covers.

(c) Missing, broken, split, or poorly fitting hatch covers that would jeopardize the safety of employees shall be reported at once to the officers in charge of the vessel. Pending replacement or repairs by the vessel, work shall not be performed in the section containing the unsafe covers or in adjacent sections unless the flooring is made safe.

(d) When the hatch covers and beams are not of uniform size, they shall be placed only in the hatch, deck, and section in which they fit properly.

(e) Small trimming hatches located in intermediate decks shall be adequately covered or guarded while work is proceeding in the hatch in which they are located, unless they are actually in use.

§ 1504.32 Stowed cargo and temporary landing platforms.

(a) Temporary tables on which loads are to be landed shall be of sufficient size and strength to permit the employees thereon to work in safety.

(b) When an edge of a hatch section or of stowed cargo more than 8 feet high is so exposed that it presents a danger of persons falling, the edge shall be guarded by a line, safety net or railing.

(c) When two gangs are working in the same hatch on different levels, a safety net shall be rigged and securely fastened so as to prevent men or cargo from falling.

§ 1504.33 Deck loads.

(a) Employees shall not be permitted to pass fore and aft over or around deck loads unless there is a safe passage.

(b) Signalmen shall not be permitted to walk over deck loads from rail to coaming unless there is a safe passage.

§ 1504.34 Skeleton decks.

No cargo shall be worked on a skeleton deck, mechano deck or other superstructure unless temporary flooring

is provided, when necessary, to make a safe working surface.

§ 1504.35 Open hatches.

Open weather deck hatches around which longshoremen must work which are not protected to a height of 24 inches by coamings, shall be guarded by taut lines at a height of 36 to 42 inches above the deck except on the side on which cargo is being worked. Any portable stanchions or uprights used shall be so supported or secured as to prevent accidental dislodgement; *Provided, however,* That the requirements of this section shall not be deemed to apply to barges or to Great Lakes type bulk carriers.

§ 1504.36 Weather deck rails.

Removable weather deck railings shall be kept in place except when cargo operations require them to be removed, in which case they shall be replaced as soon as such cargo operations are completed.

§ 1504.37 Sides of barges.

Employees shall not be permitted to walk along the sides of covered lighters or of barges with coamings more than 5 feet high unless there is a 3-foot clear walkway or a grab rail or taut handline is provided.

§ 1504.38 Freshly oiled decks.

If decks are wet with fresh paint or oil, the employer shall not permit employees to engage in longshoring operations until necessary walking and working areas have been made safe by the use of suitable non-skid materials.

Subpart E—Opening and Closing Hatches

§ 1504.41 Coaming clearances.

(a) *Weather deck.* If a deck load of lumber or other smooth sided deck cargo over 5 feet high is stowed within 3 feet of the hatch coaming and employees handling beams and hatch covers are not protected by at least a 24 inch height of the coaming, a taut handline shall be provided along the side of the deckload for their protection. The requirements of § 1504.35(a) are not intended to apply in this situation.

(b) *Intermediate deck.* (1) Before intermediate deck hatch covers and beams are removed or replaced by employees, there shall be a 3-foot working space between the stowed cargo and the coaming at both sides and at one end of the hatches with athwartship beams, and at both ends of those hatches with fore and aft beams, except that a reasonable tolerance will be permitted in circumstances where adherence to a 3-foot working space would create undue hardship.

(2) The 3-foot clearance required by subparagraph (1) of this paragraph is not required on the covered portion of a partially opened hatch, nor is it required when lower decks have been filled to beam height with cargo of such a nature as to provide a safe surface upon which employees may work.

(3) For purposes of subparagraph (1) of this paragraph, banana or other fitted gratings which are in good condition shall be considered a part of the decking when properly placed within the 3-foot area.

(c) *Trunk hatches and other permanent or semi-permanent structures and spare parts.* When bulkheads, lockers, reefer compartments or large spare parts are within 3 feet of the coaming, grab rails or taut handlines shall be provided for the protection of employees handling beams and hatch covers.

(d) The provisions of this section regarding coaming clearances do not apply to hatches which are opened by hydraulic or other mechanical means, but in all cases in which the 3 foot clearance does not exist, means shall be taken to prevent stowed cargo which is likely to shift from falling into the hold.

§ 1504.42 Beam and pontoon bridles.

Beam and pontoon bridles shall not be used unless they meet the following requirements:

(a) Bridles shall be long enough to easily reach the holes, rings, or other lifting attachments on the beams and pontoons. The bridles shall be of adequate strength and properly maintained, including covering or blunting of protruding ends in wire rope splices.

(b) Bridles for lifting hatch beams shall be equipped with toggles, shackles,

or hooks or other devices of such design that they cannot become accidentally dislodged from the beams with which they are used. Hooks other than those herein described may be used only when they are hooked into the standing part of the bridle. Toggles, when used, shall be at least one inch longer than twice the longest diameter of the holes into which they are placed.

(c) Bridles used for lifting pontoons and plugs shall have the number of legs required by the design of the pontoon or plug, and all legs shall be used. Where any use of a bridle requires fewer than the number of legs provided, idle legs shall be hung on the hook or ring, or otherwise prevented from swinging free.

(d) At least two legs of all strongback and pontoon bridles shall be equipped with a substantial fiber rope lanyard at least 8 feet long and in good condition. The bridle end of the lanyard may be of chain or wire.

§ 1504.43 Handling beams and covers.

Only paragraphs (f)(2), (h), and (i) of this section apply to folding, sliding, or hinged metal hatch covers or to those hatch covers handled by cranes carried for that purpose.

(a) (1) When hatch covers or pontoons are stowed on the weather deck abreast of hatches they shall be arranged in stable piles not closer than 3 feet from the hatch coaming and, when on the working side of the deck, not higher than the coaming, unless they are spread one high between coaming and rail with no space between them and with not less than a 24 inch height of hatch coaming maintained.

(2) When, in the case of pontoons, the requirements of subparagraph (1) of this paragraph cannot be met due to the narrowness of the available deck area, pontoons may be stowed more than one high against the coaming, provided that not less than a 24-inch height of hatch coaming is maintained on the working side of the vessel. If pontoons must be stowed closer than 3 feet to and higher than the coaming on the idle side, they shall be secured against movement.

(3) When some, but not all, conventional small weather deck hatch boards or similar covers on seagoing vessels are removed from the beams in a section of

a partially opened hatch during cargo handling, cleaning or other operations, those removed shall not be stowed on those left in place within that section.

(b) Beams shall be laid on their sides, or stood on edge close together and lashed: *Provided, however,* That this paragraph shall not apply in cases where beams are of such design that (1) the width of the flange is 50 percent or more of the height of the web and (2) that when a beam is stood upright the flange rests flat on the deck.

(c) Strongbacks, hatch covers and pontoons shall be so placed as not to interfere with a safe walkway from rail to hatch coaming or fore and aft, and so secured that they cannot be tipped over or dragged into hatches or overboard by drafts or gear. Dunnage or other suitable material shall be used under and between tiers of strongbacks and pontoons.

(d) Hatch covers unshipped in an intermediate deck shall be placed at least 3 feet from the coaming or they shall be removed to another deck. Strongbacks unshipped in an intermediate deck shall not be placed closer than 6 inches to the coaming, and if placed closer than 3 feet, they shall be so secured that they cannot be tipped or dragged into a lower compartment. If this is not possible they shall be removed to another deck.

(e) Any beam or pontoon left in place adjacent to a section through which cargo, dunnage, equipment, or any other material is being worked, shall be lashed, locked, or otherwise secured so that it cannot be displaced by accident. All portable, manually handled hatch covers, including those bound together to make a larger cover, shall be removed from any working section.

(f) (1) The roller hatch beam at the edge of the open section of the hatch shall be lashed or pinned back so that it cannot be moved toward the open section.

(2) Rolling, sectional or telescopic hatch covers of barges which open in a fore and aft direction shall be secured against unintentional movement while in the open position.

(g) When a hatch is to be covered, hatch covers or night tents shall be used. Any partial hatch covering, such

as alternate hatch covers or strips of dunnage, shall not be covered by a tarpaulin.

(h) Hinged or folding hatch covers normally stowed in an approximately vertical position shall be positively secured when in the upright position.

(i) Hatches shall not be opened or closed while employees are in the square of the hatch below.

Subpart F—Ship's Cargo Handling Gear

§ 1504.51 General requirements.²

(a) Neither the safe working load as specified in the cargo gear certification papers, nor any safe working load marked on the booms, shall be exceeded. Any limitations imposed by the certifying authority shall be adhered to.

(b) Any component of cargo handling gear, including tent gantlines and other associated rigging, which is visibly unsafe shall not be used until made safe.

§ 1504.52 Specific requirements.

Gear which does not comply with the following requirements shall not be used:

(a) *Preventers.* (1) When preventers are used they shall be of sufficient strength for the intended purpose and secured to the head of the boom independent of working guys except when, in the case of cast fittings, the strength of the fitting exceeds the total strength of all lines secured to it. Any tails, fittings, or other means of making the preventers fast on deck shall provide strength equal to that of the preventer itself.

(b) *Stoppers.* (1) When used, chain topping lift stoppers shall be in good condition, equipped with manila tails, and of a length to allow not fewer than three half-hitches in the chain.

(2) When used, chain stoppers shall be shackled or otherwise secured in such a manner that their links are not bent by being passed around fittings. The point of attachment shall be of sufficient strength and so located that the stoppers are reasonably in line with the normal topping lift lead at the time the stopper is applied.

(3) When used, patent stoppers of the

² See also § 1504.12.

clamp type shall be suited to the size of the rope used. Clamps shall be in good condition and free of paint and dirt which would prevent their being drawn tight.

(c) *Falls.* (1) The end of the winch fall shall be secured to the drum by clamps, U-bolts, shackles, or some other equally strong method. Fiber rope fastenings shall not be used.

(2) Winch falls shall not be used with fewer than three turns on the winch drum.

(3) Eyes in the ends of wire rope cargo falls shall not be formed by knots and, in single part falls, shall not be formed by wire rope clips.

(4) When the design of the winch permits, the fall shall be so wound on the drum that the control mechanism moves in the same direction as the load.

(d) *Heel blocks.* (1) When employees are required to work in the bight formed by the heel block, a preventer of at least $\frac{3}{4}$ -inch diameter wire rope, rove reasonably snug and adequately secured, shall be rigged, or equally effective means shall be taken to hold the block and fall in the event that the heel block attachments should fail. Where physical limitations prohibit the fitting of a wire rope preventer of the required size or of other equally effective means, the maximum possible protection shall be provided.

(2) If the heel block is not so rigged as to prevent its falling when not under strain, it shall be secured to prevent alternate raising and dropping of the block: *Provided, however,* That this requirement shall not apply when the heel block is so located as to be at least 10 feet above the deck when at its lowest point.

(e) *Coaming rollers.* When used, portable coaming rollers, whether provided by the ship or by the employer, shall be secured by wire preventers in addition to the regular coaming clamps.

(f) *Cargo hooks.* Cargo hooks shall be as close to the junction of the falls as the assembly permits, but in no case farther than two feet from it, except that this provision shall not apply when the construction of the vessel and the operation in progress are such that fall angles in excess of 120 degrees do not normally occur. Overhaul chains shall not be shortened by bolting or knotting.

§ 1504.53 Cargo winches.

(a) *General.* (1) When moving parts of winches or other deck machinery present a hazard, they shall be guarded.

(2) Winches shall not be used if control levers operate with excessive friction or excessive play.

(3) Double gear winches or other winches equipped with a clutch shall not be used unless a positive means of locking the gear shift is provided.

(4) When changing gears on a two gear winch, there shall be no load other than the fall and cargo hook assembly on the winch.

(5) Any defect or malfunction of winches shall be reported immediately to the officer in charge of the vessel.

(6) Temporary seats and shelters for winch drivers which create a hazard to the winchmen or other employees shall not be used.

(7) Except for short handles on wheel type controls, winch drivers shall not be permitted to use winch control extension levers unless they are provided by either the ship or the employer. Such levers shall be of adequate strength and securely fastened with metal connections at the fulcrum and at the permanent control lever.

(b) *Steam winches.* (1) Means shall be taken to prevent escaping steam from obscuring any part of the decks or other work places or from otherwise hindering or injuring any employee.

(2) Access shall be maintained to the steam valve between each winch and the deck steam line. If this valve is not operative with normal hand pressure, the winch shall not be used.

(3) Extension control levers which tend to fall of their own weight shall be counterbalanced.

(4) When winches are left unattended, control levers shall be secured in the neutral position.

(c) *Electrical winches.* (1) When the electro-magnetic or other service brake is unable to hold the load, the winch shall not be used.

(2) Winches shall not be used when one or more control points, either hoisting or lowering, is not operating properly. Employees shall not be permitted to tamper with or adjust electric control circuits.

(3) When winches are left unattended, control levers shall be placed in the neutral position and, whenever possible, the power shall be shut off or control levers locked at the winch or the operating controls.

§ 1504.54 Rigging gear.

(a) When alternate positions for securing guys are provided, the guys shall be so placed as to produce a minimum stress without permitting the boom to jackknife.

(b) The head of the midship boom shall be spotted no farther outboard of the coaming than is necessary for control of the load.

(c) *Preventers.* When preventers are used, the following shall apply:

(1) Preventers shall be properly secured to suitable fittings, other than those to which the guys are secured, and shall be as nearly parallel to the guys as available fittings permit.

(2) Unless the cleat is also a chock and the hauling part is led through the chock opening, the leads of preventers to cleats shall be such that the direction of the line pull of the preventer is as nearly as possible parallel to the plane of the surface on which the cleat is mounted.

(3) Guys and associated preventers shall be adjusted so as to share the load as nearly equally as practicable where cargo operations are being conducted by burtoning; *Provided, however,* That where guys are designed and intended for trimming purposes only and the preventer is intended to perform the function of the guy, the guy shall be left slack.

(d) Cargo falls under load shall not be permitted to chafe on any standing or other running rigging: *Provided, however,* That this shall not be construed to mean hatch coamings or other similar structural parts of the vessel.

(e) (1) Where a bull wire is taken to a gypsy head for the purpose of lowering or topping a boom, the bull wire shall be secured to the gypsy head by shackle or other equally strong method. Securing by fiber rope fastening will not be considered adequate.

(2) When, in lowering or topping a boom, it is not possible to secure the bull

wire to the gypsy head, or when the topping lift itself is taken to the gypsy head, sufficient turns, in no case less than five (5), shall be used.

(f) When deck loads extend above the rail and there is less than 8 inches horizontal clearance between the edge of the deck load and the inside of the bulkhead or rail, employees shall not be permitted to go overside unless adequate precautions are taken to prevent them from falling.

§ 1504.55 Cranes.

Unless permanently guarded, the accessible areas within the swing radius of the outermost part of the body of a revolving crane shall be temporarily guarded by ropes or other suitable means during cargo operations, so as to prevent an employee being in a position to be caught between the body of the crane and fixed parts of the vessel or of the crane itself.

Subpart G—Cargo Handling Gear and Equipment Other Than Ship's Gear

§ 1504.61 General.

(a) All gear and equipment provided by the employer shall be inspected by the employer or his authorized representative before each use and, when necessary, at intervals during its use, to ensure that it is safe. Any gear which is found upon such inspection to be visibly unsafe shall not be used until it is made safe.

(b) All special stevedoring gear provided by the employer, the strength of which depends upon components other than commonly used stock items such as shackles, ropes or chains, shall be tested as a unit in the following manner before initially being put into use:

(1) Gear intended to handle lifts up to and including 20 short tons (40,000 lbs.) shall be tested to 25 percent in excess of its safe working load.

(2) Gear intended to handle lifts over 20 short tons (40,000 lbs.) but not exceeding 50 short tons (100,000 lbs.) shall be tested to 5 short tons (10,000 lbs.) in excess of its safe working load.

(3) Gear intended to handle lifts over 50 short tons (100,000 lbs.) shall be tested to 10 percent in excess of its safe working load.

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(4) The employer shall maintain a record of the dates and results of the tests with each unit of gear concerned clearly identifiable. The records shall be available for examination by representatives of the Bureau of Labor Standards.

(c) The safe working load of gear as specified in §§ 1504.62 through 1504.66 shall not be exceeded.

(d) The weight shall be plainly marked on any article of stevedoring gear hoisted by ship's gear and weighing in excess of 2,000 lbs.

§ 1504.62 Fiber rope and fiber rope slings.

(a) Table G-1 shall be used to determine the safe working load of various sizes of manila rope and rope slings at various angles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than five (5) is maintained.

(b) Where synthetic fiber ropes are substituted for manila ropes of less than three (3) inches circumference, the substitute shall be of equal size. Where synthetic fiber ropes are substituted for manila ropes of three (3) inches circumference or more, the size of the synthetic rope is to be determined from the formula:

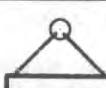
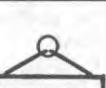
$$C = \sqrt{0.6C_s^2 + 0.4C_m^2}$$

Where C = the required circumference of the synthetic rope in inches.

C_s = the circumference to the nearest one-quarter inch of a synthetic rope having a breaking strength not less than the breaking strength of the size manila rope that would be required by paragraph (a) of this section.

C_m = the circumference of manila rope in inches which would be required by paragraph (a) of this section.

TABLE G-1
MANILA ROPE
(In pounds or tons of 2000 pounds)

Circumference	Diameter in Inches	Single Leg	60°	45°	30°
					
3/4	1/4	120 lbs.	204 lbs.	170 lbs.	120 lbs.
1	5/16	200	346	282	200
1-1/8	3/8	270	467	380	270
1-1/4	7/16	350	605	493	350
1-3/8	15/32	450	775	635	450
1-1/2	1/2	530	915	798	530
1-3/4	9/16	690	1190	973	690
2	5/8	880	1520	1240	880
2-1/4	3/4	1080	1870	1520	1080
2-1/2	13/16	1300	2250	1830	1300
2-3/4	7/8	1540	2660	2170	1540
3	1	1800	3120	2540	1800
3-1/4	1-1/16	1.0 Tons	1.7 Tons	1.4 Tons	1.0 Tons
3-1/2	1-1/8	1.2	2.1	1.7	1.2
3-3/4	1-1/4	1.35	2.3	1.9	1.35
4	1-5/16	1.5	2.6	2.1	1.5
4-1/2	1-1/2	1.8	3.1	2.5	1.8
5	1-5/8	2.25	3.9	3.2	2.25
5-1/2	1-3/4	2.6	4.5	3.7	2.6
6	2	3.1	5.4	4.4	3.1
6-1/2	2-1/8	3.6	6.2	5.1	3.6

In making such a substitution it should be ascertained that the inherent characteristics of the synthetic fiber are suitable for the intended service of the rope.

§ 1504.63 Wire rope and wire rope slings.

(a) Tables G-2 through G-5 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, provided that a safety factor of not less than five (5) is maintained.

TABLE G-2
RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT WIRE ROPE CORE,
WIRE ROPE AND WIRE ROPE SLINGS
 (In tons of 2000 pounds)

Rope Dia. Inches	SINGLE LEG					
	Vertical			Choker		
	A	B	C	A	B	C
6x19 CLASSIFICATION						
1/4"	.59	.56	.53	.44	.42	.40
3/8"	1.3	1.2	1.1	.98	.93	.86
1/2"	2.3	2.2	2.0	1.7	1.6	1.5
5/8"	3.6	3.4	3.0	2.7	2.5	2.2
3/4"	5.1	4.9	4.2	3.8	3.6	3.1
7/8"	6.9	6.6	5.5	5.2	4.9	4.1
1"	9.0	8.5	7.2	6.7	6.4	5.4
1-1/8"	11.	10.	9.0	8.5	7.8	6.8
6x37 CLASSIFICATION						
1-1/4"	13.	12.	10.	9.9	9.2	7.9
1-3/8"	16.	15.	13.	12.	11.	9.6
1-1/2"	19.	17.	15.	14.	13.	11.
1-3/4"	26.	24.	20.	19.	18.	15.
2"	33.	30.	26.	25.	23.	20.
2-1/4"	41.	38.	33.	31.	29.	25.
(A) - Socket or Swaged Terminal attachment. (B) - Mechanical Sleeve attachment. (C) - Hand Tucked Splice attachment.						

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TABLE G-3.
RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT
WIRE ROPE CORE, WIRE ROPE SLINGS
(In tons of 2000 pounds)

Rope Dia. Inches	TWO - LEG BRIDLE OR BASKET HITCH											
	Vertical			60°			45°			30°		
	A	B	C	A	B	C	A	B	C	A	B	C
6x19 CLASSIFICATION												
1/4"	1.2	1.1	1.0	1.0	.97	.92	.83	.79	.75	.59	.56	.53
3/8"	2.6	2.5	2.3	2.3	2.1	2.0	1.8	1.8	1.6	1.3	1.2	1.1
1/2"	4.6	4.4	3.9	4.0	3.8	3.4	3.2	3.1	2.8	2.3	2.2	2.0
5/8"	7.2	6.8	6.0	6.2	5.9	5.2	5.1	4.8	4.2	3.6	3.4	3.0
3/4"	10.	9.7	8.4	8.9	8.4	7.3	7.2	6.9	5.9	5.1	4.9	4.2
7/8"	14.	13.	11.	12.	11.	9.6	9.8	9.3	7.8	6.9	6.6	5.5
1"	18.	17.	14.	15.	15.	12.	13.	12.	10.	9.0	8.5	7.2
1-1/8"	23.	21.	18.	19.	18.	16.	16.	15.	13.	11.	10.	9.0
6x37 CLASSIFICATION												
1-1/4"	26.	24.	21.	23.	21.	18.	19.	17.	15.	13.	12.	10.
1-3/8"	32.	29.	25.	28.	25.	22.	22.	21.	18.	16.	15.	13.
1-1/2"	38.	35.	30.	33.	30.	26.	27.	25.	21.	19.	17.	15.
1-3/4"	51.	47.	41.	44.	41.	35.	36.	33.	29.	26.	24.	20.
2"	66.	61.	53.	57.	53.	46.	47.	43.	37.	33.	30.	26.
2-1/4"	83.	76.	66.	72.	66.	57.	58.	54.	47.	41.	38.	33.
(A) - Socket or Swaged Terminal Attachment. (B) - Mechanical Sleeve Attachment. (C) - Hand Tucked Splice Attachment.												

TABLE G-4
RATED CAPACITIES FOR IMPROVED PLOW STEEL, FIBER CORE, WIRE
ROPE AND WIRE ROPE SLINGS
(In tons of 2000 pounds)

Rope Dia. Inches	SINGLE LEG					
	Vertical			Choker		
	A	B	C	A	B	C
6x19 CLASSIFICATION						
1/4	.55	.51	.49	.41	.38	.37
3/8	1.2	1.1	1.1	.91	.85	.80
1/2	2.1	2.0	1.8	1.6	1.5	1.4
5/8	3.3	3.1	2.8	2.5	2.3	2.1
3/4	4.8	4.4	3.9	3.6	3.3	2.9
7/8	6.4	5.9	5.1	4.8	4.5	3.9
1	8.4	7.7	6.7	6.3	5.8	5.0
1-1/8	10.	9.5	8.4	7.9	7.1	6.3
6x37 CLASSIFICATION						
1-1/4	12.	11.	9.8	9.2	8.3	7.4
1-3/8	15.	13.	12.	11.	10.	8.9
1-1/2	17.	16.	14.	13.	12.	10.
1-3/4	24.	21.	19.	18.	16.	14.
2	31.	28.	25.	23.	21.	18.

(A) - Socket or Swaged Terminal attachment.
 (B) - Mechanical Sleeve attachment.
 (C) - Hand Tucked Splice attachment.

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TABLE G-5
RATED CAPACITIES FOR IMPROVED PLOW STEEL,
FIBER CORE, WIRE ROPE SLINGS
(In tons of 2000 pounds)

Rope Dia. Inches	Vertical			60°			45°			30°		
	A	B	C	A	B	C	A	B	C	A	B	C
6x19 CLASSIFICATION												
1/4	1.1	1.0	.99	.95	.88	.85	.77	.72	.70	.55	.51	.49
3/8	2.4	2.2	2.1	2.1	1.9	1.8	1.7	1.6	1.5	1.2	1.1	1.1
1/2	4.3	3.9	3.7	3.7	3.4	3.2	3.0	2.8	2.6	2.1	2.0	1.8
5/8	6.7	6.2	5.8	5.8	5.3	4.8	4.7	4.4	4.0	3.3	3.1	2.8
3/4	9.5	8.8	7.8	8.2	7.6	6.8	6.7	6.2	5.5	4.8	4.4	3.9
7/8	13.	12.	10.	11.	10.	8.9	9.1	8.4	7.3	6.4	5.9	5.1
1	17.	15.	13.	14.	13.	11.	12.	11.	9.4	8.4	7.7	8.7
1-1/8	21.	19.	17.	18.	16.	14.	15.	13.	12.	10.	9.5	8.4
6x37 CLASSIFICATION												
1-1/4	25.	22.	20.	21.	19.	17.	17.	16.	14.	12.	11.	9.8
1-3/8	30.	27.	24.	26.	23.	20.	21.	19.	17.	15.	13.	12.
1-1/2	35.	32.	28.	30.	27.	24.	25.	22.	20.	17.	16.	14.
1-3/4	48.	43.	38.	41.	37.	33.	34.	30.	27.	24.	21.	19.
2	62.	55.	49.	53.	48.	43.	43.	39.	35.	31.	28.	25.
(A) - Socket or Swaged Terminal attachment. (B) - Mechanical Sleeve attachment. (C) - Hand Tucked Splice attachment.												

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Where "U" bolt wire rope clips are used to form eyes, Table G-6 shall be used to determine the number and spacing of clips. The "U" bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(d) Wire rope shall not be secured by knots, except on haul back lines on scrapers.

TABLE G-6—NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel, rope diameter inches	Number of clips		Minimum spacing (inches)
	Drop forged	Other material	
1/2	3	4	3
5/8	3	4	3 3/4
3/4	4	5	4 1/2
7/8	4	5	5 1/4
1	4	6	6
1 1/8	5	6	6 3/4
1 1/4	5	7	7 1/2
1 3/8	6	7	8 1/4
1 1/2	6	8	9

§ 1504.64 Chains and chain slings.

(a) Tables G-7 and G-8 shall be used to determine the maximum safe working loads of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products. Proof coil steel chain, also known as common or hardware chain, or other chain not recommended for slinging or hoisting by the manufacturer, shall not be used for hoisting purposes.

(b) All sling chains, including end fastenings, shall be given a visual inspection before being used on the job. A thorough inspection of all chains in use shall be made every 3 months. Each chain shall bear an indication of the month in which it was thoroughly inspected. The thorough inspection shall include inspection for wear, defective welds, deformation and increase in length or stretch.

TABLE G-7
WROUGHT IRON CHAIN
(In pounds or tons of 2000 pounds)

Nominal Size Chain Stock Inch.	Single Leg	60°	45°	30°
* 1/4	1060	1835	1500	1060
* 5/16	1655	2865	2340	1655
3/8	2385	2.1	3370	2385
* 7/16	3250	2.8	2.3	3250
1/2	2.1	3.7	3.0	2.1
* 9/16	2.7	4.6	3.8	2.7
5/8	3.3	5.7	4.7	3.3
3/4	4.8	8.3	6.7	4.8
7/8	6.5	11.2	9.2	6.5
1	8.5	14.7	12.0	8.5
1-1/8	10.0	17.3	14.2	10.0
1-1/4	12.4	21.4	17.5	12.4
1-3/8	15.0	25.9	21.1	15.0
1-1/2	17.8	30.8	25.2	17.8
1-5/8	20.9	36.2	29.5	20.9
1-3/4	24.2	42.0	34.3	24.2
1-7/8	27.6	47.9	39.1	27.6
2	31.6	54.8	44.8	31.6

*** These sizes of wrought iron chain are no longer manufactured in the United States.**

TABLE G-8
ALLOY STEEL CHAIN
(In tons of 2000 pounds)

Nominal Size Chain Stock Inch.	Single Leg	60°	45°	30°
1/4	1.62	2.82	2.27	1.62
3/8	3.30	5.70	4.65	3.30
1/2	5.62	9.75	7.90	5.62
5/8	8.25	14.25	11.65	8.25
3/4	11.5	19.9	16.2	11.5
7/8	14.3	24.9	20.3	14.3
1	19.3	33.5	27.3	19.8
1-1/8	22.2	38.5	31.5	22.2
1-1/4	28.7	49.7	40.5	28.7
1-3/8	33.5	58.0	47.0	33.5
1-1/2	39.7	68.5	56.0	39.7
1-5/8	42.5	73.5	59.5	42.5
1-3/4	47.0	81.5	62.0	47.0

(c) Interlink wear, not accompanied by stretch in excess of five (5) percent, shall be noted and the chain removed from service when maximum allowable wear at any point of link, as indicated in Table G-9, has been reached.

TABLE G-9
MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain size in inches	Maximum allowable wear in fraction of inches
1/4 (9/32)	3/64
3/8	9/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	13/64
1	3/16
1-1/8	7/32
1-1/4	3/8
1-3/8	9/32
1-1/2	5/16
1-5/8	13/32
1-3/4	13/64

(d) Chain slings shall be removed from service when, due to stretch, the increase in length of a measured section exceeds five (5) percent; when a link is bent, twisted or otherwise damaged; or when raised scarfs or defective welds appear.

(e) All repairs to chains shall be made under qualified supervision. Links or portions of the chain found to be defective, as described in paragraph (d) of this section, shall be replaced by links having proper dimensions and made of material similar to that of the chain. Before repaired chains are returned to service, they shall be proof tested to the proof test load recommended by the manufacturer.

(f) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months when recommended by the manufacturer. The chain manufacturer shall be consulted for recommended procedures for annealing or normalizing. Alloy chains shall not be annealed.