In addition to the major investment analysis, an informal scoping process will be undertaken as part of this project. The process will include meetings, review sessions as appropriate, and discussions at regularly scheduled meetings. Participants will include the East-West Gateway Coordinating Council, the Missouri Highway and Transportation Department and other Federal, State and local agencies. Further details and a scoping information packet may be obtained from one of the contact persons listed above.

To ensure that the full range of issues related to the proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this proposed action and the EIS should be directed to FHWA or IDOT contact persons at the addresses provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Research, Planning, and Construction. The regulations implementing Executive Order 12372 intergovernmental consultation on Federal programs and activities apply to this program.)

Issued on April 28, 1994.

James C. Partlow,

Design Operations Engineer, Federal Highway Administration, Illinois Division, Springfield, Illinois.

[FR Doc. 94-13338 Filed 6-1-94; 8:45 am]

BILLING CODE 4910-22-M

National Highway Traffic Safety Administration

Discretionary Cooperative Agreements To Support Biomechanics Research

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

ACTION: Announcement of Discretionary Cooperative Agreement to Support Biomechanical Research.

SUMMARY: This notice announces a discretionary cooperative agreement program with the National Highway Traffic Safety Administration to support research studies to evaluate the biomechanical response of human surrogates to impact and solicits applications for projects under this program.

DATES: Applications must be received on or before July 5, 1994.

ADDRESSES: Applications must be submitted to the National Highway Traffic Safety Administration, Office of Contracts and Procurement (NAD-30), ATTN: Belinda Leapley, 400 Seventh Street, SW., room 5301, Washington, DC 20590, USA. All applications submitted must include a reference to NHTSA Cooperative Agreement Program No. DTNH22-94-R-07260. Interested applicants are advised that no separate application package exists beyond the contents of this announcement.

FOR FURTHER INFORMATION CONTACT: General administrative questions may be directed to Belinda Leapley, Office of Contracts and Procurement, at (202) 366-9566. Programmatic questions relating to this cooperative agreement program should be directed to Richard M. Morgan, Biomechanics Division (NRD-12), 400 Seventh Street, SW., room 6221B, Washington, DC 20590, USA, at (202) 366-4717.

SUPPLEMENTARY INFORMATION:

Background and Objectives

The National Highway Traffic Safety Administration is responsible for devising strategies to save lives and reduce injuries from motor vehicle crashes. The purpose of this cooperative agreement program is to promote the improvement of traffic safety for the public through the support of research studies designed to evaluate the biomechanical response of human surrogates to impact as a means of expanding the base of scientific knowledge in this field and to provide for the coordinated exchange of scientific information collected as a result of the studies conducted.

Impact trauma research employs the principles of mechanics to discover the physical response and physiological results of impacts to the human body. Generally, the teams doing the research are comprised of individuals from different disciplines: engineering, physiology, medicine, biology, and anatomy. The team studies the physical response of the body to impact by measuring and recording engineering parameters defining the event, such as force, accelerations, displacements, surface contours, strains, pressure, etc., and observing the physiological consequences in terms of physical or functional alterations to the body.

One of the major research materials used to simulate injury to the living human is the human cadaver (hereinafter referred to as a human surrogate) exposed to impact and detailed response measurement.

The focus of this cooperative research effort is the study of human surrogate response and injury to physical impacts simulating some significant aspect of automotive impact injury, *i.e.*, head, neck, torso, or lower extremity injury produced in drivers and passengers, restrained by various safety devices and exposed to either a frontal, lateral, or rear impact. The specific objectives of this cooperative research effort are to: (1) Delineate the mechanism of injury, (2) develop functional relationships between the measurable engineering parameters and the extent and severity of injury, and (3) quantify the impact response of the body in such a way as to allow the development of mechanical analogs of the human body.

NHTSA Involvement

The NHTSA, Biomechanics Division, will be involved in all activities undertaken as part of the cooperative agreement program and will:

1. Provide, on an as-needed basis, one professional staff person, to be designated as the Contracting Officer's Technical Representative (COTR), to participate in the planning and management of the cooperative agreement and coordinate activities between the organization and the NHTSA;
2. Make available information and technical assistance from government sources, within available resources and as determined appropriate by the COTR;
3. Provide liaison with other government agencies and organizations as appropriate; and
4. Stimulate the exchange of ideas and problems among cooperative agreement recipients, and, if appropriate, NHTSA contractors and other interested parties.

Involvement for Recipient of an Award

Any recipient of an award will:

1. Perform an effort in accordance with the application proposal and any incorporation revisions;
2. Contribute any in-kind resources, that might have been specified by the recipient in the application, for the performance of the effort under the agreement;
3. Meet periodically with the NHTSA COTR to promote the exchange of information so as to assure coordination of the cooperative effort and related projects; and
4. Provide the NHTSA COTR with following required reports:

a. Data Reports: The dynamic and other data measured in each human surrogate impact test will be provided by the recipient(s) within four (4) weeks after the test is run. For each and every test performed with a human surrogate, a data package shall be submitted to the COTR. For example, were a human subject to be impacted by pendulum to the right femur and later to be impacted by pendulum to the thorax, the two (2) impacts are separate tests even though there was only one (1) human surrogate.

A data package consists of (1) high speed film, (2) paper test report, and (3) either magnetic tape or floppy disk complying with the NHTSA Data Tape Reference Guide. The NHTSA, Biomechanics Division, maintains a Biomechanics Data Base which provides information, upon request, to the public, including educational institutions and other research organizations.

To facilitate the input of data as well as the exchange of information, any recipient of a cooperative agreement awarded as a result of this notice must provide the magnetic tape in the format specified in the "NHTSA Data Tape Reference Guide." A copy of this document may be obtained from the programmatic information contact designated in this notice.

b. Performance Reports: The recipient shall present one (1) hour semiannual technical performance briefings at the NHTSA headquarters building (at 400 Seventh Street, SW., Washington, DC 20590) which shall be due 30 days after the reporting period and a final performance report within 90 days after the completion of the research effort. An original and two copies of the final performance report shall be submitted to the COTR.

Period of Support

The research effort described in this notice will be supported through the award of at least one cooperative agreement. NHTSA reserves the right to make multiple awards depending upon the merit of the applications received.

Contingent upon the availability of funds and satisfactory performance, a cooperative agreement(s) will be awarded to an eligible organization(s) for project periods of up to five years. No cooperative agreement awarded as a result of this notice shall exceed $550,000 per year or $2,750,000 for five years.

Eligibility Requirements

In order to be eligible to participate in this cooperative agreement program, an applicant must be an educational institution or other nonprofit research organization. For profit research organizations may apply; however, no fee or profit will be allowed.

Application Procedure

Each applicant must submit one original and two copies of their application package to: Cooperative Agreement Program No. DTNH22–94–R–07260, Office of Contracts and Procurement (NAD–30), NHTSA, 400 Seventh Street, SW., room 5301, Washington, DC 20590, USA. Only complete application packages received on or before the date identified above under **DATES:** shall be considered. Submission of three additional copies will expedite processing but is not required.

Application Contents

1. The application package must be submitted with OMB Standard Form 424 (Rev. 4–88, including 424A and 424B), Application for Federal Assistance, with the required information filled in and the certified assurances included. While the Form 424–A deals with budget information, and section B identifies Budget Categories, the available space does not permit a level of detail which is sufficient to provide for a meaningful evaluation of the proposed costs. A supplemental sheet should be provided which represents a detailed breakdown of the proposed costs, as well as any costs which the applicant proposes to contribute in support of this effort.

2. Applications shall include a program narrative statement which addresses the following:

a. The objectives, goals, and anticipated outcomes of the proposed research effort;

b. The method or methods that will be used;

c. The source of the human surrogates to be used;

d. The number, quality, and anticipated ages at death (Because NHTSA has interest in obtaining knowledge of the impact injury process and its effect on the total automotive-population-at-risk, an experimental human subject pool with ages representative of this population is highly desirable.) of the human surrogates (viz human cadavers) the applicant expects to use for this research effort along with documentation (retrospective or prospective) that provides evidence that the applicant has access to the proposed quantity, quality, and projected ages of the experimental material;

e. The proposed program director and other key personnel identified for participation in the proposed research effort, including a description of their qualifications and their respective organizational responsibilities;

f. A description of the general, as well as specialized impact simulation, test facilities and equipment currently available or to be obtained for use in the conduct of the proposed research effort; and

g. A description of the applicant's previous experience or on-going research program that is related to this proposed research effort.

Review Process and Criteria

Initially, all applications will be reviewed to confirm that the applicant is an eligible recipient and to assure that the application contains all of the information required by the Application Contents section of this notice.

Each complete application from an eligible recipient will then be evaluated by a Technical Evaluation Committee. The applications will be evaluated using the following criteria:

1. The applicant's understanding of the purpose and unique problems represented by the research objectives of this cooperative agreement program as evidenced in the description of their proposed research effort. Specific attention shall be placed upon the applicant's stated means for obtaining the quantity of experimental material necessary to conduct the proposed research effort.

2. The potential of the proposed research effort accomplishments to make an innovative and/or significant contribution to the base of biomechanical knowledge as it may be applied to saving lives and reducing injuries resulting from motor vehicle crashes.

3. The technical merit of the proposed research effort, including the feasibility of the approach, planned methodology, and anticipated results.

4. The adequacy of test facilities and equipment identified to accomplish the proposed research effort, including impact simulation.

5. The adequacy of the organizational plan for accomplishing the proposed research effort, including the qualifications and experience of the research team, the various disciplines represented, and the relative level of effort proposed for professional, technical, and support staff.

Award Selection Factors

The award selection may not be based solely on the evaluation results. Award preference may be given to an innovative or creative approach that offers a potentially significant contribution to achieve the specific objectives of this cooperative research effort. Award preference may be given to a proposal with a larger percentage of cost sharing.

Terms and Conditions of the Award

1. The protection of the rights and welfare of human subjects in NHTSA-sponsored experiments is established in Department of Transportation 49 CFR Part 11 and in NHTSA Orders 700–1, 700–3, and 700–4. Any recipient must satisfy the requirements and guidelines

of 49 CFR part 101 and the NHTSA Orders 700 series prior to award of the cooperative agreement. A copy of 49 CFR part 11 and the NHTSA 700 series may be obtained from the programmatic information contact designated in this notice.

2. Prior to award, each recipient must comply with the certification requirements of 49 CFR part 29—Department of Transportation Government-wide Department and Suspension (Nonprocurement) and Government-wide Requirements for Drug-Free Workplace (Grants), as well as 49 CFR part 20— Department of Transportation New Restrictions on Lobbying.

3. During the effective period of the cooperative agreement(s) awarded as a result of this notice, each agreement shall be subject to the general administrative requirements of OMB Circular A–110, the cost principles of OMB Circular A–21, A–122, or FAR 31.2 as applicable to the recipient, the requirements of 49 CFR parts 20 and 29, and the NHTSA General Provisions for Assistance Agreements.

Issued on: May 20, 1994.

George L. Parker,

Associate Administrator for Research and Development.

[FR Doc. 94–13457 Filed 6–1–94; 8:45 am]

BILLING CODE 4910–59–P

[Docket No. 94–46; Notice 1]

Notice of Receipt of Petition for Determination That Nonconforming 1988 Volkswagen Golf Passenger Cars Are Eligible for Importation

AGENCY: National Highway Traffic Safety Administration, DOT.

ACTION: Notice of receipt of petition for determination that nonconforming 1988 Volkswagen Golf passenger cars are eligible for importation.

SUMMARY: This notice announces receipt by the National Highway Traffic Safety Administration (NHTSA) of a petition for a determination that a 1988 Volkswagen Golf that was not originally manufactured to comply with all applicable Federal motor vehicle safety standards is eligible for importation into the United States because (1) it is substantially similar to a vehicle that was originally manufactured for importation into and sale in the United States and that was certified by its manufacturer as complying with the safety standards, and (2) it is capable of being readily modified to conform to the standards.

DATES: The closing date for comments on the petition is July 5, 1994.

ADDRESSES: Comments should refer to the docket number and notice number, and be submitted to: Docket Section, room 5109, National Highway Traffic Safety Administration, 400 Seventh St., SW., Washington, DC 20590. [Docket hours are from 9:30 am to 4 pm]

FOR FURTHER INFORMATION CONTACT: Ted Bayler, Office of Vehicle Safety Compliance, NHTSA (202–366–5306).

SUPPLEMENTARY INFORMATION:

Background

Under section 108(c)(3)(A)(i) of the National Traffic and Motor Vehicle Safety Act (the Act), 15 U.S.C. 1397(c)(3)(A)(i), a motor vehicle that was not originally manufactured to conform to all applicable Federal motor vehicle safety standards shall be refused admission into the United States on and after January 31, 1990, unless NHTSA has determined that the motor vehicle is substantially similar to a motor vehicle originally manufactured for importation into and sale in the United States, certified under section 114 of the Act, and of the same model year as the model of the motor vehicle to be compared, and is capable of being readily modified to conform to all applicable Federal motor vehicle safety standards.

Petitions for eligibility determinations may be submitted by either manufacturers of importers who have registered with NHTSA pursuant to 49 CFR part 592. As specified in 49 CFR 593.7, NHTSA publishes notice in the Federal Register of each petition that it receives, and affords interested persons an opportunity to comment on the petition. At the close of the comment period, NHTSA determines, on the basis of the petition and any comments that it has received, whether the vehicle is eligible for importation. The agency then publishes this determination in the Federal Register.

J.K. Motors of Kingsville, Maryland ("J.K.") (Registered Importer R–90–006) has petitioned NHTSA to determine whether 1988 Volkswagen Golf passenger cars are eligible for importation into the United States. The vehicle which J.K. believes is substantially similar is the 1988 Volkswagen Golf that was manufactured for important into, and sale in, the United States and certified by its manufacturer, Volkswagenwerk A.G., as conforming to all applicable Federal motor vehicle safety standards.

The petitioner claims that it carefully compared the non-U.S. certified 1988 Volkswagen Golf to its U.S. certified counterpart, and found the two vehicles to be substantially similar with respect to compliance with most Federal motor vehicle safety standards.

J.K. submitted information with its petition intended to demonstrate that the non-U.S. certified 1988 Volkswagen Golf, as originally manufactured, conforms to many Federal motor vehicle safety standards in the same manner as its U.S. certified counterpart, or is capable of being readily modified to conform to those standards.

Specifically, the petitioner claims that the non-U.S. certified 1988 Volkswagen Golf is identical to its U.S. certified counterpart with respect to compliance with Standards Nos. 102 *Transmission Shift Lever Sequence * * **, 103 *Defrosting and Defogging Systems*, 104 *Windshield Wiping and Washing Systems*, 105 *Hydraulic Brake Systems*, 106 *Brake Hoses*, 107 *Reflecting Surfaces*, 109 *New Pneumatic Tires*, 113 *Hood Latch Systems*, 116 *Brake Fluid*, 124 *Accelerator Control Systems*, 201 *Occupant Protection in Interior Impact*, 202 *Head Restraints*, 203 *Impact Protection for the Driver From the Steering Control System*, 204 *Streering Control Rearward Displacement*, 205 *Glazing Materials*, 206 *Door Locks and Door Retention Components*, 207 *Seating System*, 209 *Seat Belt Assemblies*, 210 *Seat Belt Assembly Anchorages*, 211 *Wheel Nuts, Wheel Discs and Hubcaps*, 212 *Windshield Retention*, 216 *Roof Crush Resistance*, 219 *Windshield Zone Intrusion*, 301 *Fuel System Integrity*, and 302 *Flammability of Interior Materials*.

Petitioner also contends that the vehicle is capable of being readily modified to meet the following standards, in the manner indicated:

Standard No. 101 *Controls and Displays:* (a) Substitution of a lens marked "Brake" for a lens with an ECE symbol on the brake failure indicator lamp; (b) recalibration of the speedometer/odometer from Kilometers to miles per hour.

Standard No. 108 *Lamps, Reflective Devices and Associated Equipment:* (a) Installation of U.S.—model headlamp assemblies which incorporate sealed beam headlamps and front sidemarkers; (b) installation of U.S.—model taillamp assemblies which incorporate rear sidemarkers; (c) installation of a high mounted stop lamp; (d) replacement of bulb failure modules with U.S.—model components.

Standard No. 110 *Tire Selection and Rims:* installation of a tire information placard.

Standard No. 111 *Rearview Mirror:* replacement of the passenger side

rearview mirror with a U.S.-model component.

Standard No. 114 *Theft Protection:* installation of a key microswitch in the steering lock assembly, and a warning buzzer.

Standard No. 115 *Vehicle Identification Number:* installation of a VIN plate that can be read from outside the left windshield pillar, and VIN reference label on the edge of the door or latch post nearest the driver.

Standard No. 118 *Power-Operated Window Systems:* installation of a relay in the wiring for the power window system so that the window transport is inoperative when the ignition is turned off.

Standard No. 208 *Occupant Crash Protection:* installation of a seat belt warning buzzer, wired to the seatbelt latch.

Standard No. 214 *Side Door Strength:* installation of doorbars.

Additionally, the petitioner states that the bumpers on the 1988 Volkswagen Golf must be reinforced to comply with the Bumper Standard found in 49 CFR part 581.

Interested persons are invited to submit comments on the petition described above. Comments should refer to the docket number and be submitted to: Docket Section, National Highway Traffic Safety Administration, Room 5109, 400 Seventh Street, S.W., Washington, DC 20590. It is requested but not required that 10 copies be submitted.

All comments received before the close of business on the closing date indicated above will be considered, and will be available for examination in the docket at the above address both before and after that date. To the extent possible, comments filed after the closing date with also be considered. Notice of final action on the petition will be published in the **Federal Register** pursuant to the authority indicated below.

Authority: 15 U.S.C. 1397(c)(3)(A)(i)(I) and (C)(ii); 49 CFR 593.8; delegations of authority at 49 CFR 1.50 and 501.8.

Issued on: May 26, 1994.

William A. Boehly,

Associate Administrator for Enforcement.

[FR Doc. 94–13325 Filed 6–1–94; 8:45 am]

BILLING CODE 4910–59–M

Sunshine Act Meetings

Federal Register
Vol. 59, No. 105
Thursday, June 2, 1994

This section of the FEDERAL REGISTER contains notices of meetings published under the "Government in the Sunshine Act" (Pub. L. 94-409) 5 U.S.C. 552b(e)(3).

FEDERAL ELECTION COMMISSION

"FEDERAL REGISTER" NUMBER: 93–13101.

PREVIOUSLY ANNOUNCED DATE AND TIME: Thursday, June 2, 1994, 10 a.m., meeting open to the public.

The following items were deleted from the Agenda:

Convention Regulations: Final Rules and Explanation and Justification
Foreign Nationals Brochure

The following items were added to the agenda:

Advisory Opinion 1994–9: Grant S. Cowan on behalf of Armco Steel Company, L.P. (continued from meeting of May 26, 1994)
Advisory Opinion 1994–11: Alan R. Kidston of FMC Corporation (continued from meeting of May 26, 1994)
Advisory Opinion 1994–13: Peter Bagatelos on behalf of Voter Education Project (continued from meeting of May 26, 1994)

DATE & TIME: Tuesday, June 7, 1994 at 10 a.m.

PLACE: 999 E Street, NW., Washington, DC.

STATUS: This meeting will be closed to the public.

ITEMS TO BE DISCUSSED:
Compliance matters pursuant to 2 U.S.C. §437g
Audits conducted pursuant to 2 U.S.C. §437g, §438(b), and title 26, U.S.C.
Matters concerning participation in civil actions or proceedings or arbitration
Internal personnel rules and procedures or matters affecting a particular employee
Briefing on Allocation Regulations

DATE AND TIME: Thursday, June 9, 1994 at 10 a.m.

PLACE: 999 E Street, NW., Washington, DC (Ninth Floor).

STATUS: This meeting will be open to the public.

ITEMS TO BE DISCUSSED:
Draft Final Rules Implementing the Commission's Responsibilities under the National Voter Registration Act, with Statement of Basis and Purpose
Administrative Matters

DATE AND TIME: Thursday, June 9, 1994 at 10 a.m.

PLACE: 999 E Street, NW., Washington, DC (Ninth Floor).

STATUS: This meeting will be open to the public.

ITEMS TO BE DISCUSSED:
Correction and Approval of Minutes
Advisory Opinion 1994–14: Scott Lehman of Tsakanikas for U.S. Congress
Administrative Matters

PERSON TO CONTACT FOR INFORMATION: Mr. Fred Eiland, Press Officer, Telephone: (202) 219–4155.

Delores Hardy,
Administrative Assistant.

[FR Doc. 94–13590 Filed 5–31–94; 3:22 pm]
BILLING CODE 6715–01–M

NATIONAL SCIENCE FOUNDATION, NATIONAL SCIENCE BOARD

DATE AND TIME:

June 9, 1994, 10 a.m., closed session.
June 9, 1994, 10:05 a.m., open session.
June 10, 1994, 8:30 a.m., open session.

PLACE: National Science Foundation, 4201 Wilson Boulevard, Room 1235, Arlington, Virginia 22230.

STATUS: Part of this meeting will be open to the public. Part of this meeting will be closed to the public.

MATTERS TO BE CONSIDERED:

Thursday, June 9, 1994

Closed session (10 a.m.–10:05 a.m.): Minutes from May Meeting
Open session (10:05 a.m.–12:00 p.m.) and (1:30 p.m.–5:30 p.m.): Minutes from May Meeting; Chairman's Report; Director's Report; and Long-Range Planning

Friday, June 10, 1994

Open session (8:30 a.m.–12 p.m.): Long-Range Planning: Continued; and Other Business/Adjourn

Marta Cehelsky,
Executive Officer.

[FR Doc. 94–13497 Filed 5–31–94; 10:29 am]
BILLING CODE 7555–01–M

Federal Register

Thursday
June 2, 1994

Part II

Department of Labor

Occupational Safety and Health Administration

29 CFR Parts 1910, 1917, and 1918
Longshoring and Marine Terminals; Proposed Rule

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Parts 1910, 1917, and 1918

[Docket No. S–025]

Longshoring and Marine Terminals

AGENCY: Occupational Safety and Health Administration (OSHA).

ACTION: Proposed rule; Notice of informal public hearings.

SUMMARY: The Occupational Safety and Health Administration (OSHA) proposes to revise its Safety and Health Regulations for Longshoring and, to a far lesser extent, to amend its Safety and Health Regulations for Marine Terminals. The proposed rule covers cargo handling and related activities conducted aboard vessels and at Marine Terminals. The proposed amendments to the Marine Terminals standard are intended primarily to provide regulatory consistency with the proposed Longshoring ship-board rules. The proposed rules would be "vertical" standards which apply to longshoring and marine terminal activities only, except for those general industry provisions referenced within this proposed rule.

This proposal contains requirements for longshoring and marine terminal operations; the testing and certification of specific types of cargo lifting appliances and associated auxiliary gear; other cargo handling equipment such as conveyors and industrial trucks; access to vessels; working surfaces; and personal protective equipment. Additionally, specialized longshoring operations such as containerized cargo, roll-on roll-off (Ro-Ro) and menhaden are specifically addressed.

The principal hazards addressed by this proposal are injuries and accidents associated with cargo lifting gear, vehicular cargo transferral, manual cargo handling, hazardous atmospheres and materials, and finally, those hazards posed by the more modern and sophisticated cargo handling methods brought about by intermodalism.

This provides notice of OSHA's intent to schedule informal public hearings on OSHA's proposed rulemaking on Longshoring and the related Marine Terminal provisions.

DATES: Written comments on the standard must be postmarked on or before September 23, 1994. Notices of intention to appear at the informal public hearings must be postmarked by August 24, 1994.Written comments, testimony, and all evidence which will be offered into the hearing record must be postmarked by 21 days prior to the date of the hearing to be attended. The hearings will begin at 9:30 a.m. and be held in the following cities, beginning on the following dates:

Charleston, South Carolina on September 20, 1994;

Seattle, Washington on October 19, 1994; and

New Orleans, Louisiana on November 15, 1994.

Requests for public hearings in locations other than the above must be received by July 11, 1994.

Parties who request more than 10 minutes for their presentation at the informal public hearing and parties who will submit documentary evidence at the hearing must submit the full text of their testimony and all documentary evidence, postmarked on or before 21 days prior the date of the hearing to be attended.

ADDRESSES: Written comments and requests for additional hearings should be submitted to the Docket Office, Docket S–025, Room N–2625, U.S. Department of Labor, Occupational Safety and Health Administration, 200 Constitution Avenue, N.W., Washington, D.C. 20210. Telephone: (202) 219-7894. Comments of 10 pages or less may be faxed to the Docket Office, if followed by a hard copy. The OSHA Docket Office fax number is (202) 219–5046.

Notice of intention to appear, testimony and documentary evidence to be submitted at the hearing are to be sent to Mr. Tom Hall, OSHA Division of Consumer Affairs, Docket No. S–025, Room N–3647, U.S. Department of Labor, 200 Constitution Avenue N.W., Washington, DC 20210, telephone (202) 219–8615.

Actual addresses for the locations of the regional hearings in Charleston, South Carolina, Seattle, Washington, and New Orleans, Louisiana will be announced in a later Federal Register document.

FOR FURTHER INFORMATION CONTACT: Mr. James F. Foster, Director, Office of Information and Consumer Affairs, OSHA, U.S. Department of Labor, Room N–3647, 200 Constitution Avenue, N.W., Washington, D.C. 20210. Telephone (202) 219–8148.

SUPPLEMENTARY INFORMATION

I. Background

As a result of the high number and serious nature of accidents occurring to port workers in the United States, Congress, in 1958, amended the Longshore and Harborworker's Compensation Act (LHWCA) (33 U.S.C. 901 *et seq.*) to provide a large segment of port based employees with a safer work environment. The amendments (P.L. 85–742, 72 Stat. 835) significantly strengthened Section 41 of the LHWCA (33 U.S.C. 941) by requiring employers covered by that Act to "furnish, maintain and use" equipment, and to establish safe working conditions in accordance with regulations promulgated by the Secretary of Labor. Two years later, the Labor Standards Bureau (LSB) of the Department of Labor issued the first set of safety and health regulations for longshoring activities as 29 CFR part 9 (25 FR 1565). These standards were amended on several occasions between 1960 and 1971. Since 1971, there have been no substantive changes to these provisions.

The Occupational Safety and Health Act of 1970 (the Act) (29 U.S.C. 650 *et seq.*), which established the Occupational Safety and Health Administration (OSHA), directed the Secretary of Labor to adopt, under the authority conferred by section 6(a) of the Act, "Any established Federal standard" as an OSHA standard during the first 2 years of the Act. The Longshoring standards, then codified as 29 CFR part 1504, were adopted by OSHA under section 6(a) in 1971, and were recodified as 29 CFR part 1918.

The longshoring industry has changed dramatically since 1971. The methods of cargo handling and the equipment associated with those methods have undergone significant modification. Vessels designed specifically for the carriage of intermodal containers, vehicular rolling stock, and even barges, are now the most common types of ships calling at U.S. ports. By contrast, the established Longshoring standard was designed largely for activities being conducted using methods and equipment that have been overshadowed or replaced by more modern methods of cargo handling. The proposal being published today will seek to modernize OSHA's regulatory approach to deal with these changes in the industry. It is important to consider, however, that some of the older, more conventional vessel configurations, equipped with features and aspects that are addressed in the current standard, continue to call at U.S. ports. For that reason, the Agency will retain in this proposal a number of provisions whose utility, although diminished, will continue to be necessary. Nevertheless, the Agency requests the public to comment on certain provisions that it considers obsolete and no longer in use. For example, the Agency is considering deleting the provisions that address the

manually lowering or topping of booms based on a determination that these operations are no longer performed as a part of longshoring work.

On July 5, 1983, OSHA published its final rule for Marine Terminals (48 FR 30886)(Ex. 1–101). These rules were designed to address the shoreside segment of marine cargo handling. Since the Marine Terminal standards currently address equipment and situations (i.e., powered industrial trucks; conveyors; passage between levels and across openings; etc.) that have shipboard counterparts, appropriate provisions from those standards are incorporated into this proposal for shipboard cargo handling, as well. Accordingly, the Agency will rely upon background material and data used to substantiate OSHA's rule for Marine Terminals, and incorporates the docket (S–506) developed in that rulemaking.

This proposal seeks to provide a practical continuity as it addresses the more conventional and time proven methods of cargo handling along with those more modern and revolutionary. The Agency welcomes all suggestions on how to better meet this goal.

Longshoring Hazards

Traditionally, the longshore industry has been notable in terms of its accident experience. The work environment found in the marine cargo handling sector exposes workers to a greater risk of injury than is true for most other industries. In fact, in the last calendar year for which industrial illnesses and accidents are fully tabulated, this industrial sector had one of the highest rate of lost workdays in the nation. The following tables found in BLS reports (Exs. 1–109, 1–110, 1–111, 1–112, and1–113) are useful in making a comparative assessment:

Table A

Total of lost workdays (rate per 100 full time employees)	1985	1986	1987	1988	1989	1990	1991
Private sector	64.9	65.8	69.9	76.1	78.7	84.0	86.5
Construction	129	134	136	142	143	148	148
SIC 446 (449)	350	405	422	436	343	284	329

Note: These 1988 to 1991 figures are based on SIC Code 449, which includes water transportation. It should be noted that the SIC Code for water transportation was changed from 446 to 499 in 1987.

Table B

Total cases (rate per 100 full-time employees)	1985	1986	1987	1988	1989	1990	1991
Private sector	7.9	7.9	8.3	8.6	8.6	8.8	8.4
Construction Trades	15.2	15.2	14.7	14.6	14.3	14.2	13.0
SIC 446 (449)	16.3	18.0	17.0	14.5	14.7	13.5	13.9

Note: These 1988 to 1991 figures are based on SIC Code 449, which includes water transportation. It should be noted that the SIC Code for water transportation was changed from 446 to 449 in 1987.

In 1985, OSHA requested the Bureau of Labor Statistics (BLS) to initiate a survey that could be used to develop common aspects of accidents occurring within the current longshore sector (Ex. 1–73). This survey helped to point out that in spite of the increases in automation that have occurred in the industry, injuries and lost workday cases continue to remain high and the break bulk type of operation still accounts for a major portion of the injuries that occur aboard ship.

OSHA sought to validate even further the conclusions it could draw, both from this survey and from regularly published BLS occupational safety and health statistics. In so doing, the Agency reviewed data published in *Seafarer* magazine (April 1987). In an article entitled "WGMA reports safety statistics for 85–86 contract year" (Ex. 1–14), that periodical listed a number of pertinent figures that serve to corroborate the other accident information OSHA has secured. The West Gulf Report, prepared by Mr. Hal Draper, Director of Safety, Health and Training for the West Gulf Maritime Association, addressed the accident experience of several ports from Lake Charles, Louisiana to Brownsville, Texas. Quoting directly from the article:

West Gulf Report. Draper's report on West Gulf longshore accidents during the 1985–86 contract year covered a total of 1,192 incidents.

According to his analysis, 70% of the accidents occurred on board ships; the remaining 30% on the dock or in the warehouse/terminal. Cargo was involved in 30% of the accidents, 64% of which involved sacks/bags, and 12% steel/pipe. Two hundred and forty of the incidents (20%) involved the individual being struck by a moving object; 221 (19%) resulted from lifting, pushing, pulling or bodily reaction; 208 (17%) from falls from the same level-slip or trip; 142 (12%) from striking against, or stepping/jumping on an object; 130 (11%) from being struck by a falling object; and 109 (9%) from being caught in, under, or between objects. Thirteen percent of all accidents involved stevedore gear/equipment.

Another way the Agency attempted to identify the major sources of longshoring accidents for rulemaking purposes was to examine a number of fatal or near fatal accidents reported to OSHA from this industry sector during the period July 1972–March 1992. In conducting this analysis, OSHA examined these case files to determine the precise cause of the accident. A brief summary of a few of the more than 250 such accidents reviewed is provided below.

Boston, Massachusetts—August 1974. A longshoreman, seriously injured while working in the hold of a bulk cargo vessel, was placed aboard a stokes basket stretcher to be transported ashore by the vessel's cargo hoisting gear. The stokes basket had no effective means to secure the injured worker to the stretcher. While in transit, the injured worker fell out of the litter, back into the hold (Ex. 1–90).

Port Elizabeth, New Jersey—June 1978. One employee was killed and one seriously injured when an intermodal container lifting beam, being lowered to hoist the container both men were standing on, suddenly fell. The device, weighing in excess of 4 tons, crushed both employees. Compliance with proposed §1918.81(k) would have prevented this accident (Ex. 1–87).

Port Newark, New Jersey—August 1976. An employee aboard an elevator Ro-Ro ship, while in the process of discharging automobiles, drove into what was thought to be an available elevator to gain access to the ramp or discharge deck. The elevator was

actually at a higher deck. The employee and vehicle fell into the shaft and down three decks. Barricading of the open deck spaces could have prevented this accident (Ex. 1–88).

San Juan, Puerto Rico—August 1978. An employee aboard a seagoing, multi-deck Ro-Ro barge was run over and killed by a tractor trailer while the trailer was being maneuvered into its stowage position. No signalman was provided to protect employees from the hazard that ultimately killed this lasher (an employee engaged in securing cargo). Additionally, illumination was severely lacking within the confines of the vessel's below deck cargo spaces. The use of proper illumination and a signaller for this operation could have prevented the fatality (Ex. 1–89).

Port Elizabeth, New Jersey—August 1984. Two workers, while driving in a vehicle within a large Ro-Ro vessel, fell from the end of an elevated internal ramp back down to deck level. These employees thought the ramp could take them to the next higher deck, however, the ramp was not so positioned. The car they were operating landed on its roof. One employee was killed, the other was injured. Barricading of the ramp could have prevented this accident (Ex. 1–86).

Houston, Texas—July 1987. Two longshoremen were killed while positioned atop a deck stowed intermodal container. As they were performing their work, an empty forty foot container being passed over their heads became disengaged from the lifting gear and fell on them. These fatalities could have been prevented if the employees had stayed clear of the overhead drafts (Ex. 1–74).

Port of Los Angeles, California—March, 1992. One longshoreman was killed while working on top of a stack of containers on the deck of a container vessel. A container top safety device was available, but the longshoreman was not attached to it. The safety device, which was attached to the container crane spreader bar, moved and became hung up. When it released, it catapulted the longshoreman off of the stack of containers and onto the dock. This incident could have been prevented if the employee had not been working on the top of the container, or had been using fall protection if it were necessary to be working there (Ex. 1–108).

Based on the BLS data, the West Gulf Maritime Association's accident analysis, and OSHA's own analysis of fatal or near fatal accidents in the cargo handling industry , OSHA concludes that regulatory action is necessary in order to meet its mandate under the Act. See Section III, Statutory Considerations, below, for a complete discussion of OSHA's "significant risk" findings.

II. General Format of the Standard

A. Vertical vs. Horizontal Standards

This proposed Longshoring standard has been drafted in a manner that will allow it to stand by itself, i.e., to be a "vertical" standard. Vertical standards are those that apply specifically to a given industry, in lieu of any other OSHA standard. In several areas of coverage specified in the proposal's scope section, OSHA's General Industry standards are incorporated by reference. This approach follows OSHA's other marine cargo handling standard, Marine Terminals, 29 CFR part 1917 (48 FR 30886). Vertical standards can encourage voluntary compliance because they are directed to the particular problems of the industry, and because they only contain provisions that are appropriate to the industry in question. On the other hand, since many industries covered by OSHA do in fact use the same or similar equipment and processes, and therefore have employees who are exposed to the same hazards, it is usually a more efficient use of the Agency's resources to develop "horizontal" standards (those applying across industry lines). It is also more efficient to train field personnel in general safety programs tailored to the horizontal General Industry standards than to train field staff in individual programs designed for specific industries.

In 1983, OSHA promulgated a vertical standard for the shoreside aspect of marine cargo handling (48 FR 30886)—OSHA's rules for Marine Terminals. As was the case in that rulemaking, the Agency is proposing the inclusion of a list of applicable General Industry standards which will supplement the specific provisions in part 1918. This provides coverage for hazards for which the marine cargo handling industry is neither unique nor different from other industries. As an example, OSHA proposes to adopt by reference §1910.95, titled "occupational noise exposure." The detrimental effects of prolonged high levels of noise is the same whether the exposure takes place aboard a vessel or in a factory. The exposure may not be as constant or the workforce may not be subjected to the same type of noise day after day, however the potential for overexposure is there. OSHA does not feel it is necessary to write a "vertical" standard that covers exposure to noise when the General Industry standard will suffice. This is entirely consistent with the current coverage provided by OSHA rules for Marine Terminals (part 1917).

The majority of this proposed Longshore standard is a "vertical" standard. The work environment aboard ship is unique in many respects. Longshore workers must continually work in the harsh environment of the waterfront, which requires exposure both to work-related hazards, such as falling cargo, and to environmental hazards, such as drowning and working around machinery in bad weather. Longshore workers perform some of the same high-hazard tasks, and confront many of the same heavy-industry hazards, as those typically associated with the construction industry. Examples of such hazards include falls, and crushing and caught-in injuries. Cargo handling and construction work are also both weather-dependent and have a high proportion of part-time and transient employees. The extremely high occupational injury and illness incidence rates for the marine cargo handling industry, mentioned in the previous section, testify to the hazardous nature of the longshoring industry.

OSHA has decided to continue a vertical standard for many aspects of this high-hazard industry, supplemented by general industry standards where necessary and appropriate. The Agency believes that this approach is necessary to adequately address the unique hazards and working conditions of this industry. OSHA also has a vertical standard for the construction industry (29 CFR part 1926), another hazardous industry with a large workforce.

OSHA solicits comments both as to the merits and the limitations of a vertical standard for longshoring operations.

B. Performance vs. Specification

The format and substance of this standard reflect OSHA's effort to eliminate unnecessary regulations and to simplify and update others. To achieve these goals, the Agency has adopted a performance approach to writing new rules and revising existing ones. A performance-based standard identifies a hazard and the level of control required to protect against the hazard, without specifying the precise means of achieving such control, while a specification standard stipulates design and construction criteria to be met to achieve a particular safety objective. The lack of flexibility in many specification standards fails to take into account the adequacy of many existing operations and work practices and discourages innovation. In keeping with

OSHA's commitment to clarity, flexibility, and in order to encourage employers to comply with the standards, this longshore industry proposal has adopted the performance approach except in those cases in which employee safety would be enhanced by more specific requirements. The Agency is interested in receiving comments from persons who feel that certain of the proposed provisions would benefit from a greater degree of specification or from a more goal-oriented approach.

III. Statutory Considerations

A. *Introduction.* Throughout this proposal, OSHA describes the hazards confronted by employees who are engaged in longshoring activities and the measures required to protect affected employees from those hazards. The Agency is providing the following discussion of the statutory mandate for OSHA rulemaking activity to explain the legal basis for its determination that the Longshoring standard, as proposed, is reasonably necessary to protect affected employees from significant risks of injury and death.

Section 2(b)(3) of the Occupational Safety and Health Act authorizes "the Secretary of Labor to set mandatory occupational safety and health standards applicable to businesses affecting interstate commerce", and section 5(a)(2) provides that "each employer shall comply with occupational safety and health standards promulgated under this Act" (emphasis added). Section 3(8) of the OSH Act (29 U.S.C. § 652(8)) provides that:

> . . . the term 'occupational safety and health standard' means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

In two recent cases, reviewing courts have expressed concern that OSHA's interpretation of these provisions of the OSH Act, particularly of section 3(8) as it pertains to safety rulemaking, could lead to overly costly or under-protective safety standards. In *International Union, UAW v. OSHA*, 938 F.2d 1310 (D.C. Cir. 1991), the District of Columbia Circuit rejected substantive challenges to OSHA's lockout/tagout standard and denied a request that enforcement of that standard be stayed, but it also expressed concern that OSHA's interpretation of the OSH Act could lead to safety standards that are very costly and only minimally protective. In *National Grain & Feed Association v. OSHA*, 866 F.2d 717 (5th Cir. 1989), the Fifth Circuit concluded that Congress gave OSHA considerable discretion in structuring the costs and benefits of safety standards but, concerned that the grain dust standard might be under-protective, directed OSHA to consider adding a provision that might further reduce significant risk of fire and explosion.

OSHA rulemakings involve a significant degree of agency expertise and policy-making discretion to which reviewing courts must defer. (See for example, *Building & Constr. Trades Dept. AFL-CIO v. Brock*, 838 F.2d 1258, 1266 (D.C. Cir. 1988); *Industrial Union Dept. AFL-CIO v. American Petroleum Inst.*, 448 U.S. 607, 655 n. 62 (1980).) At the same time, the Agency's technical expertise and policy-making authority must be exercised within discernable parameters. The lockout/tagout and grain handling standard decisions sought from OSHA more clarification on the agency's view of the scope of those parameters. In light of those decisions, OSHA believes it would be useful to include in the preamble to this proposed safety standard a statement of its view of the limits of its safety rulemaking authority and to explain why it is confident that its interpretive views have in the past avoided regulatory extremes and continue to do so in this rule.

Stated briefly, the OSH Act requires that, before promulgating any occupational safety standard, OSHA demonstrate based on substantial evidence in the record as a whole that: (1) the proposed standard will substantially reduce a significant risk of material harm; (2) compliance is technologically feasible in the sense that the protective measures being required already exist, can be brought into existence with available technology, or can be created with technology that can reasonably be developed; (3) compliance is economically feasible in the sense that industry can absorb or pass on the costs without major dislocation or threat of instability; and (4) the standard is cost effective in that it employs the least expensive protective measures capable of reducing or eliminating significant risk. Additionally, proposed safety standards must be compatible with prior agency action, must be responsive to significant comment in the record, and, to the extent allowed by statute, must be consistent with applicable Executive Orders. These elements limit OSHA's regulatory discretion for safety rulemaking and provide a decision-making framework for developing a rule within their parameters.

B. Congress concluded that OSHA regulations are necessary to protect workers from occupational hazards and that employers should be required to reduce or eliminate significant workplace health and safety threats. At section 2(a) of the OSH Act (29 U.S.C. § 651(a)), Congress announced its determination that occupational injury and illness should be eliminated as much as possible: "The Congress finds that occupational injury and illness arising out of work situations impose a substantial burden upon, and are a hindrance to, interstate commerce in terms of lost production, wage loss, medical expenses, and disability compensation payments." Congress therefore declared "it to be its purpose and policy ... to assure so far as possible every working man and woman in the Nation safe ... working conditions [29 U.S.C. § 651(b)]."

To that end, Congress instructed the Secretary of Labor to adopt existing Federal and consensus standards during the first two years after the OSH Act became effective and, in the event of conflict among any such standards, to "promulgate the standard which assures the greatest protection of the safety or health of the affected employees [29 U.S.C. § 655(a)]." Congress also directed the Secretary to set mandatory occupational safety standards [29 U.S.C. § 651(b)(3)], based on a rulemaking record and substantial evidence [29 U.S.C. § 655(b)(2)], that are "reasonably necessary or appropriate to provide safe ... employment and places of employment." When promulgating permanent safety or health standards that differ from existing national consensus standards, the Secretary must explain "why the rule as adopted will better effectuate the purposes of this Act than the national consensus standard [29 U.S.C. § 655(b)(8)]." Correspondingly, every employer must comply with OSHA standards and, in addition, "furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees [29 U.S.C. § 654(a)]."

"Congress understood that the Act would create substantial costs for employers, yet intended to impose such costs when necessary to create a safe and healthful working environment. Congress viewed the costs of health and safety as a cost of doing business.... Indeed, Congress thought that the financial costs of health and safety problems in the workplace were as large as or larger than the financial costs of eliminating these problems [*American*

Textile Mfrs. Inst. Inc. v. Donovan, 452 U.S. 490, 519–522 (1981) (ATMI); emphasis was supplied in original]." "[T]he fundamental objective of the Act [is] to prevent occupational deaths and serious injuries [*Whirlpool Corp. v. Marshall*, 445 U.S. 1, 11 (1980)]." "We know the costs would be put into consumer goods but that is the price we should pay for the 80 million workers in America [S. Rep. No. 91–1282, 91st Cong., 2d Sess. (1970); H.R. Rep. No. 91–1291, 91st Cong., 2d Sess. (1970), reprinted in Senate Committee on Labor and Public Welfare, Legislative History of the Occupational Safety and Health Act of 1970, (Committee Print 1971) ('Leg. Hist.') at 444 (Senator Yarborough)]." "Of course, it will cost a little more per item to produce a washing machine. Those of us who use washing machines will pay for the increased cost, but it is worth it, to stop the terrible death and injury rate in this country [*Id.* at 324; see also 510–511, 517]."

[T]he vitality of the Nation's economy will be enhanced by the greater productivity realized through saved lives and useful years of labor. When one man is injured or disabled by an industrial accident or disease, it is he and his family who suffer the most immediate and personal loss. However, that tragic loss also affects each of us. As a result of occupational accidents and disease, over $1.5 billion in wages is lost each year [1970 dollars], and the annual loss to the gross national product is estimated to be over $8 billion. Vast resources that could be available for productive use are siphoned off to pay workmen's compensation and medical expenses....Only through a comprehensive approach can we hope to effect a significant reduction in these job death and casualty figures. [Id. at 518–19 (Senator Cranston)] Congress considered uniform enforcement crucial because it would reduce or eliminate the disadvantage that a conscientious employer might experience where inter-industry or intra-industry competition is present. Moreover, "many employers—particularly smaller ones—simply cannot make the necessary investment in health and safety, and survive competitively, unless all are compelled to do so [Leg. Hist. at 144, 854, 1188, 1201]."

Thus, the statutory text and legislative history make clear that Congress conclusively determined that OSHA regulation is necessary to protect workers from occupational hazards and that employers should be required to reduce or eliminate significant workplace health and safety threats.

C. As construed by the courts and by OSHA, the OSH Act sets a threshold and a ceiling for safety rulemaking that provide clear and reasonable parameters for agency action. OSHA has long followed the teaching that section 3(8) of the OSH Act requires that, before it promulgates "any permanent health or safety standard, [it must] make a threshold finding that a place of employment is unsafe—in the sense that significant risks are present and can be eliminated or lessened by a change in practices [*Industrial Union Dept., AFL-CIO v. American Petroleum Inst*, 448 U.S. 607, 642 (1980) (plurality) (Benzene); emphasis was supplied in original]." When, as frequently happens in safety rulemaking, OSHA promulgates standards that differ from existing national consensus standards, it must explain "why the rule as adopted will better effectuate the purposes of this Act than the national consensus standard [29 U.S.C. § 655(b)(8)]." Thus, national consensus and existing federal standards that Congress instructed OSHA to adopt summarily within two years of the OSH Act's inception provide reference points concerning the least an OSHA standard should achieve (29 U.S.C. § 655(a)).

As a result, OSHA is precluded from regulating insignificant safety risks or from issuing safety standards that do not at least lessen risk in a significant way.

The OSH Act also limits OSHA's discretion to issue overly burdensome rules, as the agency also has long recognized that "any standard that was not economically or technologically feasible would *a fortiori* not be 'reasonably necessary or appropriate' under the Act. See *Industrial Union Dept., v. Hodgson*, [499 F.2d 467, 478 (D.C. Cir. 1974)] ('Congress does not appear to have intended to protect employees by putting their employers out of business.') [American Textile Mfrs. Inst. Inc., 452 U.S. at 513 n. 31 (a standard is economically feasible even if it portends 'disaster for some marginal firms,' but it is economically infeasible if it 'threaten[s] massive dislocation to, or imperil[s] the existence of, the industry')]."

By stating the test in terms of "threat" and "peril," the Supreme Court made clear in ATMI that economic infeasibility begins short of industry-wide bankruptcy. OSHA itself has placed the line considerably below this level. (See for example, *ATMI*, 452 U.S. at 527 n. 50; 43 FR 27360 (June 23, 1978). Proposed 200 $\mu g/m^3$ PEL for cotton dust did not raise serious possibility of industry-wide bankruptcy, but impact on weaving sector would be severe, possibly requiring reconstruction of 90 percent of all weave rooms. OSHA concluded that the 200 $\mu g/m^3$ level was not feasible for weaving and that 750 $\mu g/m^3$ was all that could reasonably be required). See also 54 FR 29245–246 (July 11, 1989); American Iron & Steel Institute, 939 F.2d at 1003. OSHA raised engineering control level for lead in small nonferrous foundries to avoid the possibility of bankruptcy for about half of small foundries even though the industry as a whole could have survived the loss of small firms.) Although the cotton dust and lead rulemakings involved health standards, the economic feasibility ceiling established therein applies equally to safety standards. Indeed, because feasibility is a necessary element of a "reasonably necessary or appropriate" standard, this ceiling boundary is the same for health and safety rulemaking since it comes from section 3(8), which governs all permanent OSHA standards.

All OSHA standards must also be cost-effective in the sense that the protective measures being required must be the least expensive measures capable of achieving the desired end (ATMI, at 514 n. 32; *Building and Const. Trades Dept., AFL-CIO v. Brock*, 838 F.2d 1258, 1269 (D.C. Cir. 1988)). OSHA gives additional consideration to financial impact in setting the period of time that should be allowed for compliance, allowing as much as ten years for compliance phase-in. (See *United Steelworkers of America v. Marshall*, 647 F.2d 1189, 1278 (D.C. Cir. 1980), *cert. denied*, 453 U.S. 913 (1981).) Additionally, OSHA's enforcement policy takes account of financial hardship on an individualized basis. OSHA's Field Operations Manual provides that, based on an employer's economic situation, OSHA may extend the period within which a violation must be corrected after issuance of a citation (CPL. 2.45B, Chapter III, paragraph E6d(3)(a), Dec. 31, 1990).

To reach the necessary findings and conclusions that a safety standard substantially reduces a significant risk of harm, is both technologically and economically feasible, and is cost effective, OSHA must conduct rulemaking in accord with the requirements of section 6 of the OSH Act. The regulatory proceeding allows it to determine the qualitative and, if possible, the quantitative nature of the risk with and without regulation, the technological feasibility of compliance, the availability of capital to the industry and the extent to which that capital is required for other purposes, the industry's profit history, the industry's ability to absorb costs or pass them on to the consumer, the impact of higher costs on demand, and the impact on competition with substitutes and imports. (See ATMI at 2501–2503; American Iron & Steel Institute generally.) Section 6(f) of the OSH Act further provides that, if the validity of

a standard is challenged, OSHA must support its conclusions with "substantial evidence in the record considered as a whole," a standard that courts have determined requires fairly close scrutiny of agency action and the explanation of that action. (See *Steelworkers*, 647 F.2d at 1206–1207.)

OSHA's powers are further circumscribed by the independent Occupational Safety and Health Review Commission, which provides a neutral forum for employer contests of citations issued by OSHA for noncompliance with health and safety standards (29 U.S.C. §§ 659–661; noted as an additional constraint in Benzene at 652 n. 59). OSHA must also respond rationally to similarities and differences among industries or industry sectors. (See *Building and Construction Trades Dept., AFL-CIO v. Brock*, 838 F.2d 1258, 1272–73 (D.C. Cir. 1988).)

OSHA safety rulemaking is thus constrained first by the need to demonstrate that the standard will substantially reduce a significant risk of material harm, and then by the requirement that compliance is technologically capable of being done and not so expensive as to threaten economic instability or dislocation for the industry. Within these parameters, further constraints such as the need to find cost-effective measures and to respond rationally to all meaningful comment militate against regulatory extremes.

D. The proposed revisions of the Longshoring and Marine Terminal standards comply with the statutory criteria described above and are not subject to the additional constraints applicable to section 6(b)(5) standards.

Standards that regulate hazards that are frequently undetectable because they are subtle or develop slowly or after long latency periods, are frequently referred to as "health" standards. Standards that regulate hazards, like explosions or electrocution, that cause immediately noticeable physical harm, are called "safety" standards. (See *National Grain & Feed Assn., v. OSHA (NGFA II)*, 866 F.2d 717, 731, 733 (5th Cir. 1989). As noted above, section 3(8) provides that all OSHA standards must be "reasonably necessary or appropriate." In addition, section 6(b)(5) requires that OSHA set health standards which limit significant risk "to the extent feasible." OSHA has determined that the proposed revisions of the Longshore and Marine Terminal standards are safety standards, because these standards address hazards, such as falling, falling objects and crushing, that are immediately dangerous to life or health, not the longer term, less obvious hazards subject to section 6(b)(5).

The OSH Act and its legislative history clearly indicate that Congress intended for OSHA to distinguish between safety standards and health standards. For example in section 2(b)(6) of the OSH Act, Congress declared that the goal of assuring safe and healthful working conditions and preserving human resources would be achieved, in part:

... by exploring ways to discover latent diseases, establishing causal connections between diseases and work in environmental conditions, and conducting other research relating to health problems, in recognition of the fact that occupational health standards present problems often different from those involved in occupational safety. The legislative history makes this distinction even clearer:

[The Secretary] should take into account that anyone working in toxic agents and physical agents which might be harmful may be subjected to such conditions for the rest of his working life, so that we can get at something which might not be toxic now, if he works in it a short time, but if he works in it the rest of his life might be very dangerous; and we want to make sure that such things are taken into consideration in establishing standards. [Leg. Hist. at 502–503 (Sen. Dominick), quoted in *Benzene* at 648–49]. Additionally, Representative Daniels distinguished between "insidious 'silent killers' such as toxic fumes, bases, acids, and chemicals" and "violent physical injury causing immediate visible physical harm" (Leg. Hist. at 1003), and Representative Udall contrasted insidious hazards like carcinogens with "the more visible and well-known question of industrial accidents and on-the-job injury" (Leg. Hist. at 1004). (See also, for example, S.Rep. No. 1282, 91st Cong., 2d Sess 2–3 (1970), U.S. Code Cong. & Admin. News 1970, pp. 5177, 5179, reprinted in Leg. Hist. at 142–43, discussing 1967 Surgeon General study that found that 65 percent of employees in industrial plants "were potentially exposed to harmful physical agents, *such as severe noise or vibration*, or to toxic materials"; Leg.Hist at 412; *id.* at 446; *id.* at 516; *id.* at 845; International Union, UAW at 1315.)

In reviewing OSHA rulemaking activity, the Supreme Court has held that section 6(b)(5) requires OSHA to set "the most protective standard consistent with feasibility" (Benzene at 643 n. 48). As Justice Stevens observed:

The reason that Congress drafted a special section for these substances ... was because Congress recognized that there were special problems in regulating health risks as opposed to safety risks. In the latter case, the risks are generally immediate and obvious, while in the former, the risks may not be evident until a worker has been exposed for long periods of time to particular substances. [Benzene, at 649 n. 54.] Challenges to the grain dust and lockout/tagout standards included assertions that grain dust in explosive quantities and uncontrolled energy releases that could expose employees to crushing, cutting, burning or explosion hazards were harmful physical agents so that OSHA was required to apply the criteria of section 6(b)(5) when determining how to protect employees from those hazards. Reviewing courts have uniformly rejected such assertions. For example, the Court in *International Union, UAW v. OSHA*, 938 F.2d 1310 (D.C. Cir. 1991) rejected the view that section 6(b)(5) provided the statutory criteria for regulation of uncontrolled energy, holding that such a "reading would obliterate a distinction that Congress drew between 'health' and 'safety' risks." The Court also noted that the language of the OSH Act and the legislative history supported the OSHA position (International Union, UAW at 1314). Additionally, the Court stated: "We accord considerable weight to an agency's construction of a statutory scheme it is entrusted to administer, rejecting it only if unreasonable" (International Union, UAW at 1313, citing Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837, 843 (1984)).

The Court reviewing the grain dust standard also deferred to OSHA's reasonable view that the Agency was not subject to the feasibility mandate of section 6(b)(5) in regulating explosive quantities of grain dust (*National Grain & Feed Association v. OSHA* (NGFA II), 866 F.2d 717, 733 (5th Cir. 1989)). It therefore applied the criteria of section 3(8), requiring the Agency to establish that the standard is "reasonably necessary or appropriate" to protect section 3(8), requiring the Agency to establish that the standard is "reasonably necessary or appropriate" to protect employee safety.

As explained in Section I, Background, above, and Section V, Summary and Explanation of the Proposal and in Section VIII, Preliminary Regulatory Impact Analysis and Regulatory Flexibility Analysis, below, OSHA has determined that marine cargo handling activities pose significant risks to employees (18 fatalities and 7,593 injuries annually) and that the provisions of the proposed rule are reasonably necessary to protect affected employees from those risks. The Agency estimates that compliance with the proposed revisions of the Longshoring and Marine Terminal standards will cost $4.7 million the first year and $1.8 million annually thereafter and will reduce the risk of the identified hazards (preventing 3 fatalities and 1,262 injuries annually). This constitutes a substantial reduction of significant risk of material harm for the population at risk of approximately 93,000 employees. The Agency believes that compliance is technologically feasible because all of the provisions of the proposed standard can be met by using currently available equipment.

facilities, supplies, and work practices. Additionally, OSHA believes that compliance is economically feasible, because, as documented in the Regulatory Impact Analysis, all regulated sectors can readily absorb or pass on compliance costs during the standard's first five years, and economic benefits will exceed compliance costs thereafter.

As detailed in Section VIII, Preliminary Regulatory Impact Analysis and Regulatory Flexibility Analysis and Table 1, below, the standard's costs, benefits, and compliance requirements are consistent with those of other OSHA safety standards, such as the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard.

Standard (CFR cite)	Final rule date (FR cite)	Number of deaths prevented annually	Number of injuries prevented annually	Annual cost first five yrs (mill)	Annual cost next five yrs (mill)
Grain handling (1910.272)	12–31–87 (52 FR 49622)	18	394	5.9 to 33.4	5.9 to 33.4
HAZWOPER (1910.120)	3–6–89 (54 FR 9311)	32	18,700	153	153
Excavations (Subpt P)	10–31–89 (54 FR 45,954)	74	800	306	306
Process Safety Mgmt (1910.119)	2–24–92 57 FR 6356	330	1,917	880.7	470.8
Permit-Required Confined Spaces (1910.146)	1–14–93 58 FR 4462	54	5,041	202.4	202.4

OSHA assessed employee risk by evaluating exposure to marine cargo handling hazards. The Agency acknowledges that some industries covered by the proposed revisions of the Longshoring and Marine Terminal standards have more documented marine cargo handling injuries or fatalities than do others. OSHA does not believe that the risk associated with exposure to marine cargo handling related hazards varies according to the number of incidents documented for a particular SIC code. OSHA has set the scope of the proposed revisions of the Longshoring and Marine Terminal standards to address those situations where employees are exposed to marine cargo handling hazards, regardless of the relative frequency of incidents. The Agency believes, based on analysis of the elements of the hazards identified, there is sufficient information for OSHA to determine that employees in the covered sectors face significant risks marine cargo handling activities. Therefore, the Agency has determined that all employees within the scope of the proposed standard face a significant risk of material harm and that compliance with the proposed revisions of the Longshoring and Marine Terminal standards is reasonably necessary to protect affected employees from that risk.

IV. Review of General Industry Standards for Longshoring Operations Applicability

Of all the work environments OSHA regulates, the shipboard workplace ranks high among those that do not track easily with many of the regulations that comprise 29 CFR part 1910 (General Industry standards). For instance, subjects such as scaffolding; powered platforms; power presses; wood working machinery; abrasive wheels; forging machines; pulp and paper mills; bakery equipment; laundry machinery; sawmills; logging; telecommunications; and spray painting, all of which receive comprehensive discussion within the text of part 1910, are virtually non-existent concerns in shipboard longshoring operations. Essentially longshoring is a transport industry and, as such, is free from many of the hazards found in general industry. Accordingly, these provisions are not included in this proposed rule.

In some areas where there is current coverage in part 1918, there is similar coverage in part 1910. OSHA's primary concern is to make sure that the 1910 provisions needed to supplement the 1918 coverage are included in the proposal. For instance, subjects such as ladders; slings; conveyors; industrial trucks; cranes and personal protective equipment, which are fully addressed within part 1910, are presently addressed with a specific regard for the maritime workplace, within OSHA's current Longshoring rules. This proposal seeks to update and revise the existing part 1918 and in some instances has relied in substantial measure upon part 1910 language. In other instances, such as when addressing container and roll on/roll off operations, entirely new concepts have been developed to take account of the sometimes unique operational aspects of the modern stevedoring community.

Where the hazards present in shipside cargo handling are directly parallel to those encountered in the shoreside aspect of marine cargo handling, such as in sanitation considerations, OSHA is proposing that the language of provisions designed to address such shoreside hazards be the same as in the Marine Terminal standards in 29 CFR part 1917.

Interested parties are requested to submit any information related to the coverage of this proposed revision of the Longshoring rules. For example, are specific hazards adequately addressed in this proposal? Are longshore worker exposed to safety and health hazards which this proposal does not adequately address? Have unnecessary provisions been included in the proposal? Are there any areas of general industry coverage that have not been included in the proposal that should be? OSHA would particularly appreciate information on these issues.

V. Summary and Explanation of the Proposal

Subpart A—Scope and Definitions

Section 1918.1 *Scope and applicability.* Proposed §1918.1 describes the scope and applicability of the Longshoring standard. The Longshoring rules apply from the foot of the gangway up, to include all cargo handling related activities aboard a given vessel. It is important to remember, however, that in ship to shore/shore to ship cargo transfer operations using shore based material handling devices, all lifting device specific aspects of such transfers will be covered by the part 1917 rules. When cargo transfer is accomplished using ship's cargo gear, the part 1918 rules shall apply.

In keeping with the concept outlined in the foregoing section of this preamble (II. General Format of the Standard), certain selected provisions currently found in OSHA's part 1910 standards have been identified to have application to shipboard longshoring operations. Sections 1918.1(b)(1) through (4), (b)(6) through (8), and (b)(10) through (12)

provide coverage for hazards for which the marine cargo handling industry is neither unique nor different from other industries. These hazards are not otherwise addressed by existing maritime standards. The hazards addressed by §1918.1(b)(5) (Tools) and (b)(9) (Machine Guarding), on the other hand, are addressed by existing maritime standards but do not receive the comprehensive treatment afforded by part 1910, subpart P, (Hand and Portable Powered Tools and Other Hand-Held Equipment) and subpart O, (Machinery and Machine Guarding).

OSHA is proposing to delete the current requirements for hand tools, §1918.72, titled Tools, and replace it with Subpart P of 29 CFR part 1910, titled Hand and Portable Powered Tools and Other Hand-Held Equipment. OSHA believes that the general Industry Subpart P regulations are more comprehensive and afford better protection. OSHA proposes to do the same in the Marine Terminal regulations by replacing the paragraphs under the sections heading Hand tools, §1917.51 and replacing them with 29 CFR 1910 subpart P.

For the same reasons, OSHA is also proposing to remove the requirements under §1917.151 titled Machine guarding, and replace them with Subpart O of the General Industry standards, part 1910, titled Machinery and Machine Guarding. OSHA is also proposing to include Subpart O, Machinery and machine guarding, to the Scope and Applicability section of part 1918.

OSHA promulgated the hazardous waste operations and emergency response (HAZWOPER) standard on March 6, 1989 (54 FR 9294). OSHA'S decision to cover all emergency response was based upon the high risk associated with emergency response by untrained and unprotected employees and the need for proper training and equipment to be provided for emergency response to hazardous substance releases. This standard currently applies in its entirety to shipboard longshoring operations.

HAZWOPER divides emergency response into three separate areas: (1) Response at uncontrolled hazardous waste sites (§1910.120(l)); (2) response at Resource, Conservation and Recovery Act of 1976 (RCRA), as amended, facilities (42 U.S.C. 6901 et seq.) §1910.120(p)(8); and (3) response to emergency hazardous substance releases not covered by the previously noted paragraphs §1910.120(q). Since the activities described in the first two areas of the HAZWOPER standard do not represent marine cargo handling activities within the scope of part 1917 or part 1918, OSHA is proposing to only apply §1910.120(q) to longshore (part 1918) and marine terminal operations (part 1917).

Paragraph (q) covers employees engaged in toxic substance emergency response no matter where it occurs. This paragraph, essentially, requires employers to develop and implement an emergency response plan to handle anticipated toxic substance emergencies prior to the commencement of emergency response operations. If employers decide to evacuate their employees from the danger area when an emergency occurs and do not permit their employees to assist in handling the emergency, they are exempt from the requirements of this paragraph if they provide an emergency action plan and meet other requirements in accordance with §1910.38(a) which states:

> The emergency action plan shall be in writing * * * and shall cover those designated actions employers and employees must take to ensure employee safety from fire and other emergencies.

Simply stated, if an employer decides "not to fight a fire" (i.e., not to respond to an emergency), then §1910.120(q) does not apply but §1910.38(a) does.

OSHA is proposing to delete the current requirements for hand tools, §1918.72, titled Tools, and replace it with subpart P of 29 CFR Part 1910, titled Hand and Portable Powered Tools and Other Hand-Held Equipment. OSHA believes that the general Industry subpart P regulations are more comprehensive and afford better protection. OSHA proposes to do the same in the Marine Terminal regulations by replacing the paragraphs under the sections heading Hand tools, §1917.51 and replacing with 29 CFR part 1910 subpart P.

For the same reasons, OSHA is also proposing to remove the requirements under §1917.51 titled Machine guarding, and replace them with subpart O of the General Industry Standards, part 1910, titled Machinery and Machine Guarding.

Proposed §1918.2 carries over many of the definitions from the current Longshoring regulations. However, there are some new definitions or some modifications to existing definitions that reflect changes in current custom and practice in the Longshore industry.

For example, the term "designated person", which is not used in the current longshore regulation, is used in this proposal. The term is used to identify a person who has a special skill in a particular area and has been so noted by the employer. Because of this skill, this employee is assigned to perform specific tasks in this area of expertise. While the concept of "designated person" is found throughout the current requirements, it is expressed in many different ways. This proposal tightens up the use of this concept by its consistent use of the term "designated person" throughout the standard. Some examples of the use of the term are: §1918.51(b) requires that a designated representative, in lieu of the employer, shall inspect vessel's cargo gear before use and at intervals during use; and §1918.55 (c)(7) where a designated person is one with knowledge in crane operations, specifically when using two or more cranes to hoist in unison, along with knowledge in rigging.

In addition, the current references to the "Federal maritime jurisdiction" and "navigable waters" in the definitions of "employee" in paragraph (e) and "employer" in paragraph (f) are being dropped. The current rules were originally promulgated under the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941) for which the navigable waters was a jurisdictional prerequisite. With the promulgation of the OSH Act, which applies to private sector employment in workplaces in a covered jurisdiction, however, such a prerequisite was no longer necessary. Therefore, OSHA is proposing to update these rules by eliminating the reference to navigable waters in this definition.

Additionally, several new or substantially revised definitions are found in paragraphs (d), (g), (h), (j), (k), and (n) of this section. The definitions for enclosed space and fumigant are added to this section for clarity since these terms are used in the standard. In addition, they are virtually identical, with the exception of the examples, to those found in the Marine Terminal standards. The term "hazardous cargo" has been expanded to reflect the Marine Terminal's definition of "hazardous cargo, materials, substance or atmosphere." This definition goes beyond the current part 1918 definition by including references to subpart Z as well as oxygen-deficient atmospheres. Additionally, it is, in turn, consistent with the Hazardous Communication standard found at 29 CFR 1910.1200. Another new definition is integral to the major impetus for revising part 1918, as discussed above: "intermodal container." The definition for "intermodal container" reflects both the definition found in the International Labor Organization (ILO) Code of Practice for Safety and Health in Dock Work, (Ex. 1–135) and the definition

found in International Standards Organization (ISO) Standard 830, Freight Containers-Terminology, (Ex. 1–134). This definition is also being proposed to replace the current definition for "intermodal container" found in the Marine Terminal standard, §1917.2(u).

The definitions of "dockboards" and "ramps", currently found in the Marine Terminal standard, are being proposed for Longshoring, as well, with minor modification.

Certain definitions currently in part 1918 would be deleted. Existing definitions referring to the existing §1918.13, certification of shore-based material handling devices were deleted because they were superseded by the Marine Terminal standard. The existing definition of the term "shall" is being deleted as unnecessary.

Subpart B—Gear Certification

A. *Section 1918.11 Gear certification.* Since 1960, safety and health regulations designed to protect U.S. dockworkers (with particular regard to vessel's cargo handling gear) have relied upon the documentary proofs of tests and examinations mandated by International Labor Organization (ILO) Convention 32 (Ex. 1–34). In Article 9 of that Convention, units and articles comprising ship's cargo handling gear are enumerated and assigned an annual/quadrennial schedule of tests/examinations that must be attended and attested to by individuals judged to be "competent" by the national authorities of the vessel's registry. Although not a signatory to that Convention, the United States has conformed to this Convention via regulation promulgated by: (1) the U.S. Coast Guard, with regard to inspected U.S. flag vessels; and (2) OSHA, with regard to foreign flag vessels (§1918.12). The Coast Guard has promulgated cargo gear regulations that exceed those found in Convention 32, namely 46 CFR part 91, that promote safe and unencumbered operations for U.S. flag vessels trading at foreign ports. On foreign flag vessels trading at U.S. ports, however, OSHA has sole responsibility for regulating and enforcing rules that address the cargo gear U.S. longshore workers utilize.

Under Convention 32, proof load testing[1] was only required initially before being taken into service. Thereafter, components such as derricks, goosenecks, mast bands, derrick bands and any other difficult to disassemble fixed gear, were to be "thoroughly examined" every four years and "inspected" every 12 months. Other hoisting machinery, such as cranes, winches, blocks, shackles, and any other accessory gear, were to be "thoroughly examined" every 12 months.

Under Convention 32, the vessel's cargo handling gear was proof load tested initially, and then perhaps never again. After that initial test, such gear received various degrees of visual scrutiny, complemented on some occasions by non-destructive testing, i.e., a hammer test.

Convention 152, adopted June 25, 1979, requires that such proof load testing is to occur at least every five years, and applies to all ship's lifting appliances. Within Article 3 of the new Convention, the term "lifting appliance" is defined as follows:

> Lifting appliance covers all stationary or mobile cargo-handling appliances, including shore-based power-operated ramps, used on shore or on board ship for suspending, raising or lowering loads or moving from one position to another while suspended or supported. (Ex. 1–5, pg.2)

Thus, the extent of cargo handling equipment found aboard ship requiring testing and certification, heretofore restricted to specific assemblies and components (i.e., derricks, cranes, winches, etc.) is being expanded in this proposal to include all "lifting appliances" under the terms of the newer ILO Convention. This would include forklifts and other powered industrial equipment used to handle cargo that might be carried by a Ro-Ro vessel; and elevators found on Ro-Ro vessels used to move cargo from one deck level to another—in addition to vessel cranes and derricks. Under this proposal in §1918.11, all this equipment would be required to be tested and thoroughly examined initially before being put into use; retested and thoroughly examined every five years; and thoroughly examined every 12 months.

In those situations where one container is used to lift another container, using twist locks, then the upper container and twist locks become, in effect, a lifting appliance and must be certified as such.

International Aspects

As is the case with all Federal agencies whose regulations impact international trade, OSHA has developed this proposal in light of international considerations. Through both law and policy, the United States has decided that standards-related activities shall not unnecessarily be a barrier to trade. The Trade Agreements Act of 1979 (19 U.S.C. 2501 *et seq*). addresses technical barriers to trade with regard to federal regulation. This Act states in Title 19 of the U.S. Code as follows:

> §2532. FEDERAL STANDARDS-RELATED ACTIVITIES
>
> No Federal Agency may engage any standards related activity that creates unnecessary obstacles to the foreign commerce of the United States, * * *.
>
> (1) Nondiscriminatory treatment. * * *
>
> * * * * * * *
>
> (2) Use of international standards.—(A) In general. * * * each Federal agency, in developing standards, shall take into consideration International standards and shall, if appropriate, base the standards on International standards.

Additionally, and consonant with this country's position on barriers to international trade, the United States is a signatory to the Multilateral Convention on the Facilitation of International Maritime Traffic (1965) (Ex. 1–3). As a contracting government, the United States has agreed to:

> * * * Undertake to cooperate in securing the highest practicable degree of uniformity in formalities, documentary requirements and procedures in all matters in which such uniformity will facilitate and improve international maritime traffic and keep to a minimum any alterations informalities, documentary requirements and procedures necessary to meet special requirements of a domestic nature. (Article 3)

Mindful of these international aspects, OSHA sought to formulate an acceptable approach to the vessel's cargo handling gear issue, and to other issues. The Agency requested the Department of State (Ex. 1–7) to present OSHA's tentative approach to all foreign nations whose flags may enter U.S. ports. This exercise was conducted in hope of ascertaining global acceptance. Reports back from responding foreign nations (Ex. 1–6) indicated overwhelming support for the Agency's approach to these issues, and OSHA has incorporated it in this proposal. Most nations, although stipulating that they had not as yet ratified the more recent ILO Convention, indicated that national laws recently ratified or those currently in the legislative process were at least as strong, and in some cases more stringent, than Convention 152. In consideration of this widespread international acceptance of ILO Convention 152's approach to testing and certification of cargo gear, OSHA has decided to propose it in this revision of the Longshoring standards. The Agency is interested in any additional comment on this issue that interested parties may be in a position to offer.

[1] Proof load testing, as used here, means lifting an known weight that is in excess of the safe working load (SWL) of the lifting appliance being tested.

Subpart C—Means of Access

Section 1918.21 Gangways and other means of access. This proposed section joins together two similar sections (§1918.11—Gangways and §1918.21—Gangways and Other Means of Access) of OSHA's current Longshoring rules. Clarity is improved in that rules addressing the same specific issue will no longer be situated in two different subparts of part 1918. As is the case in the current rules, gangway dimensions and characteristics are set out in proposed paragraph (a) to provide the safe access to vessels necessary for longshore workers. By using a blend of specification with performance based alternatives, the proposal lends the flexibility needed in accommodating foreign vessels. Language has been added that allows the use of materials that have been developed since the current rule was written, as long as the material has a strength equivalent to those that are listed.

Proposed paragraph (b) carries over language from the current rules, as well as the term "trimmed" found in the Joint Maritime Safety Code of the New York Shipping Association/ International Longshoremen's Association (NYSA/ILA Safety Code) (Ex. 1–2) part M, paragraph 1), and requires that despite changing conditions brought about by tides, cargo operations, etc., the gangway and its components must be wholly serviceable.

Proposed paragraphs (c) through (k) are similar to the language found in the current rules. Some paragraphs have been modified to address some problems associated with the current language. Paragraph (d) has been modified to require a safety net or suitable protection when the gangway overhangs the water in such a manner that there is a danger of employees falling between the ship and the dock. The net is required to prevent an employee from falling to a lower level. This is consistent with ILO'S "Safety and Health in Dock Work," (Ex. 1–138). A new paragraph (i) has been added to address the hazard associated with slippery handrails and walking surfaces on gangways. Paragraph (j) references §1918.92 for illumination requirements on a gangway. In summary, these paragraphs address the requirement for a safe passage from the dock to the deck.

Proposed paragraph (l) recognizes the U.S. Coast Guard's authority relating to jurisdictional matters aboard vessels having a current and valid certificate of inspection. Notwithstanding, for the purpose of this rule, if access is attained other than by the vessel's regular gangway, that access shall conform to the entirety of this section.

Proposed §1918.22 carries over language from the current rules. Both paragraphs of this section contain the standard universal criteria for rope ladders, also known as "Jacob's ladders", namely, that such ladders be either double-runged or flat-treaded, so as to provide a more substantial tread surface; that they be well maintained and properly secured to available fittings; and that they not be permitted to hang from their lashing points with slack in them.

It is often the case that such ladders are provided by the vessel when a more traditional means of access cannot be utilized. Notwithstanding, under these proposed rules the employer (who is often a contractor rendering a service to the vessel) must comply with this proposed section before employees are permitted to use these ladders.

Proposed §1918.23 also carries over language from the current rules. Paragraph (a) sets out criteria for ramps used to gain vehicular access to or between barges. Of primary importance is that such ramps be of sufficient strength for the intended load. These ramps must be equipped with sideboards that will prevent vehicles from falling. They must also be well maintained and properly secured during use.

Paragraph (b) addresses employee passage to and from certain floating craft. Under favorable conditions, it is sometimes possible to pass to and from such vessels without the aid of any device. In other than favorable conditions, however, this paragraph sets forth the criteria to provide safe passage. Of significant importance is the exception included at the end of the paragraph. That exception recognizes practical difficulties encountered on the Mississippi River system in providing traditional means of access on all occasions. When originally promulgated in 1960, the longshore rules (Ex. 1–39) took no cognizance of these special difficulties. In 1965, the Labor Standards Bureau published the following proposed clarification, (Ex. 1–40):

> In order to provide practical solutions in cases where current requirements cannot be met, because of local river and bank conditions (this section) should be amended by the addition of a provision. (p.7609)

A provision to that effect was published in the Federal register in final form on May 21, 1966 (Ex. 1–41). Historically (Ex. 1–98), this exception has been based on tidal and current conditions on the Mississippi system (see definition at proposed §1918.2(s)). OSHA's experience has thus far concluded that such exceptional conditions prevail only on this inland system; however, the Agency solicits comments from interested individuals with other information on this issue.

A sentence has been added to proposed §1924.23(c) that requires no more than two Jacob's ladders for any single barge, raft, or log boom being worked. This proposal is consistent with the requirements in §1918.25(a) which requires a maximum of two access ladders in a hatch. The term "gang" is used here and several other places in this proposal. It refers to a group of longshore persons that are assigned to a particular hold, deck, etc. on a ship for the purpose of loading or discharging cargo.

A new paragraph (e) has been added to this section to address the problem associated with the lower rungs of a Jacob's ladder being crushed between the barge and another structure by requiring that a spacer or equivalent means be used to prevent it from occurring. If the lower rungs are crushed, this could cause an employee to fall between the barge and other structure.

Another new paragraph (f) has been added to this section. This paragraph requires the a net or equivalent protection if there is a space between the vessel, barge or other structure when using a Jacob's ladder to prevent an employee from falling into the water.

Proposed §1918.24 combines the current language of the existing longshore provisions for bridge plates and ramps with the terms that apply to similar shoreside equipment within 29 CFR part 1917 (Marine Terminals, §1917.124).

In the adoption of such parallel rules, OSHA hopes to enhance the uniformity of regulation that is critical to safety performance both shipboard and shoreside. Throughout this proposal, the Agency has attempted to foster such uniformity and requests comments as to how this goal can be better achieved.

Paragraphs (a)(1)(iv) and (b)(1)(v) would be revised to require sideboards that are at least 6 inches (.16 m) high. This height is the same as found for bull rails that were in place at the time of the effective date of the Marine Terminal standard, found in §1917.112. OSHA believes that specifying the height of the sideboards will provide the necessary protection to prevent vehicles and equipment from accidently falling off the edge. OSHA requests comment from the public concerning appropriateness of the height of the sideboards. OSHA is also proposing to require the same 6

inch (.16 m) sideboards for dockboards and ramps that are in the Marine Terminal standard, §1917.124.

Proposed §1918.25 combines the current requirements for portable ladders contained in the existing Longshoring rules with the similar rules of §1917.119. For fixed ladders, however, there is a distinction between the proposed and current Longshore standard which has to do with clearance in back of the ladder rungs. The existing requirement is 4 inches (.11 m), but the proposed clearance is 6 inches (.16 m), which reflects the current ILO Standard.

Consistent with ILO's Guide to Safety and Health in Dock Work, (Ex. 1–129), OSHA is proposing that vessels built after December 5, 1981, (the date when ILO Convention 152, Occupational Safety and Health in Dock Work was put into effect), have a 6-inch (15 cm) clearance between the ladder and the surface to which it is fastened. Vessels built prior to December 5, 1981, however, may have a 4 inch (10 cm) clearance between the ladder and the surface to which it is fastened. OSHA encourages comment on this issue. (It should be noted where a fixed ladder has inadequate clearance, a suitable portable ladder could be used.)

Generally, proposed §1918.25 includes much of the current language for ladders with some modifications. Provisions have been added that reference ANSI standards for manufactured portable ladders. There are also proposed provisions for ladder maintenance and usage that are similar to what is in the Marine Terminals standard, but are new to Longshoring.

In paragraphs §1918.25(c) and (e) the phrase "positively secured against shifting or slipping" has been changed to "positively secured or held against shifting or slipping while in use". This change acknowledges that a worker(s) may hold a portable ladder in place while another worker is climbing the ladder in situations where the ladder cannot be secured and is consistent with the PMA-ILWU Safety Code, Rule 1506 (Ex. 1–145).

In addition, for the purpose of clarifying paragraph (e), where the employer can demonstrate that employees can safely use the cargo itself to climb in and out of the hold (often referred to as "safe cargo steps"), a straight ladder is not necessary.

Paragraph (j)(8) on, ladder usage, acknowledges that while some ladders may not have slip-resistant bases, they can be readily secured by lashing them in place to prevent slipping or shifting when being used.

Subpart D—Working surfaces

OSHA clearly understands that many of the falling hazards addressed in part by this and other subparts, represent working environments and physical characteristics no longer observed with the type of frequency that was the case when the current Longshoring rules were last revised. Nonetheless, conventional cargo handling methods together with more traditional vessel designs are still encountered at U.S. ports. For this reason, OSHA proposes to retain current provisions that still have application.

As an example, proposed §1918.31(c) prohibits employers from allowing work to be conducted on surfaces comprised of missing, broken or poorly fitting hatch covers. Currently, it is relatively rare to experience a vessel trading at U.S. ports, fitted with the type of removable hatch covers this provision addresses. Despite that rarity, such situations do arise.

Proposed §1918.31(d) prohibits the placing of poorly fitting hatch covers and hatch beams that would constitute a work surface. As a practical matter, it is rare to see vessels at U.S. ports fitted out with hatch beams. In those instances, however, identifying marks are usually permanently fixed to such equipment. Those marks correspond to marks found on receptacle fittings on the vessel proper. In all cases, notwithstanding the presence of corresponding marks, the employer must make sure that all hatch beams and covers are seated securely, providing a strong and stable work surface.

Proposed §1918.32(a) carries over language from the current Longshoring rule. Frequently cargo must be landed on temporary surfaces, generally presented by other cargo stows, prior to its ultimate place of rest. When this is so, it is important that employees have enough available space to work in safety upon such a surface, and that the temporary table is strong enough to safely support the loads being imposed. There are obviously many strength and size possibilities, which will be dictated by the size and weight of the drafts being landed.

Proposed §1918.32(b) has been revised to address changes that have occurred in technology and work practices. Employees working on the tops of containers are now covered by §1918.85(j), Container top safety. (For a full discussion see the preamble to §1918.85(j) below). When employees working in cargo holds, are exposed to falls of more than 8 feet (2.4 m), the edge of the working surface must be guarded by a safety net, or must be otherwise rendered safe (such as by providing guardrails or fall arrest systems) to prevent employee injury. It should be noted that proposed §1918.32(b) does not include employees working on the top of intermodal containers in a hold as this is also covered under §1918.85(j).

Of prime importance is that the intent of this provision is satisfied, rather than providing just the appearance of compliance. Many times, particularly when safety nets have been rigged, they have been allowed to become very slack, and have sometimes been secured only at their top ends. The improper rigging of safety nets compromises or even removes the protection provided to falling employees. In these very critical fall hazard situations, this provision insists that fully considered precautions are taken. The Pacific Coast Marine Safety Code (PCMSC) Rule 1016 (Ex. 1–145) is very similar in construction.

This paragraph has also been revised to distinguish between the purpose and use of vertical safety nets, which rise at right angles at the perimeter of a work surface thus preventing employees from falling, and trapeze nets, which are designed to be placed horizontally below a raised work surface to prevent falling employees from striking the surface below. Additionally, this section requires that any nets used for purposes of fall protection meet the applicable requirements.

Proposed §1918.33(a) and (b) are carried over from the current Longshoring rules. As the heading of this section indicates, these provisions address the safe performance of work on or around deck loads. Provisions for work performed by employees atop deck-stowed intermodal containers will be found at proposed §1918.85(j).

OSHA is proposing to change the title and text of §1918.34. The current title of this section is "Skeleton decks." OSHA has consulted, without success, numerous individuals from the maritime community and researched several maritime publications, textbooks, etc. in an effort to define the terms "skeleton deck" and "mechano deck." OSHA feels that the use of these terms and the practice of working cargo on these particular types of decks are obsolete. Since the hazards remain even though these terms do not, OSHA is proposing to change the title of the section to "Other decks" in order to group unique or uncommon decks; using generic language to address the hazards associated with landing cargo on such decks that are not designed for such use. OSHA encourages the public to comment on whether the terms

"skeleton deck" and "mechano deck" should be kept in the text of the standard and on whether these provisions are necessary.

Proposed §1918.35 addresses hazards longshore workers face when conducting operations around open weather deck hatchways. Vessels calling at U.S. ports are of varied designs and capabilities. Some vessels have coamings, which are the vertical structure that surrounds the hatch opening on a ship, that are substantially higher than the proposed section's minimum acceptable range (36 to 42 inches) (.92 to 1.07 m) other vessels may have no hatch coamings at all, but rather flush decks or decks with an abbreviated sill, which present substantial fall hazards to longshore workers. On such vessels, when workers work around the perimeter of open hatchways, appropriate guarding must be provided. This proposal stipulates that taut lines or guardrails attaining the acceptable range be erected on all but the working side of the hatch. This proposal mandates that stanchions or uprights used in their construction be supported or secured in a manner that will prevent them from coming accidentally loose.

Proposed §1918.37 addresses the fall hazards associated with working on the decks of lighters and barges. Proposed paragraph (a) retains language from the current rule. It prohibits the use of marginal (less than 3 feet (.92 m) wide) deck space along the sides of covered lighters or barges on all such vessels having coamings over 5 feet (1.5 m) high. Alternately, an employer must provide a taut handline or, as is most often the case, the vessel must be fitted with a serviceable grab rail.

Proposed paragraph (b), also retains language from the current rule. It prohibits working or walking on unsound surfaces. This can be a particularly important consideration on barges, in that powered industrial trucks are often brought aboard to assist in operations. The proposed rule requires a visual check of such decks before loading operations begin. If during the course of discharge operations an unsafe surface is discovered, work must be discontinued until protective measures are taken (such as bridging the unsafe surface with steel plate or barricading a deck section deemed unsafe).

Proposed §1918.38, as well as §1918.88 titled "log operations" are entirely new sections addressing log loading operations and reflect current industry practice. Section 1918.38 is based on Rules 640 and 641 of the PCMSC (Ex. 1–145); on a report on log operations submitted to OSHA's Maritime Safety Standards Office by Region X (Ex. 1–146); and a training video on log operations produced by the PMA and ILWU (Ex. 1–147). Loading logs from water presents very serious falling and drowning hazards. Thus, safe walking working surfaces are extremely important to longshore workers who are positioned offshore during log loading operations. Sound footing is essential during access to and while working on log rafts, which are in fact the cargo. The proposed requirements provide for safe access to the worksite and a safe working surface area. The working surface must be wide enough to allow for stable footing, securely fastened together, and substantial enough to support the weight of the employees on it. OSHA has concluded that the basic requirements for providing such safe surfaces should be included in this rulemaking, and seeks comment on their completeness.

Subpart E—Opening and closing hatches

Proposed §1918.41 addresses coaming clearances and provides requirements to protect longshore workers from fall hazards and from being struck by falling cargo during the process of opening up and closing hatches. Proposed paragraph (a) addresses weather deck clearances. When a smooth-sided deck load is stowed within 3 feet (.92 m) of the hatch coaming, and the available coaming height is <24 inches, a taut handline shall be provided so that employees are able to safely remove or replace hatch beams and covers. Similar language covering such situations is found in the NYSA/ILA Joint Maritime Safety Code—part C/Rule 38 (Ex. 1–2) and the PCMSC—Rule 1007 (Ex. 1–145).

Throughout this proposal, OSHA has specified that "taut" lines or "taut" handrails or guardrails be provided in certain situations where available walking or working space is compromised because of inevitable stowage or vessel design considerations. In using the term taut, as with other terms commonly encountered in maritime safety codes, OSHA is using language which is familiar in the industry under current practices. Where necessary, OSHA is proposing definitions for various terms used in the proposed standards, to ensure that these terms are uniformly understood. To be as clear as possible with regard to its intention in utilizing the term "taut" in connection with the subject lines, handrails and guardrails, the Agency states that "taut" connotes tightly and securely drawn, and as length and distance may warrant, securely fastened at intervals. The idea behind providing these taut lines, etc., is to allow an employee to rely on these objects in maintaining or regaining a stable balance in a constrained work area.

Generally, guardrails successfully serve their purpose when their height can stay within a serviceable range (42 to 36 inches) (1.07 m to .92 m). "Taut" handrails and "taut" lines, however, are sometimes required to be fitted to objects and structures of varying dimensions (such as deck cargo and the sides of covered lighters) for the purpose of enabling an employee to maintain balance and footing.

Proposed paragraph (b)(1) addresses intermediate deck hatchway clearance, and requires that a 3 foot (.91 m) clear work area be provided between stowed cargo and hatch coaming at both sides and one end of hatches with athwartship beams, and at both ends of hatches with fore and aft beams, while employees are engaged in opening or closing the hatchway. Proposed paragraph (b)(2) makes it clear that the 3-foot (.91 m) working surface under proposed paragraph (b)(1), is not required when a fall hazard is not present. Proposed paragraph (b)(3) recognizes that fitted grating over-decking, such as the type used in some perishables trades, can be considered part of the actual deck or working space (for the purposes of assessing compliance with proposed paragraph (b)(1)), if they are properly placed within the 3-foot clearance area and if they are in good condition (flush fitting and presenting a level work surface). OSHA has dropped the reference to "banana" gratings because OSHA feels it is an unnecessary reference.

Proposed paragraph (c) would require grab rails or taut hand lines to be provided where, because of wing-space structures or spare parts storage, coaming clearance is minimized. Proposed paragraph (d) advises that this proposed section is inapplicable in situations that permit the opening and closing of hatches without employees having to place or remove individual sections manually. It cautions, however, that whenever the 3-foot clearance is lacking, cargo which is likely to shift or fall must be blocked or otherwise restrained.

Proposed §1918.42, similar to §1918.41, is carried over substantively in its entirety from the current longshore rules, although some editing has been done for clarity. Provisions in this section addresses the hazards associated with handling hatch beams and pontoons, such as falling into the hatch or being struck by these removable items. Equivalent rules can

be found on section 2 of the PCMSC (Ex. 1–145) and parts C and O of the NYSA/ILA Joint Maritime Safety Code (Ex. 1–2). In summary, it is proposed that hatch beam and pontoon bridles be long enough to easily fit their attachment points. Hatch beam bridles must be equipped with attachment devices that cannot become accidentally dislodged, such as toggles. Pontoon bridles are required to have the appropriate number of legs to conform to the design of the cover. All such legs must be utilized when lifting. If all legs of a bridle cannot be used due to the design of the cover, the spare leg(s) must be prevented from free swinging. Finally, as for the construction of these bridles, OSHA requires that for proper manual guidance, at least two legs be fitted with a fibre rope lanyard, and that the bridle end of the lanyard (the end attached directly to the bridle) be constructed of chain or wire rope.

Proposed §1918.43 is generally carried over from the current longshore rules, with some changes made for clarity, a revision to paragraph (j), and the addition of a new paragraph (i). Provisions in this section address the hazards associated with handling and stowing of hatch boards, hatch beams, and pontoons, such as falling into the hatch or being struck by improperly stowed items. Similar requirements are found in Section X of the PCMSC (Ex. 1–145), part O of the NYSA/ILA code (Ex. 1–2), and ILO Convention 152.

In revised paragraph (j), tarpaulins may be used to reduce the dust emissions of bulk cargoes instead of night tents if the vessel lacks cargo gear. In these situations, OSHA requires positive means, such as placards or barricades, be taken to prevent employees from walking on the tarpaulin that is covering an open or partially open hatch. Verbal warnings or instructions do not satisfy this provision.

A new paragraph (i) is being proposed to address the hazards of unsecured materials falling from hatch covers when they are being moved overhead.

Subpart F—Vessel's Cargo Handling Gear

Proposed subpart F would apply to all gear and equipment used in cargo handling that is the property of the vessel. Examples of this type of equipment can include cranes, derricks, specialized brjdles, winches, wire rope, and shackles. This subpart addresses hazards associated with the use of that gear. This would include such hazards as using faulty gear, overloading or improperly rigging cargo gear, or improper operation of cargo gear, which can result in serious injury or death. (See Ex. 1–103.)

Proposed §1918.51 contains general requirements that apply to all cargo handling equipment that is permanently attached to a vessel.

Proposed paragraph (a) stipulates that the safe working load of the gear, whether marked on the lifting appliance itself or specified in the required certificates/gear register, shall not be exceeded. Proposed paragraph (b) requires that each component of ship's cargo handling gear be inspected by the employer before use, and at intervals during use. This requirement is more clearly worded than the existing requirement by specifying the employer's obligation to perform a visual inspection. Also, this new language more closely parallels the shoreside requirement found in 29 CFR 1917.42(a)(2). The paragraph also prohibits the use of unsafe gear. Proposed paragraph (c) provides criteria for splicing wire rope and for wire rope configuration characteristics. Additionally, the paragraph conforms the Longshore regulations to some current use criteria for wire rope that appear in OSHA's rules for the shoreside aspect of marine cargo handling (Marine Terminals—29 CFR part 1917). Proposed paragraphs (d), (e), and (f), also parallel the shore side rules. OSHA believes that the new language in this section enhances the safety of the worker in several ways. In paragraph (c), new and more stringent requirements are proposed for wire rope that is part of the ship's cargo handling gear. In addition, the new provisions (paragraphs (d), (e), and (f)) set replacement criteria for wire rope slings, natural and synthetic fibre rope slings, synthetic web slings, chains and chain slings, none of which are addressed by the existing standard.

Proposed §§1918.52, 1918.53, and 1918.54 and all address the subject of rigging and operating vessel's cargo handling gear. By and large, the requirements of these sections are found in the existing rule. Some language modifications have been made to enhance clarity. In addition, some paragraphs have new language that enhances the understanding of the provision which promotes greater compliance and eases enforcement burdens. For example, proposed §1918.53(e) adds to the existing reporting requirement of a defective winch, the following requirement "... and the winch shall not be used until the defect or malfunction is corrected." Similarly, paragraph (i) adds a monitoring requirement during operation and (k) removes a feasibility exception based on design that is no longer necessary today due to technological improvements.

OSHA wishes to raise the issue and solicit comment from the public regarding whether or not to delete §1918.52(b). This paragraph addresses the use of chain topping lift stoppers and clamp type stoppers that are used to manually lower and raise the boom. This method of topping the boom is a potentially dangerous operation and has been largely replaced by the use of electric topping lift winches, which do not require the use of stoppers. However, OSHA understands that as a result of the breakup of the Soviet Union, vessels which had not been allowed to sail into the U.S. because of restrictions placed on Soviet bloc countries, are now calling on various ports of the United States. In some cases, these vessels are old, and have types of cargo handling gear that had been largely replaced by more modern gear. In light of this occurrence, OSHA solicits public comment on this issue.

A new paragraph has been added, §1918.54(a), that addresses the hazard associated with the poor practice of rigging guys or preventers so that they chafe against other guys, preventers, or stays. This practice can cause the vessels's cargo gear to fail as the chafing can cause the wires to separate. This can lead to serious injury or death as the gear and cargo fall down on the deck or into the hold.

Proposed §1918.55 covers deck cranes permanently affixed to a vessel. The existing rule only addresses one of the hazards—the guarding of the swing radius. The new requirements more completely address the hazards encountered in the use of ship's cranes. These rules become necessary due to the widespread replacement of winches and booms by ship's cranes on newer vessels. In addition, the new provisions closely parallel similar shoreside requirements in part 1917 and other OSHA crane standards.

This section prohibits the use of cranes which develop a visible or known defect that impacts on its safe operation. In addition, the operator's position must be well maintained, with good visibility provided through the operator cab's glass. During cargo operations, areas that are within the swing radius of the body of revolving cranes and are accessible to employees must be guarded to prevent an employee from being caught between the body of the crane and any fixed structure, or between parts of the crane. Paragraph (c) of §1918.55 also addresses the danger of employees being caught between shipboard gantry cranes, such as would

be found on a LASH (Lighter aboard ship) vessel or a self contained container ship, and fixed structures on deck along the path of the cranes travel. (Ex. 1–103, cases 26 and 27).

Crane brakes must be monitored throughout the workshift. If they are unable to hold the load, the crane must not be used. If cranes are used in tandem, a designated person (see definitions) must direct the operation with special emphasis on positioning, rigging and movement.

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

Proposed Subpart G applies to all cargo handling gear utilized in cargo operations that is not part of the vessel (ship's gear). Proposed §1918.61 is very broad in its coverage. In paragraph (a) it stipulates that all gear and equipment brought aboard a vessel must be inspected before and during its use by the employer or a designated person to determine its condition. If, upon inspection, an unsafe condition is found, the gear must not be used until deficiencies are corrected.

Proposed paragraph (b)(1) is carried over from the current longshore rules and requires that the Safe Working Load (SWL) of the gear not be exceeded. Proposed paragraph (b)(2) is new. This paragraph requires the marking of the SWL on special stevedoring gear with a safe working load (SWL) of over five short tons. OSHA believes that this is a basic requirement (Ex. 1–151), and that most gear in use is already marked with the SWL on it.

Paragraph (c), which is similar to the current language, stipulates that the weight of any article of stevedoring gear that exceeds 2,000 pounds (1 short ton) must be plainly marked with the weight of that article before being hoisted by the ship's gear. Examples of such stevedoring gear are container handling lifting frames and certain multi-point engagement bridles. It is important to consider the weight of such articles when evaluating safe working loads of the ship's cargo gear.This is because the weight of the gear must be added to the weight of the load being lifted to determine the actual load, which together cannot exceed the SWL.

Proposed paragraphs (d) and (e) remain unchanged and address certification and certification procedures.

Proposed paragraph (f) addresses special stevedoring gear fabricated of components that are not common, off-the-shelf type items. For example, gear room constructed spreader bars for heavy lift cargo, special lifting devices for unique pieces of cargo, or bar pallet bridles will have some components that are not marketed or purchased with a specific cargo handling use in mind. Such certification must be performed in accordance with paragraphs (d) and (e) by an agency accredited by the Department of Labor under 29 CFR part 1919 before being put into use. Also, all intermodal container spreaders that are supplied by the stevedore for hoisting afloat shall be similarly inspected, tested, and certificated. Special stevedoring gear with a SWL of five short tons or less can continue to be inspected and tested as a unit by a designated person.

OSHA is also proposing that all cargo handling gear covered by §1918.61(f) with a SWL greater than 5 short tons be inspected and proof load tested every four years in accordance with the chart found in paragraph (f) of this section. This inspection and proof load test may be done by an agency accredited by the U.S. Department of Labor under 29 CFR part 1919, or it can be done by a designated person.

This change to the existing longshore regulations parallels similar requirements found in 29 CFR part 1917, Marine Terminals. For consistency between the two parts, OSHA is proposing in this rulemaking, to change §1917.50(b)(5) to reflect the 5 long ton exemption that is being proposed in §1918.61 and to require the periodic testing of special stevedoring gear and container spreaders every four years by a designated person, shoreside as well as shipside.

OSHA feels that this will provide additional protection for those employees that use special stevedoring gear and will eliminate any confusion that may currently exist by requiring special stevedoring gear with a SWL greater than five long tons and spreaders supplied by the employer to be inspected, tested, and certificated whether it is used by shore-based material handling equipment or by cargo handling gear afloat.

Proposed §1918.62 covers all miscellaneous gear that is not part of ship's gear, such as all slings, shackles, hooks, blocks and pallets (loose gear), employed aboard a vessel for use in cargo handling operations. The hazards addressed by this section are those generally associated with an employee's being struck by falling objects, i.e. dunnage, gear or cargo, when the gear fails. The provisions in this section helps to assure that loose gear used in the longshoring operation is both adequate in strength and size and in good enough condition to safely perform the operation. To foster uniformity, the Agency proposes the same requirements for miscellaneous gear as required in shoreside cargo handling at 29 CFR 1917.42. (See 46 FR 4194 and 48 FR 30895 for a full discussion of the rationale for these provisions.)

OSHA proposes a comprehensive system of tables (See Appendix II) that will be utilized in the event that manufacturer's recommendations/certificates are not immediately available at the worksite for safe working load assessment. The tables are primarily based on ASME B30.9–1990 (Slings), (Ex. 1–148), as well as requirements applying to wire rope clips and shackles currently contained in the Agency's rules for Marine Terminals. It is OSHA's position that the manufacturers's recommended use and safe working load criteria, given the wide universe of international fabrication of all miscellaneous gear, are the most reliable factors to utilize in determining safe usage. However, the Agency appreciates that certificates or manufacturers' use recommendations may not be instantly available in certain circumstances. For instance, when inbound pre-slung drafts of cargo are ready for discharge at a given port, certificates or use recommendations might not be found aboard the vessel. Because such pieces of miscellaneous gear are not "ship's gear," it is likely that no data on them will appear within the ship's collection of certificates. Likewise, such gear cannot be properly classified as "stevedore supplied gear," for the stevedore will not have known the characteristics of the slings until the hatch section is actually observed. In these circumstances, the tables found in Appendix II can be relied upon to provide a realistic safe working load.

In accordance with I.L.O. recommendation 160 (Ex. 1–8), OSHA, in proposed requirement §1918.62(h)(5)(ii), has added wording to prohibit the use of wrought iron in new parts of lifting appliances or loose gear. As a practical matter, wrought iron is rarely seen on vessels that are trading today. However, as with many of the regulations in this rule that have reduced application, there is the possibility that such conditions may still exist, and for that reason the relevant standards are being left in the proposal. OSHA invites the public to comment on this matter.

Finally, a new paragraph is proposed to be added, (g)(2)(vi), that adds an additional criterion to cause a synthetic web sling to be removed from service. If warning threads or markers that the manufacturer has designed to indicate excessive wear or damage are visible, than the sling must be removed from service. Proposed §§1918.63 and

1918.64 provide requirements for the use of chutes, rollers and both gravity and mechanically powered conveyors. OSHA proposes to bring into part 1918 the requirements that cover such pieces of equipment within the shoreside (29 CFR 1917.48 and 1917.49) rules. In this manner, no regulatory disparity will exist with equipment that often physically originates on shore and extends onto the ship. (See 46 FR 4208 and 48 FR 30900 for a full discussion of the rationale for these provisions as adopted in the Marine Terminal standard.) Notable among the changes brought about by bringing those shoreside rules aboard vessels, is the requirement that powered conveyors be locked out and tagged during most maintenance, repair, and serving. Also, that same procedure would be required in most situations that require the removal of a jam or overload on the powered conveyor system.

Proposed §1918.65 covers the use of all mechanically powered vehicles brought aboard vessels to conduct or assist in cargo handling operations. Included in this category of equipment are all industrial trucks and all bulk cargo moving vehicles. In that these same vehicles are similarly utilized in the shoreside aspect of marine cargo handling, the hazards are essentially the same. These would include, among others, exceeding the safe working capacity of the vehicle; cargo falling on the operator either from stowage on the vessel or from being handled by the vehicle itself; improper maintenance which could lead to unsafe operation of the vehicle; and the falling hazards associated with the lifting of personnel by mechanically powered vehicles. Therefore, OSHA has proposed to track the requirements found in §1917.43 that are applicable to this class of equipment. (See 46 FR 4197 and 48 FR 30896 for a full discussion of the rationale of these provisions as adopted in the Marine Terminal standard.) Additionally, the Agency is proposing a requirement for roll-over protection on bulk cargo moving vehicles (such as the type used to trim and position bulk cargo in underdeck spaces). Such protection is required on similar pieces of equipment used in construction industry settings, where the hazard posed by turnover also exists. OSHA seeks comment on whether this provision provides adequate protection shipside and whether similar protection is needed shoreside.

OSHA is proposing, in §1918.65(g), that vehicles purchased after the effective date of the final rule shall be equipped with parking brakes. OSHA believes that, although most older equipment may not be equipped with parking brakes, equipment that is currently being manufactured is generally equipped with such brakes. A parking brake is especially important when working Ro-Ro type vessels where the ramps can have a steep grade.

Proposed §1918.66 covers all cranes and derricks which are not part of a vessel's permanent cargo handling gear, but are placed aboard a vessel temporarily to conduct cargo operations. As an example, mobile and crawler type cranes are at times positioned upon barges and thereupon transported to locations adjacent to a vessel to load and discharge cargo. Given that these hoisting devices are identical at both the shoreside and shipboard location, the hazards associated with the operation of this equipment are basically the same. These would include, among others, exceeding the safe working capacity of the crane or derrick; improper operation; improper maintenance; exposed mechanical moving parts; falling hazards associated with lifting personnel; and crushing hazards. Therefore, OSHA has relied upon its rules for cranes and derricks found in 29 CFR 1917.45 to provide regulatory consistency to the marine cargo handling industrial sector. (See 46 FR 4201 and 48 FR 30897 for a full discussion of the rationale of these provisions as adopted in the Marine Terminal standard.)

In one obvious departure from the foregoing principle, the Agency has chosen not to propose requirements for load indicating devices within this section for shipside cargo handling. Usually such devices rely upon boom radius (outreach) as a component determinant in arriving at a load indication. When afloat, however, boom radius can be compromised by load and stability factors, resulting in indications that are not accurate. OSHA seeks comment from interested persons as to whether this approach provides adequate safety. In addition, the Agency solicits comment on alternative means of preventing overloads of cranes used aboard ships. Are there reliable alternate devices (that do not use radius as a central component in arriving at a load indication) that are sufficiently developed to accurately indicate the weight of the load? Would load moment indicators provide equal or better protection. Are some systems more precise than others? What other procedures could be employed to prevent overload conditions?

Additionally, proposed §1918.66(c)(2) requires that the hoisting mechanism of cranes and derricks, when being used to hoist personnel, shall operate in the power up and power down mode with automatic brake application when stopped. This provision is similar to the requirements found in the personnel hoisting section of the OSHA Construction standards at 29 CFR 1926.550(g)(ii)(D). Earlier OSHA had proposed such a rule for all cranes in the Marine Terminal Proposal (46 FR 4237) but comments and other record evidence convinced OSHA that, at the time, this would be infeasible for mobile cranes. The final Marine Terminal standard, promulgated in 1983, therefore, only applied this provision to overhead and container gantry cranes.

However, in 1988, OSHA issued its Construction standard for Crane or Derrick Suspended Personnel Platforms, (29 CFR 1926.550(g); 53 FR 29116). This rulemaking reexamined the feasibility of the controlled load lowering provision and, based on the record evidence, OSHA determined that controlled load lowering was both feasible and necessary when using cranes to hoist employees. For a detailed discussion, see 53 FR 29122.

In light of these findings, OSHA is proposing to include the controlled load lowering provision in this part, and to amend part 1917 (§1917.45(j)(2)) to cover all cranes and derricks, including mobile cranes. OSHA wishes to emphasize that hoisting employees by crane is *not* a safe practice and should be used only where other means are not feasible. OSHA solicits comment on this issue.

Proposed §1918.66(c)(3) is a new requirement has also been taken from the from OSHA's Construction Safety standards applicable to hoisting personnel. This requires that a crane used to lift personnel be equipped with an anti-two block device. This is a device which prevents the hoist block from coming into contact with the head block of the boom. Such "two-blocking" can occur when the operator is not paying attention to how high the hoist block is in relation to the head of the boom. After contact, continued hoisting of the block can cause the block to separate from the load line, or break the load line itself, causing the hoist block and load to fall. OSHA feels that this requirement is necessary to prevent serious injury or death to employees being hoisted by a crane. In the 1988 construction rulemaking, this requirement was also found to be both necessary and feasible.

Proposed §1918.67 carries over the exact requirements currently found in OSHA's Longshoring rule at §1918.75. Paragraphs (a) and (b) both provide that the employer must obtain permission from the officer in charge of the vessel

whenever internal combustion or electrically powered tools, equipment or vehicles are brought aboard, and whenever the ship's power is needed for operating the employer's electrical tools or equipment. These requirements are prudent, in that such employer-provided equipment may be incompatible with vessel systems and could lead to electrical and ventilation problems, among others.

Proposed §1918.68 provides for the effective grounding of all portable electrical equipment, such as saws, drills, grinders, etc., through a separate equipment conductor that either runs with or encloses both circuit conductors. This represents a clarification of the current rule. Double-insulated tools and battery-operated tools are excluded from the requirements.

Proposed §1918.69 is a section titled "Tools." The current requirements with the same title are found in §1918.72, which addresses the safety devices that are required on portable tools, generally, and portable circular saws specifically. OSHA believes that the current OSHA General Industry standards, subpart P, titled "Hand and Portable Powered Tools and Other Hand-Held Equipment" comprehensively address the subject of portable tools. The hazards presented by these tools in this industry are no different than in general industry. Rather than repeating these requirements here, OSHA has decided to reference them in this proposal.

Subpart H—Handling Cargo

Proposed Subpart H specifically covers the cargo handling process. These sections (§§1918.81–89) address the hazards encountered by longshore workers while loading and unloading cargo. The primary hazards involve situations where the employee falls or is struck by cargo during the operation. In this subpart, OSHA is proposing to retain many of the rules currently found within subpart H of the current Longshoring standards (part 1918); to carry over applicable regulatory language from the Agency's rules for the shoreside segment of marine cargo handling (part 1917); and to add new requirements to account for occupational situations that are both unique to the shipboard workplace setting and up to date in their coverage of intermodal transport systems.

Sections 1918.81 through 1918.84 address those hazards common to the handling of break bulk (or general) cargo. They require proper slinging, building, bulling and stowing drafts of cargo in order to prevent cargo from coming loose from the draft and falling on or tipping over on workers.

Proposed paragraph (a) of §1918.81 is a general requirement for safety in the hoisting of slung drafts (loads hoisted by a sling or slings). Many factors can result in an unsafely slung draft. For instance, the wires of the sling may be placed on or around the cargo in a manner that causes a load to become unstable once it is hoisted. Such a situation can be recognized and effectively handled simply by rearranging the placement of the sling. Also, multi-tiered drafts are sometimes hoisted in a very unstable condition that is caused by one tier resting off center of another. Even a slight slacking of the gear can cause drafts slung in this manner to come apart. Readjustment of such drafts before hoisting can easily remedy that unsafe condition.

Proposed paragraph (b) requires that slings attached to the lifting gear for handling more than one draft in succession be positively engaged to the hoisting system. This is usually accomplished by shackling the bridle (or sling) directly into the falls. Mousing (closing off) the throat of the cargo hook assembly, is not permitted.

Proposed paragraph (c) provides protection for a common hazard encountered in break bulk cargo operations; that of being struck by sliding pieces of cargo or dunnage (shoring materials) that fall from the draft while in transit. There are at least two ways to correct such a situation: the first is to reconfigure the sling so that the top layer of the cargo is effectively engaged; the second is to secure the potential "sliders" to themselves (by banding them, for instance) or to the more substantial part of the draft.

Proposed paragraphs (d), (e), and (h) are virtually identical to the current rules but are modified somewhat for clarity. Proposed paragraphs (f) and (g), on the other hand, are derived from the Marine Terminal standard which address the hoisting of "unitized loads." Unitized loads are loads that are banded or strapped together into a unit. Hoisting hazards with such loads occur when the bands are used to hoist the load but were not designed to do so; and when hoisting is performed when the banding is damaged. (See full discussion at 46 FR 4189.)

Proposed paragraph (i) requires that loads not be hoisted unless the crane or winch operator can clearly see the draft at all times, or, alternatively, can clearly see the signals given by a signal person who is observing the draft. This is particularly important in that many break bulk vessels in current use and under construction are being fitted with revolving deck cranes. When using booms rigged in union purchase (the rigging of two booms together to be used as one lifting unit) the position of the boom head (and thus the location of the load's ultimate place of landing) is predetermined, rarely changed, and fairly reliable. By contrast, in using deck cranes, the position of the boom bead can be varied easily. Loads, therefore, can be landed at many more locations, causing increased exposure of personnel to being struck by loads. Effective signaling requires a clear observation of the load by the signalperson and of the signalperson by the operator.

Proposed paragraph (k) provides that the employer must require employees to stay clear of the area beneath overhead drafts or descending lifting gear. The employer is obligated to train certain employees in correct and safe procedures associated with the job, and to require that employees adhere to the well established and enforced work rules that are contained in that training. (See full discussion at 46 FR 4194.) OSHA is also proposing to include the same language in the Marine Terminal standard in §1917.13(h).

Proposed paragraph (l) prohibits riding of the load or the cargo engaging means. This precludes the utilization of any cargo or any cargo engaging device (hook, clamshell, grapple, etc.) as a personnel conveyance. This proposed paragraph does not cover, however, the riding of loaded intermodal container spreaders, which is addressed in §1918.85(g). In accordance with proposed §1918.23(b), specific latitude is afforded longshoring operations taking place on the Mississippi river system, where the use of a personnel basket may be used. However, careful consideration and consultation with the Agency is important in the exercise of that latitude.

Proposed §§1918.82 and 1918.83 (a) and (b) address the hazards of cargo becoming inadvertently dislodged from an improperly built draft or improper stowage and falling or shifting, thus striking workers. The language is virtually identical to the current longshore rule. §1918.83(c), however, addresses a different hazard—losing workers in the hold of a ship. Such a hazard is greatly enhanced when the worker is working alone or in an isolated area, such as in tanks or reefer compartments. Also, workers trimming grain could be lost in the cargo. To deal with these hazards, the proposed and current rules require an employee check-in, check-out system or frequent checks thereby accounting for the safety of employees working in these conditions.

Proposed §1918.84 addresses the "bulling" of cargo. Bulling is the horizontal dragging of cargo (across a deck space) with none of the weight of the cargo supported by the hoisting wire(s). In practice, this procedure is accomplished with power generally provided by the cargo winch (with the hoist runner led out through the heel block), and then to an angled system of "fairleads" that provide mechanical advantage in achieving a horizontal pull on the cargo. The paragraphs that comprise this section are all taken from the current part 1918 regulations, but have been somewhat clarified and reordered into a more logical sequence. They are also covered (in part) within the NYSA-ILA Safety Code (Ex. 1–2) and the PCMSC (Ex. 1–145).

Proposed §1918.85 applies to containerized cargo operations of any form. The proposed paragraphs track both the current Longshoring standards of part 1918, as well as the shoreside requirements found in the Marine Terminals rule (part 1917). In summary, each intermodal container (see definition at §1918.2(h)) must be marked with its gross, net, and tare (empty) weights. Generally, containers must be weighed *before* being hoisted aboard a vessel, to arrive at an actual gross weight. No container is permitted to be hoisted aboard a vessel if its actual gross weight exceeds either the maximum gross weight marked on the container or the safe working load of the gear that is being utilized to load the ship. In the case of containers coming from foreign ports, container weights must be determined by utilizing data provided in shipping documents or, as is most often the case, by weights shown on cargo stow plans.

Proposed paragraph (b) addresses the topic of overloaded intermodal containers. This issue has raised a good deal of international concern (Exs. 1–120, 1–121, 1–122, 1–123, 1–124, 1–125, 1–126). The proposed provisions largely reflect the current rules in both the Longshore and Marine Terminal standards. OSHA feels that the protection afforded by its rules as they pertain to outbound (export) containers, namely that with few exceptions all are weighed before hoisting, will permit very few overweight loads going out from U.S. ports. The reliability of manifested or stow plan weights of containers coming into U.S. ports, however, appears to be in serious question as documented by the previous exhibits. The question then becomes, whether there is a better method of determining the actual weights of these containers, and how should such a method be implemented in the standards. The Agency requests interested persons to submit comment into the record concerning both as to the Agency's perception of the problem, and what better regulatory approach OSHA may take in seeking resolution. For instance, instead of relying upon the proposed language of this section, should OSHA require that container handling gantry cranes (currently exempted from the rule requiring a load indicating device—§1918.74(a)(9)(viii)) be fitted with such a piece of equipment?

In addition, a new proposed §1918.85(b)(6) has been added as a result of OSHA Instruction STD 2.2 dated July 3, 1989 (Ex. 1–114). Prior to the issuance of this instruction, the rule required closed containers loaded only with automobiles to be weighed. This instruction (and the language of this paragraph) allows closed dry van containers that have been loaded with vehicles to be loaded onto a vessel without being weighed on a scale. By contrast, other loaded containers, other than open top containers and containers solely used for the carriage of compressed gases, have to be weighed on a scale before being loaded onto a vessel. The reasoning behind the Instruction and this paragraph is that the weight of the vehicles inside a container will not exceed the net weight that the container itself is designed to carry. There are, however, three conditions that must be met in order for this exception to apply. First, the container must only contain assembled vehicles and no other cargo; second, the container must be marked on the outside so that an employee can readily discern that the container is carrying vehicles; and finally, the vehicles must have been loaded at the marine terminal. This paragraph is also to be proposed to be put into the Marine Terminal standard as 29 CFR 1917.71(b)(6).

Proposed paragraph (d) addresses the hazard of handling a defective container. Although existing §1918.85(d) addresses the inspection of both outbound and inbound containers for visible defects, the proposed language does not mention the limitation of outbound or inbound. With regard to outbound containers, the hazards associated with handling a defective container are effectively covered by §1917.71(g) of the Marine Terminal standard. In this paragraph, OSHA chooses not to limit the inspection requirement to only inbound containers since certain other containers, including possibly defective ones, may need to be shifted in order to discharge an inbound container. Since a defective outbound container can create an identical hazard to the worker as does a defective inbound container, this proposal makes no distinction between the two. Finally, the provisions for handling a defective container remain the same as the current requirements: special safe handling or emptying of the container.

In proposed paragraph (e), the Agency would require that employees be required to stay clear of the area beneath suspended containers. Accidents of an extremely serious nature have occurred in recent years (Ex. 1–37, 1–87) that highlight the need to propose this provision. Additionally, the Agency has such a requirement in its shoreside rules (§1917.71(d)(2)).

Proposed paragraph (f) on lifting fittings contains identical language to that found in the Agency's shoreside rules (§1917.71(f)). Discussion is warranted, however, on the need to apply paragraph (f)(1)(i) on board ships. Often, particularly in below deck stowage on conventional break bulk vessels, it may be tempting to utilize ship's gear or shoreside mobile cranes and rig four leg bridles with hooks (engaging the four top corner castings) to facilitate easier stowage. In handling loaded containers, this practice is dangerous and is prohibited. The International Cargo Handling Coordination Association (ICHCA), has published a paper entitled "The Safe Handling of ISO Freight Containers with Hooks * * *" that clearly outlines the inherent dangers of this practice (Ex. 1–13) as well as methods to accomplish stowage safely in such situations. Additionally, other international standards exist (Exs. 1–115, 1–116 and 1–117) that recommend that loaded containers only be lifted vertically when being handled from the top. Any method of lifting containers that is not vertical places undue stress which could lead to failure of the container. OSHA believes that this regulatory approach is well taken and reasonable.

In proposed paragraph (g), the Agency requires that a safe means of access and egress be provided to each employee who, due to the nature of the work, must work atop stowed containers—both above and below deck. In practice, most employees gain such access by riding aboard safety platforms installed on container crane lifting frames. Such means are permissible when conducted in a manner consistent with design requirements found in the shoreside rules (§1917.45(j)). While the shoreside rules already apply whenever a shore-based crane acts as the personnel conveyance, this proposed paragraph (which incorporates by reference the

shoreside design criteria) provides for the same requirements to apply whenever shipboard equipment carries out the same function.

Proposed paragraph (h) applies on vessels so equipped, to any loaded intermodal container spreader. It is well known throughout the industry that there are significant risks associated with riding a loaded container spreader. "Free falls" (or the unintended release of a container from a spreader), although infrequent, occur only while under load (Exs. 1–25 and 1–26). Additionally, having riders aboard a loaded spreader adds to the responsibilities of the crane operator, and whose attention is already occupied with the task of getting the containers to their intended location. The Agency is proposing a similar prohibition for the shoreside aspect of marine cargo handling (part 1917) as part of this proposal, proposed §1917.45(j)(9).

In proposed paragraph (i), OSHA would require (when safer methods are available) that ladders not be used to gain access to the tops of containers that are stowed greater than two high. The Agency deems gaining access by means of a properly designed and conveyed personnel platform (such as those often found on intermodal container spreaders) as being safer than employing ladders in climbing to heights that can attain 50. ft or more (Ex. 1–10).

Proposed paragraph (j) covers the hazard of falling from the tops of intermodal containers. This hazard has long been recognized by the stevedoring industry as both extremely dangerous and difficult to prevent.

Although constituting a small percentage of the total number of shipboard accidents in the United States, falls from the tops of containers have resulted in a number of serious occupational injuries and fatalities (Exs. 1–18, 1–19, 1–20, 1–21, 1–22, 1–23, 1–24, 1–43, 1–67, 1–68, 1–100, 1–108). As early as 1968, U.S. terminal operators recognized the need to improve container top safety. Matson Terminals, Inc., in conjunction with their parent ocean operator, Matson Navigation Company, developed the first system of container top fall protection within the worldwide intermodal network (Ex. 1–53). In that system, Matson provided for a "D" ring fixture to be installed within the roof of each company-owned intermodal container. Employees working aloft were provided with a safety belt and lanyard that could be secured to the "D" ring anchorage. For a number of reasons, use of the system proved to be difficult, and it is not widely used today.

In 1970, OSHA's predecessor agency, the Bureau of Labor Standards, was contacted by the Coast Labor Relations Committee of the International Longshoremen's and Warehousemen's Union, who raised this issue specifically. In their letter of August 24, 1970 (Ex. 1–50), the Coast Committee asserted:

> Consider if you will the dangers attendant to working atop containers. They are not equipped with skidproof surfaces, there are no protective railings, and there are no requirements that safety belts be provided. In dry warm weather such work is dangerous enough, but the dangers are critically compounded when workers must labor atop these during windy and wet weather. At the very least, BLS regulations ought to provide that * * * safety belts be [required] for men working aloft.

As the containerized transport revolution progressed during the 1970's and into the 1980's, and intermodal containers become more common in the cargo handling trades, container top exposures increased proportionately. At that time, there was no specific container top safety provision in the Longshoring standards. The Agency issued citations under the General Duty Clause (Section 5(a)(190) of the Act and §1918.32(b) of OSHA's rules for Longshoring (Exs. 1–139). The latter provision states, in the context of applying to stowed cargo and temporary landing platforms:

> When the edge of a hatch section or stowed cargo more than 8 feet high is so exposed that it presents a danger of an employer falling, the edge shall be guarded by a safety net of adequate strength to prevent injury to a falling employee, or by other means protection equal protection under the existing circumstances.

Although there were questions regarding the applicability of §1918.32(b) to container operations, it was determined that the provision did indeed have application to container top on-deck exposures. In an Instruction to the Field (CPL 2–1.17) dated August 30, 1982, the Agency's policy on the issue was spelled out (Ex. 1–49). In that instruction, OSHA determined that although the §1918.32(b) provision applied, there would be situations where the abatement of the container fall hazard was not feasible. In such situations, the instruction noted:

> A violation (of §1918.32(b)) shall not be issued; however, OSHA should recommend and encourage the employer to work toward a solution and assist the employer in every way possible to effect a means of protection by advice, consultation and dissemination of information obtained during other inspections.

With the onset of containerized cargo handling, it became necessary to secure containers (not placed in cell guides) to each other to prevent unintentional movement during transit. To achieve this stability, workers placed stacking cones in the corner castings of the container ("coning") while the containers were being loaded on the ship. While the containers were unloaded from the ship, workers removed stacking cones from the corner castings of the container ("deconing"). The original stacking cones were replaced in the early 1970's by conventional twistlocks which eliminated the need for some lashing but still required workers to climb on top of the containers to place or remove them. Today twistlocks are the most commonly used fitting for securing freight containers onboard vessels (Ex. 1–140). Semi-automatic twistlocks, developed in the mid 1980's, eliminate the need for some lashing but also eliminate the need for workers to go on top of the containers for the purposes of coning and deconing. While some work performed on container tops remains unaffected by the use of SATLs, most of the work that would otherwise require workers to go atop containers could be eliminated. The use of these devices could, effectively, "engineer out" exposure to container top falling hazards.

Industry efforts to find feasible methods for container top fall hazard abatement received a significant impetus when, on June 27, 1985, Longshore Division members of the International Longshoremen's and Warehousemen's Union (ILWU) called a work stoppage that put at a standstill all container operations at the ports of Los Angeles and Long Beach, California. The work stoppage (Ex. 1–42) punctuated the ILWU's concern over a series of work related deaths that occurred over a 14-month period. Although only one of these occupational fatalities was attributable to container top exposure, the labor union insisted that an effective work rule to minimize the hazards associated with container top work be instituted, and asserted that such a work rule was central to averting a continued work stoppage.

On July 1, 1985, the ILWU and the Pacific Maritime Association (PMA), acting as management's representative, agreed upon a package of 25 work rules that were specifically designed to enhance safety at container terminals. That successful management and labor agreement led to the resumption of work.Internationally, a number of national and multi-national organizations are aware of and have

acted upon the problem. The International Labor Organization, in its Code of Practice for Safety and Health in Dockwork (Ex. 1–130) specifically requires that:

> A person gaining access to the top of a container should be adequately protected against the danger of falling where appropriate by wearing a suitable safety harness properly tethered, or by other effective means, whilst on the container.

In its Directions for Safety in Dockwork, the National Swedish Board of Occupational Safety and Health (Ex. 1–131) provides, in pertinent part, that:

> Work on top of a container is only permissible if measures have been taken to prevent falling down.

In the Netherlands, the Inspectorate of Dock Labor notes (Ex. 1–44) that:

> For general containertop [sic] safety in most cases the recommendations of I.L.O. and ICHCA are followed.

In the port of Hamburg, Germany, a "lash basket" designed by a dockworker (Ex. 1–45) rides underneath the container spreader and moves between container stows, minimizing containertop exposures. Also, in the port of Bremerhaven, a specially designed "rigger box," which is similar in configuration to some U.S. designs, protects dockworkers who go on top of containers in that port (Ex. 1–52).

In the wake of a fatal accident that occurred in a New Zealand port in 1979, the New Zealand section of ICHCA responded by conducting and publishing a study, entitled: "Container Top Safety—An Overview" (Ex. 1–46). In that study, ICHCA analyzed the problem and a number of possible solutions, among them having the employee tethered to a fixed anchorage. Other tentative solutions arrived at by a number of worldwide locales were also discussed.

OSHA believes that longshore workers who work on container tops are exposed to fall hazards that can cause serious injury or death. Containers are typically stacked from one to nine below deck and one to six above deck. The loading and unloading procedures typically require a worker to place and remove container stacking alignment cones in and from the container's corner castings. This means that workers performing these tasks are regularly exposed to falling hazards of up to 90 feet (27.3 m).

Within the last few years, advances have been made in the technology of securing intermodal containers which have had a dramatic effect on container top safety. The use of positive container securing devices or systems, such as semi-automatic twistlocks (SATL) and above deck cell guides, can nearly eliminate the need for workers to work on the tops of containers thereby eliminating the falling hazard. Although OSHA has participated in an ongoing dialogue with industry, labor, the international cargo handling community, and others interested in how these technologies can improve worker safety, actual record evidence is somewhat limited. However, OSHA's information does include a comprehensive study prepared by a safety expert under contract to OSHA that addresses the hazards associated with containerized cargo handling (Ex. 1–139); an ICHCA Safety Panel Research Paper addressing the use of semi-automatic twistlocks (Ex. 1–140); a time-and-motion study comparing the use of conventional twistlocks (also referred to as manual twistlocks) with semi-automatic twistlocks (Ex. 1–141); safety information produced by the United Kingdom (U.K.) addressing jammed container fittings (Ex. 1–142); an article published by a U.K. terminal association that addresses the freeing of jammed twistlocks (Ex. 1–143); and a newsletter from an insurance company addressing container twistlocks (Ex. 1–144).

The ICHCA study is the most comprehensive study on the SATL experience (Ex. 1–140). This study defines SATL at page 3 as follows:

> Semi-Automatic Twistlock (SATL)—A twistlock which will automatically engage in the locked position when the locking mechanism has been triggered by the weight of the container as it is landed onto another container or deck foundation.

Since prototypes were first developed in Japan in the mid 1980's, manufacturers around the world have made improvements on the design which enhance both durability and reliability. (Id.) In fact, the ICHCA study indicates the existence of approximately 22 different models of SATLs (Id. P. 6). Manufacturers indicate that, with proper use and maintenance, the average lifespan of the SATL in the marine environment would be about the same as a conventional twistlock—about 10 years (Id. p. 59).

As indicated in both the ICHCA study (Id.) and the OSHA study (Ex. 1–139), the use of SATLs is widespread throughout the world and the United States. In fact, OSHA estimates that over 25 percent of ships calling in U.S. ports are already utilizing SATLs. Proponents of the use of SATLs argue that the device avoids accidents and saves money. Unlike conventional twistlocks, which must be inserted by workers on top of the container and manually locked, semi-automatic twistlocks are inserted into the bottom of the container by workers standing on the dock and lock automatically when placed upon another container. Both SATLs and conventional twistlocks can be unlocked by workers standing on the deck of the ship using an actuator pole. In the case of unloading with the conventional twistlock, the upper container is then removed leaving the twistlocks on the top of the lower container. The major operational distinction is that workers must remove conventional twistlocks from the top of a shipboard container before the spreader can attach to the corner castings, while the SATL is designed to remain attached to the bottom of the container being unloaded. SATLs are then removed by workers standing on the dock. This operation using SATLs, therefore, eliminates worker exposure to falling hazards. Finally, proponents argue that the use of SATLs enhances productivity and reduces lashing costs. (Ex. 1–140, p. 76; Ex. 1–141). In fact, a time-and-motion study that compares the performance of conventional twistlocks to that of SATLs indicates an increase in productivity in the range of 25 to 29 percent. This translates to a 11.1 percent reduction in stevedoring costs (Ex. 1–141, p. 4 and 5; Ex. 2). To the extent that this study is representative of all container cargo handling operations affected by this rule, it indicates substantial reductions of fall hazards by the use of SATLs. OSHA seeks comment from interested parties including any additional data or studies that address this issue.

As indicated above, another advancement in securing containers in transit that eliminates the need for workers to go on top of containers is the development of above deck cell guides. Cell guides are rigid, structural members that form cells where containers are stowed. These cell guides allow for the ready placement of containers in a manner that prevents movement once so placed. Although cell guides in the hold are common in container ships, above deck cell guides are far less common, constituting only 2 percent (Ex. 2, pgs. 2–19) of container ships calling at U.S. ports.

In addition, OSHA is aware of the existence of positive container securing devices other than those discussed above, such as the SeaLand framing system (Ex. 1–57). OSHA believes that use of the term "positive container securing devices" is broad enough to allow for innovative technological improvement.

While the use of SATLs is the most widespread method of positively

securing containers that eliminates the fall hazard, OSHA is aware of certain problems that have been encountered with their application, use and design. (Ex. 1–140, 1–142, 1–143,1–144). The Agency is working closely with those international standards setting organizations responsible for developing design and use specifications. In this rulemaking, OSHA solicits relevant information regarding the use of SATLs.

Proposed §1918.85(j) addresses the hazards associated with working on the tops of containers. In keeping with OSHA's hierarchy of controlling hazards, this paragraph requires the use of feasible engineering controls. In proposed paragraph (j)(1) a definition for "fall hazard" is provided in a footnote. The definition seeks to narrow the elevated work surfaces where fall hazards exist in order to reflect the reality of a changing work surface. A longshore worker working on the top of containers for the purpose of loading or unloading a layer of containers is working on an elevated work surface that can increase or decrease at the rate of 320 square feet (29.4 m^2) every few minutes. OSHA believes that such a rapidly changing elevated work surface is unique to this industry. For example, five 40-foot containers stowed side by side present a work surface of approximately 40 foot (12.2 m) by 40 foot (12.2 m) (1600 square feet)(147.2 m^2). According to this definition, falling hazards (absent weather considerations) only exist within 3 feet (.92 m) of the perimeter or 3 feet (.9 m) by 148 feet (45.1 m) (444 square feet) (40.8 m^2). By contrast, the hazardous area on top of a single container is 252 square feet (23.4 m^2) of the 320 square feet (29.4 m^2). The definition makes it clear that it is the unprotected edge where the hazard exists, and not necessarily the entire work surface. Additionally, any gap of 12 inches (.31 m) or more on a horizontal surface formed by containers is considered an unprotected edge and a falling hazard would exist under this definition. (For further discussion of the gap issue see 51 FR 42685 and 53 FR 48186). Finally, OSHA believes that any work within 3 feet (.92 m) of the unprotected edge constitutes a hazard (See Ex. 1–139).

Another important element of this definition is the vertical distance necessary to constitute a fall hazard. OSHA believes that, in this industry and in this work operation, 10 feet (3.0 m) is the appropriate vertical distance. There are several considerations that leads OSHA to this conclusion. The height of the overwhelming majority of intermodal containers range from 8 feet (2.4 m) to 9½ feet (2.7 m) (Ex. 1–139). Therefore, an employee working on top of a one-high container where the surface is less then 10 feet (3.04 m) would not, by definition, be exposed to a fall hazard. However, such containers are usually worked off ladders, not the top. Also, if such a container is stowed on a raised surface, such as a hatch cover or pedestal, that puts the top of the container at 10 feet or over, then any workers on top would, by definition, be exposed to fall hazards. The unique working surface in this operation coupled with heightened awareness of the longshore worker and the absence of accident data at this distance further assures OSHA that 10 foot is the appropriate height.

OSHA is aware that an opposing view exists. Labor is of the opinion that OSHA should make this vertical height 8 feet (2.4 m) to be consistent with the proposed requirement §1918.32(b) where a fall hazard is considered to exist over 8 feet (2.4 m) when handling non-containerized cargo (Ex. 1–150). OSHA wishes to fully assess all factors attendant to this issue, and solicits all pertinent views and data on the appropriate height for fall protection.

Two final considerations in the definition of a fall hazard are with regard to the elements and the "adjoining surface." When weather conditions are such that the vision or footing of workers on top of containers is impaired then a fall hazard will, by definition, exist. The proposed standard requires such workers to be protected by fall protection, regardless of the fall distance or their proximity to the edge. OSHA notes that unsure footing on container top work surfaces created by oil or grease is addressed in the housekeeping section, §1918.91, of this proposed standard. In addition, in the Marine Terminal standard, OSHA defers to adverse weather conditions by prohibiting terminal crane operations in high-wind conditions (§1917.45(g)).

The other consideration involves the measurement of the vertical distance from "the adjoining surface." Informal discussions between OSHA staff and various affected parties have indicated concern that this phrase must be carefully defined in order to avoid confusion in the maritime community. An enforcement concern is a that vertical height measurement might be made from the elevated surface to an adjoining surface which would not be the landing surface in the event of a fall. Should the term, "adjoining surface" be further clarified by adding either performance or specification language? For example, the term could read, "adjoining landing surface (in the event of a fall)"; or "adjoining surface with a minimum 8 by 8-foot area (2.4 m by 2.4 m)." OSHA solicits comment on this issue.

In view of the recent technological improvements in positive container securing devices indicated above, OSHA feels that many work operations, notably coning and deconing, that exposed workers to container top fall hazards can now be eliminated. As noted above, SATLs have proven to be particularly effective when container gantry cranes are utilized (Ex. 1–140). In fact, the use of these devices in these circumstances can, in most instances, eliminate the need for workers to go on top of containers. In light of this, three years after the date of publication of this proposal, proposed §1918.85(j)(1) would prohibit the performance of any work, notably coning and deconing, on top of containers that can be eliminated by the proper use of these devices. OSHA has estimated that over 25 percent of ships calling at U.S. ports already utilize SATLs (Ex. 2). Since it is OSHA's policy to allow a reasonable time to come into compliance with final standards, the proposed compliance date for the implementation of engineering controls would be three years.

OSHA is optimistic that exposures to container top fall hazards will significantly decrease with the expanded deployment of positive container securing devices worldwide. At the same time, the Agency is sensitive to the magnitude of a phase-in process for SATLs. Consequently, OSHA is proposing a lengthy effective date of this section of three years from the date the proposed standard is issued. Consonant also with the Agency's policy, OSHA will continue to disseminate information to employers and employees in this industrial sector, as to how other operations throughout the nation and the world are approaching the problem.

OSHA recognizes that positive container securing devices will not entirely eliminate the need for workers to go on the top of containers. Certain container placement or securing tasks, in addition to coning or deconing, must be performed. In these situations (e.g., securing bridge clamps or releasing jammed twistlocks), a comprehensive fall protection program must be implemented.

Where cranes other than container gantry cranes are used to handle containers, OSHA recognizes that the use of SATLs may not be feasible. Precise placement capabilities of a container gantry crane are far superior to other lifting devices, thus facilitating the use of SATLs. This enhanced capability is due to the four point

suspension system of the gantry crane, which provides greater stability and control of the container being handled, enabling the crane operator to place the container without assistance. Container operations where the spreader is suspended from a single point, on the other hand, have far less stability and control and typically requires the assistance of other employees in the placement of containers. In these circumstances, employees can frequently be exposed to fall hazards. In light of the discussion above, even when the use of SATLs is feasible when other than gantry cranes are being utilized, the need for employees to work on container tops in the handling of containers may not be eliminated. Therefore, OSHA would not require the use of positive container securing devices when containers are not being handled by container gantry cranes.

Nonetheless, there is nothing in the proposed standard that would prohibit an employer from employing SATLs where a single point suspension is in use. However, under these circumstances, SATLs in the container being placed have been shown to jam or puncture the top of the container below with improper alignment (Ex. 1–140). OSHA solicits all pertinent views and information on all issues.

With regard to the feasibility of fall protection, OSHA recognizes that, in this industry, there may be particular instances when even fall protection may not be feasible. An example of circumstances where fall protection may not be feasible is the placement of an overheight container on a chimney stow using gear that requires the manual release of hooks. In these situations the proposed standard requires the employer to:

1. Make a determination that an employee will be exposed to a fall hazard but that the use of fall protection is not feasible;
2. Alert the exposed employee about the hazards involved; and
3. Instruct the exposed employee how to best minimize the hazard.

OSHA wishes to emphasize that such a situation is not common and that when they occur, the burden is on the employer to fully comply with these requirements prior to the actual exposure. In fact, the OSHA study indicated that a "specific set of circumstances could not be framed" where fall protection might not be feasible (Ex. 1–139, p. 1). Furthermore, situations that will be considered infeasible for fall protection will be narrowly construed in the enforcement context. A footnote in the standard refers to non-mandatory Appendix III which provides examples of situations where it may be considered infeasible to use fall protection. Where feasible, however, OSHA will require that fall protection be provided.

Proposed §1918.85(k) establishes the technical requirements necessary to provide a fall protection system that is tailored to the handling of containers. Most of the requirements in this paragraph are basic to any occupationally related fall protection system. These include all of the paragraphs with the exception of (k)(7) and (k)(10), and are based on the PCMSC (Ex. 1–145), American National Standards Institute (ANSI) consensus standard Z359.1–1992 and the OSHA standards §§1910.66 and 1926.104. Essentially, these requirements address the design, selection, care and proper use of a personal fall protection system. In addition, §1918.85(k)(7) and (10) have been specially crafted for the container top situation. Paragraph (k)(7) addresses the situation where a container gantry crane, or its extension, is being used as the anchorage point for the fall protection system in use. Under these circumstances, the crane must be placed in the slow speed mode and equipped with a remote shut-off switch in the control of the tied off employee. In addition, an indicator must be present to inform the employee when the remote is operational. OSHA seeks comment on whether the indicator should reflect that both the slow speed mode and the remote shut-off are operational.

The other proposed requirement unique to this work operation, paragraph (k)(10), addresses the situation where the employee is being transported by a device, such as a safety cage, attached to a container gantry crane spreader. Such a device is required to have a means of attachment to the spreader in place in addition to the primary attachment mechanism of the spreader (hydraulic twistlock mechanism) to prevent accidental disengagement. OSHA is aware of several instances where accidental disengagement of a load has occurred (Ex. 1–25, 1–26). This secondary means of attachment is intended to minimize the potential for injury if accidental disengagement were to occur.

A final issue for discussion in this section is Paragraph (k)(13) where an employee retrieval procedure in the case of a fall must be established. It has been suggested that local emergency response personnel be consulted in the development of this procedure in order to assure that rescue or retrieval efforts do not exacerbate any injury. OSHA believes that such a consultation would be prudent.

OSHA invites comment on all issues related to container top safety and encourages the submission of relevant views and information.

Proposed §1918.85(l) addresses container operations that require employees to work along unguarded edges other than on container tops. In these situations, fall protection meeting the requirements of paragraph (k) of this section must be provided where the fall distance is greater than 8 feet (2.4 m). This primarily addresses work operations such as lashing or locking and unlocking twist locks from other surfaces, or signalling to direct the placement of containers. Frequently, this work operation requires employees to work in elevated positions that remove the fall protection that would have normally been provided by the ship's coaming or railings. OSHA recently investigated a fatality where an employee fell 34 feet (10.3 m) from a lashing platform that was inadequately guarded (Ex. 1–149).

Proposed §1918.86 is a new section that addresses operations aboard vessels that accommodate Ro-Ro (Roll-on/Roll-off) traffic.The emergence of Ro-Ro vessels is a fairly recent development and were not addressed in the current rules. Along with container operations, this section proposes new provisions that address advances in modern technology in the marine cargo handling industry. Examples of such vessels are car carriers, which facilitate the import and export automobile trades, and stern or side port combination carriers, which provide water carriage for wheel mounted as well as containerized cargo. Commonly such vessels are fitted with ramps that extend to the dock or wharf, and are fitted with ramps internally or, alternatively, are fitted with cargo elevators (lifts). In this manner, cargo is either driven through the vessel from deck to deck until reaching its final stowage location, or hoisted by cargo elevator to its proper deck and then driven to its final stowage location. Once positioned in its stowage location, the wheeled cargo is lashed to securing fittings that are provided on the deck. In such operations, lashing personnel are exposed to being struck by vehicular traffic. In addition, other workers involved with loading or unloading wheeled cargo, both drivers and pedestrians, are exposed to traffic hazards. OSHA is aware of a number of accidents (Ex. 1–78, 1–89) that are attributable to this process, wherein employees are interspersed with vehicles in a closely confined,

marginally illuminated and poorly traffic managed space.

In proposed paragraph (a), OSHA would require an organized system of traffic control to be established and maintained at each entrance and exit ramp. The confluence of vehicular and pedestrian traffic in Ro-Ro operations, and thus the area where substantial accident potential is most pronounced, is the area on and around access ramps. With this mode of cargo carriage on the increase, accident potential is expected to increase proportionately. Ramps inside the vessel, although generally not as congested as ship-to-shore access lanes, must also be addressed by the traffic control system if they experience a periodic traffic flow that warrants such control. In developing this rule, OSHA considered positions taken by the International Labor Organization in their Code of Practice for Dock Work (Ex. 1–106), which provides that:

> A system of movement control of vehicles used in loading and unloading ships should be effectively and continuously applied.

In assessing other national requirements, the Agency found that Sweden in its Dock Work Directions issued by the National Board of Occupational Safety and Health (Ex. 1–136), also requires that:

> A traffic guard shall be stationed wherever motor vehicles need to be directed, e.g., on roll on-roll off ramps, narrow wharves and places where there is traffic crossing and the view is limited.

Clearly, shipside traffic control is just as necessary as it is in the shoreside environment. In OSHA's preamble to the Marine Terminals standard, the Agency emphasized (46 FR 4200) in its assessment of the importance of traffic control at the shoreside marine terminal setting:

> * * * the importance of these practices to employee safety cannot be over estimated.

Given the close relationship between shoreside and shipboard vehicular utilization, it is appropriate that OSHA's rules addressing the two be complementary.

Proposed paragraph (b) addresses the hazard of exceeding the capacity of the ramp used to transfer cargo. As a result of ramp failure, the likely injury to occur is drowning or being crushed in the vehicle. Ramps must be plainly marked with their load capacity and these capacities must not be exceeded (Ex. 1–5).

Proposed paragraph (c) provides protection for employees that use the ship's ramp for access. In such situations, OSHA proposes that a physical separation, i.e., a barrier, be provided to separate the employee and the vehicles. Often vessels are fitted out in this manner (Ex. 1–84). However, should it be the case that a particular vessel is not so fitted, it is a matter that is easily rectified. When the design of the ramp prevents physical separation of pedestrians from vehicles, a signalperson shall direct traffic, and shall not allow concurrent use. Additionally, OSHA proposes to require that such ramps utilized for pedestrian access be fitted out in the same manner as would a traditional pedestrian gangway (see §1918.21).

Proposed paragraph (d) requires that ramps be properly maintained and secured. This is consistent with §1918.24(b) which addresses maintaining and securing portable ramps.

Proposed paragraph (e) recognizes that in many of the modern generations of Ro-Ro vessels, internal ramps are elevatable. Such a construction feature allows for multiple access destinations, depending upon the placement of the ramp. If a ramp is placed in such a manner as to allow access to a given deck, thereby creating a void in another access route (that could perhaps lead to a substantial drop or fall), this paragraph provides that the incomplete route be clearly identified and barricaded. OSHA has investigated at least one (Ex. 1–86) occupational fatality in which this circumstance was apparent.

Paragraph (f) requires that all brake air lines be connected and tested prior to commencing operations. The proper operation of brakes is necessary when operating inside a Ro-Ro vessel that typically has ramps with steep grades.

Proposed paragraph (g) requires that flat bed and low boy trailers be marked with their cargo capacity and not be overloaded. These operations typically employ the use of trailers not designed for over-the-road use such as low boy trailers (sometimes referred to as "mafi's") that allow access to low deck height spaces found in Ro-Ro vessels.

Proposed paragraph (h) is analogous to OSHA's current weight requirement for intermodal containers. It would require that cargo to be handled via the ship's ramp be either marked with its weight or have such weight clearly marked in a written record.As a practical matter, vessel stow plans most always contain such data.

Proposed paragraph (i) requires tractors to have sufficient power and braking capacity to safely operate on Ro-Ro vessels.As previously noted, this is especially important in negotiating tight spaces and steep grades on Ro-Ro vessels.

Proposed paragraph (k) would require that internal combustion engine vehicles only be operated when adequate ventilation exists or is provided. It also provides guidance in determining acceptable levels of air contaminants generated by the internal combustion process, by referring the reader to the appropriate section of this part and part 1910, subpart Z (which is referenced in subpart A of this proposal. In most situations, the vessels themselves are fitted out with ventilation systems at all decks. It has been the Agency's observation that a number of purpose built Ro-Ro vessels possess ventilation systems that function remarkably well (Ex. 1–72), monitoring ambient air for various air contaminants as well as explosive properties.

Proposed paragraph (l) would require that cargo be secured to prevent sliding loads. This addresses the specific hazard of cargo falling off trailers while in transit on Ro-Ro vessels.

Proposed paragraph (m) would require that authorized persons, equipped with high visibility vests (or equivalent protection), be the only employees permitted on any deck where Ro-Ro operations are being conducted. Requiring only high visibility vests (or equivalent protection) and eliminating the allowance of using decals or reflectors is a departure from what has been allowed in the Marine Terminal standard. As is noted in Section VI of this preamble, OSHA proposes to eliminate the allowance of decals or reflectors in §1917.71(e) because of problems experienced with the use of decals, reflectors, and similar items. The reflective area of a decal on a hard hat is obviously less than that of a vest. Also, the reflective value is lost during daylight hours or whenever the wearer takes off the hard hat. A number of serious accidents (Exs. 1–78, 1–89) have occurred in the past due to the nature of the work involved in such cargo operations. This paragraph, along with the signalling requirements in proposed paragraph (n) that follow, are expected to enable employers to avoid vehicle-related accidents onboard ships. Paragraph (n) addresses signalling requirements for maneuvering vehicles into stowage positions while other personnel are in the adjacent vicinity.

In proposed §1918.87, OSHA sets out requirements for the utilization of shipboard elevators (lifts). Elevators are most common on a number of different Ro-Ro and Combination carrier vessel designs. The hazards addressed by this section are cargo falling from an improperly loaded elevator; and from wheeled cargo or employees falling into

open spaces in the deck created by a moving elevator. In approaching the issue of elevator usage, the Agency remained mindful of foreign vessel design prerogatives. Consequently, the four paragraphs proposed within this section, are protective of U.S. longshore workers obliged to use such installations, but are not expected to have an impact on any other nation's vessel designs.

In summarizing this section, OSHA would require that safe working loads of elevators be determined and adhered to. As a "lifting appliance," shipboard elevators are part of a complement of gear that comes under considerable discussion in ILO Convention No. 152 (see discussion of Subpart B—Gear Certification). As such, shipboard installations of elevators will require certification of safe working loads as well as the posting of elevator capacity. In practical terms, the employer's responsibility with regard to this paragraph is relatively simple to discharge. The requirement for evenly distributing the weight(s) to be lifted, particularly when considering the various drive mechanisms providing power to the elevator platforms, is an important provision.

Proposed paragraph (c) also is an important requirement that, while allowing the driver of a vehicle to remain at the vehicle's controls, prohibits other persons from riding the elevator to other decks. Of necessity, the sides of many shipboard elevators are unguarded while in transit. Riders, therefore, would be exposed to falls from sometimes significant heights. The ILO's Code of Practice for Dock Work (Ex. 1–107) addresses this issue in much the same manner.

In proposed paragraph (d), OSHA addresses a problem that both this Agency and the earlier Labor Standards Bureau have recognize as needing attention (Ex. 1–82). This provision would require that if fall hazards are created by open decks during the operation of shipboard elevators, the decks shall be barricaded. OSHA believes that under current international practice most installations will already be effectively guarded. In those situations, however, where the installation falls short in providing this safeguard, the employer must take the initiative in acquiring and effectively utilizing the required barrier protection.

Proposed §1918.88, "Log operations," as previously mentioned in the preamble discussion of proposed §1916.38 "Log rafts," is also an entirely new section addressing the hazards associated with loading logs from the water into a vessel. This is a particularly hazardous operation both because of the location where it occurs (on the water) and the nature of the cargo. Logs that are loaded from the water usually have been in the water for a long period of time, causing them to absorb water. The extra water adds to their weight and also loosens the bark, making the log surface very unsure and slippery. The proposed provisions of this section have been taken from both existing longshore regulations and from the ILWU-PMA Pacific Coast Marine Safety Code (PCMSC) (Ex. 1–145). In addition, these new requirements are supported by record evidence developed by OSHA personnel in Region 10 (Ex. 1–146).

Proposed paragraph (a) is taken from PCMSC Rule 417 (Ex. 1–145) and addresses the hazards associated with unstable logs that could be in the hold of a vessel creating a situation where employees could be injured or killed should the logs shift. Employees must not be in spaces in the hold when and where logs being loaded could strike them.

Proposed paragraph (b) addresses the hazard associated with the physical condition of the log surface, which may be slippery if there is no bark, or otherwise hazardous if the bark is loose and slides off the log as the employee is stepping on it. Employers must provide appropriate footwear to employees that have to climb on the log. Such footwear typically are spiked, also known as "caulked" shoes, may be styled like a sandal that attaches to existing footwear, and specifically designed for working logs (Ex. 1–146, pp.13–14).

Proposed paragraph (c), which is taken from the current longshore 1918.96(f), requires that lifelines be furnished and hung over the side when working log booms or cribs.

Proposed paragraph (d) is also taken from the current longshore regulation §1918.23(c), and requires that a Jacob's ladder be provided for each gang when working a log boom. However, in accordance with the provision in proposed §1918.23(c), no more than two Jacob's ladders are required for each log boom being worked.

Proposed paragraph (e) has also been taken from the current longshore regulations, §1918.96(e), and requires that a U.S. Coast Guard approved life ring with at least 90 feet (27.4 m) of line be in the vicinity of the work area.

The final paragraph, (f), requires that a rescue boat be available when employees are working on log rafts or booms. This requirement is similar to that found in Rule 638 of the PCMSC (Ex. 1–145). This addresses the hazard of employees falling into the water while loading logs and being carried away by the river current and possibly drowning. The requirement of a rescue boat would allow an employee who falls into the water to be quickly rescued.

Much of the proposed language in this section is based on rules found in the Pacific Coast Marine Safety Code (PCMSC) (Ex. 1–145), which has been negotiated by the Pacific Maritime Association and the International Longshoremen's and Warehousemen's Union. In addition, OSHA believes that the proposed requirements reflect the current safe industry practice.

OSHA requests comment from the public concerning the completeness of these proposed regulations pertaining to handling logs from the water.

Proposed §1918.89, addressing hazardous cargo, is carried over from the existing Longshore standard (§1918.86). The same language is found addressing this issue when at shoreside cargo handling operations (§1917.22). Proposed §1918.89 and the Hazard Communication rule that is referenced in the "Scope and Applicability" paragraph, §1918.1(b)(6), complement one another in covering employee notification and procedures for handling hazardous cargo. OSHA requests comment from the public on whether §1918.89(a) and (c), and similar language in §1917.22(a) and (c) is repetitious in light of the Hazard Communication rule, keeping in mind that HazCom is referenced in both Parts. (In addition, the exposure of employees to toxic and hazardous substances is addressed in subpart B of part 1917, in proposed subpart I of part 1918 and in subpart Z of part 1910.)

Subpart I—General Working Conditions

In 1987, OSHA extended the coverage of the Hazard Communication standard (HazCom) (29 CFR 1910.1200) to all employers with employees exposed to hazardous chemicals in their workplaces. As a result, subpart I of part 1918 was amended to include the requirements of that standard as §1918.90. Basically the HazCom standard requires such employers to provide information to their employees concerning hazardous chemicals by means of hazard communication programs. These programs would include the use of labels, material safety data sheets (MSDS), training and access to written records. In addition, distributors of hazardous chemicals are required to ensure that containers they distribute are properly labeled, and that a material safety data sheet is provided to their customers.

On August 24, 1987, OSHA, in expanding the coverage of this rule, also

made certain revisions that address the handling of sealed containers of hazardous materials, such as is usually done in longshoring work. Specifically, OSHA stated at 52 FR 31861:

> There are a number of work situations where employees only handle sealed containers of chemicals, and under normal conditions of use would not open the containers and would not expect to experience any measurable exposure to the chemicals. Such work operations include, for example, warehousing, retail sales, *marine cargo handling*, and trucking terminals. (Emphasis added.)

OSHA recognized, nonetheless, that even under these circumstances, the potential for a hazardous exposure could occur.

> It is reasonable to assume, however, that all such containers are subject to leakage and breakage, and these employees are in fact potentially exposed by virtue of the presence of these hazardous chemicals in their workplaces. Because of this potential exposure, they need information to protect themselves form the hazards of these chemicals in the event such an emergency situation occurs. (Id.)

Proposed §1918.90 consists solely of a cross-reference to the Scope and Applicability section of the proposal, specifically §1918.1(b)(6), which references the Hazardous Communication standard, §1910.1200. OSHA has decided to reference the Hazard Communication standard in the scope section of this proposal as one of the part 1910 provisions applicable to longshoring. This would have no effect on either the enforceability or the applicability of HazCom to longshoring. OSHA proposes to do the same in the Marine Terminals standard (part 1917).

The primary HazCom obligations that apply to longshoring are found in §1910.1200(b)(4). This paragraph sets out the basic duties of employers: (1) not to remove or deface labels affixed to containers of hazardous chemicals; (2) to maintain and provide access to any MSDS's that are received for hazardous chemicals while the chemicals are in the workplace; and (3) to obtain an MSDS when one is not received but an employee requests one. In addition, the employer must train employees in accordance with the provisions of the rule to ensure they are protected in the event of a spill or leak. The Agency seeks comment on this different approach.

Proposed §1918.91 addresses housekeeping. In assessing the types of accidents that most occur in shipboard cargo handling, one fact has remained constant: many involve slips, trips, and falls (Exs. 1–14, 1–73). Housekeeping factors cause a substantial number of such accidents. Staying with the principle of providing a uniform regulatory approach to shipboard and shoreside occupational safety and health, OSHA proposes, in this section, to bring into part 1918 those applicable provisions of part 1917 that cover the same hazards on shore. Those remaining provisions, which are vessel-specific, would be retained from the current part 1918. In addition, OSHA considers lashing gear that is used with containers, roll-on, roll-off cargo, and, in particular, automobiles, to be "equipment," as referred to in paragraph (a).

Proposed §1918.92 provides illumination requirements for cargo handling work aboard vessels. Here again, OSHA remains consistent with its shoreside rules in requiring 5 footcandles (average) (54 lux) of illumination at cargo operations. In proposing this standard, OSHA believes that it will not only remain uniform with its shoreside rule (§1917.123), but also remain consistent with good illumination safety principles. (Ex. 1–152)

In crossing from one location to another, in this case shore to ship, it is a well-recognized safety practice to provide uniform lighting. On this topic, the American National Standard practice for Industrial Illumination (ANSI/IES RP–7–1991) (Ex. 1–152) states the following:

> Alternate areas of extreme luminance differences are undesirable because it tires the eyes to adjust to them.
>
> .... uniformity permits flexibility of functions and equipment and assures more uniform luminances.

Proposed paragraph (c) would require that lighting provided aboard ship does not shine into the eyes of personnel in key positions of cargo control, such as crane and winch operators. Certainly it is extremely important to allow a clear and unencumbered view to those that are in control of the cargo transit. With the same principle in mind, it would also be required that stationary lights (those not mounted on vehicles) on Ro-Ro vessels not shine into the eyes of drivers. In addition, the proposed requirements for portable lights and entry into dark areas closely parallel the provisions in the existing standard.

Proposed §1918.93, Hazardous atmospheres and substances, is designed to provide protection from atmospheric hazards which are not specifically addressed in other proposed sections. In as much as these hazards are virtually identical to those found in marine terminals, the language of this section largely tracks the requirements found in §1917.23. Since the promulgation of the Marine Terminal standard, OSHA has promulgated a Permit-Required Confined Spaces standard for General Industry (58 FR 4462, Jan. 14, 1993). Since both the Marine Terminal and Longshoring standards currently addressed hazards associated with confined spaces, OSHA did not intend the General Industry standard to apply to these workplaces. However, OSHA also had planned, in its ongoing development of this longshore proposal, to conform the relevant longshore requirements to the more explicit and protective marine terminal requirements. Furthermore, this approach is consistent with the vertical nature of these maritime standards.

The use of the phrase "the employer is aware" that a hazardous condition exists means that the employer is or should be aware of the hazardous condition. This section establishes requirements for the determination of the hazard, the testing during ventilation, and the procedures for entry into hazardous atmospheres. In addition, the hazards associated with emergency entry, inadvertent entry and asbestos spills are also addressed.

Proposed §1918.94 provides requirements for ventilation and atmospheric workplace conditions. Proposed paragraph (a) specifically addresses the hazards associated with carbon monoxide (CO) aboard ship. Longshoring work frequently involves the use of internal combustion-powered equipment to facilitate the stowage and removal of cargo. This equipment would include fork lift trucks, bulk cargo movers and the cargo itself (vehicles on Ro-Ro ships). Occupational fatalities and disabling illnesses still appear on the waterfront (Exs. 1–76, 1–77, and 1–81) due to high levels of (CO) accumulating from these sources in cargo spaces.

Currently OSHA's limit for (CO) in General Industry, Construction, and Shipyards is 50 ppm as an 8-hour TWA. The limits in Marine Terminals and Longshoring are a 50 ppm and, in confined spaces, a 100 ppm ceiling. The ACGIH–1986 has a TLV®-TWA of 50 ppm and a TLV®-STEL of 400 ppm for (CO) (Ex. 3–8). NIOSH (Ex. 3–1) recommends an 8-hour TWA limit of 35 ppm and a 200 ppm ceiling. For both Longshoring and Marine Terminals, OSHA is proposing to lower the PELs for CO to 35 ppm (8-hour TWA) and is proposing a 200 ppm (ceiling, measured over 5 minutes) in outdoor, non-enclosed spaces. OSHA is proposing to retain the 100 ppm ceiling for CO in enclosed spaces in Marine Terminals and Longshoring. NIOSH concurs (Ex.

3–2) that the proposed limits are appropriate.

Carbon monoxide is a flammable, colorless, practically odorless gas. It is used as a reducing agent in metallurgical operations, in the manufacture of metal carbonyls and zinc-based white pigments, and as a chemical intermediate. Most occupational exposures to this ubiquitous substance are the result of the incomplete combustion of organic material (HSDB 1990; Ex. 3–18).

Carbon monoxide has caused a large number of industrial fatalities as a result of its tendency to combine readily with hemoglobin to form carboxyhemoglobin (COHb). The Immediately Dangerous to Life and Health (IDLH) level for carbon monoxide is 1500 ppm (Ex. 3–3). At levels above this, workers quickly lose consciousness; if exposure is not terminated immediately, death by asphyxiation follows quickly.

In experimental animals, asphyxiation occurs when the air-borne concentration of CO exceeds 3 percent (30,000 ppm) (HSDB 1990). CO also causes reproductive and developmental effects in animals. The LD_{50} in rats is 1807 ppm for 4 hours (Ex. 3–4).

Excessive accumulations of COHb cause hypoxic stress in healthy individuals as a result of the reduced oxygen carrying capacity of the blood. In patients with cardiovascular disease, such stress can further impair cardiovascular function. A number of studies show that 8-hour TWA exposures to 50 ppm carbon monoxide generally results in COHb levels of 8 to 10 percent. Such levels are not generally associated with overt signs or symptoms of health impairment in healthy individuals with strong cardiovascular systems who are working under nonstressful conditions. However, the ACGIH believes that a TLV®-TWA of 25 ppm, which results in COHb levels of 4 percent or less, may be necessary to protect workers with cardiovascular disease, because this condition places workers at higher risk of serious cardiovascular injury (Ex. 3–8, p. 1106). The NIOSH REL of 35 ppm TWA is also aimed at protecting workers with chronic heart disease (CHD); NIOSH believes that such workers should not be allowed to have carboxyhemoglobin levels that approach 5 percent. In the part 1910 air contaminants rulemaking, several commenters questioned the need to lower the 8-hour TWA and to add a STEL.In response to these commenters, OSHA quoted the ACGIH (Id.):

> Each molecule of CO combining with hemoglobin reduces the oxygen carrying capacity of the blood and exerts a finite stress on man. Thus, it may be reasoned that there is no dose of CO that is not without an effect on the body. Whether that effect is physiologic or harmful *depends upon the dose of CO and the state of health of the exposed individual.* The body compensates for this hypoxic stress by increasing cardiac output and blood flow to specific organs, such as the brain or the heart. When this ability to compensate is overpowered or is limited by disease, tissue injury results [emphasis added].
>
> Exposure to CO sufficient to produce COHb saturations in the 3-5% range impairs cardiovascular function in patients with cardiovascular disease and in normal subjects. * * * The primary effect of exposure to low concentrations of CO on workmen results from the hypoxic stress secondary to the reduction in the oxygen-carrying capacity of blood. * * * Workmen with significant disease, both detected and undetected, may not be able to compensate adequately and are at risk of serious injury. For such workers, a TLV of 25 ppm * * * might be necessary. Even such a concentration might be detrimental to the health of some workers who might have far advanced cardiovascular disease. * * * It would appear to the Committee that the time-weighted TLV of 50 ppm for carbon monoxide might also be too high under conditions of heavy labor, high temperatures, or at high elevations (Ex. 3–8).

Thus, the ACGIH also regards a lower limit for CO as necessary to protect workers with cardiovascular or pulmonary disease or those working under stressful conditions.

OSHA believes that it is clearly necessary to set a CO level that protects workers who have CHD because (1) a large percentage of employees have it, (2) it is often not diagnosed or diagnosable, and (3) it is frequently fatal. The 35 ppm 8-hour TWA is designed to protect employees with asymptomatic CHD. The term CHD is generally used to refer to the process of atherosclerosis of the coronary arteries, which leads to disturbances in the myocardial blood supply.

The general worker population in the United States is composed of a very significant number of persons with CHD. Since the identification of such persons in the absence of overt clinical symptoms is virtually impossible, it is necessary to assume that the average worker has asymptomatic CHD, especially when his/her first clinical symptom may be sudden death (Ex. 3–1). Several studies demonstrate the significant risk associated with CO exposure, particularly with respect to coronary heart disease. A study of firefighters in Los Angeles (Ex. 3–10) suggests that CO exposure during firefighting may be responsible for the high incidence of heart disease in firefighters. In some fires, peak exposures were occasionally as high as 3000 ppm CO, with 40 percent of peak values in the 100-to 500-ppm CO range. However, in some fires, the peak CO exposure was below 100 ppm. Although these peak exposures in firefighters were high, firefighters are likely to be exposed overall for fewer hours than the workers of concern in this rulemaking.

A prevalence study was recently performed on angina pectoris, ECG changes, and blood pressure that involved 1,000 workers from 20 foundries (Ex. 3–11). A clear dose-response was found with regard to the prevalence of angina (as obtained by history on a World Health Organization-recommended questionnaire) and CO exposure in workers (both smokers and nonsmokers).

NIOSH conducted a prospective cohort mortality study among 1,558 white male motor vehicle examiners who were employed in New Jersey for a minimum of 6 months between 1944 and 1973 (Ex. 3–12). Industrial hygiene surveys indicated that the examiners were exposed to carbon monoxide at a time-weighted-average (TWA) of 10 to 24 ppm. Using a modified life table technique, the expected deaths were compared to the expected deaths through August 1973. The overall deficit of mortality observed (SMR180) in this occupational cohort during the first 10-year period was to be expected as a result of the widely accepted "healthy worker effect." However, the component SMR for cardiovascular disease deaths (134) was unexpected, since the "healthy worker effect" had been most significantly associated with decreased cardiovascular disease mortality (Ex. 3–13). This evidence suggests that slightly elevated COHb may contribute to excess cardiovascular disease rates in a healthy population that is of average fitness (since the work is not physically hard).

A recent study (Ex. 3–14) reviewed the epidemiological evidence for an association between carbon monoxide and heart disease and concluded that carbon monoxide exerts acute and possibly reversible short-term effects that can increase the risk of cardiovascular disease.

In another recent study, male volunteers aged 35 to 75 with stable exertional angina pectoris and positive exercise treadmill tests were exposed to CO concentrations designed to cause 2.2 to 4.4 percent COHb levels after exercise. The subjects performed a symptom-limited exercise test on a treadmill, followed by exposure for 1 hour to CO, and then performed a second treadmill test. All subjects who completed the study (N=63) showed significant decreases in time to onset of ischemic ST-segment changes; in the 2 percent COHb group, this change

equalled 5.1 percent, and in the 4 percent COHb group it averaged a 12.1 percent decrease (Allred, Bleecher, Chaitman, Dahms, Gottlieb, Hackney et al. 1989, in Res. Rep. Hlth. Effect. Inst. 25:79).

As pointed out above, cardiovascular disease (detected or undetected) and pulmonary impairment are widespread in the general population in this country, in workers as well as other subpopulations. In addition, OSHA is particularly concerned about the adverse effects of CO because workers regularly encounter complex and stressful situations at work, including heat stress, jobs demanding heavy exertion, and tasks requiring both judgment and motor coordination. OSHA standards are intended to protect workers of average and below-average fitness and those who engage only intermittently in heavy physical labor and who do not therefore receive the benefit of physical conditioning.

OSHA thus has determined that, in Longshoring and Marine Terminals, the proposed 8-hour TWA of 35 ppm for carbon monoxide is needed to reduce the significantly increased risk of cardiovascular disease that is associated with overexposure to CO. The Agency also believes that a ceiling of 200 ppm in outdoors, non-enclosed spaces is necessary to ensure that peak CO exposures are kept below the 1500 ppm IDLH level by a reasonable safety factor. The ceiling limit will also assist in keeping COHb levels below 5 percent; the ceiling will be measured over 5 minutes to permit the use of simpler monitoring techniques.

Based on this evidence, OSHA is proposing an 8-hour TWA of 35 ppm and a ceiling of 200 ppm in outdoor, non-enclosed spaces as the PELs for carbon monoxide in the longshoring and marine terminal industries. In these industries, however, most employees regularly enter and work in a compartment, hold, or other enclosed space, in which CO levels can increase rapidly if uncontrolled. CO, therefore, presents an especially great danger of death from IDLH levels of CO. Consequently, OSHA is retaining the 100 ppm ceiling for CO in such spaces, as well as the provision requiring monitoring of these spaces. The Agency would continue to require that the employer monitor the ambient air within any cargo space where internal combustion engines discharge their exhaust. Therefore, when concentrations of CO in these enclosed spaces reach 100 ppm, work shall be suspended and the workers removed from the spaces. Work shall not resume until concentrations of CO, as determined by actual monitoring, have been reduced to within the allowable limits.

The Agency believes that these limits will ensure that the COHb levels of exposed workers (especially of non-smokers) in these sectors are maintained at or below 5 percent, which will protect those workers at greater risk because of cardiovascular or pulmonary impairment. In addition, these revised limits will protect healthy workers in the affected sectors who must work in environments involving intermittent exertion, heat stress, or other strenuous conditions. OSHA believes that these limits are necessary to substantially reduce the significant occupational risk associated with both chronic and peak exposures to carbon monoxide in the workplace. The hypoxic stress associated with exposure to carbon monoxide clearly constitutes a material impairment of health and functional capacity. For a more complete discussion of these health effects see 57 FR 26371.

If natural or vessel supplied ventilation is not sufficient to maintain levels within the allowable limits, the employer must utilize supplemental methods until such levels are reached (generally accomplished with portable blowers). It should be noted that the proposed requirement deletes the language "before work is resumed." This is to make the requirement reflect more clearly the actual industry practices being employed to control exposure to CO through the use of engineering controls. The longshoring work itself generates CO through the use of the loading equipment. In reality, then, it is not the circumstance that 100 ppm is routinely reached, the hold is cleared of workers, supplemental blowers are used to clear the air and then the workers return to work. Rather, when a sustained build-up of CO is detected, even at much lower levels, the supplemental blowers or other additional means are employed to maintain the exposures to within the allowable limits.

Portable ventilating equipment must be guarded to prevent employee injury, and they must be effectively grounded by a grounding conductor run with or enclosing the circuit conductors. In situations where portable ventilating equipment is run by vessel supplied power, the grounding conductor must be bonded to the structure of the vessel. Given the shipboard environment, careful attention must be paid to the electric cords of portable equipment, making certain they are not worn or otherwise unserviceable.

OSHA is proposing to retain the requirement for recording tests of the atmosphere. The stevedoring community is successfully using such testing logs as a frame of reference in assessing atmospheric conditions from one point in time to the next.

In proposed paragraph (b), OSHA addresses the longshoring hazards associated with handling grain that has been treated with fumigants. Grain is subject to infestation by insects and rodents during storage and shipping. Fumigants used to control infestation can be liquid or solid compounds that release poisonous gases and can be applied in the form of sprays, fogs or gases or by direct contact (Ex. 1–104).

> * * * these gases are harmful, possibly fatal, to humans as long as they remain potent. Therefore, they constitute a safety hazard from the time of application throughout the duration of their potency—which may last for several days. (Id. p.36).

Here, OSHA would require that the employer determine whether or not grain to be loaded or discharged aboard a vessel had been fumigated. Such a determination shall be based on direct communication with knowledgeable persons from both the grain elevator and the vessel.

When a cargo has been fumigated, an employer shall designate a person (see §1918.2(c)), who is thoroughly familiar with the characteristics of the fumigant being used and how to properly assess contaminant levels; fully aware of the manufacturer of the fumigant's use recommendations and warnings; and knowledgeable about the proper personal protective equipment which must be worn to safely guard against the possible effects of the fumigant. The designated person must test the vessel's compartments after loading begins, but before longshore employees (generally trimmers) enter. Subsequent tests must be made to ensure that fumigant concentrations to exposed personnel never attain levels that are beyond the allowable limits. Records of those tests are retained by the employer for a period of 30 days. Whenever the concentration in any compartment reaches the level specified as hazardous by the fumigant manufacturer or by subpart Z of 29 CFR part 1910, whichever is lower, all employees shall be removed from such compartments and shall not be permitted to re-enter until such time as tests demonstrate that the atmosphere is within allowable limits.

Consistent with §1917.25 of the Marine Terminal standard, during emergencies or while tests are being undertaken in compartments that have

hazardous or unknown concentrations of fumigant, the designated person entering the compartment must be properly outfitted with personal protective equipment, (See criteria at proposed §1918.94(b)(3)(v)), and must be observed while conducting such tests by two standby employees, who are themselves properly outfitted. The personal protective equipment used by the designated person and the observers, will be required to be readily available wherever fumigated grains are handled.

In situations where it is necessary to carry out insecticide or pesticide treatment of a localized nature, such as in rodent control, paragraph (b)(4) would require that employees conducting the treatment and those that may be exposed to the chemical(s) applied, be equipped with personal protective equipment that meets the specifications set out by the manufacturer of the chemical(s) being used.

In proposing these rules covering fumigated grain cargoes, the Agency has relied upon the existing rule for longshore employment (Ex. 1–39) but has also utilized the Agency's experience in promulgating the general industry Permit-required Confined Space standard (29 CFR 1910.146, 58 FR 4549), together with accident data (Ex. 1–104) relating to fumigated grain cargoes aboard ship. Finally, these rules are further supported by similar provisions found in the Pacific Coast Marine Safety Code (Ex. 1–145) and the U.S. Coast Guard's "Interim Regulations for Shipboard Fumigation," 46 CFR–147A (Ex. 1–105).

In proposed paragraph (c), the Agency proposes requirements for handling cargoes of fumigated tobacco. Tobacco cargoes, both ported and exported, are shipped most typically in bales, in hogsheads, and in intermodal containers. OSHA's proposed Longshoring requirements apply when cargoes are break-bulk, i.e., piece lots of bales or in hogsheads. When such cargoes are containerized, OSHA addresses employee exposure in the Marine Terminal standard (29 CFR 1917.25(g)).

In the case of break-bulk fumigated tobacco cargoes, the employer would be required to determine (by written notification) if the cargo has in fact been fumigated. If so, the employer would be further required to obtain a written warranty from the fumigator(s) that the cargo has been sufficiently aerated (concentration of fumigant is within allowable limits.) OSHA notes that this practice is currently in place at all longshore operations in the U.S. handling tobacco. In the case of containerized shipments of fumigated tobacco, OSHA is proposing new language that can be found in the proposed changes to the Marine Terminal regulations, §1917.25(g), which is part of this proposal and which is discussed in Section VI of this rulemaking.

Proposed paragraphs (d) and (e) remain virtually identical to the existing provisions. Paragraph (d) involves a work practice to discover hazardous exposures to fumigants of any cargo other than grain and tobacco while paragraph (e) involves the use of personal protective equipment to protect against heavy concentrations of dust.

Proposed paragraph (f) addresses operations aboard vessels engaged in the menhaden trade. Menhaden is a term that refers to several species of trash fish. Menhaden is used to produce, among other products, fertilizer, pet food and fish oil. (See 46 FR 4213.) As cargo to specialized menhaden marine terminals, menhaden presents a health hazard to longshore workers when it decomposes, generating hydrogen sulfide (H_2S). As recently as 1987, a hydrogen sulfide incident aboard a menhaden vessel led to serious injury and a fatality (Ex. 1–80). OSHA's current limit for hydrogen sulfide in Marine Terminals is 20 ppm as an 8-hour TWA; the current Longshore standard is silent with regard to both H_22S and menhaden. The 1986 ACGIH TLV®s for hydrogen sulfide are 10 ppm as an 8-hour TWA and 15 ppm as a 15 minute STEL (Ex. 3–8); NIOSH has a 10-ppm, 10-minute REL for this substance (Ex. 3–3). OSHA is proposing an 8-hour TWA of 10 ppm in Longshoring and Marine Terminals with a STEL of 15 ppm. Promulgation of these PELs will make OSHA's limits for hydrogen sulfide consistent with the best available evidence on the hazards of H_2S exposure.

Hydrogen sulfide is a colorless, flammable gas with the odor of rotten eggs. It is widely used as a chemical intermediate, an analytical reagent, and in the manufacture of "heavy water" (H_2O_2) in the utilities sector. In agriculture, it is used as a disinfectant (HSDB 1985). It is also generated by the fermentation of animal manure. Many farm workers have been exposed to this substance while working in the vicinity of liquid manure storage pits and have been asphyxiated as a consequence (Ex. 4–1). Hydrogen sulfide also is encountered in natural oil and gas deposits and in sewers, caissons, tunnels, and other construction sites (Grant 1986, p. 495). When used in pesticidal applications and as directed on the label, this substance is regulated by the EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In longshoring, the hazard is brought about by the generation of hydrogen sulfide gas, caused by the decomposition of the menhaden (and similar species) catch.

Hydrogen sulfide's effects on experimental animals are similar to those seen in exposed workers: conjunctivitis, pulmonary irritation, acute poisoning, and death by chemical asphyxiation (Ex. 4–2). The LD_{50} in mice is 673 ppm for 1 hour (Ex. 4–3). A number of experiments have demonstrated that exposure to hydrogen sulfide concentrations of 50 to 100 ppm for several hours (or sometimes longer) causes damage to the corneal epithelium of dogs, cats, rabbits, and guinea pigs; animals are believed to be somewhat less sensitive than humans to hydrogen sulfide's ocular effects but may be more sensitive to its pulmonary effects (Grant 1986, p. 1496).

When inhaled at concentrations exceeding 500 ppm, exposure to hydrogen sulfide has caused respiratory paralysis and death. Acutely poisoned individuals who recover may experience headaches, fatigue, dizziness, and nystagmus; eventually, however, recovery is usually complete (Ex. 4–4). The 1986 ACGIH *Documentation* (Ex. 1-3, p. 1318) cites several reports (Ex. 4–6) of the occurrence of adverse ocular effects, including conjunctivitis, caused by exposure to 20 ppm or less of hydrogen sulfide. A study by Poda and Aiken (Ex. 4–7) reports that the adoption of a voluntary limit of 10 ppm in two heavy-water plants eliminated exposure problems at those facilities. An early study by Flury and Zernik (1931f) reports that the conjunctivitis caused by the exposure of volunteers to 10 to 15 ppm of hydrogen sulfide for six hours endured for several days; however, this substance is not known to have caused irreversible eye damage.The author of the best-known general source on the toxicology of the eye (Grant 1986) states that "where the concentration [of hydrogen sulfide] is regularly kept below 10 ppm in air, it is rare to have any irritation of the eyes" (p. 1496). OSHA believes that the proposed STEL will ensure that concentrations are maintained close to the 8-hour TWA and that excursions above irritant levels are thus minimized.

Based on this evidence, OSHA believes that the current 10-ppm 8-hour TWA limit alone does not adequately protect workers in Longshoring and Marine Terminals against the adverse ocular effects associated with exposure

to concentrations of hydrogen sulfide above 10 ppm. OSHA believes that the eye irritation and conjunctivitis associated with such exposures represent a significant risk of material health impairment to these workers because they may experience pain and other ocular effects and be forced to seek medical treatment after such exposures. OSHA is accordingly proposing an 8-hour TWA limit of 10 ppm for hydrogen sulfide with a short-term limit of 15 ppm in these parts 1917 and 1918. Based on available information, the Agency has determined that these limits are necessary to provide protection from the significant risk of exposure-related ocular effects, including conjunctivitis, corneal edema, and distortion of vision, associated with occupational exposure to hydrogen sulfide.

Since the hazard this paragraph seeks to avoid is brought about by the generation of hydrogen sulfide gas, caused by the decomposition of the menhaden (and similar species) catch, the requirements are not applicable to operations aboard vessels with operable refrigerated compartments used to hold the catch. Paragraph (f) requires that tests be performed before and during discharge, by designated personnel who are trained and competent in their understanding of the potential hazards involved within the catch hold(s). The test would include assessments of hydrogen sulfide and oxygen content of the atmosphere(s) within the hold(s). Employers would be prohibited from sending employees into the hold(s) unless the hydrogen sulfide level was kept below 10 parts per million on a time weighted average with a short term exposure limit of 15 ppm measured over a 15 minute sampling period. Oxygen levels must be maintained to at least 19.5 percent.

In arriving at these proposed requirements, OSHA utilizes information that supported similar requirements for the shoreside aspect of menhaden operations in the Agency's rules for Marine Terminals (§1917.73; See discussion at 46 FR 4213). Also, in the development of the proposed requirements, the National Fish Meal & Oil Association was clearly supportive of the proposed regulatory posture. In communications between that group and the Department of Labor, and in memoranda to the association's membership (Ex. 1–56), it is clear that industry practice is quite consistent with OSHA's proposal.

Proposed §1918.95 contains requirements for sanitary considerations at all longshoring operations. OSHA believes that the hazards associated with poor sanitation and sanitary practices are well established and need not be elaborated here. The proposed provisions are fully consistent with the current regulations for shoreside cargo handling (§1917.127), providing the uniformity that is necessary between the two segments of marine cargo handling. OSHA is proposing in both §§1917.127 and 1918.95 to include tables which specify the number of toilet facilities according to the number of employees at the worksite. This table has been taken from the sanitation section in OSHA's Construction Safety Regulations, 29 CFR 1926.51(c). OSHA requests the public to comment on the inclusion of this table in this proposal.

Summarizing the section, OSHA would require that employers provide their workers with washing and toilet facilities that are equipped with hot and cold (or tepid) running water; soap; clean hand towels (or warm air blowers); clean and functional toilets (that offer separate compartments with a latched door), and clean drinking water (with no common cups). The consumption of food or drink would continue to be prohibited wherever hazardous materials are stowed or being handled (see definition at §1918.2(g)). Additionally, cargo handling operations are to be separated (by barriers) from the vessel's uncovered refuse and, in the unlikely event of a sanitary line overboard discharge, from it as well. Since longshoring work is performed adjacent to a marine terminal, if the marine terminal's sanitation facilities are available for longshore employees' use, this would constitute compliance with §1918.95. (Section 1917.127, which covers sanitation at marine terminals, is virtually identical to proposed §1918.95.)

Because longshoring operations generally take place in a location with restricted space, i.e., aboard a ship, other non-associated but often necessary work (such as ship's maintenance and repair) must be conducted carefully, with due deference to the cargo handling being performed. In such circumstances, employees may be exposed to hazards associated with excessive noise leading to impaired communications, excessive light or heat from hot work, overspray from abrasive blasting or spray painting, or non-ionizing radiation. In OSHA's current rules for Longshoring (§1918.95), the Agency has prescribed requirements to account for the hazards that can be anticipated when maintenance and repair work are concurrently undertaken with cargo handling. Those same rules are proposed in §1918.95 (with very minor change) to be included in the revision of this part. Summarizing them, longshoring operations would be prohibited when noise produced by such concurrent work interferes with the communication of warnings or instructions; when falling objects could fall on cargo handlers from such work being conducted overhead; when welding slag, burning sparks or welding rod flash could injure cargo handlers; and when abrasive blasting or spray painting is being performed in the vicinity of cargo operations.

Additionally, OSHA is proposing to prohibit cargo handling operations where the employees are exposed to electromagnetic (non-ionizing) radiation that is emitted from the radio and radar equipment on the vessel. This could be especially dangerous when employees are working on the tops of containers while work is being done to the radar or radio equipment. OSHA is also aware of the dangers associated with non-ionizing radiation emitted from radio and television towers that are close to marine cargo handling facilities and has included the words "or from radio or television transmitting towers ashore" in this paragraph. OSHA issued a Hazard Information Bulletin on September 5, 1990, concerning a non-ionizing radiation incident caused by radio transmitting towers that were near a cargo handling facility. The radio frequency emissions were aimed in the direction of the cargo handling operation and the radiation caused longshore workers touching the crane wires and hooks to be burned. This situation was corrected by having the transmissions directed away from the cargo handling area, however other options were available such as, insulating the cargo hook, or providing proper personal protective equipment (Ex. 1–137).

Proposed §1918.97 sets out requirements for first aid and lifesaving, and parallels closely the same considerations set out by OSHA in its rules for the shoreside aspect of marine cargo handling (§1917.26). The hazards that this section is meant to address are those that would occur in the absence of first aid or rescue; that is, following an accident, this section is intended to mitigate the extent of injury to the employee.

In summarizing this proposed section, the employer would be required to direct all employees to report all injuries. A first aid kit would be required to be available at each vessel being worked, with at least one person holding a valid first aid certificate also available to administer first aid. OSHA does not stipulate who the certificate's issuing organization must be, but

remains consistent with its position taken while developing the Marine Terminals rule, wherein the agency stated at 46 FR 4193:

> No particular first aid course or approving agency is designated, so long as the certificate is issued by a responsible organization which requires successful completion of a course as evidence of qualification.

OSHA sets out no specific criteria for the contents of the required first aid kit(s). The Agency does, however, propose to have those needs individualized by a physician who, in consultation with the employer, can customize first aid kit contents to the hazards to be encountered. This is consistent with the approach taken by OSHA in its General Industry (§1910.151(b)) and its Construction standards (§1926.50(d)(1)). OSHA believes this approach to be not only more flexible, but more protective as well. It should be noted that OSHA is proposing to amend the Marine Terminal regulations to read the same as what is being proposed in this draft in regards to first aid kits and emergency stretchers. Requiring weekly checks of the contents of first aid kits is again consistent with OSHA's Safety and Health Regulations for Construction, §1926.50(d)(2).

Additionally, OSHA proposes to include more specific requirements addressing strength and design characteristics of emergency stretchers (Stokes baskets). These requirements reflect the terms of an agreement between the West Gulf Maritime Association and individual locals of the I.L.A. operating on the Gulf of Mexico, which OSHA considers to be appropriate for inclusion in the proposal. The requirement that the stretcher have at least four sets of "effective" patient restraints means that the restraints must be able to secure the patient to the stretcher even if the stretcher and patient is being lifted vertically. In an accident cited earlier in the preamble, (Ex. 1–90), where the employee was being carried vertically in the stretcher, the restraints were not effective and the patient fell off.

In proposed §1918.98, OSHA sets out requirements for the qualifications of machinery operators, i.e., crane or winch operators, industrial truck drivers, conveyor operators, etc., and provides proposed language to require the training of supervisory personnel, i.e., gang foremen, stevedore superintendents, etc., in accident prevention. The hazards addressed by this section arise from inexperienced, untrained or inappropriate operators of cargo handling machinery; and hazards created by improperly trained supervisory personnel. These hazards can readily lead to accidental injury or death.

Both topics originate in the shoreside rules (§1917.27), and focus on very important aspects indisputably tied to safe cargo operations. The proposed provisions would require that all employees (except supervised trainees) be familiar with signs, signals and operating instructions before operating cargo handling machinery or before giving signals to operators. OSHA would require that employee competency to perform such work be determined by the employer, using training and experience as criteria in making such a determination. The employer would be prohibited from allowing employees with a known incapacitating ailment, such as heart disease or epilepsy, or employees with defective uncorrected hearing or eyesight, from operating that equipment. Because supervisory training is considered to be essential to reducing the amount of accidents in any industrial setting, the Agency proposes to set requirements for the shipboard cargo handling workplace that will complement such requirements already in place for shoreside work. OSHA asks the public to comment on the effectiveness of the shoreside supervisory programs and benefits that have been derived. In proposing this requirement, the Agency notes that the great majority of supervisory persons already trained in accident prevention under the part 1917 rules, are those same individuals who would be covered by the training requirement under this proposal. The Agency requests interested persons to submit comment on the proportion of supervisory employees for whom such training would actually be required. The same built-in transition periods established for training within the Marine Terminals rule (two years after the promulgation of the final rule and after that date 90 days after supervisory assignment), are proposed also for shipboard application. The criteria for course content is performance-based, allowing for instruction to be tailored to the particular operation(s). The recommended topics included as a footnote are considered to be rudimentary to most shipboard cargo handling operations.

It should be noted that current §1918.98 entitled "Grain fitting" is being deleted by this proposal. OSHA believes that this type of longshoring operation is obsolete and no longer exists. OSHA, however, recognizes that interested parties may have differing views regarding this deletion and invite comment on this point.

Subpart J—Personal Protective Equipment

All proposed sections of this subpart are based in the requirements for personal protective equipment found in the shoreside requirements for marine cargo handling (§§1917.91, 1917.92, 1917.92, 1917.93, 1917.94, and 1917.95). The hazards addressed by this section are those that personal protective equipment can eliminate or ameliorate by its proper use. For example, eye protection can prevent the loss of an eye; foot protection can prevent a broken foot; respirators can prevent toxic poisoning; and so on. As was the case in that rulemaking, (48 FR 30903), OSHA again sets out the principle that whether the PPE costs must be borne by employers depends largely on whether the employee has possession, responsibility and control over the specific piece of equipment. As an example, items such as protective gloves and foot wear are among pieces of gear that employees may bring home for personal use between work shifts, but the employees would be protected by the gear while at work. As such, the employer has to make available and assure that employees wear such equipment, but the standard does not require the employer to furnish it free of cost. Other items however, such as respirators, fall protection systems and special protective clothing, are pieces of gear that the employer is required to furnish and maintain.These are items that do not leave the workplace and are always under the control of the employer. Such items are those for which the employee is not obligated to bear any cost under the standards. OSHA understands that various arrangements exist for shared cost responsibilities and sole cost responsibilities at different parts of the Nation's waterfront, and leaves to the employers and employees the right to resolve such issues.

Proposed §1918.101, would require employees performing work which is hazardous to the eyes be provided with protection that meets the requirements (evidenced by marking or labeling) of the American National Standard for Occupational and Educational Eye and Face Protection (ANSI Z87.1–1989). Such eye protection would be required to be maintained in good condition, with cleaning and disinfection performed prior to issuance to another worker.

Proposed §1918.102 refers to §1918.1(b)(12), which adopts by

reference OSHA's General Industry standard for respiratory protection (§1910.134). The shipboard cargo handling environment is not unique in the selection or use of respiratory protection.

In proposed §1918.103, the Agency requires that employees whose heads are exposed to hazards associated with impact or electric shocks or burns be equipped with and be required to wear protective hats that meet the design requirements (evidenced by marking or labeling) of American National Standard Requirements for Protective Head Wear for Industrial Workers (ANSI Z89.1–1986). It also requires that cleaning and disinfection be performed when reissued to another worker.

Proposed §1918.104 addresses foot protection, requiring that employees exposed to impact or puncture hazards wear safety footwear meeting the design requirements of the American National Standard for Personal Protection—Protective Footwear. ANSI Z41–1991.

In this rulemaking, OSHA also proposes to update the American National Standards Institute (ANSI) references that are in the Marine Terminal standard so that they are the same as in the proposed Longshoring standard; §1917.91 (Eye protection); §1917.93 (Head protection); and §1917.94 (Foot protection).

In proposed §1918.105, other forms of protective measures for personnel are addressed. In summary, OSHA adopts a general approach to all additional protective clothing which requires that the employer provide and see to the proper use of all such measures. The Agency would require that all additional protective clothing be cleaned and disinfected before reissuance. It notes, however, that some types of equipment, such as disposable coveralls, require no cleaning or disinfection since they are single use items and discarded once used. Also, in some instances protective clothing may be issued, but because never worn or soiled, necessitates no further sanitary measures.

Personal flotation devices would be provided by the employer and required for all employees whose work exposes them to falls into the water in any of the following circumstances: when they are working in isolation (such as when adjusting by oneself mooring lines of a small craft abreast of a larger vessel); where physical constraints posed by limited working or walking area creates a fall hazard (such as when securing lines at the outboard edge of a barge having a narrow fore and aft walkway, or where the work area is obstructed by cargo or other obstacles in a manner that does not allow employees safe footing (such as when securing boom tie-downs at the outboard edge of a floating crane whose deck is congested with auxiliary hoisting equipment). OSHA is also proposing to add that personal flotation devices be worn by employees that are doing any work on the deck of a barge. There are numerous incidents of drowning which have occurred when employees have fallen overboard from a barge. Often these falls from a barge occur in the river system, where rapid currents increase the danger of drowning (Exs. 1–103, Case Nos. 13, 17, 18, 72, 77, 78, 79, 80, 81, 82, 101, 130, 136, 139, 143). OSHA feels that the danger of falling overboard while working on the deck of a barge (as opposed to working on the deck of a ship where the edge of the deck generally is guarded by a bulwark and railing) is sufficiently great as to add this proposed language. All personal flotation devices would be required to be a Coast Guard approved preserver or vest, and would be expected to be maintained in a safe and serviceable condition (no rips, rot or punctures and all closure devices in good order).

In all cases, it is clearly not enough just to have PPE available; the equipment needs to be used. The standard requires the employer to enforce the wearing of each type PPE whenever it is needed.

Appendices I, II, and III

Appendix I is a non-mandatory appendix that sets out the format of vessel cargo gear registers and certificates, under the terms of ILO Convention 152 (Ex. 1–33), discussed earlier in reference to §1918.11. Major changes from the original ILO Convention 32 (Ex. 1–34), include a new Form (Form No. 2 (U) which is a certificate issued by a "competent person" (most often a surveyor under the employ of a vessel classification society or inspection surety service) that contains the results of testing and examination of derricks used in union purchase.

In the case of foreign flagged ship's gear with which U.S.longshore workers load or discharge cargo, OSHA acts in the role of the "competent authority" in determining which "competent person(s)"/"responsible person(s)" are in fact qualified to witness tests/exams and execute certificates and registers. For this purpose, as a practical matter, OSHA recognizes persons and organizations acceptable to the Nation under whose laws the particular vessel is registered. In the event that a given flag has no laws that specifically apply (Ex. 1–91), OSHA would rely upon the vessel having a register and certificates endorsed by an entity approved for that purpose by the Commandant of the U.S. Coast Guard (see 46 CFR 91.37) or, alternately, an organization accredited by OSHA under part 1919 of this chapter (see proposed §1918.11). Another significant change from the original Convention, is the interval between tests of cargo handling gear. Such gear, under the terms of Convention 32, was required to be tested (for the assignment of a safe working load) initially before being taken into use. Because OSHA's current rule adopts the testing and examination requirements for vessel's cargo gear contained in Convention 32 (see §1918.12(a) of the current rules), the Agency can presently require that such gear is initially tested but, absent special circumstances, the gear is not required to be tested again. As a practical matter, most vessels (those operating under the rules of classification societies and international inspection services) have been operating under a quadrennial test schedule. With the advent of Convention 152, the international standard has shifted to "at least once in every five years," giving latitude to all organizations desiring to maintain the four year cycle. In proposing to stay in step with the international standard, OSHA offers this Appendix to assist employers and employees in correctly ascertaining the form and content of registers and certificates prescribed for in the newer Convention.

Appendix II, which is also non-mandatory, is offered as an aid to employers and employees in arriving at strength values of various pieces of gear used aboard ship in longshoring operations. Although the primary source for information on component gear strength is "the manufacturer's recommendations" or "the manufacturer's recommended ratings," the Agency appreciates that instances will arise wherein such recommendations or ratings will not be available (such as when some preslung cargoes are to be discharged from foreign ports). In such instances, proposed Appendix contains tables which can be used to evaluate hoisting equipment. Many of the tables appearing in this Appendix are taken directly from the latest American National Standard (ASME B30.9–1990 and addenda titled, Slings) (Ex. 1–148). The balance of the tables (those for allowable chain wear; shackle safe working loads; and wire rope clips) are derived from an amalgam of other OSHA rules for Longshoring, Construction (§1926.251), and General

Industry (§1910.184). These tables have been carefully assessed by OSHA as to their appropriateness for cargo handling applications, and the Agency believes that they will serve as fully protective criteria.

Appendix III, which is also non-mandatory, recognizes that, in some very limited situations, the use of fall protection may be infeasible. OSHA has listed two narrowly defined situations where it feels that fall protection may not be feasible. OSHA solicits comment from the public regarding the appropriateness of these two examples and whether there are additional examples of infeasibility. In addition, OSHA would consider this as an appropriate place to include any other advisory information regarding container top safety and solicits comments accordingly.

VI. Proposed Amendments and Corrections To Marine Terminal Standards

Several of the proposed amendments to the Longshoring standard (part 1918) address marine cargo handling hazards that should be reflected by a corresponding provision in the Marine Terminal standard (part 1917). For example, both parts currently do not explicitly prohibit employees from riding the hook or the load. By contrast, proposed §1918.81(l) prohibits this practice as does proposed §1917.45(l). The basis for this prohibition is discussed above. For the purposes of this discussion, when the basis for a proposed amendment is treated in the preamble above, it is not necessary to repeat it here. OSHA is requesting comment from the public on proposed amendments to Marine Terminals (part 1917) standards.

A new paragraph (d) has been added to §1917.11 that addresses the hazards associated with protruding nails that may be left in materials, such as dunnage, that have ben removed from the vessels and placed ashore. This paragraph has been taken from language that is in the current Longshoring regulations and is in the proposal at §1918.91(h)(2).

Currently in both parts, the allowable exposure limits for carbon monoxide is 50 ppm over an 8-hour time weighted average with a ceiling of 100 ppm. OSHA is proposing to change the 8-hour time weighted average to 35 ppm while leaving the ceiling limit at 100 ppm. This change is reflected in both proposed parts in §§1918.94 and 1917.24. (See above.)

In another example, currently in both §§1918.96 and 1917.26, the contents of a first-aid kit are specifically listed. In proposed §1918.96, however, the contents of a first-aid kit are to be determined by a physician. OSHA feels that the proposed part 1918 standard is more protective and proposes to amend §1917.26 to be consistent. OSHA would also incorporate into part 1917 the more extensive provisions that are found in proposed §1918.96 pertaining to the requirements for stokes basket stretchers.

In §1917.45(j)(2), OSHA is proposing to require that all cranes used to hoist personnel be equipped with and operate in the power up and power down mode and have the brake apply automatically when not hoisting or lowering. This is consistent with proposed §1918.66(c)(2).

OSHA is proposing a new requirement in §1917.50(i)(1), that prohibits exceeding the safe working load of cargo handing gear which is similar to language found in proposed §1918.61(b)(1). OSHA is also proposing a new requirement in §1917.50(i)(2), which requires the safe working load be marked on cargo handling gear with a safe working load greater than 5 short tons. This proposal is similar to proposed §1918.61(b)(2). See the discussion on these proposed requirements in the preamble for §1918.61.

In §1917.71(e), OSHA is proposing to allow only high-visibility vests (or equivalent protection) to be worn and remove the words "decals or reflectors." This would be in agreement with proposed §1918.86(n). As indicated above, the reflective area of a decal on a hard hat is obviously less than that of a vest. Also, the reflective value is lost during daylight hours or whenever the wearer takes off the hard hat. A number of serious accidents (Exs. 1–78, 1–89) have occurred in the past due to the nature of the work involved in such cargo operations. Additionally, OSHA is proposing to amend the language found in §1917.71(f)(5) to reflect the language found in proposed §1918.86(f), which requires that all brake air-lines be connected when pulling trailers equipped with air brakes.

OSHA is proposing to change §1917.73(a)(2) to read 10 ppm of hydrogen sulfide to agree with proposed §1918.94(f)(4). As recently as 1987, a hydrogen sulfide incident aboard a menhaden vessel led to serious injury and a fatality (Ex. 1–80). (See discussion of this for 1918.94(f) in Section V of this proposal).

OSHA proposes to carry over to §1917.71 the provision found in proposed §1918.86(g) that requires that flat bed and low boys trailers (mafi's) be marked with their cargo capacities and not be overloaded.

OSHA also seeks public comment on two proposed rules to be included in the Marine Terminal standard that do not have analogous rules in the proposed Longshoring standard. First, OSHA proposes to require that seat (lap) belt restraints be installed in the crane operators seat in high-speed container gantry cranes. High speed container gantry cranes are now capable of hoist speeds of 360 feet per minute (110 m/min) (without a load) and trolley speeds of 500 feet per minute (152 m/min). OSHA is concerned that the operator may be exposed to potentially injurious effects of sudden stops and starts (Ex. 1–133). OSHA believes that operator restraints will minimize the hazard and seeks comment from the public on this issue.

In the case of shipments of tobacco that have been containerized and then fumigated, OSHA is proposing, in §1917.25(g), that such containers be aerated (before being loaded on a ship) as follows: (1) If in unsealed bales or in hogsheads, aerated (with doors open) for 48 hours after fumigation has been completed, and, (2) if contained in a plastic enclosure, aerated (with doors open) for 72 hours. In proposing these requirements, OSHA relies on studies performed by the U.S. Department of Agriculture, Agriculture Research Service (Ex. 1–70). These studies concluded that intermodal containers so treated required 48 to 72 hours aeration to be free of hazardous fumigant levels. Past and recent communications (Ex. 1–95) with the Tobacco Association of the United States, also show that organization in accord with the 72-hour aeration required for tobacco shipped in polyethylene or similarly lined boxes carried in intermodal containers.

Upon the publication of the final Marine Terminal standard, several technical drafting amendments were treated in the preamble that were not consistently picked up in the subsequent regulatory text. OSHA is now proposing that these amendments be made. Several paragraphs have been corrected by removing the phrase, "The employer shall ensure...", from the beginning of the paragraph. See the discussion for this in 48 FR 30888–30889. The paragraphs that have been corrected in this manner are: §§1917.18(a); 1917.43(e)(1)(i); 1917.44(o)(3)(ii); 1917.44(o)(4); 1917.126(b); 1917.152(f)(1); 1917.152(f)(2) and 1917.152(f)(3)(iv). In addition, several paragraphs are being proposed to be revised by changing the phrase, "shall be available at the terminal" to the phrase, "shall be made

available for inspection". See the discussion for this in 48 FR 30889. The proposed paragraphs that reflect this change are: §§1917.24(d), 1917.25.(c), 1917.42(b)(4), 1917.42(c)(1), 1917.42(d)(1), 1917.42(h)(4), and 1917.42(h)(5).

OSHA is also aware of several typographical errors that are in the current 29 CFR part 1917 and intends to correct those in this rulemaking. For example, one of these corrections is in §1917.42. A square root sign has been added to the formula found in paragraph (d)(2), correcting an error that is in the current formula. OSHA seeks public comment on any other areas in the Marine Terminal standard that are affected because of the changes proposed to the Longshoring standard in this rulemaking.

VII. Other Issues

A. OSHA is raising the issue of the possible harmful effects of diesel exhaust on employees, especially those employees who work Ro/Ro vessels where exposure to such exhaust is probably the greatest. OSHA is aware that studies have been done concerning the effects of diesel exhaust by the Mine Safety and Health Administration (MSHA) in the mining industry. OSHA is not aware of any studies relating to the longshoring industry, (although the International Cargo Handling and Coordination Association (ICHCA) is in the process of drafting a paper entitled "Fumes in Ships", which will address this topic), and requests the public to submit pertinent information. OSHA requests information of the following: 1. What are the health effects of diesel exhaust? 2. What are the typical timeframes where employees are exposed to diesel exhaust? 3. Is mechanical ventilation sufficient to eliminate any harmful effects? 4. What other methods can be employed to reduce any harmful effects?

B. OSHA is aware of the problem of picking up the chassis and fifth wheel along with the container due to the failure of the container and chassis to separate during a loading operation. This is due to one or more of the chassis's twistlocks being in the locked position or one or more of the twist locks "hanging up" while in the unlocked position. Unfortunately, the driver of the fifth wheel is in the cab as it is being lifted and often sustains injuries when the cab and chassis fall back to the ground before the crane operator can lower everything back down. OSHA requests information on the following questions: 1) How frequently does this problem occur;? 2) OSHA believes this is primarily a problem on the West Coast. Is this true and why;? 3) OSHA is aware of several devices that have been developed to shut the crane down once the device detects the fifth wheel being raised off the ground. OSHA seeks information on the effectiveness of these devices in eliminating the problem, and the cost to purchase and install these devices; 4) Are there other ways to eliminate the problem, such as better "monitoring" of the chassis twistlocks under the hook through training and work practices, or requiring the driver to get out of the cab until the container is lifted clear of the chassis?

C. OSHA has long recognized the utility of comprehensive occupational safety and health programs, and adopted non-mandatory guidance for safety and health program management on January 26, 1989 (54 FR 3904). These guidelines were based on a distillation of safety and health management practices used by employers that have implemented successful comprehensive programs. The major elements OSHA identified in the guidelines for effective occupational safety and health programs are: 1) management commitment and employee involvement; 2) worksite analysis to anticipate and identify potential hazards; 3) hazard prevention and control; and 4) safety and health training.

Successfully implemented programs generally result in facilities that have a lower incidence of occupationally related illnesses and injuries. In particular, OSHA has found that companies which have implemented comprehensive safety and health programs and are participating in its Voluntary Protection Programs (VPP) have lost-workday rates that range from one-fifth to one-third the rates experienced by average worksites within their industrial classification. In addition, participating sites have reported improved employee morale, product quality, and productivity as some of the secondary benefits of their safety and health management activities.

Occupational safety and health standards and guidelines, whether mandatory or developed as voluntary consensus activities, traditionally have tended to focus on specific problems or hazards rather than taking a broad, program-oriented approach.In recent years, however, OSHA has promulgated a number of generic standards that have program requirements. There is now increasing evidence that a requirement for all employers to address occupational safety and health programmatically can provide an effective supplement to specific hazard-related requirements, and provides an added degree of safety and health for employees.

Properly designed and implemented comprehensive programs focus the attention of both employers and employees on safety and health in the workplace. With increased awareness of safety and health concerns, and the commitment to alleviate the hazards by implementing appropriate controls, workplace-related safety and health injuries and illnesses are expected to decrease.

While the specific elements of existing comprehensive occupational safety and health (COSH) programs may vary, the general concept is the same. COSH programs are designed to coordinate and integrate all facets of occupational safety and health into the management practices for the facility. Rather than addressing problems on a one-by-one basis, implementation of a COSH program requires company management to systematically review all hazards in the facility, and develop a plan to prevent or control them. All employees of the facility must be involved in the development and implementation of the plan, and there must be a company-wide commitment to controlling or eliminating occupational safety and health problems. The program is implemented on a continuing basis, that is, there are provisions for ensuring that the situation in the facility is monitored on a regular basis to ensure that the program is working. Program evaluation activities to assess effectiveness are also part of the concept.

The logic of this approach is simple—prevent adverse effects from occurring by identifying hazards, and implementing a plan to eliminate or minimize them. By doing this systematically, resources are not duplicated or wasted, and a coordinated, integrated strategy can be implemented. Effective functioning of such a program depends largely on the commitment and involvement of all members of the organization, beginning with the highest level of management.

OSHA believes the COSH program approach can be applied in any establishment, and in any size facility. The complexity of the specific program in a particular establishment will depend on the nature of the business, the number of employees, and the types of hazards present. While the basic components of a COSH program would be the same in, for example, a marine terminal and an automobile manufacturing plant shop, the methods used to implement them would vary based on the different needs of the facilities. Every type and size of

establishment should nevertheless have a systematic approach to addressing occupational safety and health concerns. All workplaces, from office situations to health care facilities, restaurants to stevedoring operations, can benefit from the development and implementation of an appropriate COSH program.

Request for Comments and Information

OSHA is raising this issue to solicit public input on COSH programs. The Agency is particularly interested in learning about the experiences of employers who have already implemented such programs, and those of employees who work in facilities where these programs have been implemented. The purpose of collecting these comments is to determine whether OSHA should adopt mandatory requirements for comprehensive occupational safety and health programs; what the components of such programs should be; what problems employers have had in implementing such programs, and what can be done to alleviate those problems; the benefits of implementing COSH programs; methods that can be used to evaluate the effectiveness of the programs; the costs and economic feasibility of such programs; the impacts on small businesses; and suggestions regarding existing OSHA rules that could be consolidated or modified as a result of promulgating requirements for mandatory COSH programs.

Format of Questions and Responses

The specific questions asked are designed to elicit the information OSHA believes would be helpful in determining appropriate elements for COSH programs in longshoring work. The questions are in some cases directed towards specific audiences, such as employers who have implemented programs. Other questions have more general applicability. Interested persons may also submit other information or opinions which they believe are relevant.

OSHA asks that commenters respond to the specific questions enumerated, and to number responses in accordance with the number of the question to which the response is addressed. In addition, it would also be helpful for OSHA to receive copies of written materials to supplement these responses, such as copies of written programs, examples of forms used, and sample evaluations.

1) OSHA would like to receive information and data regarding the respondents to this notice in order to properly profile the responses. If you are submitting comments in response to this notice on behalf of an employer or group of employers that have implemented a COSH program, or employee or group of employees working in such a facility, please provide the following specific information. If you are not one of either of these groups, please indicate your role or relation to COSH programs.

a) The size of the facility by number of employees;

b) When the program was implemented;

c) Why the program was implemented (e.g., voluntary decision, state requirements, insurance carrier's requirements, etc.);

d) What the major components of the existing program are;

e) What the initial and annual costs of implementing each of these components have been, and how you derived these costs;

f) What resources have been required to operate the programs; and,

g) What cost savings, illness or injury reductions, or other benefits (e.g., changes in productivity, absenteeism, turnover, insurance, etc.) have accrued due to implementation of the program, and how you derived these benefits.Components of a COSH Program

As described above, OSHA has published and distributed guidelines for safety and health management programs which include four major elements. OSHA would like comments on whether these elements are appropriate; whether more specific information should be provided regarding what should be addressed under each of these elements; and what other elements may be appropriate for inclusion in COSH programs.

Management commitment and employee involvement. The first element included in the guidelines is management commitment and employee involvement, or management leadership. Management commitment is expected to be stated in a worksite policy which outlines the organization's priority on safety and health, and indicates who has primary responsibility for implementation of various aspects of the policy. Other facets of this element include establishing and communicating clear goals and objectives for the program; providing visible management involvement; ensuring employee involvement; providing adequate authority and resources for those responsible; holding those responsible accountable; ensuring contract workers are protected; and reviewing and evaluating the program at least annually.

2) Please comment on the inclusion of management commitment and employee involvement as a major element of a COSH program.It has been OSHA's experience and that there is no situation where these considerations are inappropriate.

3) Is this a common program component? How is it implemented? Is the program integrated into the overall management of the workplace? How well does this work?

4) Who is responsible for managing the program? What skills and knowledge must this person have to be the program manager? What is the role of the President or Chief Executive Officer? The facility manager? The supervisor? The employee? Do performance evaluations include an assessment of performance with regard to safety and health? Are managers and employees held accountable for safety and health performance? How?

5) Are written policy statements prepared and distributed? Please provide examples. Are there situations where a program can operate effectively without having a written plan?

6) What was the primary motivation for implementing the program (e.g., voluntary, state requirements)? Have insurance companies encouraged adoption of COSH programs? How was this done?

7) How is employee involvement ensured in existing programs? Are labor-management committees used? If so, please provide details about how the committees are formed and are operating. What other suggestions do you have for ensuring employee involvement?

8) How are existing programs evaluated to determine whether or not they are effective? Are worksite program audits conducted? What do the audits include? How often are workplace conditions reevaluated after the initial assessment? Please provide copies of any evaluation procedures that may be available. What are the criteria for determining that the program is or is not effective? What type of evidence is required to demonstrate that each program element has been implemented? Is the program integrated into the overall management of the workplace?

9) Have any problems been encountered in implementing this element in existing programs? If so, how were these problems solved? Is the guidance provided in the voluntary guidelines sufficient to implement this element appropriately? What other information would be useful?

Worksite analysis. The second element in the guidelines is worksite analysis. Employers must identify all worksite hazards by conducting an initial and subsequent periodic comprehensive baseline worksite surveys for safety and health. The surveys would vary by the type of workplace, and the nature of the hazards present, but would include an assessment of both safety and health hazards. Examples of situations that would have to be assessed would include: exposure to chemicals; exposure to noise, radiation, or other physical hazards; ergonomics hazards; procedures to handle chemicals that have physical effects such as flammability and reactivity; machine guarding; shoring of trenches; and potential for falls. Programs must include provisions for regular worksite inspections to determine if existing controls are working, and to identify uncontrolled hazards; investigations of accidents, or other unusual incidents; analysis of planned and new facilities, processes, materials and equipment; job hazard analysis; an employee hazard reporting system; and analysis of injury and illness trends.

10) Do existing programs you are familiar with include worksite analysis? How is it implemented, and who is responsible for doing it? Please provide examples of how this element is being implemented in existing programs. What criteria are used to determine what hazards are present? Are there OSHA standards, guidelines, or other documents you can recommend to assist employers? What do you consider to be the most significant hazard in the workplace?

11) Do existing programs include chemical exposure assessments as part of the worksite analysis process? Should further guidance be provided for exposure assessment? What criteria for exposure assessment are used in existing programs? Is exposure monitoring conducted? What criteria are used to determine when monitoring is to be done? Who is performing exposure monitoring? What training or background did they have to prepare them for this? Are other types of hazards subject to monitoring (such as noise, radiation)? What criteria are used to monitor these hazards?

12) Do existing programs include an ergonomics component? How are ergonomics problems identified? What criteria are used? Who does the evaluation, and what is their relevant training or background?

13) Has any illness/injury trend analysis been undertaken in facilities with COSH programs? What have the trends shown? What action was taken as a result of the findings? Please provide any trend data you have to demonstrate the effect of such programs.

14) What problems have been encountered in implementing this element in existing programs? How were these problems solved? Is the guidance provided in the voluntary guidelines sufficient to implement this element appropriately? What other information would be useful?

Hazard prevention and control. Once the hazards have been identified, the third element the COSH program must address is hazard prevention and control. The current and potential hazards must be corrected or controlled in a timely manner, using engineering techniques where feasible and appropriate.Procedures for working safely are to be established, and all affected parties must understand and follow them. Personal protective equipment is to be made available where appropriate; administrative controls are to be used when necessary; provision is to be made for repair and maintenance of equipment; emergency preparedness is to be addressed; and a medical program must be available.

15) Do existing programs you are familiar with include hazard prevention and control? How is it implemented, and who is responsible for doing it? Please provide examples of how this element is being implemented in existing programs. In particular, please provide any available information about how hazards and risks are defined, and how risk reduction goals are set. Who decides what control measures are implemented? What criteria are used? Does the program include an evaluation of occupational safety and health implications when new facilities, processes, materials, or equipment are planned?

16) Do existing programs include standard operating procedures for repair and maintenance?

17) Are their programs for emergency preparedness? If so, how are they compiled and made available? Is there a plan for emergency response? If so, what types of emergencies are addressed? Please provide samples of your standard operating procedures and emergency preparedness and response plans.

18) Is a medical program available? What is the scope of the program, e.g. does it cover assessments related to workplace conditions, wellness programs, etc.? Are medical services provided in-house, or are they contracted out? What types of health professionals are involved in delivering occupational health services? What are their respective roles and what is their relevant training or background?

19) Does the medical program include preplacement medical surveillance? Periodic medical surveillance? What criteria are used to determine what surveillance is done? Who decides what surveillance is to be done? Are medical records reviewed to determine if there are trends in injuries and illnesses? Who conducts the review? What is done with the results?

20) Have problems been encountered in implementing this element in existing programs? If so, how were these problems solved? Is the guidance provided in the voluntary guidelines sufficient to implement this element appropriately? What other information would be useful?

Safety and health training. The last major element in the voluntary guidelines for COSH programs is safety and health training. In order to ensure that the program works effectively, all employees must be trained to understand the safety and health concerns in their workplace; the plan to minimize or eliminate those concerns; and their roles in implementation of the plan. This includes training for those in supervisory or management roles. Responsibilities must be clearly described, and the lines of authority appropriately drawn. OSHA has published Voluntary Training Guidelines to provide employers with information about designing and implementing an appropriate safety and health training program. (See Training Requirements in OSHA Standards and Training Guidelines, OSHA 2254 (Revised), 1992.)

21) Do existing programs include safety and health training? How is it implemented, and who is responsible for performing and implementing it? Please provide examples of how this element is being implemented in existing programs, including the type of training, such as classroom instruction, on-the-job work practices training, videotapes, or interactive videos. Does the type of training vary with the type of operation? Have OSHA's Voluntary Training Guidelines been used in designing and implementing the safety and health training program?

22) Is safety and health training conducted prior to workplace assignment? What does it include in this situation? Are training requirements for various programs combined into one training program? Approximately how long does the initial training take for managers? For supervisors? For other workers? Is periodic training conducted? How often? How long does

periodic training take? What is included in the periodic training?

23) Do you have workers who are subject to training certification requirements? How has this worked?

24) Is the training evaluated to determine whether or not it is effective? How is this done?

25) What qualifications do the trainers have?

26) Have problems been encountered in implementing this element in existing programs? If so, how were these problems solved? Is the guidance provided in the voluntary guidelines sufficient to implement this element appropriately? What other information would be useful?

Issues Related to Regulation

If OSHA determines that it would be appropriate to promulgate a standard for COSH programs, there are a number of other issues which will have to be addressed. Comments from the public are solicited on the following:

27) Should the voluntary guidelines OSHA issued in 1989 be the primary basis for any future regulatory activity in this area? Based on your experiences, what modifications to the guidelines would be necessary in order for OSHA to use them as a basis for regulation? Are there additional elements that should be included in a COSH program? What other information do you think employers would need to implement an appropriate program?

28) The current guidelines are very generally written, and OSHA believes they can be applied in any type of industry or workplace. Do you think that industry-specific guidelines are required? If so, what should the breakdown be, and what is the rationale for different program requirements?

29) The current guidelines are also applicable to all sizes of industries. Do you think that small businesses should be treated differently? If so, why, and in what way?

30) It has been suggested that if OSHA promulgates requirements for COSH programs, there are existing OSHA standards that could be revised, modified, consolidated, or otherwise changed as a result. Without diminishing employee protections under current OSHA standards, what rules do you think could be reconsidered if the Agency promulgates a new rule requiring COSH programs? Commenters are requested to be specific, and provide the rationale for any suggestions.

31) If OSHA promulgates a rule for COSH programs, what type of outreach or compliance assistance materials would you suggest be made available to employers? What would be the most effective way for OSHA to reach small employers who do not belong to trade associations or professional societies?

D. OSHA is aware of the increased usage of Flexible Intermediate Bulk Containers (FIBC's) which are used to handle bulk chemical solids. Some of the FIBC's are designed only to be used for one voyage while others are designed for repeated usage. OSHA wishes to know: 1) What means are used to mark and identify the one use only type of FIBC, and are they adequate? and 2) What are the current industry practices regarding the testing of FIBC's and should OSHA incorporate them into this regulation?

E. OSHA issued a standard for the control of hazardous energy sources (lockout/tagout) that applied to general industry employment under 29 CFR part 1910 as §1910.147 (54 FR 36645). This standard addresses practices and procedures that are necessary to disable machinery or equipment and to prevent the release of potentially hazardous energy while maintenance and servicing activities are being performed. The standard requires that lockout be utilized for equipment which is designed with a lockout capacity, and tagout may be used for equipment which was not designed to be locked out. Servicing and maintenance activities are necessary adjuncts to the industrial process.They are needed to maintain the ability of all machines, equipment, or processes to perform their intended functions. OSHA believes that these types of operations present the employee with the same types of hazards of unexpected activation, re-energization, or the release of stored energy, regardless of the type of industrial setting. For these reasons, OSHA is soliciting public comment regarding the appropriateness of including "The control of hazardous energy (lockout/tagout)" in the "Scope and applicability" sections of both 29 CFR part 1917 (Marine Terminals) and 29 CFR part 1918 (Longshoring). While OSHA recognizes that marine terminal activities are more likely to contain work operations where lockout/tagout hazards are present, it also sees the potential to occur in some longshoring related operations. OSHA wants to know: 1) should §1910.147 be included in Marine Terminals and why or why not, and 2) should §1910.147 be included in longshoring and why or why not?

F. As indicated earlier, OSHA contracted a safety expert, A. J. Scardino, to conduct a study of the fall hazards associated with the cargo handling of intermodal containers. (Ex. 1–139). The development of the data that was used in formulating the opinions and recommendations of this study, involved the visiting and documentation of the activities at 20 major ports in the United States. Those ports were: Gulfport, MS, Houston, TX, Barbers Cut, TX, Galveston, TX, Miami, FL, Miami River, FL, Port Everglade, FL, Charleston, SC, Savannah, GA, Norfolk, VA, Portsmith, VA, Elizabeth, NJ, New Jersey, NJ, Long Beach, CA, Los Angeles, CA, Seattle, WA, Tacoma, WA, Oakland, CA, San Francisco, CA, Honolulu, HI. As part of the data gathering process the contractor conferred with: members of the Technical Committee of the National Maritime Safety Association, representatives of Labor Associations, individual Stevedores, Longshore personnel, and Port representatives.

Of the many areas of inquiry that resulted in positive recommendations, the issue of the location of the fixed anchorage point in relation to the working surface was addressed:

> When feasible the attachment point of the fall protection system shall be located "above" the head of the employee. Every effort should be made to assure that the attachment point for the system is located no lower than the vertical height position of the harness "D" ring. According to "Humanscale 7a", for the 50th percentile male, this would be 1.4 meters (55.4 inches).

In support of this position, the study cites the National Safety Council in its *Accident Prevention Manual for Industrial Operations 9th. Edition* (the Bible on Safety) states: (p. 347) "A belt or harness is worthless unless it is being worn at the time that a fall is possible and attached to a lanyard or fall arrestor with an *adequate overhead anchorage*." (Emphasis added; Id. p. 3.) In addition Mr. Scardino indicates the importance of pre-exposure planning by citing Best's Safety Directory 1994 Edition which states: (p634) "A fixture point above head height always should be planned." (Id.)(Ex. 1–153).

With regard to current practice, many fall protection systems in use could meet the raised attachment requirement recommended by Mr. Scardino " * * * approximately 70 to 75% of the existing operations that employ various fall protection techniques would be able to meet * * *" the requirement. (Id.) Some existing systems have attachments to devices that are installed on the work surface. Recommendations addressing these systems include:

> The use of systems that are at foot level, thereby creating a tripping hazard, should be discouraged. If these systems are to be used, then, the components that make up the system should be of a high visibility color. This field study further determined that the

systems were not reliable and created a sense of false security.

While it is recognized that there is in existence, fall protection that does not meet this criteria, steps should be taken to meet these minimums *within a three year period.*

In light of these recommendations, OSHA wishes to raise an additional issue. To what extent is it necessary and appropriate to add an additional criteria to those found in §1918.85(k) requiring an elevated anchorage point in order to assure worker safety.

VIII. Preliminary Regulatory Impact and Regulatory Flexibility Analysis

Note: Numbered references that appear in brackets in this Section VIII, Preliminary Regulatory Impact and Regulatory Flexibility Analysis, are to the References that appear at the end of Section VIII.

A. Executive Summary

Introduction

Executive Order 12866 and the Regulatory Flexibility Act require OSHA to analyze the costs, benefits, and other consequences and impacts associated with proposed standards. Consistent with these requirements, OSHA has prepared this regulatory impact analysis for the proposed revisions to the Longshoring and Marine Terminals standards.

This analysis includes a description of the industries affected by the regulation, an evaluation of the risks addressed, an assessment of the benefits attributable to the proposed revisions, the determination of the technological feasibility of the new requirements, the estimation of the costs of compliance with proposed revisions, the determination of the economic feasibility of compliance with the proposed revisions, and an analysis of the economic and other impacts associated with this rulemaking.

Affected Industries

The requirements of the proposed revisions apply to all establishments involved in marine cargo handling. As classified by the 1987 Standard Industrial Classification (SIC) manual, this industry consists of establishments in SIC 4491 as well as establishments in other SICs conducting marine cargo handling activities.

Evaluation of Risk and Potential Benefits

An estimated 7,593 injuries and 18 fatalities occur annually during marine cargo handling activities. The proposed revisions to the Longshoring and Marine Terminals standards are expected to result in the prevention of 1,262 injuries and 3 fatalities, annually. Many additional fatalities and injuries would be prevented through full compliance with existing requirements retained in the proposed standards. Most of the injuries occurring during marine cargo handling activities could be prevented through compliance with the existing as well as with the proposed standards. In addition to the unquantifiable benefits associated with the reduction in pain and suffering associated with these incidents, the prevention of these injuries will result in savings of over $18 million dollars, annually. This estimate includes savings related to wage and productivity losses, medical costs, administrative expenses, and other costs associated with accidents.

Technological Feasibility

Since the proposed requirements can be met using existing equipment and methods, the proposed new requirements are considered to be technologically feasible.

Costs

The estimated costs associated with the proposed revisions to the Longshoring and Marine Terminals standards amount to less than $4.7 million for the first year and less than $1.8 million, annually, after the first year. These costs primarily reflect the sum of various minor expenditures associated with modifications to existing standards. New provisions involving compliance costs include requirements for sideboards on dockboards and ramps, required certification of fall protection systems, requirements for the vertical application of lifting forces to containers, requirements for high visibility vests, and requirements to provide personal flotation devices, among others.

Economic Impacts

Compliance with the proposed new requirements of the Longshoring and Marine Terminals standards has been determined to be economically feasible and is not expected to produce any significant adverse economic impacts. The costs that are imposed by the regulation should be a minimal burden on marine cargo handling establishments. The total estimated first-year costs of compliance represent less than 0.06 percent of revenues associated with marine cargo handling activities and less than 1.19 percent of profits. Total annualized costs for subsequent years represent less than 0.03 percent of revenues and 0.46 percent of profits.

Regulatory Flexibility Analysis

Pursuant to the Regulatory Flexibility Act, OSHA has made an assessment of the impact of the revised standards and has concluded that it would not have a significant impact upon a substantial number of small entities. The estimated compliance costs do not involve large capital expenditures, and there is no significant differential effect on small firms relative to that on large firms.

B. Industry Profile

Introduction

This section provides an overview of affected establishments, classifications of affected vessels, population at risk, wages of affected workers, gang sizes and cargo handling rates, operating revenues and shipping costs.

Overview of Stevedoring and Marine Terminals

Marine terminals are designated areas of ports which include wharves, bulkheads, quays, piers, docks and other berthing locations. Adjacent storage or contiguous areas associated with the primary movements of cargo or materials from vessel to shore or shore to vessel, and structures devoted to receiving, handling, holding, consolidating, loading or delivering waterborne shipments are considered part of the marine terminal. Marine terminals are the facilities owned or leased by stevedores or marine terminal operators (MTOs). MTOs and stevedores provide most of the portside services that shipping lines require. They provide the equipment and machinery for conducting cargo handling at multi-use terminal facilities, in addition to specialized terminals designed to handle specific types of cargo [2].

Stevedores are persons or firms contracting with a ship owner or agent for the purpose of loading or unloading ships or barges in ports. Stevedores are direct employers of longshore labor and contractors to ship owners. Basically, they are middlemen between the entity requiring the service and the longshore workers who perform the physical labor. The stevedore's role is to provide the cargo handling expertise and the equipment required to load or unload all types of cargo safely and efficiently.

The stevedore may also be the MTO. The functional roles and activities of stevedores and MTOs vary throughout the United States and often cannot be distinguished. The stevedore contractor and the MTO may be distinctly different entities, the same entity, or corporately related. In some cases, public entities or port authorities may be the MTOs. These entities may also act as stevedores or lease the terminals to private operators [2].

Workplaces Affected

Compliance with the proposed revisions to the Longshoring and Marine Terminals standards will affect two

areas where marine cargo handling operations occur. Activities that occur off the dock (work aboard vessels) are covered under OSHA's Longshoring standard (29 CFR part 1918) and those which occur on the dock fall under the Marine Terminals standard (29 CFR part 1917). The Longshoring standard covers establishments classified under SIC 4491 (marine cargo handling), as well as various establishments in manufacturing; transportation; communications; electric, gas and sanitary services; and wholesale trade.

Data on the exact number of stevedoring companies currently operating in the United States are not available. For the purposes of this analysis, the number of marine terminals estimated by the Maritime Administration (MARAD) was used as the estimate of the total number of firms affected by the Longshoring standard. According to MARAD, there are a total of 3,700 marine terminals in the United States [4]. Establishments engaged primarily in marine cargo handling are classified under Standard Industrial Classification (SIC) 4491, Marine Cargo Handling. The Bureau of the Census estimated that 746 establishments are classified under SIC 4491 [7]. To identify other affected industry sectors, Kearney/Centaur screened OSHA inspection data for non-SIC 4491 sectors where 29 CFR part 1918 citations were issued. Non-SIC 4491 establishments primarily engage in activities other than longshoring, although longshore work is a small part of their overall operation. For example, manufacturing establishments which load their products directly onto barges are covered by the OSHA's Longshoring standard, though these operations represent only a very small part of their total activity. Kearney/Centaur estimated the distribution of the remaining establishments among affected industry sectors according to the distribution of non-SIC 4491 29 CFR part 1918 citations issued in other sectors. The estimated number of affected establishments is shown in Table B-1 by industry and in Table B-2 by region. Although only 20 percent of establishments affected by the longshoring standard are in SIC 4491, the majority of affected workers, as discussed below, are accounted for in SIC 4491.

Table B–1—Number of Affected Establishments, by Industry

Industry	Longshoring 29 CFR part 1918	Marine Terminals 29 CFR part 1917
SIC 4491–Marine Cargo Handling	746	746
Manufacturing	1660	N/A
Transportation, Communications, and Electric, Gas and Sanitary Services	662	662
Wholesale Trade	273	161
Other SICs[1]	359	359
TOTAL	3,700	1,928

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

[1]Other SICs include SIC 13 (Oil and Gas Extraction), SIC 15 (Building Construction), and sectors under SIC 44 (Water Transportation) other than SIC 4491.

Table B–2—Number of Affected Establishments, by Region

Industry	Longshoring 29 CFR part 1918	Marine Terminals 29 CFR part 1917
Atlantic	586	305
Gulf/Mississippi	2,164	1,128
Great Lakes	301	157
Pacific	649	338
TOTAL	3,700	1,928

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

Of the industry sectors covered by the Longshoring standard, most also fall under the scope of the Marine Terminals standard, with the exception of manufacturing establishments and some wholesale trade establishments. Approximately 1,928 of the 3,700 marine terminals covered by the Longshoring standard are estimated to fall under the scope of the Marine Terminals standard [1].

The stevedore/MTO typically hires longshore workers, usually on a daily basis, from a hiring hall or labor pool of union or nonunion members. Labor force size varies directly with the amount of work contracted to be performed. This method of hiring creates difficulty in determining the size of the affected establishments. No data were available on the number of small stevedoring firms. To estimate the number of small firms, the percent of establishments in SIC 4491 classified by the Bureau of the Census as employing fewer than 20 workers, is used. Fifty-six percent of affected establishments are estimated to be small establishments [7].

Types of Vessels

This discussion describes the affected vessels calling at U.S. marine terminals. The proposed rule will be applicable to five broad vessel categories. Four of these categories are self-propelled vessels: bulk carriers, freighters, combination passenger/cargo ships, and cruise ships. The fifth category consists of non-self-propelled dry cargo barges. Descriptions of these vessel categories, as well as important subcategories, are presented in Tables B-3 and B-4. Tankers and tanker barges are excluded since these vessels are primarily under the jurisdiction of the U.S. Coast Guard.

Table B–3—Categories of Self-Propelled Vessels

BULK CARRIERS	
Ships designed to carry dry bulk cargo such as ore, wood chips, coal, and grain. They are also used to carry heavy general cargo items such as logs or steel.	
FREIGHTERS	
General Cargo Carriers	Includes refrigerated and unrefrigerated breakbulk carriers as well as car carriers, cattle carriers, pallet carriers, and timber carriers. Breakbulk cargo consists of heterogenous items of general cargo, packaged and moved as single parcels or assembled together on pallet boards and wire rope slings. These packages are loaded and unloaded using ship's gear or wharf cranes. Containers are also carried on general cargo carriers.
Full Containerships	Ships equipped with permanent below-deck container cells with little or no space for other types of cargo.
Partial Containerships	Multi-purpose ships where one or more, but not all, compartments are fitted with permanent container cells. The remaining compartments are used for other types of cargo. Partial containerships include container/car carriers, container/rail car carriers, and container/roll-on/roll-off ships.
Roll-On/Roll-Off (RO-RO) Ships	Ships which are specially designed to carry wheeled containers or container/trailer combinations, automobiles, and other vehicles which are loaded and unloaded using the roll-on/roll-off method. Containers are often carried on the upper deck of RO-RO ships.

Table B–3—Categories of Self-Propelled Vessels—Continued

Barge Carriers	Ships designed to carry either barges or some variable number of barges and containers simultaneously. Currently this class includes two types of vessels, the LASH (lighter aboard ship) and the SEABEE. They differ in that barges are loaded onto LASH ships by crane and onto SEABEE ships by a submersible elevator at the stern of the vessel.
COMBINATION PASSENGER/CARGO SHIPS	
Cargo ships with a capacity for 13 or more passengers.	
CRUISE SHIPS/PASSENGER SHIPS	
Ships functioning primarily to transport passengers, usually for purposes of recreation and tourism. Does not include passenger ferries.	

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

Table B–4—Non-Self-Propelled Vessels

DRY CARGO BARGES	
Large mostly double hulled cargo holds lacking an internal means of propulsion. Virtually all barges used on the inland river system are 195 feet long by 35 feet wide and have loaded drafts of up to nine feet. Barges can carry virtually any dry cargo and have and average capacity of 1,500 tons or about 52,500 bushels. Also classified as barges are scows and ocean-going barges. These barges tend to be much larger and have a higher freeboard than barges used on the inland river system.	
Barges are typically lashed together in groups referred to as tows. The standard tow on most navigable rivers is three barges wide by five barges long for a total of 15 barges. Tow sizes, however, vary by waterway with tows as large as 45 barges on the lower Mississippi and as small as two barges on the intracoastal waterway. Tows are usually propelled by a towboat pushing them ahead, though occasionally they are moved by a towboat pulling them on a hawser.	
Open Hopper	Barges used primarily for dry bulk cargo, such as sand, gravel,and coal, which are not suseptible to weather damage.
Covered Hopper	Barges used for grain and other commodities that need to be protected from the weather.
Scows and Ocean-Going Barges	Barges which generally carry most of their cargo on deck.
Deck Barges	Barges used for transporting vehicles and heavy equipment.
Container Barges	Barges used to transport standardized container cargo.

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

Self-Propelled Vessels

Table B–5 shows the number of self-propelled vessels of 1,000 gross tons (GTs) and over in the world fleet, by type of vessel. Of the 692 U.S. flag vessels, approximately two-thirds are privately owned and the remaining one-third are Government owned. Only 11 of the 225 Government owned vessels were active as of mid–1992 and were being used by several Government agencies, state maritime academies, or private steamship companies under various forms of agreement with the Maritime Administration. All U.S. flag vessels are owned either by the Government or U.S. firms. However, U.S. firms also own a substantial number of merchant vessels that are registered under foreign flags. As shown in Table B–5, 313 of the 23,549 foreign flag vessels are owned by U.S. parent companies. Although no data were available on the total number of self-propelled vessels in the world fleet of under 1,000 Gts, data were available on the number of vessels calling at U.S. ports. According to Bureau of the Census data [5], approximately 1,980 U.S. flag and 9,593 foreign flag self-propelled vessels called at U.S. ports in 1992.

Table B–5—Self-Propelled Vessels of 1,000 Gross Tons and Over in the World Fleet, 1992

Vessel Type	U.S. Flag Vessels			Total Number of Foreign Flag Vessels	Foreign Flag Vessels Owned by U.S. Companies	World Fleet
	Private	Government	Total			
Bulk Carriers	92	1	93	5,449	47	5,542
Tankers	203	25	228	5,316	208	5,544
Total Freighters	167	192	359	12,222	55	12,581
Break Bulk Carriers	26	120	146	9,977	29	10,123
Containerships	83	9	92	1,198	15	1,290
Partial Containerships	17	35	52	110	0	162
Roll-On/Roll-Off	29	21	50	916	7	966
Barge Carriers	12	7	19	21	4	40
Combination Passenger/Cargo	3	7	10	337	3	347
Cruise Ships/Passenger Ships	2	0	2	225	N/A	227
TOTAL	467	225	692	23,549	313	24,241

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

Non-Self-Propelled Vessels

The total number of non-self-propelled vessels is shown in Table B–6. Of the 31,017 non-self propelled vessels, 87 percent are dry cargo barges, 13 percent are tanker barges, and less than 1 percent are railroad car floats. Nearly 86 percent of all non-self-propelled vessels in the United States operate on the domestic river and intracoastal waterway system and carry nearly all of the waterborne cargo transported on the inland waterways. Thirteen percent of the non-self-propelled vessels (4,158 vessels) in the United States operate on the Atlantic, Gulf and Pacific coasts. The remaining 1 percent of non-self-propelled vessels operate in the Great Lakes.

Table B–6—Non-Self-Propelled Vessels in the U.S. (as of December 31, 1990)

Vessel Type	Atlantic, Gulf and Pacific Coasts	Inland Waterways[1]	Great Lakes	Total
Dry Cargo Barges	3,500	23,320	271	27,091
Tanker Barges	652	3,231	30	3,913
Railroad Car Floats	6	2	5	13
TOTAL	4,158	26,553	306	31,017

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].
[1]Includes Mississippi River System, the Gulf and Atlantic Intracoastal Waterway and the Columbia/Snake River System.

Containers and Container-Carrying Vessels

Over recent years, there has been an increase in the volume of containerized cargo handled. Containers are large, standard size metal boxes, equipped with corner castings, into which cargo is packed for shipment. Containers are designed to be moved with common handling equipment enabling economical, high-speed intermodal transfers in large units between ships, railcars, truck chassis, and barges, using a minimum of labor. The container, therefore, serves as the transfer unit rather than the cargo contained therein. Most containers in the U.S. inventory are either 20-foot (6.1 m) containers (56 percent) or 40-foot containers (12.2 m) (42 percent).

Containerships are vessels equipped with permanent container cells. They have little or no space for other types of cargo. Partial containerships are multi-purpose ships where one or more, but not all, compartments are fitted with permanent container cells. The remaining compartments are used for other types of cargo. Several other types of vessels also carry containers.

Table B-7 presents the number of liner service container-carrying vessels calling at U.S. ports by type of vessel, flag of vessel (U.S. or foreign), and container capacity.

Table B–7—Number and Container Capacity of Liner Service Container Carrying Vessels Calling at U.S. Ports, 1992

Vessel Type	Number of Vessels			Container Capacity in TEUs[1]		
	U.S.	Foreign Flag	Total	U.S.	Foreign Flag	Total
Bulk/Containership	0	106	106	0	130,279	130,279
Containership	83	510	593	183,358	1,126,341	1,309,699
RO-RO/Containership	7	36	43	10,031	51,584	61,615
Partial Containership	17	135	152	7,422	58,961	66,383
Barge Carrier	11	0	11	6,940	0	6,940
Other						
Break Bulk	N/A	N/A	11	N/A	N/A	3,161
RO/RO[2]	29	75	104	28,509	73,748	102,257
TOTAL	147	862	1,020[3]	236,260	1,440,913	1,680,334[4]

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].
[1]TEU - Twenty-foot Equivalent Unit: equal to the capacity of a 20x8x8 foot container.
[2]Includes 13 RO-RO tug/barge combinations.
[3]Number of U.S. and foreign flag vessels does not add to the total shown since a breakdown of the number of break bulk carriers between U.S. and foreign flag fleets was not available.
[4]The container capacity of U.S. and foreign flag vessels does not add to the total shown since a breakdown of the container capacity of break bulk carriers between U.S. and foreign flag fleets was not available.

Vessels in liner service operate on fixed routes to advertised ports on published schedules. As shown in the table, 1,020 container-carrying liner service vessels with a total container capacity of approximately 1.7 million TEUs (twenty-foot equivalent units) called at U.S. ports in 1992. Virtually all containerships, partial containerships, bulk/containerships, RO RO/containerships and barge carriers are in liner service, and essentially, the entire container capacity of these types of vessels are accounted for in liner services. Break bulk freighters and RO-RO ships also carry containers. Although RO-RO ships are generally in liner service, break bulk carriers are not. Data on the number and container capacity of non-liner service break bulk carriers were unavailable. However, based on the proportion of container traffic accounted for by break bulk freighters, the estimated number of voyages made annually to the United States by these vessels, and their average container capacity, Kearney/Centaur estimated that 544 non-liner service break bulk freighters with a container capacity of 78,336 containers called at U.S. ports in 1992.

Combining the number of liner service and non-liner service container-carrying vessels, OSHA therefore estimates that a total of 1,564 container-carrying vessels, with an overall container capacity of 1.76 million TEUs, call annually at U.S. ports [1]

Population at Risk

Based on employment data from the Bureau of the Census and OSHA inspection data, approximately 93,427 workers are estimated to be affected by the Longshoring standard, over 58 percent of which are employed in SIC 4491. Kearney/Centaur estimated that about 70,140 of these workers would also be covered by the Marine Terminals standard, 78 percent of which are in SIC 4491. Estimates of full-time equivalent workers, as well as the population at risk are shown in Table B-8, by industry and in Table B-9, by region.

Table B–8—Number of Full-Time Equivalent Workers and Population at Risk, by Industry

Industry	Number of FTE Workers Covered by 29 CFR part 1918[1]	Population at Risk Covered by 29 CFR part 1918	Number of FTE Workers Covered by 29 CFR part 1917[1]	Population at Risk Covered by 29 CFR part 1917
SIC 4491–Marine Cargo Handling	54,617	54,617	54,617	54,617
Manufacturing	18,700	21,811	N/A	N/A
Transportation, Communications, and Electric, Gas and Sanitary Services	7,467	8,705	7,467	8,705
Wholesale Trade	3,100	3,582	1,823	2,106
Other SICs[2]	4,067	4,712	4,067	4,712
TOTAL	87,951	93,427	67,974	70,140

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

[1]The number of full-time equivalent (FTE) workers is based on a 1,436 hour which is the average number of hours worked per year by longshore workers in SIC 4491.

[2]Other SICs include SIC 13 (Oil and Gas Extraction), SIC 15 (Building Construction), and other sectors under SIC 44 (Water Transportation) other than SIC 4491.

Table B–9—Number of Full-Time Equivalent Workers and Population at Risk, by Region

Industry	Number of FTE Workers Covered by 29 CFR part 1918[1]	Population at Risk Covered by 29 CFR part 1918	Number of FTE Workers Covered by 29 CFR part 1917[1]	Population at Risk Covered by 29 CFR part 1917
Atlantic	13,923	14,789	10,761	11,103
Gulf/Mississippi	51,451	54,655	39,765	41,032
Great Lakes	7,150	7,596	5,526	5,703
Pacific	15,426	16,387	11,922	12,302
TOTAL	87,950	93,427	67,974	70,140

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

[1]The number of full-time equivalent (FTE) workers is based on a 1,436 hour which is the average number of hours worked per year by longshore workers in SIC 4491.

Gang Sizes and Cargo Handling Rates

Table B-10 summarizes the average stevedoring crew sizes by type of operation. These estimates include both off-the-dock and dockside workers directly involved in the loading or unloading of cargo. Average cargo handling rates are also presented. Based on cargo handling rates, and the types and total tonnages of cargo handled, Kearney/Centaur estimated that approximately 54 million person-hours of exposure occur during longshoring loading and unloading activities, annually.

Table B–10—Summary of Average Stevedoring Gang Size and Cargo Handling Rates, by Type of Loading and Unloading Operation

Operation	Number of Workers			Average Cargo Handling Rate in Short Tons per:		
	Off-the-Dock	On-the-Dock	On-Site	Gang Hour	Off-the-Dock Employee Work-hour	Dockside Employee Work-hour
Break Bulk	9	6	15	80.0	8.9	13.3
Container	8	9	17	232.9	29.1	25.9
Bulk Carrier/Conveyor Loading	7	2	9	1,250.0	178.6	625.0
Bulk Carrier/Clam Shell Unloading	2	3	5	250.0	125.0	83.3
RO-RO	25	4	29	90.0	3.6	22.5
Barge/Break Bulk	4	5	9	112.5	28.1	22.5
Barge/Conveyor Loading	2	3	5	168.8	84.4	56.3
Barge/Bulk-Clam Shell Unloading	1	2	3	150.0	150.0	75.0

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

Wages

Wages of longshore workers vary among regions and ports.Two primary factors account for this variation. First, local union contractual agreements vary in wage rates, holidays, and other rules or benefits which affect the wages and earnings of longshore workers. Second, the number of hours worked per year varies by port and region, resulting in variations in overtime wage payments. The average national wage rate of longshore workers, including overtime and benefits, is estimated to be $40.30 per hour. The average supervisor wage rate, including overtime and benefits, is estimated at $50.78 [1].

Operating Revenues and Shipping Costs

Statistics on shipping costs were estimated based on vessel operating revenue data for domestic water carriers compiled by The U.S. Department of Transportation. Table B-11 presents operating revenues and tonnage data, by region, for 1990.

As shown, operating revenues were nearly $3.0 billion for Coastal regions, $2.9 billion for Inland waterways, and $0.6 billion for the Great Lakes region. The operating revenues per ton of freight hauled were $10.27, $4.57 and $5.33, respectively.

The cost for shipping a 40-foot (12.0 m) container with FAK (freight-of-all-kinds) worth $100,000 and weighing 10 long tons from New York to Rotterdam was estimated to range from $277.40 to $300.50 per long ton. The cost for the same shipment from Los Angeles to Tokyo was estimated to range from $243.60 to $288.30 per long ton [1].

Table B–11—Operating Revenues, Ton-Miles, Tons, and Average Haul of Freight Carries, 1990

Region	Operating Revenues ($ millions)	Ton-Miles (millions)	Operating Revenues per Ton-Mile	Tons of Freight Hauled (millions)	Average Haul per (miles/ton)	Operating Revenues per Ton of Freight Hauled
Coastal	$3,008	470,000	$0.006	293	1,604	$10.27
Inland	2,865	283,000	0.010	627	451	4.57
Great Lakes	576	57,000	0.010	108	528	5.33
All Regions	$6,449	810,000	$0.008	1,028	788	$6.27

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 2].

C. Technological Feasibility and Costs of Compliance

Technological Feasibility

All of the requirements of the proposed standard can be met using currently available equipment, facilities, tests, inspections, supplies, and work practices. OSHA's analysis of the technological requirements of each provision indicates that none of the proposed provisions will create any problem of supply or availability of equipment, facilities, or personnel.

Although the proposed standard will require the expenditure of resources to fully comply, there are no technological constraints associated with full compliance with the proposed regulation.

Costs of Compliance

This section presents preliminary estimates of costs that will be incurred by firms to come into compliance with the proposed revisions to the Longshoring and Marine Terminals standards. The costs of the proposed revisions to the two standards are shown in Table C–1.

Table C–1—Summary of Total Compliance Costs (1993 Dollars)

Rule	Total First-Year Costs	Total Annualized Costs*
29 CFR part 1918: Longshoring	$4,088,445	$1,755,773
29 CFR part 1917: Marine Terminals	535,585	20,099
TOTAL	$4,624,029	$1,775,872

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis.

* Annualized cost is the sum of annualized capital costs and recurring annual costs.

Total first-year costs are estimated to amount to less than $4.7 million. After the first year, affected establishments will incur costs of approximately $1.8 million, annually. These costs were estimated using a baseline of full compliance with existing rules and estimates of current practice for those cost elements not required under previous standards[2]. OSHA welcomes comments on the preliminary costs and assumptions presented in this analysis.

Methodology

A side-by-side comparison of the proposed and existing rules was conducted to identify revisions to the existing rules. In addition, a profile of current industry practices was developed to enable estimates of incremental compliance costs to be made.

The data used in this preliminary analysis of compliance costs were obtained from three studies conducted in 1986, 1989 and in 1994 by OSHA's contractor, Kearney/Centaur. In 1986 and 1989, analyses were performed on proposed requirements identified as changes to existing standards. These studies were conducted through field visits and telephone surveys of U.S. ports.

The 1994 study was conducted to update information collected in previous studies and to collect information on the impact of proposed revisions made recently to the Longshoring and Marine Terminals standards. Efforts included interviews with industry officials to gather information on key cost issues, and calls to equipment manufacturers, suppliers, and professional service providers.

Three general types of costs were identified: first-year costs, capital costs, and recurring annual costs. First-year costs are training and workplace analysis costs that which are expected to be incurred in the first year after promulgation of a final rule. Capital costs are costs for equipment with a working life of more than one year. Recurring annual costs are costs that will be incurred each year after promulgation of a final rule.

The majority of compliance costs are expected to be borne directly by stevedoring companies, although vessel operators may incur some short-term costs.

Revisions to 29 CFR part 1918: Longshoring

This section presents preliminary cost estimates attributable to proposed revisions to OSHA's Longshoring standard. Provisions for which costs are not specifically addressed are not expected to have any incremental costs beyond those estimated for workplace analysis and general training.

General First-Year Costs

Proposed revisions to the existing Longshoring standard will result in general costs for workplace analysis and training. Total first-year costs for these activities are estimated at $1,607,563, and will most likely be borne by stevedoring firms.

Workplace Analysis

Workplace analysis involves evaluating an establishment to determine what needs to be done to achieve compliance with the proposed

[2] This is not intended to suggest that all establishments are fully complying with existing regulations. However, the costs presented in this analysis reflect only those costs which are attributable to to proposed revisions to existing regulations.

rule. Preliminary costs for this activity are estimated using the hourly wage rate of a safety consultant or safety engineer. The average hourly fee for a safety consultant is estimated to be $87.50, based on a range of $50 to $125 per hour [1]. The average time per establishment to have a safety consultant conduct such an analysis is estimated to be about an hour and a half [1]. This yields an average cost per facility of $131.25. The total first-year workplace analysis cost across all 3,700 affected establishments is estimated to be $485,625. This cost will most likely be borne by stevedoring firms.

Training

First-year costs will be necessary to train supervisors on the new requirements of the proposed rule. No recurring annual training costs are estimated since interviews with industry officials indicated that longshore supervisors receive regular safety training, and training in new requirements will replace safety training related to the existing rule. Kearney/Centaur field visits, and telephone interviews with longshore safety experts and industry officials revealed that supervisors will assure implementation of proposed requirements. No additional training time will be required for longshore workers. The proposed rule will result in three types of training: (1) general training in new requirements; (2) additional safety training for RO-RO and containerized operations; and (3) accident prevention proficiency training for supervisors overseeing five or more workers. The costs of additional training for container and RO-RO operations, and accident prevention proficiency training will be discussed under the appropriate subparts.

OSHA assumes that first-year supplementary general training will be required to familiarize supervisors with the new requirements of the proposed rule. The number of supervisors that will need general training is estimated using a 10 to 1 employee to supervisor ratio. As discussed in the Industry Profile, approximately 93,427 workers are estimated to be at risk. Hence, 9,343 supervisors are estimated to require general training. Kearney/Centaur estimated that less than one hour of training, in addition to regular safety training, will be necessary to train each supervisor. Using an average supervisor wage rate of $50.78, the total first-year cost of supervisor time to receive general training is estimated at $474,438.

In addition to the cost of supervisor training time, the cost to provide safety instruction is estimated. The fee for an instructor is estimated to be about $175 per hour of training [1]. The total cost for general safety instruction is estimated at $647,500.

Subpart C: Means of Access

Most of the proposed revisions to this subpart are not expected to impose additional costs on affected establishments. For example, proposed requirements for portable ladders are already addressed in the existing Marine Terminals standard. Since portable ladders used on the vessel are typically the same ladders used on the dock, no incremental costs are expected to be incurred. No additional costs are expected to result from requiring 6 inches (15.2 cm) or more of clearance in the back of ladder rungs. This requirement can be met using portable ladders, which are currently available on-site [1].

The proposed requirement for 6 inch (15.2 cm) sideboards on dockboards and ramps is expected to impose additional costs on stevedoring firms. Based on Kearney/Centaur interviews with regional industry representatives, approximately 1,070 ramps will need to be retrofitted at a unit cost of $1,000 [1]. The incremental capital cost for this provision is estimated at $1,070,000.

Subpart D: Working Surfaces

In the existing rule, 29 CFR 1918.32(b) requires fall protection for workers exposed to fall hazards at the edge of a hatch section or stowed cargo over 8 feet (2.4 m) high. Although changes to the regulatory text are being proposed for clarification purposes, the proposed language does not impose additional responsibilities upon employers. Hence, no incremental costs are attributed to this provision. This is consistent with court interpretations, as found by the Occupational Safety and Health Review Commission in its decision of October 24, 1979, OSHRC Docket No. 15242 concerning §1918.32(b) citation of Seattle Crescent Container Service, and the decision of the U.S. Court of Appeals, Ninth Circuit in Long Beach Container Terminal Inc. v. OSHRC and Brock, February 23, 1987.

Proposed revisions to Subpart D also include requirements for "walking sticks" (floating walking and working surfaces) for employees working logs out of the water. However, local rules in ports affected by this requirement currently include these requirements, and affected establishments are already in compliance [1].

Subpart E: Opening and Closing Hatches

The proposed rule includes several revisions to this subpart. Proposed revisions impose more restrictions on working spaces along coamings, more flexibility on covering hatches with tarpaulins, and more flexibility on securing hatch covers. The proposed revisions would also require that all unsecured materials be removed before moving hatch covers. Such changes in work practices are not expected to result in incremental costs other than first-year costs for general training discussed earlier in this chapter [1].

Subpart F: Ship's Cargo Handling Gear

Proposed revisions to this subpart address changes in work practices. Costs attributed to changes in work practices are accounted for in the general first-year cost estimates.

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

This subpart covers all employer-provided gear and equipment used in longshoring operations aboard vessels. The majority of the gear used aboard vessels is also used on the dock. To the extent that proposed revisions to the Longshoring standard covering this gear are addressed by the existing Marine Terminals standard, no incremental costs are estimated.

The proposed rule would require that all special stevedoring gear purchased or fabricated 90 days or more after publication of a final rule, and having a safe working load of 5 short tons or over, be certified by an OSHA accredited agency in accordance with 29 CFR part 1919. Most gear covered under this subpart is either also used on the dock and therefore, already required to be certified under 29 CFR 1917.50, or already certified prior to purchase by the manufacturer. Although situations do arise in which special gear is manufactured and used only on the vessel, such occurrences are rare and the overall cost to affected establishments is expected to be minimal.

Two requirements, however, are expected to impose costs on affected establishments. The proposed requirements for the quadrennial testing of special stevedoring gear and the lockout/tagout of powered conveyors are expected to generate compliance costs.

OSHA assumes that only the 746 establishments classified under SIC 4491 will be affected by the proposed requirement for quadrennial testing of special gear and equipment. Testing is estimated to take an average of five hours per affected establishment. Assuming that a designated person with an average wage rate of $40.30 will do the testing, the average cost per

establishment is estimated to be $201.50 every four years, or $50.38 annually. The total annual cost for affected establishments to comply with this provision is estimated at $37,583 [1].

Compliance costs are also expected to result from the proposed revision requiring the lockout/tagout of powered conveyors. Those conveyors with master shut-off switches used only aboard vessels and not on the dock will be affected. Kearney/Centaur estimated that existing switches on a total of 60 powered conveyors would need to be replaced by general duty 240 volt/100 amp, 3 pole, fused, lockable safety switches. The unit cost for switch replacement, including installation charges, is estimated to be $315 each ($130 for materials cost, $112 direct labor, $73 overhead and other charges) [1]. OSHA estimates that the total capital cost associated with the lockout/tagout of powered conveyors is $18,900. This cost will most likely be borne by stevedoring firms.

Subpart H: Handling Cargo

Nine proposed revisions to the existing rule were identified as substantive changes to the existing rule.

Vertical Lifting of Containers

The proposed rule requires that, when containers are being hoisted by the top fittings, lifting forces must be applied vertically from at least four such fittings. Since container gantry cranes provide vertical lifts, only non-container cranes will be affected. Stevedores using non-container cranes currently use either box spreaders, or wires and hooks to lift containers. The use of box spreaders would provide vertical lifts. Approximately 423 non-container gantry cranes are used to lift containers. However, box spreaders would only need to be purchased for 8 to 20 percent of these cranes [1]. Approximately one 20 foot (6.1 m) box spreader and one 40 foot (12.2 m) box spreader will need to be purchased for 59 cranes (14 percent of non-container cranes). Kearney/Centaur estimated, based on an interview with a box spreader manufacturer, that a 20-foot (6.1 m) box spreader costs about $8,800 and a 40-foot (12.2 m) box spreader costs about $9,800. The total cost per crane to purchase one 20-foot (6.1 m) box spreader and one 40-foot (12.2 m) box spreader is, therefore, estimated at $18,600 ($8,800 + $9,800). Thus, the total capital cost that will be incurred by stevedoring companies to comply with this provision is estimated at $1,101,492 [1].

Prohibiting Work On Top of Containers to the Extent Feasible

The proposed rule would eliminate work on top of container stacks, to the extent feasible, through the use of engineering controls. Compliance with this proposed requirement is considered feasible, for most operations, when container gantry cranes are used to move containers. To secure stacked containers, twistlocks are placed in the corner castings of each container. When manual twistlocks are used, workers are placed, usually by crane, on top of each container to place or remove (cone or decone) twistlocks. The use of semi-automatic twistlocks (SATLs) and above-deck cell guides would eliminate the need for workers to go atop containers for the purpose of coning or deconing. These engineering controls would greatly reduce the time spent on top of containers and thus, reduce the fall hazards. The use of such controls would also eliminate the need to use personal protective equipment (PPE) for the purposes of coning and deconing.

Kearney/Centaur conducted a time-motion study comparing the use of SATLs with the use of fall protection using tie-off. Through field visits to eight ports, Kearney/Centaur observed various container operations on different types of vessels. Activities that directly affect the total time to complete a project (activities on the critical path) were identified, and the average time to complete each of these activities was estimated. Operations that delay the crane are activities on the critical path. The study demonstrated that the use of SATLs would result in significant decreases in crane delay time, since workers would no longer need to be placed on each container to cone or decone. This finding is consistent with other studies conducted on the use of SATLs [1, Appendix E].

The unit cost of a SATL is about $20 more than the cost of a conventional twistlock. Thus, the incremental cost per SATL is estimated to be $20 [1]. An estimated 177 U.S.-owned vessels and 350 foreign-owned vessels will need to purchase SATLs. The total annualized investment cost to purchase SATLs is estimated at about $2 million for U.S. vessel operators and $4 million for foreign operators.

The use of SATLs is expected to result in cost savings to vessel operators, as well as to stevedores, in terms of productivity increases. The total dollar value of the cost savings depends on the time savings per vessel, the vessel configuration, the number of containers carried, the number of container cranes used to load or unload the vessel, and the number of trips made to U.S. ports. In each case, as analyzed in Kearney/Centaur's study, cost savings exceed the annualized cost of purchasing SATLs. Even under the worst case scenario, annual productivity increases more than offset the annualized investment cost of the SATLs.

The use of SATLs also results in reduced damage to containers. Conventional twistlocks are often thrown or dropped onto the tops of containers, often damaging them. Since SATLs are placed and removed on the dock, such damage would be avoided.

Furthermore, interviews with industry officials revealed that shipping lines are already rapidly converting to the use of SATLs. Approximately 47 to 55 percent of all containerships calling at U.S. ports are currently using SATLs. An estimated 22 to 26 percent of U.S. flag containerships and 74 to 78 percent of foreign flag containerships currently use SATLs. In addition, major shipping lines are currently in the process of fully converting to the use of SATLs [1].

In conclusion, based on the Kearney/Centaur study, the annual productivity gains realized as a result of using of SATLs are expected to exceed the annualized investment cost to purchase SATLs. OSHA requests additional data and comments on this issue.

Certification of Fall Protection Systems

The certification of fall protection systems used in container operations is also expected to result in compliance costs. The proposed rule would require that all fall protection systems be certified by a registered professional engineer as being capable of sustaining at least twice the potential impact of an employee's fall. Based on Kearney/Centaur interviews with industry officials, compliance with this provision would require, on average, one annual certification per establishment involved in container operations. Each certification is expected to take about two hours. Approximately 277 establishments are estimated to be involved in container operations [1]. The services of a registered professional engineer to conduct the required testing and provide certification are estimated to cost about $50 per hour, or $100 per establishment, annually. In addition, there may be a $200 documentation fee and a 15 percent administrative surcharge. This results in an average cost of $345 per establishment, and a total annual recurring cost of $95,565 for stevedoring firms.

Secondary Attachments for Safety Cages

The proposed standard requires the use of secondary attachments for safety cages attached to container gantry

cranes which are used to hoist employees. Few safety cages have secondary means of attachment. The installation of padeyes on cages to allow them to be attached to the spreader by chains and hooks would satisfy this requirement. Approximately 75 to 100 safety cages are currently in use, 90 percent of which lack secondary means of attachment [1]. Applying this percentage to 88 safety cages (the midpoint of the estimated range of safety cages in use) yields an estimate of 79 cages that will need to be retrofitted. The installation of padeyes is estimated to cost $200 per safety cage. No costs are attributed to the purchase of hooks and chains since these items are readily available from existing inventories of equipment. The total capital cost to comply with this provision is estimated at $15,840. This cost would is likely to be borne by stevedoring companies [1].

Marking of Load Capacities on RO-RO Ramps

The proposed provision requiring that RO-RO ramps be marked with their load capacities is expected to impose first-year costs primarily on vessel operators. Field visits and interviews with industry representatives indicated that virtually none of the vessels have load capacities marked on their ramps. The Bureau of the Census reported that 147 RO-RO vessels called at U.S. ports in 1992. Approximately 120 of these are RO-RO car carriers, and 27 are heavy capacity RO-RO vessels. On average, car carriers have about four ramps each and heavy capacity RO-RO vessels have 1.5 ramps each. Thus, an estimated 521 ramps would need to be marked. Industry officials indicated that this procedure would require about 0.5 hour per vessel to obtain the necessary information, and 0.5 hour to mark each ramp. Thus, a total of 334 labor hours would be required. Using a labor rate of $40.30, the total estimated first-year cost for vessel operators to comply with this requirement is $13,460.

Separation of Vehicles and Pedestrians on RO-RO Ramps

The proposed rule also requires that pedestrians and vehicles be physically separated on RO-RO ramps. When no physical separation is present or feasible, a signal person would be required to direct traffic, disallowing concurrent use. Although some heavy capacity RO-RO ramps have pedestrian walkways built into them, most are relatively wide and are often used concurrently by pedestrians and vehicles.

For car carriers, ramps are narrow and many do not have room to designate both a pedestrian walkway and a car lane. Discussions with car carrier foremen indicated that, currently, a gang member is assigned the duty of directing traffic and coordinating the movement of vehicles. Consequently, no incremental costs are expected to be incurred for a signal person. However, decreases in productivity may result since vehicles, which would normally be driven onto ramps when pedestrians are present, would have to wait until all pedestrians clear the ramp.

Kearney/Centaur indicated that productivity decreases would be in the form of additional personnel rather than vessel delays. Based on the number of vehicles imported to and exported from the United States each year, the probability that pedestrians and vehicles would concurrently use a ramp, and the average delay time that would result for each incident, Kearney/Centaur estimated that this proposed requirement would result in a total annual delay time of about 2,178.7 hours [1]. Applying an average longshore worker wage rate of $40.30 to the total time delay yields a recurring annual cost of about $87,801.

Marking Flat Bed and Low Boy Trailers

The proposed rule requires that flat bed and low boy trailers (mafis) be marked with their load capacities. Kearney/Centaur concluded that the 307 establishments involved in container and RO-RO operations will be affected by this requirement, 80 percent of which are already in compliance [1]. To mark all mafis would take about eight hours per establishment. Using an average hourly wage rate of $40.30, the first-year incremental cost of this requirement is estimated at $19,795.

High Visibility Vests

The proposed rule would require that high visibility vests be used during RO-RO and container operations. Kearney/Centaur estimated that one vest would be required, annually, for each affected worker [1]. OSHA estimates that about 75 percent (40,963 workers) of SIC 4491 workers are involved in container or RO-RO operations. The average unit cost of a high visibility vest is estimated to be $6.50 [1]. Therefore, the annual recurring cost for high visibility vests is estimated at $266,260.

Additional Training in Container and RO-RO Safety

Since there are several revisions proposed for container and RO-RO operations, additional training is expected to be needed. OSHA estimates that 75 percent of longshore workers employed in SIC 4491 (40,963 workers) engage in either container or RO-RO operations or both. Assuming one supervisor will need to be trained for every 10 workers at risk, 4,096 supervisors will need additional training. Additional training in container and RO-RO operations is not expected to exceed 0.5 hour [1]. Applying an hourly supervisor wage rate of $50.78 yields a first-year cost of approximately $103,997.

A first-year cost to provide safety instruction is also estimated. An estimated 307 establishments will need instructors for container and RO-RO safety training [1]. Using an hourly instruction fee of $175 per hour of training provided, the estimated instruction cost is $26,863.

The total first-year cost for additional container and RO-RO safety training is estimated to be $130,860, and will most likely be borne by stevedoring firms.

Subpart I: General Working Conditions

Illumination

According to industry officials, most lighting situations meet the proposed requirement of 5 footcandles (54 lux) of illumination. The existing rule requires that "adequate" lighting be provided at all times. OSHA assumes that establishments not using at least 5 footcandles (54 lux) of lighting would be in violation of the existing rule. Thus, no incremental costs are estimated for this provision.

Sanitation

The proposed standard includes specifications on the number of toilets that would need to be available to longshore workers. Kearney/Centaur interviews with industry representatives indicated that current practice already meets this proposed requirement, with the exception of certain situations in the Gulf region. Compliance with this requirement can be achieved through semi-monthly rentals of portable toilets at a rental cost of $65 each. The total recurring annual cost to comply with the proposed sanitation requirements is estimated to be $1,560 for stevedoring companies operating in the Gulf [1].

First Aid Kits

The proposed rule would require that first aid kits be checked at least weekly and that contents be approved by a physician. Industry officials indicated that first aid kits currently in use are stocked on the basis of recommendations by first aid and safety professionals and are expected to already meet physicians' recommendations. Thus, kit contents are not expected to change as a result of proposed revisions.Incremental costs are expected to result in the form of labor time necessary to perform weekly checks of the contents of each kit. This

procedure is not expected to take more than 5 minutes per week per establishment. Applying an average hourly wage rate of $40.30 yields an annual cost of $174.63 per establishment per year. The total recurring annual cost for all 3,700 establishments to comply with this requirement is estimated at $646,143.

Stretchers

Incremental costs are expected to result from the proposed requirement that stretchers be equipped with four sets of working patient restraints. Costs are estimated assuming that 25 percent of the affected workplaces would need to retrofit their stretchers. Approximately one stretcher per establishment would need to be retrofitted at an average cost of $400 each [1]. The total capital cost for this requirement is estimated at $370,000.

Accident Prevention Proficiency Training for Supervisors

The proposed rule would require that all supervisors overseeing more than five workers complete a course in accident prevention. This training is currently required under the Marine Terminals standard. Kearney/Centaur field visits indicated that approximately 75 percent of supervisors already receive accident prevention training [1]. Each course is estimated to take two hours. At an average supervisor wage rate of $50.78 per hour, the cost for 2,336 supervisors to receive this training is $237,244. The average fee to provide instruction is estimated to be $175 per hour of training. Assuming that 25 percent of the affected establishments (925 establishments) would require such training, the cost for instruction is estimated at $323,750 ($175 x 2 x 925). The total first-year cost for accident prevention proficiency training is, therefore, estimated to be $560,994 and is expected to be borne by stevedoring companies.

In addition to first-year costs, annual recurring costs are expected to be incurred as a result of supervisor turnover. Kearney/Centaur estimated that the turnover rate for longshore supervisors is about five percent per year. The resulting annual cost of supervisor time is estimated at $11,883. The annual cost to provide instruction is $16,188, assuming that five percent of establishments would need such instruction. The recurring annual cost for accident prevention proficiency training is, therefore, estimated at $28,070.

Subpart J: Personal Protective Equipment

The proposed rule would broaden the existing scope to require that personal flotation devices be used in more situations where workers may be at risk of falling into the water. Since the existing rule already requires the use of personal flotation devices in the Gulf/Mississippi region, no incremental costs in addition to general training costs are expected to be incurred by establishments in this region. To estimate the number of flotation devices that would be needed, OSHA assumes that 50 percent of employees not working in the Gulf/Mississippi region (19,386 workers), would need personal flotation devices. The average unit cost per life vest meeting the required specifications is estimated at $55 [8]. Thus, the total capital cost to purchase personal flotation devices is estimated at $1,066,230.

Summary

As shown in Table C–2, the total first-year cost of the proposed revisions to the Longshoring standard is estimated at $4,088,445. After the first year, establishments will incur an estimated $1,755,773, annually.

Table C-2—Preliminary Cost Estimates of Proposed Revisions to 29 CFR Part 1918 (Longshoring) (1993 Dollars)

Source	First-Year Costs	Capital Costs	Annualized Capital Costs*	Recurring Annual Costs	Total First-Year Costs	Total Annualized Costs
Workplace Analysis	485,625				485,625	
General Training						
Supervisor Time	474,438				474,438	
Instruction	647,500				647,500	
Subpart C						
6″ sideboards: dockboards/ramps		1,070,000	174,138		174,138	174,138
Subpart G						
4-yr. testing of special gear				37,580	37,580	37,580
Lockout/tagout: powered conveyors		18,900	3,076		3,076	3,076
Subpart H						
Vertical lifts		1,101,492	179,263		179,263	179,263
Certification: fall protection				95,565	95,565	95,565
Secondary safety cage attachments		15,840	2,578		2,578	2,578
Marking RO-RO ramps	13,460				13,460	
Separation of vehicles/pedestrians on RO-RO ramps				87,801	87,801	87,801
Marking flat bed/low boy trailers	19,795				19,795	
High visibility vests				266,260	266,260	266,260
Training						
Supervisor Time	103,997				103,997	
Instructor	26,863				26,863	
Subpart I						
Sanitation				1,560	1,560	1,560
First aid kits				646,143	646,143	646,143
Stretchers		370,000	60,216		60,216	60,216
Accident prevention training	560,994			28,070	589,064	28,070
Subpart J						
Personal flotation devices		1,066,230	173,524		173,524	173,524

Table C-2—Preliminary Cost Estimates of Proposed Revisions to 29 CFR Part 1918 (Longshoring) (1993 Dollars)—Continued

Source	First-Year Costs	Capital Costs	Annualized Capital Costs*	Recurring Annual Costs	Total First-Year Costs	Total Annualized Costs
TOTAL	$2,332,672	$3,642,462	$592,794	$1,162,979	$4,088,445	$1,755,773

Source: U.S. Department of Labor OSHA, based on Kearney/Centaur [1, Chapter 4].
* Annualized over 10 years using a 10% interest rate.

Revisions to 29 CFR Part 1917: Marine Terminals

Several of the proposed revisions to the Marine Terminals standard are not expected to generate any specific costs. Some of the costs of the proposed revisions are included in the cost analysis of the proposed Longshoring standard. For example, the first aid kits and stretchers used for workers aboard vessels are the same ones used in marine terminals. Also, Kearney/Centaur concluded, based on interviews with industry representatives, that many of the proposed requirements reflect current practices. For example, current industry practice prohibits riding the load and hoisting workers by hooks. In addition, industry officials indicated that lowering the 8-hour time-weighted average exposure limit of carbon monoxide from 50 ppm to 35 ppm would not be a problem.

Compliance with most of the proposed revisions to the Marine Terminals standard can be met through workplace analysis and general training. Specific compliance costs are expected to be generated from the proposed requirement for seat belts in high speed container gantry cranes.

First-Year Costs

Costs for workplace analysis and general training are based on the assumption that 1,928 establishments and 70,140 workers (see Industry Profile), would be affected by proposed revisions to the Marine Terminals standard [1]. The total first-year cost for these activities is estimated at $515,485.

Workplace Analysis

Approximately one hour, on average, is estimated to be required for a safety consultant, familiar with the proposed rule, to evaluate an establishment. At an average fee of $87.50 per hour, the total estimated first-year cost for workplace analysis is $168,700 [1].

General Training

One supervisor per every 10 workers (7,014 supervisors) would receive supplementary general training in the proposed new requirements. General training in the proposed requirements is estimated to take about 0.5 hour. Using an average supervisor wage rate of $50.78, the total first-year cost of supervisor time for additional training is estimated at $178,085. The cost per establishment to provide instruction, using an average fee of $175 per hour of training, is estimated at $168,700.

Thus, the total first-year cost of general training is estimated at $346,785, and will most likely be borne by stevedoring firms.

Seat Belts

The proposed rule requires that seat belts be placed in the operators' seats of high-speed container gantry cranes. Kearney/Centaur estimated that 40 percent of the 411 container gantry cranes in U.S. ports are already equipped with chest harnesses. Based on interviews, the cost to retrofit one crane is estimated at $500. The total capital cost to retrofit 247 container cranes is estimated to be $123,500.

Summary

Proposed revisions to the Marine Terminals standard are estimated to result in first-year costs totalling $535,585 and annualized costs totalling $20,099 (Table C–3).

Table C-3—Preliminary Cost Estimates of Proposed Revisions to 29 CFR Part 1917 (Marine Terminals) (1993 Dollars)

	First-Year Cost	Capital Cost	Annualized Capital Cost*	Total First-Year Cost	Total Annualized Cost
Workplace Analysis	168,700			168,700	
General Training					
Supervisor Time	178,085			178,085	
Instructor	168,700			168,700	
Seatbelts		123,500	20,099	20,099	20,099
TOTAL	$515,485	$123,500	$20,099	$535,585	$20,099

Source: U.S. Department of Labor OSHA, based on Kearney/Centaur [1, Chapter 4].
* Annualized over 10 years using a 10% interest rate.

D. Benefits

Introduction

The proposed revisions to the Longshoring and Marine Terminals standards are expected to reduce the numbers of injuries and fatalities in the marine cargo handling industry. Since affected workers are involved in both off-the-dock (covered under 29 CFR part 1918) and on-the-dock activities (covered under 29 CFR part 1917), separate analyses are presented on accidents that occur in each area of operation.

Injuries and Fatalities

As presented in the Industry Profile, approximately 87,951 full-time equivalent (FTE) longshore workers, based on a 1,436 hour work-year, are affected by the Longshoring standard. Approximately 67,974 of these workers are also covered by the Marine Terminals standard. About 54,617 of affected workers are employed in SIC 4491, while the others are employed in establishments classified under other industry sectors. A summary of injuries occurring among affected workers in the marine cargo handling industry is shown in Table D-1. As shown, a total of 18 fatalities and 7,593 injuries occurred among workers affected by the Longshoring and Marine Terminals standards.

Table D-1—Estimated Annual Number of Fatalities and Injuries Occurring Among Affected Workers

Type of Incident	Total Cases	Off-the-Dock	On-the-Dock
Fatalities	18	10	8
Injuries	7,593	4,208	3,385
Non-Lost Workday Cases	2,903	1,609	1,294
Lost Workday Cases	4,690	2,599	2,091
Lost Workdays	182,442	101,109	81,332

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, based on Kearney/Centaur [1, Chapter 5].

Injuries

The Bureau of Labor Statistics (BLS) provided the 1991 injury rate for SIC 4491. This rate was 13.6 for every 100 FTE workers, based on a 2000 hour work-year [1]. The lost workday and non-lost workday injury rates per 100 FTE workers were 8.4 and 5.2, respectively. An average of 38.9 lost workdays occurred per lost workday injury.

BLS also conducted a study of longshore-related injuries processed under the Federal Longshoremen's and Harbor Workers' Compensation Act [9]. According to this study, 49 percent of longshore-related injuries occurred off the dock, while 51 percent occurred on the dock.

Since BLS injury rates are per 100 FTE workers based on a 2,000 hour work-year, the number of FTE workers based on a 1,436 hour work-year must be converted to FTEs based on a 2,000-hour work-year. The conversion results in 63,148 FTE off-the-dock workers and 48,805 FTE on-the-dock workers.

Off-the-Dock

The number of off-the-dock injuries was estimated by applying 49 percent of the BLS injury rate to the 63,148 FTE off-the-dock workers (based on a 2,000 hour work-year). As a result, 4,208 annual injuries are estimated to occur off the dock. Of these, 2,599 are lost workday cases resulting in 101,109 lost workdays, and 1,609 are non-lost workday cases.

On-the-Dock

The number of FTE workers affected by the Marine Terminals standard, based on a 2,000 hour work-year, is 48,805. Applying 51 percent of the BLS injury rate to the 48,805 FTE workers on the dock yields 3,385 annual injuries occurring on the dock. Of these, 1,294 are non-lost workday cases and 2,091 are lost workday cases resulting in 81,332 lost workdays.

Fatalities

Although BLS did not provide a fatality rate for SIC 4491, data were available on the total of number of 1992 fatalities that occurred in SIC 4491. BLS indicated that 13 fatalities occurred among SIC 4491 workers [1]. Since 54,617 FTE workers (based on a 1,436 hour work-year) are estimated to be employed in SIC 4491, a fatality rate of 0.0238 per 100 FTE workers (based on a 1,436 hour work-year) was derived.

Off-the-Dock

To determine the number of off-the-dock fatalities occurring annually, 49 percent of the fatality rate was applied to the 87,951 FTE longshore workers (based on a 1,436 hour work-year). This results in 10 fatalities occurring, annually, off the dock.

On-the-Dock

To estimate the number of fatalities occurring among the population covered by the Marine Terminals standard, OSHA used 51 percent of the fatality rate estimated above. As a result, approximately eight fatalities are estimated to occur on the dock, annually.

BENEFITS

The proposed revisions to the Longshoring and Marine Terminals standards are expected to reduce many of the risks involved in marine cargo handling operations. Reductions in fatalities and injuries are expected as a result of proposed revisions to the two standards.

In reviewing OSHA's first reports of serious accidents in the marine cargo handling industry, Kearney/Centaur estimated the percent of fatalities that would have been prevented by proposed revisions to the existing standards. Approximately 30 percent of off-the-dock fatalities and injuries could have been prevented through compliance with proposed requirements. Thus, an estimated 3 fatalities are expected to be prevented, annually, by the proposed requirements. In addition, an estimated 1,262 injuries would be prevented annually through compliance with proposed new requirements. Many additional fatalities and injuries would be prevented through full compliance with existing requirements retained in the proposed standards.

Summary of Benefits

All of the proposed revisions to the Longshoring and Marine Terminals standards are likely to reduce the risk of injuries occurring in the marine cargo handling industry. The proposed new requirements are expected to prevent approximately 3 of the 18 fatalities and 1,262 of the 7,593 injuries occurring annually among affected workers. Approximately 779 lost workday injuries involving 30,303 lost workdays are expected to be prevented, annually. An additional 483 non-lost workday cases are also expected to be avoided. Many additional fatalities and injuries would likely be prevented through full compliance with existing requirements retained in the proposed standards.

E. Economic Impacts

Compliance with the requirements of the proposed revisions to the Longshoring and Marine Terminals standards are not expected to produce any significant adverse economic impacts.The costs that are imposed by the regulation should be a minimal burden on all affected establishments.

The total annual revenues and profits associated with longshoring operations are approximately $7.8 billion and $388.9 million, respectively [1]. The total estimated costs of compliance with the proposed revisions to the Longshoring and Marine Terminals standards rules are less than $4.7 million for the first year after promulgation of the final rules and less than $1.8 million annually, thereafter. Thus, the total first-year costs of compliance with the proposed revisions represent less than 0.06 percent of the revenues and 1.19 percent of the profits of the industry. Compliance costs for subsequent years represent less than 0.03 percent of revenues and less than 0.46 percent of profits.

Current practices in the marine cargo handling industry indicate that the requirements of the proposed standard can generally be met without significant hardship. Many employers already comply with the proposed requirements and presumably are not imposing substantial disadvantages on themselves.

Since stevedoring establishments engaging in similar cargo handling operations in the United States would be subject to the same regulations, no competitive disadvantages between industries or with regard to international trade are projected. Costs are expected to be passed through as an increase in the costs of cargo handling and shipping, and the effect on profits and prices should be negligible. The estimated compliance costs would represent an average increase in cost of less than 25 cents for shipping a loaded container in or out of U.S. ports, which costs an average of about $3000. On the whole, the costs of marine cargo handling operations for society would actually decrease as fewer accidents would mean less lost time and wages and fewer medical and legal resources

necessary for a given amount of cargo shipping and handling.

The estimated savings to society attributable to the prevention of injuries and fatalities would far outweigh the costs of preventing these incidents. According to the National Safety Council, the total costs associated with occupational injuries and deaths in 1992 were $115.9 billion, or an average cost of over $15,000 per case. This estimate includes wage and productivity losses, medical costs, administrative expenses, and other costs associated with accidents. The estimated benefits anticipated from proposed requirements include unquantifiable reductions in pain and suffering, plus estimated savings of over $18 million annually.

REGULATORY FLEXIBILITY ANALYSIS

Pursuant to the Regulatory Flexibility Act (P.L. 96-353, 94 Stat. 1164 (5 U.S.C. 601 *et seq.*)), OSHA has made an assessment of the impact of the proposed revisions to the Longshoring and Marine Terminals standards, and has concluded that they would not have a significant impact upon a substantial number of small entities.

The important criterion that governs a Regulatory Flexibility Analysis is whether the proposed standards would impose significant costs upon small entities. "Significance" is determined by the effect upon profits, market share, and the entity's financial viability. In particular, the effect of the proposed revisions upon small entities relative to their effect upon large entities needs to be specifically evaluated. That is, OSHA must determine whether the proposed requirements would have a relatively greater negative effect upon small entities than they would have upon large entities, thereby putting small entities at a competitive disadvantage, and if so, whether there are ways to minimize any differentially adverse effects without increasing the risk to employees.

If the costs of compliance are proportional to firm size and are insignificant to small firms, then there is no significant differential burden on small firms relative to that on large firms. In those cases involving large absolute costs (typically capital equipment costs), financing may be more difficult to obtain for small entities than for larger entities and in such cases of economies of scale in compliance, the burden on small firms will be greater than the burden on large firms. The proposed changes to the Longshoring and Marine Terminals standards, however, require minimal capital expenditures and generally impose costs that are proportional to firm size and the amount of business done. In addition, these costs would be a minimal component of the overall costs of operations. As a result, small entities would not be put at a competitive disadvantage to large entities due to these compliance costs.

Thus, OSHA concluded that the proposed revisions to the Longshoring and Marine Terminals standards would not have a significant adverse impact upon a substantial number of small entities.

F. Other Impacts

Impact Upon International Trade

OSHA determined that compliance with the proposed revisions to the Longshoring and Marine Terminals standards would not have any measurable impact upon international trade. The compliance costs are minimal and are not expected to affect exports, imports, or international competitiveness. To the extent that compliance with the proposed rule would increase cargo handling efficiency and reduce the number of injuries and fatalities associated with these operations, shipping costs may be reduced and result in a general increase in the competitiveness of U.S. firms.

References

1. Kearney/Centaur, Division of A.T. Kearney, Inc., *Economic Assessment of OSHA's Proposed Longshoring Standard*, prepared for the U.S. Department of Labor, Occupational Safety and Health Administration, Office of Regulatory Analysis, Contract No. J–9–F–1–0015.

2. U.S. Department of Transportation, Maritime Administration, "The U.S. Stevedoring and Marine Terminal Industry," January 1993.

3. U.S. Department of Transportation, Maritime Administration, "Merchant Fleets of the World: Oceangoing Steam and Motor Ships of 1,000 Gross Tons and Over as of January 1, 1992."

4. U.S. Department of Transportation, Maritime Administration, "A Report to Congress on the Status of the United States 1990–1991," December 1992.

5. U.S. Department of Commerce, Bureau of the Census, Foreign Trade Division, computer printout on the number of vessels calling at U.S. ports in 1992, May 4, 1993.

6. U.S. Department of Transportation, Maritime Administration, "Inventory of American Intermodal Equipment 1990," April 1991.

7. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, County Business Patterns 1990—United States.

8. SAFECO, Inc. Occupational Health and Safety Products Supply Catalog.

9. U.S. Department of Labor, Bureau of Labor Statistics, "Injuries Involving Longshore Operations," Bulletin 2326, May 1989.

IX. Environmental Impact

The proposed revisions to the Longshoring and Marine Terminals standards have been reviewed in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.), the regulations of the Council on Environmental Quality (CEQ) (40 CFR Part 1500), and DOL NEPA Procedures (29 CFR Part 11). No significant negative impact is foreseen on air, water or soil quality, plant or animal life, the use of land or sea, or other aspects of the environment.

X. Recordkeeping Requirements

Part 1320 of title 5 of the CFR sets forth procedures for agencies to follow in obtaining OMB clearance for information collection requirements under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* The proposed Longshoring standard requires the employer to allow OSHA access to records. In accordance with the provisions of the Paperwork Reduction Act and the regulations issued pursuant thereto, OSHA certifies that it has submitted the information collection to OMB for review under section 3504(h) of that Act.

Public reporting burden for this collection of information is estimated to average five minutes per response to allow OSHA compliance officers access to the employer's records. Send comments regarding this burden estimate, or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Information Management, Department of Labor, Room N–1301, 200 Constitution Avenue, N.W., Washington, D.C. 20210; and to the Office of Information and Regulatory Affairs Management and Budget, Washington, D.C. 20503.

XI. State Plan Requirements

Those of the 25 states with their own OSHA-approved occupational safety and health plans whose plans cover the issues of maritime safety and health must revise their existing standard within six months of the publication date of the final standard or show OSHA why there is no need for action, e.g., because an existing state standard covering this area is already "at least as effective" as the revised Federal standard. Currently five states (California, Minnesota, Oregon, Vermont and Washington) with their own state plans cover private sector onshore maritime activities. Federal OSHA enforces maritime standards offshore in all states and provides onshore coverage

of maritime activities in Federal OSHA states and in the following state Plan States: Alaska, Arizona, Connecticut[3], Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Nevada, New Mexico, New York[4], North Carolina, Puerto Rico, South Carolina, Tennessee, Utah, Virginia, Virgin Islands, and Wyoming (all states with state plans must also extend coverage to state and local government employees engaged in maritime activities.)

XII. Federalism

The standard has been reviewed in accordance with Executive Order 12612 (52 FR 41685; October 30, 1987) regarding Federalism. This Order requires that agencies, to the extent possible, refrain from limiting State policy options, consult with States prior to taking any actions that would restrict State policy options, and take such actions only when there is clear constitutional authority and the presence of a problem of national scope. The Order provides for preemption of State law only if there is a clear constitutional authority and the presence of a problem of national scope. Additionally, the Order provides for preemption of State law only if there is a clear Congressional intent for the agency to do so. Any such preemption is to be limited to the extent possible.

Section 18 of the Occupational Safety and Health Act (OSH Act), expresses Congress' clear intent to preempt State laws relating to issues with respect to which Federal OSHA has promulgated occupational safety or health standards. Under the OSH Act a State can avoid preemption only if it submits, and obtains Federal approval of, a plan for the development of such standards and their enforcement. Occupational safety and health standards developed by such Plan-States must, among other things, be at least as effective in providing safe and healthful employment and places of employment as the Federal standards.

The Federal standards on longshoring and marine terminal operations address hazards which are not unique to any one state or region of the country. Nonetheless, those States which have elected to participate under section 18 of the OSHA Act would not be preempted by this final regulation and would be able to deal with special, local conditions within the framework provided by this performance-oriented standard while ensuring that their standards are at least as effective as the Federal standard.

XIII. Public Participation

Interested persons are requested to submit written data, views and arguments concerning this proposal. Responses to the questions raised at various places in the proposal are particularly encouraged. These comments must be postmarked by September 30, 1994. Comments are to be submitted in quadruplicate or 1 original (hard-copy) and 1 disk (5¼ or 3½) in WP 5.0, 5.1, 6.0 or Ascii. Note: Any information not contained on disk, e.g., studies, articles, etc., must be submitted in quadruplicate to: The Docket Office, Docket No. S–025, Room N–2625, U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210, Telephone No. (202) 219–7894.

All written comments received within the specified comment period will be made a part of the record and will be available for public inspection and copying at the above Docket Office address.

Notice of Intention to Appear at the Informal Hearing

Pursuant to section 6(b)(3) of the OSH Act, informal public hearings will be held on this proposal in:

Charleston, South Carolina on September 30, 1994.

Seattle, Washington on October 31, 1994.

New Orleans, Louisiana on November 29, 1994. Actual addresses for the locations of the regional hearings in Charleston, South Carolina, Seattle, Washington, and New Orleans, Louisiana will be announced in a later Federal Register notice.

Persons desiring to participate at the informal public hearing must file a notice of intention to appear by August 31, 1994. The notice of intention to appear must contain the following information:

1. The name, address, and telephone number of each person to appear;
2. The capacity in which the person will appear;
3. The approximate amount of time required for the presentation;
4. The issues that will be addressed;
5. A brief statement of the position that will be taken with respect to each issue; and
6. Whether the party intends to submit documentary evidence and, if so, a brief summary of it.

The notice of intention to appear shall be mailed to Mr. Thomas Hall, OSHA Division of Consumer Affairs, Docket No. S–025, U.S. Department of Labor, Room N–3647, 200 Constitution Avenue, N.W., Washington, D.C. 20210, Telephone (202) 219–8615.

A notice of intention to appear also may be transmitted by facsimile to (202) 219–5986, by the same date, provided the original and 3 copies are sent to the same address and postmarked no later than 3 days later.

Individuals with disabilities wishing to attend the hearings should contact the hearing management officer, Mr. Tom Hall, to obtain appropriate accommodations at the hearing.

Filing of Testimony and Evidence Before the Hearing

Any party requesting more than ten (10) minutes for presentation at the informal public hearing, or who intends to submit documentary evidence, must provide in quadruplicate the testimony and evidence to be presented at the informal public hearing. One copy shall not be stapled or bound and be suitable for copying. These materials must be provided to Mr. Thomas Hall, OSHA Division of Consumer Affairs at the address above and be postmarked no later than 21 days prior to the date of the hearing.

Each submission will be reviewed in light of the amount of time requested in the notice of intention to appear. In instances where the information contained in the submission does not justify the amount of time requested, a more appropriate amount of time will be allocated and the participant will be notified of that fact prior to the informal hearing.

Any party who has not substantially complied with the above requirement may be limited to a ten-minute presentation and may be requested to return for questioning at a later time.

Any party who has not filed a notice of intention to appear may be allowed to testify for no more than 10 minutes as time permits, at the discretion of the Administrative Law Judge, but will not be allowed to question witnesses.

Notice of intention to appear, testimony and evidence will be available for inspection and copying at the Docket Office at the address above.

Conduct and Nature of Hearing

The hearing will commence at 9:30 a.m. on the first day. At that time, any procedural matters relating to the proceeding will be resolved.

The nature of an informal rulemaking hearing is established in the legislative history of section 6 of the OSH Act and is reflected by OSHA's rules of procedure for hearings (29 CFR 1911.15(a)). Although the presiding officer is an Administrative Law Judge and questioning by interested persons is allowed on crucial issues, the

[3] Plan covers only state and local government employees.

[4] Plan covers only s ate and local government employees.

proceeding is informal and legislative in type. The Agency's intent, in essence, is to provide interested persons with an opportunity to make effective oral presentations which can proceed expeditiously in the absence of procedural restraints which impede or protract the rulemaking process.

Additionally, since the hearing is primarily for information gathering and clarification, it is an informal administrative proceeding rather than an adjudicative one. The technical rules of evidence, for example do not apply. The regulations that govern hearings and the pre-hearing guidelines to be issued for this hearing will ensure fairness and due process and also facilitate the development of a clear, accurate and complete record. Those rules and guidelines will be interpreted in a manner that furthers that development. Thus, questions of relevance, procedure and participation generally will be decided so as to favor development of the record.

The hearing will be conducted in accordance with 29 CFR part 1911. It should be noted that §1911.4 specifies the Assistant Secretary may upon reasonable notice issue alternative procedures to expedite proceedings or for other good cause. The hearing will be presided over by an Administrative Law Judge who makes no decision or recommendation on the merits of OSHA's proposal. The responsibility of the Administrative Law Judge is to ensure that the hearing proceeds at a reasonable pace and in an orderly manner. The Administrative Law Judge, therefore, will have all the powers necessary and appropriate to conduct a full and fair informal hearing as provided in 29 CFR part 1911 including the powers:

1. To regulate the course of the proceedings;
2. To dispose of procedural requests, objections and comparable matters;
3. To confine the presentations to the matters pertinent to the issues raised;
4. To regulate the conduct of those present at the hearing by appropriate means;
5. In the Judge's discretion, to question and permit the questioning of any witnesses and to limit the time for questioning; and
6. In the Judge's discretion, to keep the record open for a reasonable, stated time (known as the post-hearing comment period) to receive written information and additional data, views and arguments from any person who has participated in the oral proceedings.

OSHA recognizes that there may be interested persons or organizations who, through their knowledge of the subject matter or their experience in the field, would wish to endorse or support the whole proposal or certain provisions of the proposal. OSHA welcomes such supportive comments, including any pertinent data and cost information which may be available, in order that the record of this rulemaking will present a balanced picture of public response on the issues involved.

List of Subjects in 29 CFR parts 1910, 1917, and 1918

Cargo, Cargo gear certification, Intermodal container, Longshoring, Maritime, Marine terminal, Hazardous materials, Labeling, Occupational safety and health, Protective equipment, Respiratory protection, Signs and symbols.

XIV. Authority and Signature

This document was prepared under the direction of Joseph A. Dear, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, D.C. 20210.

Accordingly, pursuant to sections 4, 6(b), 8(c), and 8(g) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Sec. 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); and 29 CFR part 1911 and Secretary of Labor's Order No. 1–90 (55 FR 8033), OSHA proposes to amend 29 CFR parts 1910, 1917 and 1918 as set forth below.

Signed at Washington, D.C. this 12th day of May, 1994.

Joseph A. Dear,

Assistant Secretary of Labor

For the reasons set out in the preamble 29 CFR Chapter XVII would be amended as follows:

PART 1910—[AMENDED]

1. The authority for part 1910 would continue to read as follows:

Authority: Secs. 4, 6 and 8 of the Occupational Safety and Health Act, 29 U.S.C. 653, 655, 657; Walsh-Healey Act, 41 U.S.C. 35 et seq; Service Contract Act of 1965, 41 U.S.C. 351 et seq; sec. 107, Contract Work Hours and Safety Standards Acts (Construction Safety Act), 40 U.S.C. 333; Sec. 41, Longshore and Harbor Workers' Compensation Act 33 U.S.C. 941; National Foundation of Arts and Humanities Act, 20 U.S.C. 951 et seq.; Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 1911, 9–83 (48 FR 35736), or 1–90 (55 FR 9033) as applicable.

2. Paragraphs (a) and (b) of §1910.16 would be revised to read as follows:

§1910.16 Longshoring and marine terminals.

(a) *Safety and health standards for longshoring.* (1) Part 1918 of this chapter shall apply exclusively, according to the provisions thereof, to all employment of every employee engaged in longshoring operations or related employment aboard any vessel. All cargo transfer accomplished with the use of shore-based material handling devices shall be regulated by part 1917 of this chapter.

(2) Part 1910 does not apply to longshoring operations except for the following provisions:

(i) *Toxic and hazardous substances.* Subpart Z applies except that the requirements of subpart Z of this part do not apply when a substance or cargo is contained within a sealed, intact means of packaging or containment complying with Department of Transportation or International Maritime Organization requirements.[1]

(ii) *Access to employee exposure and medical records.* Subpart C, §1910.20;

(iii) *Commercial diving operations.* Subpart T of this part;

(iv) *Electrical.* Subpart S of this part; when shorebased electrical installations provide power for use aboard vessels;

(v) *Hand and Portable Powered Tools and Other Hand-Held Equipment.* Subpart P of this part;

(vi) *Hazard Communication.* Subpart Z, §1910.1200;

(vii) *Hazardous waste operations and emergency response.* Subpart H, §1910.120(q).

(viii) *Ionizing radiation.* Subpart G, §1910.96;

(ix) *Machinery and Machine Guarding.* Subpart O, §1910.211;

(x) *Noise.* Subpart G, §1910.95;

(xi) *Nonionizing radiation.* Subpart G, §1910.97; and

(xii) *Respiratory protection.* Subpart I, §1910.134.

(b) *Safety and health standards for Marine Terminals.* Part 1917 of this chapter shall apply exclusively, according to the provisions thereof, to employment within a marine terminal, except as follows:

(1) The provisions of part 1917 of this chapter do not apply to the following:

(i) Facilities used solely for the bulk storage, handling and transfer of flammable and combustible liquids and gases.

(ii) Facilities subject to the regulations of the Office of Pipeline Safety Regulation of the Materials Transportation Bureau, Department of

[1] The International Maritime Organization publishes the International Maritime Dangerous Goods Code to aid compliance with International legal requirements of the International Convention for the Safety of Life at Sea, 1960.

Transportation, to the extent such regulations apply to specific working conditions.

(iii) Fully automated bulk coal handling facilities contiguous to electrical power generating plants.

(2) Part 1910 does not apply to Marine Terminals except for the following:

(i) *Abrasive blasting.* Subpart G, §1910.94(a);

(ii) *Access to employee exposure and medical records.* Subpart C, §1910.20;

(iii) *Commercial diving operations.* Subpart T of this part;

(iv) The control of hazardous energy (lockout/tagout). Subpart J, §1910.147;

(v) *Electrical.* Subpart S of this part;

(vi) *Grain handling facilities.* Subpart R, §1910.272;

(vii) *Hand and Portable Powered Tools and Other Hand-Held Equipment.* Subpart P of this part;

(viii) *Hazard Communication.* Subpart Z, §1910.1200;

(ix) *Machinery and Machine Guarding.* Subpart O;

(x) *Noise.* Subpart G, §1910.95;

(xi) *Respiratory protection.* Subpart I, §1910.143;

(xii) *Safety requirements for scaffolding.* Subpart D, §1910.28;

(xiii) *Servicing multi-piece and single piece rim wheels.* Subpart N, §1910.177; and

(xiv) *Toxic and hazardous substances.* Subpart Z applies except that the requirements of Subpart Z of this part do not apply when a substance or cargo is contained within a sealed, intact means of packaging or containment complying with Department of Transportation or International Maritime Organization requirements.[1]

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PART 1917—MARINE TERMINALS

1. The authority citation for part 1917 would continue to read as follows:

Sec. 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); secs.4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), or 9–83 (48 FR 35736), as applicable; 29 CFR part 1911.

Section 1917.28 also issued under 5 U.S.C. 553.

Subpart A—Scope and Definitions

2. In § 1917.1, the introductory text of (a) and paragraphs (a)(2)(i) through (a)(2)(x) are proposed to be revised and paragraphs (a)(2)(xi) through (a)(2)(xvii) are proposed to be added to read as follows:

§ 1917.1 Scope and applicability.

(a) The regulations of this part apply to employment within a marine terminal as defined in § 1917.2(u), including the loading, unloading, movement or other handling of cargo, ship's stores or gear within the terminal or into or out of any land carrier, holding or consolidation area, any other activity within and associated with the overall operation and functions of the terminal, such as the use and routine maintenance of facilities and equipment. All cargo transfer accomplished with the use of shore-based material handling devices shall be regulated by this part.

* * * * *

(2) * * *

(i) *Abrasive blasting.* Subpart G, § 1910.94(a);

(ii) *Access to employee exposure and medical records.* Subpart C, § 1910.20;

(iii) *Commercial diving operations.* Subpart T of part 1910;

(iv) *The control of hazardous energy (lockout/tagout).* Subpart J, § 1910.147;

(v) *Electrical.* Subpart S of part 1910;

(vi) *Grain handling facilities.* Subpart R, § 1910.272;

(vii) *Hand and portable powered tools and other hand-held equipment.* Subpart P of part 1910;

(viii) *Hazard communication.* Subpart Z, § 1910.1200;

(ix) *Hazardous waste operations and emergency response.* Subpart H, § 1910.120(q);

(x) *Ionizing radiation.* Subpart G, § 1910.96;

(xi) *Machinery and machine guarding.* Subpart O of part 1910;

(xii) *Noise.* Subpart G, § 1910.95;

(xiii) *Nonionizing radiation.* Subpart G, § 1910.97;

(xiv) *Respiratory protection.* Subpart I, § 1910.143;

(xv) *Safety requirements for scaffolding.* Subpart D, § 1910.28;

(xvi) *Servicing multi-piece and single piece rim wheels.* Subpart N, § 1910.177; and

(xvii) *Toxic and hazardous substances.* Subpart Z of part 1910 applies, except that the requirements of subpart Z of part 1910 do not apply when a substance or cargo is contained within a sealed, intact means of packaging or containment complying with Department of Transportation or International Maritime Organization requirements.[1] Notwithstanding the rules for Hazard Communication (§ 1910.1200) shall apply.

3. In § 1917.2, the paragraph designations to each definition are proposed to be removed and the definitions placed in alphabetical order, definitions for the terms *Employee* and *Employer* are proposed to be added, and the definition for the term *Intermodal container* is proposed to be revised to read as follows:

§ 1917.2 Definitions.

* * * * *

Employee means any longshore worker, or other person engaged in marine terminal operations or related employments.

Employer means an employer any of whose employees are employed, in whole or in part, in marine terminal operations.

* * * * *

Intermodal container means a reusable cargo container of rigid construction and rectangular configuration; fitted with devices permitting its ready handling, particularly its transfer from one mode of transport to another; so designed to be readily filled and emptied; intended to contain one or more articles of cargo or bulk commodities for transportation by water and one or more other transport modes without intermediate cargo handling. The term includes completely enclosed units, open top units, fractional height units, units incorporating liquid or gas tanks and other variations fitting into the container system. It does not include cylinders, drums, crates, cases, cartons, packages, sacks, unitized loads or any other form of packaging.

* * * * *

Subpart B—Marine Terminal Operations

4. Section 1917.11 is proposed to be amended by adding paragraph (d) to read as follows:

§ 1917.11 Housekeeping.

* * * * *

(d) Dunnage, lumber, or shoring material in which there are visibly protruding nails shall be removed from the immediate work area or if left in the area, the nails shall be rendered harmless.

5. Section 1917.13 is proposed to be amended by revising paragraph (g) and adding paragraphs (h) and (i) to read as follows:

[1] The International Maritime Organization publishes the International Maritime Dangerous Goods Code to aid compliance with International legal requirements of the International Convention for the Safety of Life at Sea, 1960.

[1] The International Maritime Organization publishes the International Maritime Dangerous Goods Code to aid compliance with the International legal requirements of the International Convention for the Safety of Life at Sea, 1960.

§ 1917.13 Slinging.

* * * * *

(g) Intermodal containers shall be handled in accordance with § 1917.71(f).

(h) The employer shall require employees to stay clear of the area beneath overhead drafts or descending lifting gear.

(i) Employees shall not be permitted to ride the hook or the load.

6. Section 1917.17 is proposed to be amended by revising paragraphs (i), (j), and (k) to read as follows:

§ 1917.17 Railroad facilities.

* * * * *

(i) If powered industrial trucks are used to open railcar doors, the trucks or the railcar doors shall be equipped with door opening attachments. Employees shall stand clear of the railcar doors while they are being opened and closed.

(j) Only railcar door openers or powered trucks equipped with door opening attachments shall be used to open jammed doors.

(k) Employees shall not remain in or on gondolas or flat cars when drafts that create overhead, caught-in, caught-between or struck-by hazards are being landed in or on the railcar; end gates, if raised, shall be secured.

* * * * *

7. Section 1917.18 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1917.18 Log handling.

(a) Structures (bunks) used to contain logs shall have rounded corners and rounded structural parts to avoid sling damage.

* * * * *

8. Section 1917.20 is proposed to be revised to read as follows:

§ 1917.20 Interference with communications.

Cargo handling operations shall not be carried on when noise-producing maintenance, construction or repair work interferes with the communication of warnings or instructions.

9. Section 1917.23 is proposed to be amended by revising paragraphs (b)(1) and (d) introductory text to read as follows:

§ 1917.23 Hazardous atmospheres and substances.

(See § 1917.2(r))

* * * * *

(b) *Determination of hazard.* (1) When the employer is aware that a room, building, vehicle, railcar, or other space contains or has contained a hazardous atmosphere, a designated and appropriately equipped person shall test the atmosphere before employee entry to determine whether a hazardous atmosphere exists.

* * * * *

(d) *Entry into hazardous atmospheres.* Only designated persons shall enter hazardous atmospheres, in which case the following provisions shall apply:

* * * * *

10. Section 1917.24 is proposed to be amended by revising paragraphs (a) and (d) to read as follows:

§ 1917.24 Carbon monoxide.

(a) *Exposure limits.* The carbon monoxide content of the atmosphere in a room, building, vehicle, railcar, or any enclosed space shall be maintained at not more than 35 parts per million (ppm) (0.0035%) as an 8-hour timeweighted average and employees shall be removed from the enclosed space if the carbon monoxide concentration exceeds 100 ppm (0.01%). The short term exposure limit in outdoors, non-enclosed spaces shall be 200 ppm (0.02%) measured over a 5 minute period.

* * * * *

(d) *Records.* A record of the data time, location and results of carbon monoxide tests shall be available for at least 30 days. Such records may be entered on any retrievable medium and shall be available for inspection.

* * * * *

11. Section 1917.25 is proposed to be amended by revising paragraphs (a) and (c) and adding paragraph (g) to read as follows:

§ 1917.25 Fumigants, pesticides, insecticides and hazardous preservatives.

(See § 1917.2(p))

(a) At any time the hold concentration in any compartment reaches the level specified as hazardous by the fumigant manufacturers or by Table Z–1 of 29 CFR 1910.1000, whichever is lower, all employees shall be removed from such holds or compartments and shall not be permitted to re-enter until such time as tests demonstrate that the atmosphere is safe.

* * * * *

(c) Results of any tests shall be available for at least 30 days. Such records may be entered on any retrievable medium, and shall be available for inspection.

* * * * *

(g) In the case of containerized shipments of fumigated tobacco, the contents of the container shall be aerated by opening the container doors for a period of 48 hours after the completion of fumigation and prior to loading. When tobacco is within shipping cases having polyethylene or similar bag liners, the aeration period shall be 72 hours. The employer shall obtain a written warranty from the fumigation facility stating that the appropriate aeration period has been met.

* * * * *

12. Section 1917.26 is proposed to be amended by revising paragraphs (c) and (d) to read as follows:

§ 1917.26 First aid and lifesaving facilities.

* * * * *

(c) *First aid kit.* First aid kits shall be weatherproof and shall contain individual sealed packages for each item that must be kept sterile. The contents of each kit shall be determined by a physician and such contents shall be checked at least weekly. Expended items shall be promptly replaced.

(d) *Stretchers.* (1) There shall be available for each vessel being worked, one Stokes basket stretcher, or its equivalent, permanently equipped with bridles for attaching to the hoisting gear.

(2) Stretchers shall be kept close to vessels and shall be positioned to avoid damage.

(3) A blanket or other suitable covering shall be available.

(4) Stretchers shall have at least four sets of effective patient restraints in operable condition.

(5) Lifting bridles shall be of adequate strength, capable of lifting 1,000 pounds (454 kg) with a safety factor of five, and shall be maintained in operable condition. Lifting bridles shall be provided for making vertical patient lifts at container berths. Stretchers for vertical lifts shall have foot plates.

(6) Stretchers shall be maintained in operable condition. Struts and braces shall be inspected for damage. Wire mesh shall be secured with no burrs. Damaged stretchers shall not be used until repaired.

(7) Stretchers in permanent locations shall be mounted to prevent damage and protected from the elements if located out-of-doors. If concealed from view, closures shall be marked to indicate life saving equipment.

* * * * *

13. Section 1917.27 is proposed to be amended by revising paragraph (a)(2) to read as follows:

§ 1917.27 Personnel.

(a) * * *

(2) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate the employee shall be permitted to operate a crane, winch or other power-operated

cargo handling apparatus or a power-operated vehicle.

* * * * *

14. Section 1917.28 is proposed to be amended by removing the regulatory text and revising the section heading to read as follows:

§ 1917.28 Hazard Communication.

(See § 1917.1(a)(2)(viii)).

Subpart C—Cargo Handling Gear and Equipment

15. Section 1917.42 is proposed to be amended by revising paragraphs (b)(4), (c)(1), (d), (h)(4), (h)(5), and (j) to read as follows:

§ 1917.42 Miscellaneous auxiliary gear.

* * * * *

(b) * * *

(4) Where wire rope clips are used to form eyes, the employer shall adhere to the manufacturer's recommendations, which shall be made available for inspection. If "U" bolt clips are used and the manufacturer's recommendations are not available, Table C–1 shall be used to determine the number and spacing of clips. "U" bolts shall be applied with the "U" section in contact with the dead end of the rope.

* * * * *

(c) * * *

(1) The employer shall ascertain the manufacturer's ratings for the specific natural fibre rope used and have such ratings available for inspection. The manufacturer's ratings shall be adhered to and a minimum design safety factor of five maintained.

* * * * *

(d) *Synthetic rope.*

(1) The employer shall adhere to the manufacturer's ratings and use recommendations for the specific synthetic fibre rope used and shall make such ratings available for inspection.

(2) Unless otherwise recommended by the manufacturer, when synthetic fibre ropes substituted for fibre ropes of less than 3 inches (7.62 cm) in circumference, the substitute shall be of equal size. Where substituted for manila rope of 3 inches or more in circumference, the size of the synthetic rope shall 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 that of the size fibre rope that would be required by paragraph (c) of this section and C_m= the circumference of fibre rope in inches which would be required by paragraph (c) of this section. In making such substitution, it shall be ascertained that the inherent characteristics of the synthetic fibre are suitable for hoisting.

* * * * *

(h) * * *

(4) Chains shall be repaired only under qualified supervision. Links or portions of chain defective under any of the criteria of paragraph (h)(3)(iii) of this section shall be replaced with properly dimensioned links or connections of material similar to that of the original chain. Before repaired chains are returned to service, they shall be tested to the proof load recommended by the manufacturer for the original chain. Tests shall be performed by the manufacturer or shall be certified by an agency accredited for the purpose under part 1919 of this chapter. Test certificates shall be available for inspection.

(5) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding 6 months. Heat treatment certificates shall be available for inspection. Alloy chains shall not be annealed.

* * * * *

(j) *Hooks other than hand hooks.* (1) The manufacturer's recommended safe working loads for hooks shall not be exceeded. After October 3, 1983, hooks other than hand hooks shall be tested in accordance with § 1917.50(c)(6).

* * * * *

16. Section 1917.43 is proposed to be amended by revising paragraph (e)(1)(i) to read as follows:

§ 1917.43 Powered industrial trucks.

* * * * *

(e) *Fork lift trucks.* (1) *Overhead guards.* (i) When operators are exposed to overhead falling hazards, fork lift trucks shall be equipped with securely attached overhead guards. Guards shall be constructed to protect the operator from falling boxes, cartons, packages, or similar objects.

* * * * *

17. Section 1917.44 is proposed to be amended by revising paragraphs (a), (i), (o)(3)(i), (o)(3)(ii), and (o)(4) to read as follows:

§ 1917.44 General rules applicable to vehicles.[4]

(a) The requirements of this section apply to general vehicle use within Marine Terminals except in cases where the provisions of paragraphs (c) and (l) of this section are preempted by applicable regulations of the Department of Transportation.[5]

* * * * *

(i) A distance of not less than 20 feet (6.1 m) shall be maintained between the first two vehicles in a check-in, check-out, roadability, or vessel loading/discharging line. This distance shall be maintained between any subsequent vehicles behind which employees are required to work.

* * * * *

(o) * * *

(3) * * *

(i) Only employees trained in the procedures required in paragraph (o)(4) of this section and who have demonstrated their ability to service multi-piece rim wheels shall be assigned such duties.

(ii) Employees assigned such duties shall have demonstrated their ability by the safe performance of the following tasks:

(4) *Servicing procedures.* The following procedures shall be followed:

* * * * *

18. Section 1917.45 is proposed to be amended by revising the section heading, paragraphs (f)(4)(iii), (f)(5), (f)(7), (f)(13)(ii), (i)(5)(i) introductory text, (j)(1)(iii)(D), (j)(2), and by adding paragraph (j)(9) to read as follows:

§ 1917.45 Cranes and derricks.

(See also § 1917.50.)

* * * * *

(f) * * *

(4) * * *

(iii) Stairways on cranes shall be equipped with rigid handrails meeting the requirements of § 1917.112(e).

* * * * *

(5) *Operator's station.* (i) The cab, controls and mechanism of the equipment shall be so arranged that the operator has a clear view of the load or signalman, when one is used. Cab glass, when used, shall be safety plate glass or equivalent and good visibility shall be maintained through the glass. Clothing, tools and equipment shall be stored so as not to interfere with access, operation, and the operator's view.

(ii) [Insert date 90 days after publication of the Final Rule] A seat (lap) belt, meeting the requirements of

[4] The United States Coast Guard at 33 CFR 126.15 (d) and (e) has additional regulations applicable to vehicles in terminals.

[5] Department of Transportation regulations in 49 CFR part 393, Subpart C-Brakes, address the immobilization of trailer road wheels prior to disconnection of the trailer and until braking is again provided. Section 49 CFR 393.84 addresses the condition of flooring. These DOT rules apply when the motor carrier is engaged in interstate commerce or in the transport of certain hazardous items wholly within a municipality or the commercial zone thereof.

49 CFR 571.208–210 for a Type 1 seat belt assembly, shall be installed on the operator's seat of high speed container gantry cranes where the seat trolleys.

* * * * *

(7) *Outriggers.* Outriggers shall be used according to the manufacturer's specifications or design data, which shall be available. Floats, when used, shall be securely attached to the outriggers. Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety and of sufficient width and length to prevent the crane from shifting or toppling under load.

* * * * *

(13) * * *

(ii) Each independent hoisting unit of a crane, except worm geared hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction, shall, in addition to a holding brake, be equipped with a controlled braking means to control lowering speeds.

* * * * *

(i) * * *

(5) *Operating near electric power lines.* (i) *Clearance.* Unless electrical distribution and transmission lines are de-energized and visibly grounded at point of work, or unless insulating barriers not apart of on an attachment to this crane have been erected to prevent physical contact with lines, near cranes may be operated near power lines only in accordance with the following:

* * * * *

(j) * * *

(1) * * *

(iii) * * *

(D) Equipped with a device to prevent access doors, when used, from opening accidently;

* * * * *

(2) Except in an emergency, the hoisting mechanism of all cranes or derricks used to hoist personnel shall operate in power up and power down, with automatic brake application when not hoisting or lowering.

* * * * *

(9) Employees shall not be hoisted on intermodal container spreaders while a load is engaged.

* * * * *

19. Section 1917.48 is proposed to be amended by revising paragraph (d)(2) to read as follows:

§ 1917.48 Conveyors.

* * * * *

(d) * * *

(2) Conveyors using electrically released breaks shall be constructed so that the breaks cannot be released until power is applied, and that the brakes are automatically engaged if the power fails or the operating control is returned to the "stop" position.

* * * * *

20. Section 1917.50 is proposed to be amended by revising paragraphs (c)(5) and (i) and adding paragraph (j) to read as follows:

§ 1917.50 Certification of marine terminal material handling devices.

* * * * *

(c) * * *

(5) *Special gear.* (i) 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, that has been purchased or fabricated after [Insert date 90 days after publication of Final Rule], and has a Safe Working Load (SWL) greater than 5 short tons (10,000 lbs. or 4540 kg.), shall be inspected and tested as a unit in accordance with the following table before initially being put into use:

Safe working load	Proof load
Up to 20 short tons (18.1 metric tons).	25 percent in excess.
Over 20 to 50 short tons (18.1 to 45.3 metric tons).	5 short tons in excess.
Over 50 short tons (45.3 metric tons).	10 percent in excess.

(ii) 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, with a SWL of 5 short tons (10,000 lbs. or 4540 kg.) or less shall be inspected and tested as a unit in accordance with this section or by a designated person, in accordance with the table in § 1917.50(c)(5)(i) before initially being put into use.

(iii) Every spreader not a part of ship's gear and used for hoisting intermodal containers that has been purchased or fabricated after [Insert date 90 days after publication of Final Rule], shall be inspected and tested to a proof load equal to 25 percent in excess of its rated capacity before being put into use. In addition, any spreader that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.

(iv) All cargo handling gear covered by this section with a SWL greater than 5 short tons (10,000 lbs. or 4540 kg.) shall be proof load tested according to the chart in paragraph (c)(5)(i) of this section every 4 years in accordance with paragraph (b) of this section or by a designated person.

* * * * *

(i) *Safe working load.* (1) The safe working load of gear as specified in § 1917.50 shall not be exceeded.

(2) All cargo handling gear provided by the employer with a safe working load greater than 5 short tons (10,000 lbs. or 4540 kg.) shall have its safe working load plainly marked on it.

(j) The certification requirements of this section do not apply to the following equipment:

(1) Industrial trucks and small industrial crane trucks; and

(2) Any straddle truck not capable of straddling two or more intermodal containers 16 feet (4.8 m) in width.

* * * * *

21. § 1917.51 is proposed to be amended by removing the regulatory text and revising the section heading to read as follows:

§ 1917.51 Hand tools.

(See subpart P of 29 CFR part 1910.)

22. Section 1917.71 is proposed to be amended by revising paragraphs (b)(6), (b)(7), (c), (e), (f)(1)(i) and adding paragraphs (b)(8), (f)(4) and (f)(5) to read as follows:

§ 1917.71 Terminals handling intermodal containers or roll-on roll-off operations.

* * * * *

(b) * * *

(6) Closed dry van containers carrying vehicles are exempted from paragraph (b)(4) of this section provided that:

(i) The container carries only completely assembled vehicles and no other cargo;

(ii) The container is marked on the outside in such a manner that an employee can readily discern that the container is carrying vehicles; and

(iii) The vehicles were loaded into the container at the marine terminal.

(7) The weight of loaded inbound containers from foreign ports shall be determined by weighing or by the method of calculation described in paragraph (b)(4)(ii) of this section or by shipping documents.

(8) Any scale used within the United States to weigh containers for the purpose of the requirements of this section shall meet the accuracy standards of the state or local public authority in which the scale is located.

(c) No container or containers shall be hoisted if its actual gross weight exceeds the weight marked as required in paragraph (a)(2) of this section, or if it exceeds the capacity of the crane or other hoisting device intended to be used.

* * * * *

(e) Employees working in the immediate area of container handling equipment or in the terminal's traffic lanes shall wear high visibility vests (or equivalent protection).

(f) * * *

(1) * * *

(i) When hoisting by the top fittings, the lifting forces shall be applied vertically from at least four (4) such fittings.

* * * * *

(4) Flat bed and low boy trailers (mafis) shall be marked with their cargo capacities and shall not be overloaded.

(5) Air brake connections. Tractors shall connect all brake air lines when pulling trailers equipped with air brakes.

* * * * *

23. Section 1917.73 is proposed to be amended by revising the section heading and paragraph (a)(2) to read as follows:

§ 1917.73 Terminal facilities handling menhaden and similar species of fish.

(See § 1917.2(p).)

(a) * * *

(2) Before employees enter a dock tank, it shall first be drained, rinsed and tested for hydrogen sulfide and oxygen deficiency. The hydrogen sulfide content of the atmosphere in a dock tank, compartment, or any enclosed space shall be maintained at not more than 10 parts per million (ppm) (0.0010%) as an 8-hour time weighted average. The short term exposure limit shall be 15 ppm (0.0015%) measured over a 15 minute period. The oxygen level must be maintained to at least 19.5 percent.

* * * * *

24. Section 1917.91 is proposed to be amended by revising paragraph (a)(1) to read as follows:

§ 1917.91 Eye protection.

(a)(1) When employees perform work hazardous to the eyes, the employer shall provide eye protection equipment marked or labeled as meeting the manufacturing specifications of American National Standards, Practice for Occupational and Educational Eye and Face Protection, ANSI Z–87.1–1989 and shall require that it be used.

* * * * *

25. Section 1917.93 is proposed to be amended by revising paragraph (b) to read as follows:

§ 1917.93 Head protection.

* * * * *

(b) Protective hats shall bear identifying marks or labels indicating compliance with the manufacturing provisions of American National Standards, Requirements for Protective Headwear for Industrial Workers, ANSI Z–89.1–1986.

* * * * *

26. Section 1917.94 is proposed to be amended by revising paragraph (b) to read as follows:

1917.94 Foot protection.

* * * * *

(b) Protective shoes shall bear identifying marks or labels indicating compliance with manufacturing provisions of the American National Standard for Personal Protection—*Protective Footwear*-ANSI Z41–1991.

* * * * *

27. Section 1917.112 is proposed to be amended by revising paragraph (a)(1) to read as follows:

§ 1917.112 Guarding of edges.

(a) * * *

(1) Vehicle curbs, bull rails, or other effective barriers at least 6 inches (15.24 cm) in height, shall be provided at the waterside edges of aprons and bulkheads, except where vehicles are prohibited. Curbs or bull rails installed after October 3, 1983, shall be at least 10 inches (25.4 cm) in height.

* * * * *

28. Section 1917.118 is proposed to be amended by revising paragraphs (d)(2)(i) and (f)(2) to read as follows:

§ 1917.118 Fixed ladders.

* * * * *

(d) * * *

(2)(i) Ladders installed before October 3, 1983, shall have rungs evenly spaced from 9 to 16½ inches (22.9 to 41.9 cm) apart, center to center.

* * * * *

(f) * * *

(2) Form a continuous ladder, uniformly spaced vertically from 12 inches to 16 inches (30.5 to 41 cm) apart, with a minimum width of 10 inches (25.4 cm) and projecting at least 4½ inches (11.43 cm) from the wall;

* * * * *

29. Section 1917.119 is proposed to be amended by revising paragraphs (b)(1), (d)(2), and (f)(4) to read as follows:

§ 1917.119 Portable ladders.

* * * * *

(b) * * *

(1) Rungs of manufactured portable ladders obtained before October 3, 1983, shall be capable of supporting a 200-pound (890 N) load without deformation.

* * * * *

(d) * * *

(2) Are capable of supporting a 250-pound (1120 N) load without deformation; and

* * * * *

(f) * * *

(4) Individual sections from different multi-sectional ladders or two or more single straight ladders shall not be tied or fastened together to achieve additional length.

* * * * *

30. Section 1917.121 is proposed to be amended by revising paragraph (b)(3) to read as follows:

§ 1917.121 Spiral stairways.

* * * * *

(b) * * *

(3) Minimum loading capability shall be 100 pounds per square foot (4.79 kPa), and minimum tread center concentrated loading shall be 300 pounds (1334 N);

* * * * *

31. Section 1917.124 is proposed to be amended by adding paragraphs (c)(5), (c)(6), and (d)(5) and revising the section heading and paragraph (d)(1) to read as follows:

§ 1917.124 Dockboards (car and bridge plates).

* * * * *

(c) * * *

(5) Dockboards shall be equipped with side boards that are at least 6 inches (15.2 cm) high along the space bridged.

(6) Dockboards shall be well maintained.

* * * * *

(d) *Ramps.* (1) Ramps shall be strong enough to support the loads imposed on them, provided with sideboards that are at least 6 inches (15.2 cm) high, properly secured and well maintained.

* * * * *

(5) Ramps shall be well maintained.

32. Section 1917.126 is proposed to be amended by revising paragraph (b) to read as follows:

§ 1917.126 River banks.

* * * * *

(b) Where working surfaces at river banks slope so steeply that an employee could slip or fall into the water, the outer perimeter of the working surface shall be protected by posting or other portable protection such as roping off, and that employees wear a personal flotation device meeting the requirements of § 1917.95(b).

33. Section 1917.127 is proposed to be amended by revising paragraph (a)(1) introductory text and adding a table at the end of paragraph (a)(3) to read as follows:

§ 1917.127 Sanitation.

(a) *Washing and toilet facilities.* (1) Accessible washing and toilet facilities sufficient for the sanitary requirements of employees shall be readily accessible at the worksite. The number of toilet facilities shall be provided in accordance with the table at the end of paragraph (a) of this section. The facilities shall have:

* * * * *

(3) * * *

TOILET FACILITIES TABLE

No. of employees	Minimum no. of facilities
20 or less	1 toilet seat.
20 or more	1 toilet seat and 1 urinal per 40 workers.
200 or more ...	1 toilet seat and 1 urinal per 50 workers.

* * * * *

34. Section § 1917.151 is proposed to be amended by revising the section heading to read as follows:

§ 1917.151 Machine guarding.

(See 29 CFR part 1910, subpart O.)

* * * * *

35. Section 1917.152 is proposed to be amended by revising the section heading, the introductory text of both paragraphs (f)(1) and (f)(2) and (f)(3)(iv) to read as follows:

§ 1917.152 Welding, cutting and heating (hot work).[8]

(See 29 CFR 1917.2(p)).

* * * * *

(f) * * *

(1) Mechanical ventilation requirements. General mechanical ventilation or local exhaust systems shall meet the following requirements:

* * * * *

(2) Except as specified in paragraphs (f)(3)(ii) and (f)(3)(iii) of this section, when hot work is performed in a confined space:

(3) * * *

(iv) Employees performing hot work in the open air that involves any of the metals listed in paragraphs (f)(3) (i) and (ii) of this section shall be protected by respirators in accordance with the requirements of § 1910.134, and those working on beryllium-containing base or filler metals shall be protected by supplied air respirators, in accordance with the requirements of § 1910.134.

* * * * *

[8] The U.S. Coast Guard, at 33 CFR 126.15(c), requires prior permission of the Captain of the Port if welding or other hot work is to be carried out at a facility where dangerous cargoes as defined by 33 CFR 126.07 are located or being handled.

36. Section 1917.153 is proposed to be amended by revising the section heading to read as follows:

§ 1917.153 Spray painting.

(See 29 CFR 1917.2(p)).

37. Section 1917.156 is proposed to be amended by revising paragraph (b)(3)(iii)(D) to read as follows:

§ 1917.156 Fuel handling and storage.

* * * * *

(b) * * *

(3) * * *

(iii) * * *

(D) Leakage at valves or connections; and

* * * * *

38. Section 1917.157 is proposed to be amended by revising paragraph (n) to read as follows:

§ 1917.157 Battery charging and changing.

* * * * *

(n) Chargers shall be turned off when leads are being connected or disconnected.

* * * * *

39. Part 1918 is proposed to be revised to read as follows:

PART 1918—SAFETY AND HEALTH REGULATIONS FOR LONGSHORING

Subpart A—Scope and Definitions

Sec.
1918.1 Scope and applicability
1918.2 Definitions

Subpart B—Gear Certification

1918.11 Gear certification.

Subpart C—Means of Access

1918.21 Gangways and other means of access.
1918.22 Jacob's ladders.
1918.23 Access to barges and river towboats.
1918.24 Bridge plates and ramps.
1918.25 Ladders.

Subpart D—Working Surfaces

1918.31 Hatch coverings.
1918.32 Stowed cargo and temporary landing platforms.
1918.33 Deck loads.
1918.34 Other decks.
1918.35 Open hatches.
1918.36 Weather deck rails.
1918.37 Barges.
1918.38 Log rafts.

Subpart E—Opening and Closing Hatches

1918.41 Coaming clearances.
1918.42 Hatch beam and pontoon bridles.
1918.43 Handling hatch beams and covers.

Subpart F—Vessel's Cargo Handling Gear

1918.51 General requirements.
1918.52 Specific requirements.
1918.53 Cargo winches.
1918.54 Rigging gear.
1981.55 Cranes.

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

1918.61 General.
1918.62 Miscellaneous auxiliary gear.
1918.63 Chutes, gravity conveyors and rollers.
1918.64 Powered conveyors.
1918.65 Mechanically powered vehicles used aboard vessels.
1918.66 Cranes and derricks other than vessel's gear.
1918.67 Notifying ships's officers before using certain equipment.
1918.68 Grounding.
1918.69 Tools.

Subpart H—Handling Cargo

1918.81 Slinging.
1918.82 Building drafts.
1918.83 Stowed cargo; tiering and breaking down.
1918.84 Bulling cargo.
1918.85 Containerized cargo operations.
1918.86 Roll-on roll-off (RO–RO) operations.
1918.87 Ship's cargo elevators.
1918.88 Log operations.
1918.89 Hazardous cargo. (See also § 1918.2(j)).

Subpart I—General Working Conditions

1918.90 Hazard communication (See § 1918.1(b)(6)).
1918.91 Housekeeping.
1918.92 Illumination.
1918.93 Hazardous atmospheres and substances. (See also § 1918.2(j)).
1918.94 Ventilation and atmospheric conditions. (See also § 1918.2 (j)).
1918.95 Sanitation.
1918.96 Longshoring operations in the vicinity of maintenance and repair work.
1918.97 First aid and lifesaving facilities.
1918.98 Personnel.

Subpart J—Personal Protective Equipment

1918.101 Eye protection.
1918.102 Respiratory protection. (See § 1918.1(b)(12)).
1918.103 Head protection.
1918.104 Foot protection.
1918.105 Other protective measures.

Appendix I to Part 1918—Cargo Gear Register and Certificates (Non-mandatory)

Appendix II to Part 1918—Tables for Selected Miscellaneous Auxiliary Gear (Non-mandatory)

Appendix III to Part 1918—Container Top Safety (Non-mandatory)

Authority: Sec. 41, Longshore and Harbor Worker's Compensation Act (33 U.S.C. 941); Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 1–90 (55 FR 9033).

Subpart A—Scope and Definitions

§ 1918.1 Scope and Applicability.

(a) The regulations of this part apply to longshoring operations and related employments aboard vessels. All cargo transfer accomplished with the use of shore-based material handling devices

shall be regulated by part 1917 of this chapter.

(b) Part 1910 of this chapter does not apply to longshoring except for the following provisions:

(1) *Toxic and hazardous substances.* Subpart Z of part 1910 applies except that the requirements of subpart Z of part 1910 do not apply when a substance or cargo is contained within a sealed, intact means of packaging or containment complying with Department of Transportation or International Maritime Organization requirements.[1]

(2) *Access to employee exposure and medical records.* Subpart C, § 1910.20;

(3) *Commercial diving operations.* Subpart T of part 1910;

(4) *Electrical.* Subpart S of part 1910; when shore-based electrical installations provide power for use aboard vessels;

(5) *Hand and Portable Powered Tools and Other Hand-Held Equipment.* Subpart P of part 1910;

(6) *Hazard Communication.* Subpart Z, § 1910.1200;

(7) *Hazardous waste operations and emergency response.* Subpart H, § 1910.120(q).

(8) *Ionizing radiation.* Subpart G, § 1910.96;

(9) *Machinery and Machine Guarding.* Subpart O, § 1910.211;

(10) *Noise.* Subpart G, § 1910.95;

(11) *Nonionizing radiation.* Subpart G, § 1910.97; and (12)

(12) *Respiratory protection.* Subpart I, § 1910.134.

§ 1918.2 Definitions.

(a) The terms *hatch beam* or "strongback" mean a portable transverse or longitudinal beam which is placed across a hatchway and acts as a bearer to support the hatch covers.

(b) The term *bulling* means the horizontal dragging of cargo across a surface with none of the weight of the cargo supported by the fall.

(c) The term *designated person* means a person who possesses specialized abilities in a specific area and is assigned by the employer to perform a specific task in the area.

(d) The term *dockboards (car and bridge plates)* mean devices for spanning short distances between, for example, two barges, which do not expose employees to falls greater than 4 feet (1.2 m).

(e) The term *employee* means any longshore worker, or other person engaged in longshoring operations or related employments 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.

(f) The term *employer* means a person or company that employs workers in longshoring operations or related employments, as defined herein.

(g) The term *enclosed space* means an interior space in or on a vessel, other than a confined space, that may contain or accumulate a hazardous atmosphere due to inadequate natural ventilation. Examples of enclosed spaces are holds, deep tanks and refrigerated compartments.

(h) *Fumigant* is a substance or mixture of substances, used to kill pests or prevent infestation, which is a gas or is rapidly or progressively transformed to the gaseous state, even though some nongaseous or particulate matter may remain and be dispersed in the treatment space.

(i) 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.

(j) The term *hazardous cargo, materials, substance or atmosphere* means:

(1) Any substance listed in 29 CFR part 1910, subpart Z;

(2) Any material in the Hazardous Materials Table and Hazardous Materials Communications Regulations of the Department of Transportation, 49 CFR part 172;

(3) Any article not properly described by a name in the Hazardous Materials Table and Hazardous Materials Communication Regulations of the Department of Transportation, 49 CFR part 172, but which is properly classified under the definitions of those categories of dangerous articles given in 49 CFR part 173; or

(4) Any atmosphere with an oxygen content of less than 19.5 percent or greater than 23 percent.

(k) The term *intermodal container* means a reusable cargo container of rigid construction and rectangular configuration; fitted with devices permitting its ready handling, particularly its transfer from one mode of transport to another; so designed to be readily filled and emptied; intended to contain one or more articles of cargo or bulk commodities for transportation by water and one or more other transport modes. The term includes completely enclosed units, open top units, fractional height units, units incorporating liquid or gas tanks and other variations fitting into the container system. It does not include cylinders, drums, crates, cases, cartons, packages, sacks, unitized loads or any other form of packaging.

(l) 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.

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

(n) The term *ramp* means other flat surface devices for passage between levels and across openings not covered under the term "dockboards".

(o) 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, clerk, checker, or watchman.

(p) The term *Secretary* means the Secretary of Labor.

(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.

(r) 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.

(s) For the purposes of §§ 1918.21, 1918.23, 1918.35, 1918.37, and 1918.43(f)(2), the term "barge" means an unpowered, flatbottomed, shallow draft vessel including river barges, scows, carfloats, and lighters. For the purposes of these sections the term does not include ship shaped or deep draft barges.

(t) For the purposes of §§ 1918.21 and 1918.23, 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.

(u) For the purpose of § 1918.11, the term "vessel'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. It 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. It does include all stationary or mobile

[1] The International Maritime Organization publishes International Maritime Dangerous Goods Code to aid compliance with the International legal requirements of the International Convention for the Safety of Life at Sea, 1960.

cargo handling appliances, including shore-based power-operated ramps, used on shore or on board ship for suspending, raising, or lowering loads or moving them from one position to another while suspended or supported.

(v) For the purpose of § 1918.23(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.

Subpart B—Gear Certification

§ 1918.11 Gear certification.

(See also § 1918.51).

(a) The employer shall not use the vessel's cargo handling gear until it has been 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. 152, 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 pursuant to 46 CFR part 91 are deemed to meet the requirements of paragraph (a) of this section.

(c) With respect to U.S. vessels not holding a valid Certificate of Inspection issued by the U.S. 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 (OSHA) U.S. Department of Labor, as provided in part 1919 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 U.S. Coast Guard; or

(3) Those currently accredited by OSHA U.S. Department of Labor, as provided in part 1919 of this chapter.

Subpart C—Means of Access

§ 1918.21 Gangways and other means of access.

(a) 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:

(1) Whenever practicable, a gangway of not less than 20 inches (.51 m) in width, of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a substantial straight ladder meeting the requirements of § 1918.25 of this subpart and extending at least 36 inches (.92 m) above the upper landing surface, and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a gangway nor straight ladder can be used, a Jacob's ladder meeting the requirements of § 1918.22 may be used.

(2) Each side of such gangway, and the turntable, if used, shall have a railing with a minimum height of 33 inches (.84 m) measured perpendicularly from rail to walking surfaces at the stanchion, with a midrail. Rails shall be of wood, pipe, chain, wire, rope or materials of equivalent strength and shall be kept taut at all times. Portable stanchions supporting railings shall be so supported or secured as to prevent accidental dislodgement.

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

(c) When a fixed flat 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.

(d) When the gangway overhangs the water in such a manner that there is danger of employees falling between the ship and the dock, a net or suitable protection shall be provided to prevent employees from falling to a lower level.

(e) If the foot of the gangway is more than 1 foot (.30 m) 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 (.84 m) with midrails on both sides.

(f) Gangways shall be kept clear of supporting bridles and other obstructions, in order to provide unobstructed passage. If, because of design, the gangway bridle cannot be moved in order to provide unobstructed passage, than the hazard shall be properly marked to alert employees of the danger.

(g) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured, trimmed and equipped with at least one substantial hand rail 33 inches (.84 m) in height shall be provided between the top of the bulwark and the deck.

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

(i) Handrails and walking surfaces of gangways shall be kept free of oil, grease, bulk cargoes or other substances that could cause an employee to slip and fall.

(j) The means of access shall be illuminated for its full length in accordance with § 1918.92.

(k) If possible, the vessel's means of access shall be located so that suspended loads do not pass over it. In any event, suspended loads shall not be passed over the means of access while employees or others are on it.

(l) Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the requirements of this section.

§ 1918.22 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.

§ 1918.23 Access to barges and river towboats.

(a) Ramps for access of vehicles to or between barges shall be:

(1) Of adequate strength for intended loads;

(2) Provided with side boards;

(3) Well maintained; and

(4) Properly secured.

(b) When employees cannot step safely to or from the wharf and a 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 § 1918.21(e) shall be provided. When a walkway cannot be used, a straight ladder meeting the requirements of § 1918.25 of this subpart and extending at least 36 inches (.92 m) 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 § 1918.22 may be used. Exception: For barges operating on the Mississippi River System, where the employer demonstrates that these requirements cannot reasonably be met due to local conditions, 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 § 1918.22 shall be provided for each gang working alongside unless other safe means of access are provided. However, no more than two Jacob's ladders are required for any single barge, raft or log boom being worked.

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

(e) When a Jacob's ladder is used as the means of access to a barge being worked, spacers (bumpers) shall be hung between the vessel, barge, or other structure to which the barge is tied alongside, or other equally effective means shall be taken to prevent damage to the bottom rungs of the ladder.

(f) When a Jacob's ladder is being used in such a manner that there is a danger of an employee falling between the vessel, barge, or other structure (pier), a net or other equivalent protection shall be provided.

§ 1918.24 Bridge plates and ramps.

(See also § 1918.86).

(a) *Bridge and car plates (dockboards).* Bridge and car plates used afloat shall be well maintained and shall:

(1) Be strong enough to support the loads imposed on them;

(2) Be secured or equipped with devices to prevent their dislodgement;

(3) Be equipped with hand holds or other effective means to permit safe handling and;

(4) Be equipped with side boards that are at least 6 inches (.16 m) high along the space bridged.

(b) *Portable ramps.* Portable ramps used afloat shall be well maintained and shall:

(1) Be strong enough to support the loads imposed on them;

(2) Be equipped with a railing meeting the requirements of § 1918.21(a)(2), if the slope is more than 20 degrees to the horizontal or if employees could fall more than 4 feet (1.2 m);

(3) Be equipped with a slip resistant surface;

(4) Be properly secured; and

(5) Be equipped with side boards that are at least 6 inches (15.2 cm) high.

§ 1918.25 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 effective means of gaining a handhold shall be provided at or near the head of each vertical fixed ladder cannot serve this purpose.

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

(c) Where portable straight ladders are used, they shall be of sufficient length to extend 36 inches (.91 m) above the upper landing surface, and positively secured or held against shifting or slipping. When conditions are such that a straight ladder cannot be used, Jacob's ladders meeting the requirements of § 1918.22 may be used.

(d) When 6 inches (15.2 cm) or more of clearance does not exist in back of ladder rungs, the ladder shall be deemed "unsafe" for the purpose of this section. However, for vessels built prior to December 5, 1981, the ladder shall be deemed "unsafe" when 4 inches (10 cm) or more of clearance does not exist in back of ladder rungs. Alternate means of access (for example, a portable ladder) must be utilized.

(e) (1) Where access to or from a stowed deckload or other cargo is needed and no other safe means is available, ladders or steps of adequate strength shall be furnished, and positively secured or held against shifting or slipping while in use. Steps formed by the cargo itself are acceptable when the employer demonstrates that the nature of the cargo and the type of stowage provides equivalent safe access.

(2) Where portable straight ladders are used they shall be of sufficient length to extend at least 36 inches (.92 m) above the upper landing surface.

(f) The following standards for existing manufactured portable ladders must be met:

(1) Rungs of manufactured portable ladders obtained before [insert effective date of the Final Rule] shall be capable of supporting a 200-pound (890 N) load without deformation.

(2) Rungs shall be evenly spaced from 9 to 16½ inches (22.9 to 41.9 cm), center to center.

(3) Rungs shall be continuous members between rails. Each rung of a double-rung ladder (two side rails and a center rail) shall extend the full width of the ladder.

(4) Width between side rails at the base of the ladder shall be at least 12 inches (30 cm) for ladders 10 feet (3.05 m) or less in overall length, and shall increase at least one-fourth inch (0.6 cm) for each additional 2 feet (0.61 m) of ladder length.

(g) *Standards for manufactured portable ladders.* Portable manufactured ladders obtained after [insert effective date of the Final Rule] shall bear identification indicating that they meet the appropriate ladder construction requirements of the following standards:

(1) ANSI A14.1–1990, Safety Requirements for Portable Wood Ladders;

(2) ANSI A14.2–1990, Safety Requirements for Portable Metal Ladders;

(3) ANSI A14.5–1992, Safety Requirements for Portable Reinforced Plastic Ladders.

(h) *Standards for job-made portable ladders.* Job-made ladders shall:

(1) Have a minimum and uniform distance between rungs of 12 inches (30 cm) center to center;

(2) Be capable of supporting a 250-pound (1100 N) load without deformation; and

(3) Have a minimum width between side rails of 12 inches (30 cm) for ladders 10 feet (3.05 m) or less in height. Width between rails shall increase at least one-fourth inch (0.6 cm) for each additional 2 feet (0.61 m) of ladder length.

(i) *Maintenance and inspection.* (1) The employer shall maintain portable ladders in safe condition. Ladders with the following defects shall not be used, and shall either be tagged as unusable if kept on board, or shall be removed from the vessel:

(i) Broken, split or missing rungs, cleats or steps;

(ii) Broken or split side rails;

(iii) Missing or loose bolts, rivets or fastenings;

(iv) Defective ropes; or

(v) Any other structural defect.

(2) Ladders shall be inspected for defects prior to each day's use, and after any occurrence, such as a fall, which could damage the ladder.

(j) *Ladder usage.* (1) Ladders made by fastening rungs or devices across a single rail are prohibited.

(2) Ladders shall not be used:

(i) As guys, braces or skids; or

(ii) As platforms, runways or scaffolds.

(3) Metal and wire-reinforced ladders with wooden side rails may not be used when employees on the ladder might come into contact with energized electrical conductors.

(4) Individual sections from different multi-sectional ladders or two or more single straight ladders shall not be tied or fastened together to achieve additional length.

(5) Except for combination ladders, self-supporting ladders shall not be used as single straight ladders.

(6) Unless intended for cantilever operation, non-self-supporting ladders shall not be used to climb above the top support point.

(7) Ladders shall be securely positioned on a level and firm base.

(8) Ladders shall be fitted with slip-resistant bases or lashed in place to

prevent slipping or shifting while in use.

Subpart D—Working Surfaces

§ 1918.31 Hatch coverings.

(a) No cargo, dunnage, or other material shall be loaded or unloaded by means requiring the services of employees at any partially opened intermediate deck unless either the hatch at that deck is sufficiently covered or an adequate landing area suitable for the prevailing conditions exists. Except, that in no event shall such work be done unless the working area available for such employees extends for a distance of 10 feet (3.05 m) or more fore and aft and athwartships.

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

(c) Missing, broken, or poorly fitting hatch covers that would jeopardize the safety of employees shall be reported at once to the officer 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) Hatch covers and hatch beams not of uniform size 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 securely covered or guarded while work is proceeding in the hatch in which they are located, unless they are actually in use.

§ 1918.32 Stowed cargo and temporary landing surfaces.

(a) Temporary surfaces on which loads are to be landed shall be of sufficient size and strength to permit employees to work safely.

(b) When the edge of a hatch section or of stowed cargo (excluding intermodal freight containers) is more than 8 feet (2.4 m) high and so exposed that it exposes an employee to fall hazards, the edge shall be guarded by a vertical safety net, or other means providing equal protection, to prevent an employee from falling. When the employer can demonstrate that vertical nets or other equally effective means of guarding cannot be used due to the type of cargo, cargo stowage, or other circumstances, a trapeze net shall be rigged at the top edge of the elevation or other means shall be taken to prevent injury if an employee falls. Safety net systems and their use shall comply with the appropriate provisions of the American National Standard for Personnel and Debris Nets (ANSI A10.11–1989).

(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 employees or cargo from falling.

§ 1918.33 Deck loads.

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

(b) Signalpersons shall not be permitted to walk over deck loads from rail to coaming unless there is a safe passage. If it is necessary to stand or walk at the outboard or inboard edge of the deck load having less than 24 inches (.61 cm) of bulwark, rail, coaming, or other protection exists, any signalpersons shall be provided with an equivalent means of protection against falling from the deck load.

§ 1918.34 Other decks.

(a) Cargo shall not be worked on decks that were not designed to support the load being worked.

(b) Grated decks shall be properly placed, supported, maintained and designed to support workers.

§ 1918.35 Open hatches.

Open weather deck hatches around which employees must work, which are not protected to a height of 24 inches (.61 cm) by coamings, shall be guarded by taut lines or barricades at a height of 36 to 42 inches (.92 to 1.07 m) 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.

§ 1918.36 Weather deck rails.

Removable weather deck rails 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.

§ 1918.37 Barges.

(a) Walking shall be prohibited along the sides of covered lighters or barges with coamings or cargo more than 5 feet (1.5 m) high unless a 3-foot (.91 m) clear walkway or a grab rail or taut handline is provided.

(b) Walking or working shall be prohibited on the decks of barges to be loaded unless the walking or working surfaces have been determined by visual inspection to be sound structurally and maintained properly. If in the course of discharging a barge and an unsound deck surface is discovered, work shall be discontinued and shall not be resumed until means have been taken to ensure a safe work surface.

§ 1918.38 Log rafts.

(See also § 1918.88.)

When an employee is working logs out of the water, walking sticks [2] (safety sticks) shall be provided as follows:

(a) They shall be planked and be no less than 24 inches (60.9 cm) wide;

(b) They shall extend along the entire length of all rafts on the offshore side of the vessel, and to the means of access to the log raft(s); and

(c) They shall be buoyant enough to keep the walking surface above the waterline when employees are walking on them.

Subpart E—Opening and Closing Hatches

§ 1918.41 Coaming clearances.

(a) *Weather deck.* If a deck load (such as lumber or other smooth sided deck cargo) over 5 feet (1.5 m) high is stowed within 3 feet (.91 m) of the hatch coaming and employees handling hatch beams and hatch covers are not protected by a coaming at least 24-inch (.61 m) high, a taut handline shall be provided along the side of the deckload. The requirements of § 1918.35 are not intended to apply in this situation.

(b) *Intermediate deck.* (1) There shall be a 3 foot (.91 m) working space between the stowed cargo and the coaming at both sides and at one end of the hatches with athwartship hatch beams, and at both ends of those hatches with fore and aft hatch beams, before intermediate deck hatch covers and hatch beams are removed or replaced by employees.

(2) The 3 foot (.91 m) clearance required by paragraph (b)(1) of this section is not required on the covered portion of a partially open hatch, nor is it required when lower decks have been filled to hatch beam height with cargo of such a nature as to provide a safe surface upon which employees may work.

(3) For purposes of paragraph (b)(1) of this section, fitted gratings which are in good condition shall be considered a part of the decking when properly placed within the 3 foot (.91 m) area.

(c) Grab rails or taut handlines shall be provided for the protection of employees handling hatch beams and hatch covers, when bulkheads, lockers, reefer compartments or large spare parts are within 3 feet (.91 m) of the coaming.

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[2] A "walking stick" is two logs bolted or otherwise secured together with two or three planks firmly attached on top that serves as a floating walking and working surface and that is used in the loading of logs onto vessels from the water.

(d) This section does not apply to hatches which are opened or closed by hydraulic or other mechanical means. However, in all cases in which the 3 foot (.91 m) clearance does not exist, means shall be taken to prevent stowed cargo which is likely to shift from falling into the hold.

§ 1918.42 Hatch beam and pontoon bridles.

(a) Hatch beam and pontoon bridles shall be:

(1) long enough to easily reach the holes, rings, or other lifting attachments on the hatch beams and pontoons;

(2) of adequate strength to safely lift the load; and

(3) 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 hatch 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 1 inch (2.5 cm) 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 fibre lanyard at least 8 feet (2.4 m) long and in good condition. The bridle end of the lanyard shall be of chain or wire.

§ 1918.43 Handling hatch beams and covers.

Paragraphs (f)(2), (g), and (h) of this section apply only to folding, sliding, or hinged metal hatch covers or to those hatch covers handled by cranes.

(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 (.91 m) from the hatch coaming except, when on the working side of the hatch, they are spread one high between coaming and bulwark with no space between them and with not less than a 24-inch height of hatch coaming maintained. Under no circumstances shall hatch covers or pontoons be stacked higher than the hatch coaming or bulwark on the working side of the hatch.

(2) On seagoing vessels, hatch boards or similar covers removed from the hatch beams in a section of partially opened hatch during cargo handling, cleaning or other operations, shall not be stowed on those left in place within that section.

(b) Hatch beams shall be laid on their sides, or stood on edge close together and lashed. Except that: This paragraph (b) shall not apply in cases where hatch 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) The flange rests flat on the deck when the hatch beam is stood upright.

(c) Strongbacks, hatch covers, and pontoons removed from hatch openings and placed on the weather deck shall not obstruct clear fore and aft or coaming to bulwark passageways and shall be lashed or otherwise secured to prevent accidental dislodgement. Dunnage or other suitable material shall be placed under each tier, to prevent strongbacks and hatch covers from sliding, when stowed on steel decks.

(d) Hatch covers unshipped in an intermediate deck shall be placed at least 3 feet (.91 m) 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 (15.2 cm) from the coaming, and if placed closer than 3 feet (.91 m), they shall be secured so that they cannot be tipped or dragged into a lower compartment. If such placement or securement is not possible, strongbacks shall be removed to another deck.

(e) Any hatch beam or pontoon left in place adjacent to an open hatch section being worked shall be locked or otherwise secured, so that it cannot be accidently displaced. All portable, manually handled hatch covers, including those bound together to make a larger cover, shall be removed from any working section, and adjacent sections, unless securely lashed.

(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 while in the open position against unintentional movement.

(g) Hinged or folding hatch covers normally stowed in an approximately vertical position shall be positively secured when in the upright position, unless the design of the system otherwise prohibits unintentional movement.

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

(i) All unsecured materials such as dunnage, lashings, twist-locks, or stacking cones shall be removed from the hatch cover before the hatch cover is moved.

(j) When a hatch is to be covered, hatch covers or night tents shall be used. Any covering which only partially covers the hatch, such as alternate hatch covers or strips of dunnage, shall not be covered by a tarpaulin. Except that: A tarpaulin may be used to cover an open or partially open hatch in order to reduce dust emissions during bulk cargo loading operations, provided that employees are prevented from walking on top of the tarpaulin.

Subpart F—Vessel's Cargo Handling Gear

§ 1918.51 General requirements.

(See also § 1918.11).

(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 certificating authority shall be adhered to.

(b) All components of cargo handling gear, including tent gantlines and associated rigging, shall be inspected by the employer or by a designated representative of the employer before each use and at intervals during use. Any gear which is found to be unsafe shall not be used until it is made safe.

(c) The following limitations shall apply to the use of wire rope as a part of the ship's cargo handling gear:

(1) Eye splices in wire ropes shall have at least three tucks with a whole strand of the rope and two tucks with one-half of the wire cut from each strand. Other forms of splices or connections which provide the same level of safety may be used;

(2) Except for eye splices in the ends of wires, each wire rope used in hoisting or lowering, in guying derricks, or as a topping lift, preventer, segment of a multi-part preventer, or pendant, shall consist of one continuous piece without knot or splice; and

(3) Wire rope or wire rope slings exhibiting any of the conditions specified in § 1918.62(b)(4) (i) through (vi) shall not be used.

(d) Natural and synthetic fibre rope slings exhibiting any of the conditions specified in § 1918.62(e) (1) through (7) shall not be used.

(e) Synthetic web slings exhibiting any of the conditions specified in § 1918.62(g)(2) (i) through (v) shall not be used.

(f) Chains, including slings, exhibiting any of the conditions specified in § 1918.62(h)(3)(iii), (iv), and (h)(6) shall not be used.

§ 1918.52 Specific requirements.

(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.

(2) Wire rope clips or knots shall not be used to form eyes in, nor to join sections of, preventer guys.

(b) *Stoppers.* (1) When used, chain topping lift stoppers shall be in good condition, equipped with fibre 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 in line with the normal topping lift lead at the time the stopper is applied.

(3) When used, patent stoppers of the 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. Fibre 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 so that the cargo hook rises when the winch control lever is pulled back and lowers when the lever is pushed forward.

(d) *Heel blocks.* (1) When an employee works in the bight formed by the heel block, a preventer of at least three quarter inch (1.9 cm) diameter wire rope shall be securely rigged, or equally effective means shall be taken, to hold the block and fall in the event that the heel block attachments fail. Where physical limitations prohibit the fitting of a wire rope preventer of the required size, two turns of one-half inch (1.3 cm) diameter wire rope shall be sufficient.

(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. Except that: This requirement shall not apply when the heel block is so located as to be at least 10 feet (3.0 m) above the deck when at its lowest point.

(e) *Coaming rollers.* Portable coaming rollers 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 2 feet (.61 m) 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.

§ 1918.53 Cargo winches.

(a) Moving parts of winches or other deck machinery shall be guarded.

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

(c) 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.

(d) There shall be no load other than the fall and cargo hook assembly on the winch when changing gears on a two gear winch.

(e) Any defect or malfunction of winches that affects safety shall be reported immediately to the officer in charge of the vessel, and the winch shall not be used until the defect or malfunction is corrected.

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

(g) 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.

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

(i) Winch brakes shall be monitored for performance. If winch brakes are unable to hold the load, the winch shall not be used.

(j) 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 control systems.

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

§ 1918.54 Rigging gear.

(a) *Guy and preventer placement.* Each guy or preventer shall be placed so as to prevent it from making contact with any other guy, preventer, or stay.

(b) *Guys.* 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.

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

(d) *Preventers.* (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 equally as practicable where cargo operations are being conducted by burtoning. Except, 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.

(e) *Cargo falls.* Cargo falls under load shall not be permitted to chafe on any standing or other running rigging. Exception: Rigging shall not be construed to mean hatch coamings or other similar structural parts of the vessel.

(f) *Bull wire.* (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 fibre rope fastening will not be acceptable in meeting this requirement.

(2) When, in lowering or topping a boom, it is not possible to secure the bullwire to the gypsy head, or when the topping lift itself is taken to the gypsy head, multiple turns, of at least five shall be used.

(g) *Trimming and deckloads.* When deck loads extend above the rail and

there is less than 12 inches (30.48 cm) horizontal clearance between the edge of the deck load and the inside of the bulwark or rail, a pendant or other alternate device shall be provided to allow trimming of the gear without going overside.

§ 1918.55 Cranes.

(See also § 1918.11).

The following requirements shall apply to the use of cranes forming part of a vessel's permanent equipment.

(a) *Defects.* Cranes with a visible or known defect that affects safe operation shall not be used. Defects shall be reported immediately to the officer in charge of the vessel.

(b) *Operator's station.* (1) Good visibility shall be maintained through the cab's glass (or equivalent). Cranes with broken, cracked, or scratched glass (or equivalent) that impair operator visibility shall not be used.

(2) Clothing, tools and equipment shall be so stored as to not interfere with access, operation or the operator's view.

(c) *Cargo operations.* (1) Accessible areas within the swing radius of the body of a revolving crane or within the travel of a shipboard gantry crane shall be physically guarded during operations to prevent an employee from being caught between the body of the crane and any fixed structure, or between parts of the crane.

(2) Limit switch bypass systems shall be secured during all cargo operations.

(3) Under all operating conditions, at least three full turns of rope shall remain on ungrooved drums, and two full turns on grooved drums.

(4) Crane brakes shall be monitored for performance. If crane brakes are unable to hold the load, the crane shall not be used.

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

(6) When cranes are equipped with power down capability, there shall be no free fall of the gear when a load is attached.

(7) When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the gear and movements to be made.

(d) *Unattended cranes.* When cranes are left unattended between work periods, § 1918.66(b)(4)(i) through (v) shall apply.

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

§ 1918.61 General.

(a) *Employer provided gear inspection.* All gear and equipment provided by the employer shall be inspected by the employer or designated person 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 unsafe shall not be used until it is made safe.

(b) *Safe working load.* (1) The safe working load of gear as specified in §§ 1918.61 through 1918.66 shall not be exceeded.

(2) All cargo handling gear provided by the employer with a safe working load greater than 5 short tons (10,000 lbs. or 4540 kg.) shall have its safe working load plainly marked on it.

(c) *Gear weight markings.* 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 (908 kg).

(d) *Certification.* The employer shall not use any material handling device listed in paragraph (f) of this section until it has been ascertained that the device has been certificated, as evidenced by current and valid documents attesting to compliance with the requirements of paragraph (e) of this section.

(e) *Certification procedures.* The certifications required by this section shall be performed in accordance with part 1919 of this chapter, by persons then currently accredited by OSHA as provided in that part.

(f) *Special gear.* (1) 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, that has been purchased or fabricated after [insert date 90 days after publication of Final Rule], and has a Safe Working Load (SWL) greater than 5 short tons (10,000 lbs or 4540 kg.) shall be inspected and tested as a unit in accordance with the following table before initially being put into use:

Safe working load	Proof load
Up to 20 short tons (18.1 metric tons).	25 percent in excess.
Over 20 to 50 short tons (18.1 to 45.3 metric tons).	5 short tons in excess.
Over 50 short tons (45.3 metric tons).	10 percent in excess.

(2) 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, with a SWL of 5 short tons (10,000 or 4540 kg.) or less shall be inspected and tested as a unit in accordance with this section or by a designated person, in accordance with the table in § 1918.61(f)(1) before initially being put into use.

(g) Every spreader not a part of ship's gear and used for handling intermodal containers that has been purchased or fabricated after [insert date 90 days after publication of Final Rule] shall be inspected and tested to a proof load equal to 25 percent in excess of its rated capacity before being put into use. In addition, any spreader that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.

(h) All cargo handling gear covered by this section with a SWL greater than 5 short tons (10,000 lbs. or 4540 kg.) shall be proof load tested in accordance with the chart in paragraph (f) of this section every four years in accordance with paragraphs (d) and (e) of this section or by a designated person.

(i) Certificates attesting to the required tests shall be available for inspection.

§ 1918.62 Miscellaneous auxiliary gear.

(a) *Routine inspection.* (1) At the completion of each use, loose gear such as slings, chains, bridles, blocks and hooks shall be so placed as to avoid damage to the gear. Loose gear shall be inspected and any defects corrected before reuse.

(2) Defective gear shall not be used. Distorted hooks, shackles or similar gear shall be discarded.

(b) *Wire rope and wire rope slings.* (1) The employer shall ascertain and adhere to the load ratings indicated on the vessel's wire rope certificates for all wire rope and wire rope slings comprising part of ship's gear.

(2) The employer shall adhere to the manufacturer's recommended ratings for wire rope and wire rope slings provided for use aboard ship, and shall have such ratings available for inspection. When the manufacturer is unable to supply such ratings, the employer shall use tables for wire rope and wire rope slings found in Appendix II to this part. A design safety factor of at least five shall be maintained for the common sizes of running wire used as falls in purchases, or in such uses as light load slings.

(3) Wire rope with a safety factor of less than five may be used only as follows:

(i) In specialized equipment, such as, but not limited to, cranes designed to be used with lesser wire rope safety factors;

(ii) In accordance with design factors in standing rigging applications; or

(iii) For heavy lifts or other purposes for which a safety factor of five is not feasible and for which the employer can

demonstrate that equivalent safety is ensured.

(4) Wire rope or wire rope slings provided by the employer and having any of the following conditions shall not be used:

(i) Ten randomly distributed broken wires in one rope lay or three or more broken wires in one strand in one rope lay;

(ii) Kinking, crushing, bird caging or other damage resulting in distortion of the wire rope structure;

(iii) Evidence of heat damage;

(iv) Excessive wear or corrosion, deformation or other defect in the wire or attachments, including cracks in attachments;

(v) Any indication of strand or wire slippage in end attachments; or

(vi) More than one broken wire in the close vicinity of a socket or swaged fitting.

(5) Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Coverings shall be removable so that splices can be examined. Means used to cover or blunt ends shall not damage the wire.

(6) Where wire rope clips are used to form eyes, the employer shall adhere to the manufacturer's recommendations, which shall be available for inspection. If "U" bolt clips are used and the manufacturer's recommendations are not available, Table 1 of Appendix II to this part shall be used to determine the number and spacing of clips. "U" bolts shall be applied with the "U" section in contact with the dead end of the rope.

(7) Wire rope shall not be secured by knotting.

(8) Eyes in wire rope bridles, slings, bull wires, or in single parts used for hoisting shall not be formed by wire rope clips or knots.

(9) Eye splices in wire ropes shall have at least three tucks with a whole strand of the rope, and two tucks with one-half of the wire cut from each strand. Other forms of splices or connections which are shown to be equivalently safe may be used.

(10) Except for eye splices in the ends of wires and endless rope slings, each wire rope used in hoisting or lowering, or bulling cargo, shall consist of one continuous piece without knot or splice.

(c) *Natural fibre rope.* (1) The employer shall ascertain and adhere to the manufacturer's recommended ratings for natural fibre rope and natural fibre rope slings provided for use aboard ship, and shall have such ratings available for inspection. When the manufacturer is unable to supply such ratings, Appendix II to this part provides guidelines for fibre rope ratings.

(2) If the manufacturers recommended ratings and use recommendations are unavailable, Table 2 of Appendix II to this part provides guidelines to determine safe working loads of natural fibre rope slings comprising part of pre-slung drafts.

(3) Eye splices shall consist of at least three full tucks. Short splices shall consist of at least six tucks, three on each side of the centerline.

(d) *Synthetic rope.* (1) The employer shall adhere to the manufacturer's ratings and use recommendations for the specific synthetic fibre rope and synthetic fibre rope slings provided for use aboard ship, and shall have such ratings available for inspection. When the manufacturer is unable to supply such ratings, the employer shall use Tables 3A and B of Appendix II to this part.

(2) If the manufacturers recommended ratings and use recommendations are unavailable, Tables 3A and B of Appendix II to this part shall be used to determine the safe working load of synthetic fibre rope and of synthetic rope slings comprising part of pre-slung drafts.

(3) Unless otherwise recommended by the manufacturer, when synthetic fibre ropes are substituted for natural fibre ropes of less than 3 inches (7.62 cm) in circumference, the substitute shall be of equal size. Where substituted for natural fibre rope of 3 inches (7.62 cm) or more in circumference, the size of the synthetic rope shall 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 (centimeters); C_s= the circumference to the nearest one-quarter inch (.6 cm) of a synthetic rope having a breaking strength no less than that of the size natural fibre rope that would be required by paragraph (c) of this section; and C_m= the circumference of natural fibre rope in inches (centimeters) which would be required by paragraph (c) of this section. In making each substitution, it shall be ascertained that the inherent characteristics of the synthetic-fibre are suitable for hoisting.

(e) *Removal of natural and synthetic rope from service.* Natural and synthetic rope having any of the following defects shall be removed from service:

(1) Abnormal or excessive wear including heat and chemical damage;

(2) Powdered fibre between strands;

(3) Sufficient cut or broken fibers to affect the capability of the rope;

(4) Variations in the size or roundness of strands;

(5) Discolorations other than stains not associated with rope damage;

(6) Rotting; or

(7) Distortion or other damage to attached hardware.

(f) *Thimbles.* Properly fitting thimbles shall be used when any rope is secured permanently to a ring, shackle or attachment, where practicable.

(g) *Synthetic web slings.* (1) Slings and nets or other combinations of more than one piece of synthetic webbing assembled and used as a single unit (synthetic web slings) shall not be used to hoist loads in excess of the sling's rated capacity.

(2) Synthetic web slings shall be removed from service if they exhibit any of the following defects:

(i) Acid or caustic burns;

(ii) Melting or charring of any part of the sling surface;

(iii) Snags, punctures, tears or cuts;

(iv) Broken or worn stitches;

(v) Distortion or damage to fittings; or

(vi) Display of visible warning threads or markers designed to indicate excessive wear or damage.

(3) Defective synthetic web slings removed from service shall not be returned to service unless repaired by a sling manufacturer or an entity of similar competence. Each repaired sling shall be proof tested by the repairer to twice the sling's rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for inspection.

(4) Synthetic web slings provided by the employer shall only be used in accordance with the manufacturer's use recommendations, which shall be available.

(5) Fittings shall have a breaking strength at least equal to that of the sling to which they are attached and shall be free of sharp edges.

(h) *Chains and chain slings used for hoisting.* (1) The employer shall adhere to the manufacturer's recommended ratings for safe working loads for the size of wrought iron and alloy steel chains and chain slings and shall have such ratings available for inspection. When the manufacturer does not provide such ratings, the employer shall use Table 4A of Appendix II to this part to determine safe working loads for alloy steel chains and chain slings only.

(2) Proof coil steel chain, also known as common or hardware chain, and other chain not recommended by the manufacturer for slinging or hoisting, shall not be used for slinging or hoisting.

(3) (i) Sling chains, including end fastenings, shall be inspected for visible

defects before each day's use and as often as necessary during use to ensure integrity of the sling.

(ii) Thorough inspections of chains in use shall be made quarterly to detect wear, defective welds, deformation or increase in length or stretch. The month of inspection shall be indicated on each chain by color of paint on a link or by other equally effective means.

(iii) Chains shall be removed from service when maximum allowable wear, as indicated in Table 4B of Appendix II to this part, is reached at any point of a link.

(iv) Chain slings shall be removed from service when stretch has increased the length of a measured section by more than five percent; when a link is bent, twisted or otherwise damaged; or when a link has a raised scarf or defective weld.

(v) Only designated persons shall inspect chains used for slinging and hoisting.

(4) Chains shall only be repaired under qualified supervision. Links or portions of chain defective under any of the criteria of paragraph (h)(3)(iv) of this section shall be replaced with properly dimensioned links or connections of material similar to that of the original chain. Before repaired chains are returned to service, they shall be tested to the proof test load recommended by the manufacturer for the original chain. Tests shall be performed by the manufacturer or shall be certified by an agency accredited for the purpose under part 1919 of this chapter. Test certificates shall be available for inspection.

(5) (i) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months. Heat treatment certificates shall be available for inspection. Alloy chains shall not be annealed.

(ii) No new part of a lifting appliance or item of loose gear shall be manufactured of wrought iron.

(6) Kinked or knotted chains shall not be used for lifting. Chains shall not be shortened by bolting, wiring or knotting. Makeshift links or fasteners such as wire, bolts or rods shall not be used.

(7) Hooks, rings, links and attachments affixed to sling chains shall have rated capacities at least equal to that of the chains to which they are attached.

(8) Chain slings shall bear identification of size, grade and rated capacity.

(i) *Shackles.* (1) If available, the manufacturer's recommended safe working loads for shackles shall not be exceeded. In the absence of the manufacturer's recommendations, Table 5 of Appendix II to this part, shall apply.

(2) Screw pin shackles provided by the employer and used aloft, except in cargo hook assemblies, shall have their pins positively secured.

(j) *Hooks other than hand hooks.* (1) The manufacturer's recommended safe working loads for hooks shall not be exceeded. Hooks other than hand hooks shall be tested in accordance with the provisions of paragraphs (a), (c) and (d) of § 1919.31 of this chapter, except, that manufacturer's test certificates indicating performance to the criteria in § 1919.31 (a), (c) and (d) of this chapter shall be acceptable.

(2) Bent or sprung hooks shall be discarded.

(3) Teeth of case hooks shall be maintained in safe condition.

(4) Jaws of patent clamp-type plate hooks shall be maintained in condition to grip plates securely.

(5) Loads shall be applied to the throat of the hook only.

(k) *Pallets.* (1) Pallets shall be made and maintained to support and carry loads being handled safely. Fastenings of reusable pallets used for hoisting shall be bolts and nuts, drive screws (helically threaded nails), annular threaded nails or fastenings of equivalent holding strength.

(2) Reusable wing or lip-type pallets shall be hoisted by bar bridles or other suitable gear and shall have an overhanging wing or lip of at least 3 inches (7.6 cm). They shall not be hoisted by wire slings alone.

(3) Loaded pallets that do not meet the requirements of this paragraph shall be hoisted only after being placed on pallets meeting such requirements, or shall be handled by other means providing equivalent safety.

(4) Bridles for handling flush end or box-type pallets shall be designed to prevent disengagement from the pallet under load.

(5) Pallets shall be stacked or placed to prevent falling, collapsing or otherwise causing a hazard under standard operating conditions.

(6) Disposable pallets intended only for one use shall not be reused for hoisting.

§ 1918.63 Chutes, gravity conveyors and rollers.

(a) Chutes shall be of adequate length and strength to support the conditions of use, and shall be free of splinters and sharp edges.

(b) When necessary for the safety of employees, chutes shall be equipped with sideboards to afford protection from falling objects.

(c) When necessary for the safety of employees, provisions shall be made for stopping objects other than bulk commodities at the delivery end of the chute.

(d) Chutes and gravity conveyor roller sections shall be firmly placed and secured to prevent displacement, shifting, or falling.

(e) Gravity conveyors shall be of sufficient strength to safely support the weight of materials placed upon them. Conveyor rollers shall be installed in a manner that prevents them from falling or jumping out of the frame.

(f) Frames shall be kept free of burrs and sharp edges.

§ 1918.64 Powered conveyors.

(a) *Emergency stop.* Readily accessible stop controls shall be provided for use in an emergency. Whenever the operation of any power conveyor requires personnel to work in the immediate vicinity of the conveyor, the conveyor controls shall not be left unattended while the conveyor is in operation.

(b) *Guarding.* All conveyor and trimmer drives which create a hazard shall be adequately guarded.

(c) *Approved for location.* Electric motors and controls on conveyors and trimmers used to handle grain and exposed to grain dust shall be of the type approved by a nationally recognized testing laboratory for use in Class II, Division I locations. (See § 1910.7 of this chapter.)

(d) *Grain trimmer control box.* Each grain trimmer shall have a control box located on the weather deck in close proximity to the spout feeding the trimmer.

(e) *Grain trimmer power cable.* Power cables between the deck control box and the grain trimmer shall be used only in continuous lengths without splice or tap between connections.

(f) *Portable conveyors.* Portable conveyors shall be stable within their operating ranges. When used at variable fixed levels, the unit shall be secured at the operating level.

(g) *Delivery and braking.* When necessary for the safety of employees, provisions shall be made for braking objects at the delivery end of the conveyor.

(h) *Electric brakes.* Conveyors using electrically released brakes shall be so constructed that the brakes cannot be released until power is applied, and that the brakes are automatically engaged if the power fails or the operating control is returned to the "stop" position.

(i) *Starting powered conveyors.* Powered conveyors shall not be started until all employees are clear of the conveyor or have been warned that the conveyor is about to start.

(j) *Loading and unloading.* The area around conveyor loading and unloading points shall be kept clear of obstructions during conveyor operations.

(k) *Lockout/tagout.* (1) Conveyors shall be stopped and their power sources locked out and tagged out during maintenance, repair, and servicing, unless power is necessary for testing or for making minor adjustments.

(2) The starting device shall be locked out and tagged out in the stop position before an attempt is made to remove the cause of a jam or overload of the conveying medium.

(l) *Safe practices.* (1) Only designated persons shall operate, repair or service powered conveyors.

(2) The employer shall direct employees to stay off operating conveyors.

(3) Conveyors shall be operated only with all overload devices, guards and safety devices in place and operable.

§ 1918.65 Mechanically powered vehicles used aboard vessels.

(a) *Applicability.* This section applies to every type of mechanically powered vehicle used for material or equipment handling aboard a vessel.

(b) *General.* (1) Modifications, such as adding counterweights that might affect the vehicle's capacity or safety, shall not be performed without either the manufacturer's prior written approval or the written approval of a professional engineer experienced with the equipment, who has consulted with the manufacturer, if available. Capacity, operation and maintenance instruction plates, tags or decals shall be changed to conform to the equipment as modified.

(2) Rated capacities, with and without removable counterweights, shall not be exceeded. Rated capacities shall be marked on the vehicle and shall be visible to the operator. The vehicle weight, with and without counterweight, shall be similarly marked.

(3) If loads are lifted by two or more trucks working in unison, the total weight shall not exceed the combined safe lifting capacity of all trucks.

(c) *Guards for fork lift trucks.* (1) Except as noted in paragraph (c)(5) of this section, fork lift trucks shall be equipped with overhead guards securely attached to the machines. The guard shall be of such design and construction as to protect the operator from boxes, cartons, packages, bagged material, and other similar individual items of cargo which may fall from the load being handled or from stowage.

(2) Overhead guards shall not obstruct the operator's view, and openings in the top of the guard shall not exceed 6 inches (15.2 cm) in one of the two directions, width or length. Larger openings are permitted if no opening allows the smallest unit of cargo being handled through the guard.

(3) Overhead guards shall be built so that failure of the vehicle's mast tilting mechanism will not displace the guard.

(4) Overhead guards shall be large enough to extend over the operator during all truck operations, including forward tilt.

(5) An overhead guard may be removed only when it would prevent a truck from entering a work space and if the operator is not exposed to low overhead obstructions in the work space.

(6) Where necessary to protect the operator, fork lift trucks shall be fitted with a vertical load backrest extension to prevent the load from hitting the mast when the mast is positioned at maximum backward tilt. For this purpose, a "load backrest extension" means a device extending vertically from the fork carriage frame to prevent raised loads from falling backward.

(d) *Guards for bulk cargo-moving vehicles.* (1) Every crawler type, rider operated, bulk cargo-moving vehicle shall be equipped with an operator's guard of such design and construction as to protect the operator, when seated, against injury from contact with a projecting overhead.

(2) Guards and their attachment points shall be so designed as to be able to withstand, without excessive deflection, a load applied horizontally at the operator's shoulder level equal to the drawbar pull of the machine.

(3) Guards shall not be required when the vehicle is used in situations in which the possibility of the seated operator coming in contact with projecting overheads does not exist.

(4) Bulk cargo-moving vehicles shall be equipped with roll-over protection of such design and construction as to minimize the possibility of the operator being crushed as a result of a roll-over or upset.

(e) *Approved vehicle.* (1) "Approved power-operated vehicle" means one listed as approved for the intended use or location by a nationally recognized testing laboratory.

(2) Approved vehicles shall bear a label or other identification indicating testing laboratory approval.

(3) When the atmosphere in an area is hazardous and the provisions of U.S. Coast Guard regulations 49 CFR 176.78 do not apply, only approved power-operated vehicles shall be used.

(f) *Maintenance.* (1) Mechanically powered vehicles shall be maintained in safe working order. Safety devices shall not be removed or made inoperative except as otherwise provided in this section. Vehicles with a fuel system leak or any other safety defect shall not be operated.

(2) Braking systems or other mechanisms used for braking shall be operable and in safe condition.

(3) Replacement parts whose function might affect operational safety shall be equivalent in strength and performance capability to the original parts which they replace.

(4) Repairs to the fuel and ignition systems of mechanically powered vehicles which involve fire hazards shall be conducted only in locations designated as safe for such repairs.

(5) Batteries on all mechanically powered vehicles shall be disconnected during repairs to the primary electrical system unless power is necessary for testing and repair. On vehicles equipped with systems capable of storing residual energy, that energy shall be safely discharged before work on the primary electrical system begins.

(6) Only designated persons shall perform maintenance and repair.

(g) *Parking brakes.* All mechanically powered vehicles purchased after [insert effective date of the Final Rule] shall be equipped with parking brakes.

(h) *Operation.* (1) Only stable and safely arranged loads within the rated capacity of the mechanically powered vehicle shall be handled.

(2) The employer shall direct drivers to ascend and descend grades slowly.

(3) If the load obstructs the forward view, the employer shall direct drivers to travel with the load trailing.

(4) Steering knobs shall not be used unless the vehicle is equipped with power steering.

(5) When mechanically powered vehicles use cargo lifting devices that have a means of engagement hidden from the operator, a means shall be provided to enable the operator to determine that the cargo has been engaged.

(6) No load on a mechanically powered vehicle shall be suspended or swung over any employee.

(7) When mechanically powered vehicles are used, provisions shall be made to ensure that the working surface can support the vehicle and load, and that hatch covers, truck plates, or other temporary surfaces cannot be dislodged by movement of the vehicle.

(8) When mechanically powered vehicles are left unattended, load-engaging means shall be fully lowered, controls neutralized, brakes set and power shut off. Wheels shall be blocked or curbed if the vehicle is on an incline.

(9) When lift trucks or other mechanically powered vehicles are being operated on open deck type barges, the edges of the barges shall be guarded by railings, sideboards, timbers, or other means sufficient to prevent vehicles from rolling overboard. When such vehicles are operated on covered lighters where door openings other than those being used are left open, means shall be taken to prevent vehicles from rolling overboard through such openings.

(10) Unauthorized personnel shall not ride on mechanically powered vehicles. A safe place to ride shall be provided when riding is authorized.

(11) An employee may be elevated by fork lift trucks only when a platform is secured to the lifting carriage or forks. The platform shall meet the following requirements:

(i) The platform shall have a railing complying with § 1917.112(c) of this chapter.

(ii) The platform shall have toeboards complying with § 1917.112(d) of this chapter, if tools or other objects could fall on employees below.

(iii) When the truck has controls which are elevated with the lifting carriage, means shall be provided for employees on the platform to shut off power to the vehicle.

(iv) Employees on the platform shall be protected from exposure to moving truck parts.

(v) The platform floor shall be skid resistant.

(vi) A truck operator shall be at the truck's controls when employees are elevated, unless the truck's controls are elevated with the lifting carriage.

(vii) While an employee is elevated the truck may be moved only to make minor placement adjustments.

§ 1918.66 Cranes and derricks other than vessel's gear.

(a) *General.* The following requirements shall apply to the use of cranes and derricks brought aboard vessels for the purpose of conducting longshoring operations. They shall not apply to cranes and derricks forming part of a vessels permanent equipment.

(1) *Certification.* Cranes and derricks shall be certificated in accordance with part 1919 of this chapter.

(2) *Posted weight.* The crane weight shall be posted on all cranes hoisted aboard vessels for temporary use.

(3) *Rating chart.* All cranes and derricks having ratings that vary with boom length, radius (outreach) or other variables shall have a durable rating chart visible to the operator, covering the complete range of the manufacturer's (or design) capacity ratings. The rating chart shall include all operating radii (outreach) for all permissible boom lengths and jib lengths, as applicable, with and without outriggers, and alternate ratings for optional equipment affecting such ratings. Precautions or warnings specified by the owner or manufacturer shall be included along with a chart.

(4) *Rated loads.* The manufacturer's (or design) rated loads for the conditions of use shall not be exceeded.

(5) *Change of rated loads.* Designated working loads shall not be increased beyond the manufacturer's ratings or original design limitations unless such increase receives the manufacturer's approval. When the manufacturer's services are not available or where the equipment is of foreign manufacture, engineering design analysis shall be performed or approved by a person accredited for certificating the equipment under part 1919 of this chapter. Engineering design analysis shall be performed by a registered professional engineer competent in the field of cranes and derricks. Any structural changes necessitated by the change in rating shall be carried out.

(6) *Radius indicator.* When the rated load varies with the boom radius, the crane or derrick shall be fitted with a boom angle or radius indicator visible to the operator.

(7) *Operator's station.* The cab, controls and mechanism of the equipment shall be so arranged that the operator has a clear view of the load or signalman, when one is used. Cab glass, when used, shall be safety plate glass or equivalent and good visibility shall be maintained through the glass. Clothing, tools, and equipment shall be stored so as not to interfere with access, operation, and the operator's view.

(8) *Counterweights or ballast.* Cranes shall be operated only with the specified type and amount of ballast or counterweights. Ballast or counterweights shall be located and secured only as provided in the manufacturer's or design specifications, which shall be available for inspection.

(9) *Outriggers.* Outriggers shall be used according to the manufacturer's specifications or design data, which shall be available for inspection. Floats, when used, shall be securely attached to the outriggers. Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety and of sufficient width and length to prevent the crane from shifting or toppling under load.

(10) *Exhaust gases.* Engine exhaust gases shall be discharged away from the normal position of crane operating personnel.

(11) *Electrical/Guarding.* Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact. Designated persons may work on energized equipment only if necessary during inspection, maintenance, or repair, otherwise the equipment shall be stopped and their power sources locked out and tagged out.

(12) *Fire extinguisher.* (i) At least one portable approved or listed fire extinguisher of at least a 5–BC rating or equivalent shall be accessible in the cab of the crane or derrick.

(ii) No portable fire extinguisher using carbon tetrachloride or chlorobromomethane extinguishing agents shall be used.

(13) *Rope on drums.* At least three full turns of rope shall remain on ungrooved drums, and two turns on grooved drums, under all operating conditions. Wire rope shall be secured to drums by clamps, U-bolts, shackles or equivalent means. Fibre rope fastenings are prohibited.

(14) *Brakes.* (i) Each independent hoisting unit of a crane shall be equipped with at least one holding brake, applied directly to the motor shaft or gear train.

(ii) Each independent hoisting unit of a crane shall, in addition to the holding brake, be equipped with a controlled braking means to control lowering speeds.

(iii) Holding brakes for hoist units shall have not less than the following percentage of the rated load hoisting torque at the point where the brake is applied:

(A) 125 percent when used with a controlled braking means.

(B) 100 percent when used with a mechanically controlled braking means.

(iv) All power control braking means shall be capable of maintaining safe lowering speeds of rated loads.

(15) *Operating controls.* Crane and derrick operating controls shall be clearly marked, or a chart indicating their function shall be posted at the operator's position.

(16) *Booms.* Cranes with elevatable booms and without operable automatic limiting devices shall be provided with boom stops if boom elevation can exceed maximum design angles from the horizontal.

(17) *Foot pedals.* Foot pedals shall have a non-skid surface.

(18) *Access.* Ladders, stairways, stanchions, grab irons, foot steps or equivalent means shall be provided as necessary to ensure safe access to footwalks, cab platforms, the cab and any portion of the superstructure which employees must reach.

(b) *Operations—(1) Use of cranes together.* When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the load and movements to be made.

(2) *Guarding of swing radius.* Accessible areas within the swing radius of the body of a revolving crane shall be physically guarded during operations to prevent an employee from being caught between the body of the crane and any fixed structure or between parts of the crane.

(3) *Prohibited usage.* (i) Equipment shall not be used in a manner that exerts sideloading stresses upon the crane or derrick boom.

(ii) No crane or derrick having a visible or known defect that may affect safe operation shall be used.

(4) *Unattended cranes.* The following steps shall be taken before leaving a crane unattended between work periods:

(i) Suspended loads, such as those hoisted by lifting magnets or clamshell buckets, shall be landed unless the storage position or maximum hoisting of the suspended device will provide equivalent safety;

(ii) Clutches shall be disengaged;

(iii) The power supply shall be shut off;

(iv) The crane shall be secured against accidental travel; and

(v) The boom shall be lowered or secured against movement.

(c) *Protection for employees being hoisted.* (1) No employee shall be hoisted by the load hoisting apparatus of a crane or derrick except on a platform meeting the following requirements:

(i) Enclosed by a railing or other means providing protection equivalent of that described in § 1917.112(c) of this chapter. If equipped with open railings, the platform shall be fitted with toe boards;

(ii) Having a safety factor of four based on ultimate strength;

(iii) Bearing a plate or permanent marking indicating maximum load rating, which shall not be exceeded, and the weight of the platform itself;

(iv) Equipped with a device to prevent access doors, when used, from opening accidentally;

(v) Equipped with overhead protection for employees on the platform if they are exposed to falling objects or overhead hazards;

(vi) Secured to the load line by means other than wedge and socket attachments, unless the free (bitter) end of the line is secured back to itself by a clamp placed as close above the wedge as possible.

(2) Except in an emergency, the hoisting mechanism of all cranes or derricks used to hoist personnel shall operate in power up and power down, with automatic brake application when not hoisting or lowering.

(3) All cranes and derricks used to hoist personnel shall be equipped with an anti-two blocking device.

(4) Variable radius booms of a crane or derrick used to hoist personnel shall be so constructed or secured as to prevent accidental boom movement.

(5) Platforms or devices used to hoist employees shall be inspected for defects before each day's use and shall be removed from service if defective.

(6) Employees being hoisted shall remain in continuous sight of and communication with the operator or signalman.

(7) Operators shall remain at the controls when employees are hoisted.

(8) Cranes shall not travel while employees are hoisted, except in emergency or in normal tier to tier transfer of employees during container operations.

(d) *Routine inspection.* (1) Designated persons shall visually inspect each crane and derrick on each day of use for defects in functional operating components and shall report any defect found to the employer. The employer shall inform the operator of the findings.

(2) A designated person shall thoroughly inspect all functional components and accessible structural features of each crane or device at monthly intervals.

(3) Any defects found during such inspections which may create a safety hazard shall be corrected before further equipment use. Repairs shall be performed only by designated persons.

(4) A record of monthly inspections shall be maintained for six months in or on the crane or derrick or at the terminal.

(e) *Protective devices.* (1) When exposed moving parts such as gears, chains and chain sprockets present a hazard to employees during crane and derrick operations, those parts shall be securely guarded.

(2) Crane hooks shall be latched or otherwise secured to prevent accidental load disengagement.

§ 1918.67 Notifying the ship's officers before using certain equipment.

(a) The employer shall notify the officer in charge of the vessel before bringing aboard ship internal combustion or electric powered tools, equipment or vehicles.

(b) The employer shall also notify the officer in charge of the vessel before using the ship's electric power for the operation of any electric tools or equipment.

§ 1918.68 Grounding.

The frames of portable electrical equipment and tools, other than double insulated tools and battery operated tools shall be grounded through a separate equipment conductor run with or enclosing the circuit conductors.

§ 1918.69 Tools.

(See Scope and Application, § 1918.1).

Subpart H—Handling Cargo

§ 1918.81 Slinging.

(a) Drafts shall be safely slung before being hoisted. Loose dunnage or debris hanging or protruding from loads shall be removed.

(b) Cargo handling bridles, such as pallet bridles, which are to remain attached to the hoisting gear while hoisting successive drafts, shall be attached by shackles, or other positive means shall be taken to prevent them from being accidentally disengaged from the cargo hook.

(c) Drafts of lumber, pipe, dunnage and other pieces, the top layer of which is not bound by the sling, shall be slung in such a manner as to prevent sliders. Double slings shall be used on unstrapped dunnage, except when, due to the size of hatch or deep tank openings, it is impractical to use them.

(d) Case hooks shall be used only with cases designed to be hoisted by these hooks.

(e) Bales of cotton, wool, cork, wood pulp, gunny bags or similar articles shall be hoisted only by straps strong enough to support the weight of the bale. At least two hooks, each in a separate strap, shall be used.

(f) Unitized loads bound by bands or straps may be hoisted by the banding or strapping only if the banding or strapping is suitable for hoisting and is strong enough to support the weight of the load.

(g) Additional means of hoisting shall be employed to ensure safe lifting of unitized loads having damaged banding or strapping.

(h) Loads requiring continuous manual guidance during handling shall be guided by guide ropes (tag lines) that are long enough to control the load.

(i) No draft shall be hoisted unless the winch or crane operator(s) can clearly see the draft itself or see the signals of a signalman in observation of the draft's movement.

(j) Intermodal containers shall be handled in accordance with § 1918.85.

(k) The employer shall require that employees stay clear of the area beneath

overhead drafts or descending lifting gear.

(l) Employees shall not be permitted to ride the hook or the load. Except that: As provided for in § 1918.85(g).

§ 1918.82 Building drafts.

(a) Drafts shall be built or means shall be taken to prevent cargo from falling from them.

(b) Buckets and tubs used in handling bulk or frozen cargo shall not be loaded above their rims.

§ 1918.83 Stowed cargo; tiering and breaking down.

(a) When necessary to protect personnel working in a hold, stowed cargo in ship's holds which is likely to shift or roll shall be secured or blocked.

(b) In breaking down stowed cargo, precautions shall be taken to prevent remaining cargo from falling.

(c) Employees trimming bulk cargo shall be checked in and out by the foreman. Before securing any reefer compartment, a check shall be made to ensure that no employee remains inside. Frequent checks shall be made to ensure the safety of any employee working alone in a tank or cargo compartment.

§ 1918.84 Bulling cargo.

(a) Bulling cargo shall be done with the bull line led directly from the heel block. However, bulling may be done from the head of the boom when the nature of the cargo and the surface over which it is dragged are such that the load cannot be stalled, or when the winch actually does not have sufficient strength, with the purchase used, to overload the boom.

(b) Snatch blocks shall be used to provide a fair lead for the bull line so as to avoid unnecessary dragging of the bull line against coamings and obstructions.

(c) Snatch blocks shall not be used with the point of the hook resting on the flange of a beam, but shall be hung from padeyes, straps, or beam clamps. Snatch blocks or straps shall not be made fast to batten cleats or other insecure fittings.

(d) Beam frame clamps shall be so secured as to prevent their slipping, falling, or being pulled from their stationary attachment.

(e) Falls led from cargo booms of vessels shall not be used to move scows, lighters or railcars.

§ 1918.85 Containerized cargo operations.

(a) *Container markings.* Every intermodal container shall be legibly and permanently marked with:

(l) The weight of the container when empty, in pounds;

(2) The maximum cargo weight the container is designed to carry, in pounds; and

(3) The sum of the weight of the container and the maximum cargo weight, in pounds.

(b) *Container weight.* No container shall be hoisted by any lifting appliance unless the following conditions have been met:

(1) The employer shall ascertain from the carrier whether a container to be hoisted is loaded or empty. Empty containers shall be identified before loading or discharge in such a manner as will inform every supervisor and foreman on the site and in charge of loading or discharging, or every crane or other hoisting equipment operator and signalman, if any, that such container is empty. Methods of identification may include cargo plans, manifests, or markings on the container.

(2) In the case of a loaded container:

(i) The actual gross weight shall be plainly marked so as to be visible to the crane or other hoisting equipment operator or signalman, or to every supervisor or foreman on site and in charge of the operation; or

(ii) The cargo stowage plan or equivalent permanently recorded display serving the same purpose, containing the actual gross weight and the serial number or other positive identification of that specific container, shall be provided to the crane or other hoisting equipment operator and signalman, if any, and to every supervisor and foreman on site and in charge of the operation.

(3) Every outbound container which is received at a marine terminal ready to load aboard a vessel without further consolidation or loading shall be weighed to obtain the actual gross weight, either at the terminal or elsewhere, before being hoisted.

(4) (i) When container weighing scales are located at a marine terminal, any outbound container with a load consolidated at that terminal shall be weighed to obtain the actual weight before being hoisted.

(ii) If the terminal has no scales, the actual gross weight may be calculated on the basis of the container's contents and the container's empty weight. The weights used in the calculation shall be posted conspicuously on the container, with the name of the person making the calculation, and the date.

(5) Open top vehicle carrying containers, and those built specifically and used solely for the carriage of compressed gases, are excepted from paragraphs (b)(3) and (b)(4) of this section.

(6) Closed dry van containers carrying vehicles are exempted from paragraph (b)(4) of this section provided that:

(i) The container carries only completely assembled vehicles and no other cargo;

(ii) The container is marked on the outside in such a manner that an employee can readily discern that the container is carrying vehicles; and

(iii) The vehicles were loaded into the container at the marine terminal.

(7) The weight of loaded inbound containers from foreign ports shall be determined by weighing, by the method of calculation described in paragraph (b)(4)(ii) of this section or by shipping documents.

(8) Any scale used within the United States to weigh containers for the purpose of the requirements of this section shall meet the accuracy standards of the state or local public authority in which the scale is located.

(c) *Overloaded containers.* No container or containers shall be hoisted if its actual gross weight exceeds the weight marked as required in paragraph (a)(3) of this section, or if it exceeds the capacity of the crane or other lifting appliance intended to be used.

(d) *Container inspection.* (1) Containers shall be inspected for any visible defects in structural members and fittings which would make the handling of such container unsafe.

(2) Any container found to have such a defect shall either be handled by a special means to assure safe handling; or shall be emptied before handling.

(e) *Suspended containers.* The employer shall direct employees to stay clear of the area beneath a suspended container.

(f) *Lifting fittings.* Containers shall be handled using lifting fittings or other arrangements suitable and intended for the purpose as set forth in paragraphs (f)(1) through (f)(3) of this section, except when damage to an intermodal container makes special means of handling necessary.

(1) Loaded intermodal containers of 20 feet (6.1 m) or more shall be hoisted as follows:

(i) When hoisted by the top fittings, the lifting forces shall be applied vertically from at least four such fittings.

(ii) When hoisted from bottom fittings, the hoisting connections shall bear on the fittings only, making no other contact with the container. The angles of the four bridle legs shall not be less than 30° to the horizontal in the case of 40 foot (12.2 m) containers; 37° in the case of 30 foot (9.1 m) containers; and 45° in the case of 20 foot (6.1 m) containers.

(iii) Lifting containers by fork lift trucks or grappling arms from above or from one side may be done only if the container is designed for this type of handling.

(iv) Other means of hoisting may be used only if the containers and hoisting means are designed for such use.

(2)(i) When using intermodal container spreaders that employ lanyards for activation and load disengagement, all possible precautions shall be taken to prevent accidental release of the load.

(ii) Intermodal container spreader twistlock systems shall be designed and used so that a suspended load cannot accidentally be released.

(g) *Safe container top access.* A safe means of access and egress shall be provided for each employee required to work atop an intermodal container. Unless ladders are used for access, such means shall comply with the requirements of § 1917.45(j) of this chapter.

(h) *Employee hoisting prohibition.* Employees shall not be hoisted on intermodal container spreaders while a load is engaged.

(i) *Portable ladder access.* When other safer means are available, portable ladders shall not be used in gaining access to container stacks more than two containers high.

(j) *Container top safety.* (1) Employees shall be protected from fall hazards [3] in the following manner:

(i) After June 2, 1997, employees shall not go on top of containers to perform work, notably coning and deconing, which can be eliminated through the proper use of positive container securing devices;

(ii) Work which requires employees to go on top of container tops shall be eliminated, to the extent feasible, through the proper use of positive container securing devices, which includes, but is not limited to, semi-automatic twist locks and cell guides;

(iii) A fall protection system meeting the requirements of paragraph (k) of this section shall be implemented to protect the following employees:

(A) Employees engaged in work on containers that is not described in paragraph (j)(1)(ii) of this section [4] that presents exposure to fall hazards; or

(B) Employees engaged in work on containers that are not being handled by container gantry cranes.

(2) Compliance with paragraph (j)(1)(ii) of this section shall be considered feasible when containers are being worked by container gantry cranes.

(3) Where the employer determines in the particular case that an employee will be exposed to a fall hazard but that the use of a fall protection system meeting the requirements of paragraph (k) of this section is not feasible [5] the employer shall alert the exposed employee about the hazards involved and instruct the employee how to minimize the hazard.

(k) *Fall protection.* When fall protection systems required by paragraph (j) of this section are employed, the following shall apply:

(1) Each fall protection system component, except anchorages, shall have fall arrest/restraint as its only use.

(2) Each fall protection system subjected to impact loading shall be immediately withdrawn from service and not used again until inspected and determined by a designated person to be undamaged and suitable for use.

(3) Each fall protection system shall be rigged to minimize free-fall distance so that the employee will not contact any lower level stowage or vessel structure.

(4) Each fall protection system adopted for use shall have an energy absorbing mechanism that will produce an arresting force on an employee of not greater than 1800 pounds (8 kN).

(5) Each fall protection systems' hardware shall be designed and utilized so as to prevent accidental disengagement.

(6) Each fall protection systems' fixed anchorages shall each be capable of sustaining a force of 5,000 (22.2 kN) pounds or be certified as capable of sustaining at least twice the potential impact load of an employee's fall. Such certification must be made by a registered professional engineer. When more than one employee is attached to an anchorage, the foregoing limits shall be multiplied by the number of employees attached.

(7) When "live" (activated) container gantry crane lifting beams or attached devices are used as anchorage points the following requirements apply:

(i) The crane shall be placed into a "slow" speed mode;

(ii) The crane shall be equipped with a remote shut-off switch, capable of stopping all crane functions, in the control of employee(s) attached to the beam; and

(iii) A visible or audible indicator shall be present to inform the same employee(s) when the remote shut-off is operational.

(8) Fall protection system components shall be certified as a unit of being capable of sustaining at least twice the potential impact load of an employee's fall. Such certification must be made by a registered professional engineer. When more than one employee is attached to an anchorage, the foregoing limits shall be multiplied by the number of employees attached.

(9) Each fall protection system shall incorporate the use of a full body harnesses.

(10) Each device, such as a safety cage, that is used to transport employee(s) by being attached to a container gantry crane spreader, shall have a secondary means of attachment in place and engaged to prevent accidental disengagement.

(11) Each fall protection system shall be inspected prior to each day's use by a designated person. Any defective components shall be removed from service.

(12) Before using any fall protection system, the employee shall be trained in the use and application limits of the equipment, proper hook-up, anchoring and tie-off techniques, methods of use, and proper methods of equipment inspection and storage.

(13) The employer shall establish and implement a procedure to safely retrieve personnel in case of a fall.

(l) *Working along unguarded edges.* Fall protection meeting the requirements of paragraph (k) of this section must be provided when container operations require employees to work along unguarded edges (other than on the top of a container), where the fall distance is greater than 8 feet (2.4 m).

§ 1918.86 Roll-on roll-off (RO-RO) operations.

(See also § 1918.24.)

(a) *Traffic control system.* An organized system of vehicular and pedestrian traffic control shall be established and maintained at each entrance/exit ramp and on ramps within the vessel as traffic flow warrants.

(b) *Ramp load limit.* Ramps shall be plainly marked with their load capacity. The marked capacity shall not be exceeded.

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[3] A fall hazard shall exist whenever employees are working within 3 feet (.9 m) of the unprotected edge of a work surface that is 10 or more feet (3 m) above the adjoining surface and twelve (12) inches (.3 m) or more, horizontally, from the adjacent surface; or weather conditions may impair vision or sound footing of workers on top of containers.

[4] Examples of work that may not be eliminated by positive container securing devices, where employees may be required to work on top of containers include, but are not limited to: installing or removing bridge clamps; hooking up or detaching overheight containers; or freeing a jammed semi-automatic twist lock.

[5] See non-mandatory Appendix III to this part for examples of situations where the use of a fall protection system may prove infeasible.

(c) *Pedestrian traffic.* Stern and side port ramps also used for pedestrian access shall meet the requirements of § 1918.21. Such ramps shall provide a physical separation between pedestrian and vehicular routes. When the design of the ramp prevents physical separation, a signalperson shall direct traffic and shall not allow concurrent use.

(d) *Ramp maintenance.* Ramps shall be properly maintained and secured.

(e) *Hazardous routes.* Prior to the start of Ro-Ro operations the employer shall ascertain any hazardous routes or areas that could be mistaken for normal drive-on/drive-off routes. Such hazardous routes shall be clearly identified and barricaded.

(f) *Air brake connections.* Each tractor shall have all air lines connected when pulling trailers equipped with air brakes and shall have the brakes tested before commencing operations.

(g) *Trailer load limits.* Flat bed and low boy trailers shall be marked with their cargo capacities and shall not be overloaded.

(h) *Cargo weights.* Cargo to be handled via a Ro-Ro ramp shall have its weight plainly marked in pounds (kilograms). Alternatively, the cargo stow plan or equivalent record containing the actual gross weight of the load may be used to determine the weight of the cargo.

(i) *Tractors.* Tractors used in Ro-Ro operations shall have:

(1) sufficient power to ascend ramp inclines safely; and

(2) sufficient braking capacity to descend ramp inclines safely.

(j) *Safe speeds.* Power driven vehicles used in Ro-Ro operations shall be operated at safe speeds compatible with prevailing conditions.

(k) *Ventilation.* Internal combustion engine driven vehicles shall be operated only where adequate ventilation exists or is provided. (Air contaminant requirements are found in § 1918.94 and part 1910, subpart Z of this chapter.)

(l) *Securing cargo.* Cargo loaded or discharged during Ro-Ro operations shall be secured to prevent sliding loads.

(m) *Authorized personnel.* Only authorized persons shall be permitted on any deck while loading or discharging operations are being conducted. Such authorized persons shall be equipped with high visibility vests (or equivalent protection).

(n) *Signalling requirement.* When a driver is maneuvering a vehicle into a stowage position while other personnel, such as lashers, are working in the adjacent vicinity:

(1) the driver shall be under the direction of a signaller; and

(2) No driver shall be signalled to advance or reverse motion while any personnel are in positions where they could be struck.

§ 1918.87 Ship's cargo elevators.

(a) *Safe working load.* The safe working loads of ship's cargo elevators shall be ascertained and adhered to.

(b) *Load distribution.* Loads shall be evenly distributed on the elevator's platform.

(c) *Elevator personnel restrictions.* Drivers of vehicles who remain at the controls of those vehicles shall be the only persons permitted to travel on the elevator's platform with the vehicle.

(d) *Open deck barricades.* During elevator operation, each opened deck which presents a fall hazard to employees shall be effectively barricaded.

§ 1918.88 Log operations.

(See also § 1918.38.)

(a) *Working in holds.* In holds where logs are being loaded, no employee shall remain in spaces for the placement of logs using dumper devices when the possibility of logs striking, rolling upon, or pinning them exists.

(b) *Footwear.* The employer shall provide employees that are working logs appropriate footwear, such as spiked shoes.

(c) *Lifelines.* When employees are working on log booms or cribs, lifelines shall be furnished and hung overside to the water's edge.

(d) *Jacob's ladder.* When a log boom is being worked, a Jacob's ladder meeting the requirements of § 1918.22 shall be provided for each gang working alongside unless other safe means of access are provided. However, no more than two Jacob's ladders are required for any single log boom being worked.

(e) *Life-ring.* When working a log boom alongside a ship, a U.S. Coast Guard approved 30 inch (76.2 cm) life-ring, with no less than 90 feet (27.4 m) of line shall be provided either on the floating unit itself or aboard the ship in the immediate vicinity of each floating unit being worked.

(f) *Rescue boat.* When employees are working on rafts or booms, a rescue boat shall be immediately available.

§ 1918.89 Hazardous cargo.

(See also § 1918.2(j).)

(a) *Employer preparations.* Before cargo handling operations begin, the employer shall ascertain whether any hazardous cargo is to be handled and shall determine the nature of the hazard. The employer shall inform employees of the nature of the hazard and any special procedures to be taken to prevent employee exposure, and shall instruct employees to stay clear of and to notify supervision of any leaks or spills.

(b) *Handling hazardous cargo.* Hazardous cargo shall be slung and secured so that neither the draft nor individual packages can fall as a result of tipping the draft or slacking of the supporting gear.

(c) *Emergency procedures.* If hazardous cargo is spilled or its packaging leaks, employees shall be removed from the affected area until the employer has ascertained the specific hazards; has provided any equipment, clothing and ventilation, and fire protection equipment necessary to eliminate or protect against the hazards; and has instructed cleanup employees in a safe method of cleaning up and disposing of a spill and disposing of leaking containers. Actual cleanup or disposal work shall be conducted under the supervision of a designated person.

Subpart I—General Working Conditions

§ 1918.90 Hazard communication.

(See § 1918.1(b)(6).)

§ 1918.91 Housekeeping.

(a) *General.* Active work areas shall be kept free of equipment and materials not in use, and clear of debris, projecting nails, strapping and other sharp objects not necessary to the work in progress.

(b) *Slippery surfaces.* The employer shall eliminate conditions causing slippery walking and working surfaces in immediate areas used by employees.

(c) *Free movement of drafts.* Dunnage shall not be placed at any location where it interferes with the free movement of drafts.

(d) *Dunnage height.* Dunnage racked against sweat battens or bulkheads shall not be used when the levels of such racks are above the safe reach of employees.

(e) *Coaming clearance.* Dunnage, hatch beams, tarpaulins or gear not in use shall be stowed no closer than 3 feet (.91 m) to the port and starboard sides of the weather deck hatch coaming.

(f) *Nails.* (1) Nails which are protruding from shoring or fencing in the immediate work areas shall be rendered harmless.

(2) Dunnage, lumber, or shoring material in which there are visibly protruding nails shall be removed from the immediate work area, or, if left in the area, the nails shall be rendered harmless.

(g) *Ice aloft.* Employees shall be protected from ice which may fall from aloft.

§ 1918.92 Illumination.

(a) *Walking and working areas.* Walking, working, and climbing areas shall be illuminated. Unless conditions described in the regulations of the U.S. Coast Guard (33 CFR 154.570) exist in the case of specific operations, illumination for cargo transfer operations shall be of an average minimum light intensity of 5-foot-candles (54 lux). Where occasional work tasks require more light than that which is consistently and permanently provided, supplemental lighting shall be used.

(b) *Intensity measurement.* The lighting intensity shall be measured at the task/working surface, in the plane in which the task/working surface is present.

(c) *Arrangement of lights.* Lights shall be arranged so that they do not shine into the eyes of winch-drivers, crane operators or hatchtenders. On Ro-Ro ships, stationary lights shall not shine directly into the eyes of drivers.

(d) *Portable lights.* Portable lights shall meet the following requirements:

(1) Portable lights shall be equipped with substantial reflectors and guards to prevent materials from coming into contact with the bulb.

(2) Flexible electric cords used with temporary lights shall be designed by the manufacturer for hard or extra-hard usage. Temporary and portable lights shall not be suspended by their electric cords unless the cords and lights are designed for this means of suspension. Connections and insulation shall be maintained in safe condition.

(3) Electric conductors and fixtures for portable lights shall be so arranged as to be free from contact with drafts, running gear, and other moving equipment.

(4) Portable cargo lights furnished by the employer for use aboard vessels shall be listed as approved for marine use by the U.S. Coast Guard or by a nationally recognized testing laboratory.

(e) *Entry into darkened areas.* Employees shall not be permitted to enter dark holds, compartments, decks or other spaces without a flashlight or other portable light. The use of matches or open flame lights is prohibited.

§ 1918.93 Hazardous atmospheres and substances.

(See § 1918.2(j).)

(a) *Purpose and scope.* This section covers areas in which the employer is aware that a hazardous atmosphere or substance may exist, except where one or more of the following sections or sub sections apply: Section 1918.89, Hazardous cargo; § 1918.94(a), Carbon monoxide; § 1918.94(b), Fumigated grains; § 1918.94(c), Fumigated tobacco; § 1918.94(d), Other fumigated cargoes; § 1918.94(e), Catch of Menhaden and similar species of fish.

(b) *Determination of hazard.* (1) When the employer is aware that a space on a vessel contains or has contained a hazardous atmosphere, a designated and appropriately equipped persons shall test the atmosphere before employee entry to determine whether a hazardous atmosphere exists.

(2) Records of results of any tests required by this section shall be maintained for at least 30 days.

(c) *Testing during ventilation.* When mechanical ventilation is used to maintain a safe atmosphere, tests shall be made by a designated person to ensure that the atmosphere is not hazardous.

(d) *Entry into hazardous atmospheres.* Only designated person shall enter hazardous atmospheres, in which case the following provisions shall apply:

(1) Persons entering a space containing a hazardous atmosphere shall be protected by respiratory and emergency protective equipment meeting the requirement of subpart J of this part;

(2) Persons entering a space containing a hazardous atmosphere shall be instructed in the nature of the hazard, precautions to be taken, and the use of protective and emergency equipment. Standby observers, similarly equipped and instructed, shall continuously monitor the activity of employees within such space;

(3) Except for emergency or rescue operations, employees shall not enter into any atmosphere which has been identified as flammable or oxygen deficient (less than 19.5% oxygen). Persons who may be required to enter flammable or oxygen deficient atmospheres in emergency operations shall be instructed in the dangers attendant to those atmospheres and instructed in the use of self-contained breathing apparatus, which shall be utilized.

(4) To prevent inadvertent employee entry into spaces that have been identified as having hazardous, flammable or oxygen deficient atmospheres, appropriate warning signs or equivalent means shall be posted at all means of access to those spaces.

(e) *Asbestos cargo leak.* When the packaging of asbestos cargo leaks, spillage shall be cleaned up by designated employees protected from the harmful effects of asbestos as required by § 1910.1001 of this chapter.

§ 1918.94 Ventilation and atmospheric conditions.

(See also § 1918.2(j).)

(a) *Ventilation with respect to carbon monoxide.* (1)(i) When internal combustion engines exhaust into a hold, intermediate deck, or any other compartment, the employer shall see that tests of the carbon monoxide content of the atmosphere are made with such frequency to ensure that dangerous concentrations do not exceed allowable limits. Such tests shall be made in the area in which employees are working by persons competent in the use of the test equipment and procedures. If operations are located in a deep tank or refrigerated compartment, the first test shall be made within one half hour of the time the engine starts. In order to determine the need for further testing, the initial test in all other cargo handling areas shall be taken no later than one hour after the time the engine starts.

(ii) The carbon monoxide content of the atmosphere in a compartment, hold, or any enclosed space shall be maintained at not more than 35 parts per million (ppm) (0.0035%) as an 8-hour time weighted average and employees shall be removed from the enclosed space if the carbon monoxide concentration exceeds 100 ppm (0.01%). The short term exposure limit in outdoors, non-enclosed spaces shall be 200 ppm (0.02%) measured over a 5 minute period.

(A) The term *time weighted average* means that for any period of time in which the concentration exceeds 35 parts per million, it shall be maintained at a corresponding amount below 35 parts per million for an equal period of time.

(B) The formula for "time weighted average" for an 8-hour work shift is as follows:

$$E=(C_aT_a+C_bT_b+\ldots C_nT_n)/8$$

Where: E is the equivalent exposure for the working shift. C is the concentration during any period of time T where the concentration remains constant. T is the duration in hours of the exposure at the concentration C.

(iii) When both natural ventilation and the vessel's ventilation system are inadequate to keep the carbon monoxide concentration within the allowable limits, the employer shall use supplementary means to bring such concentration within allowable limits, as determined by actual monitoring.

(2) A record of the date, time, location and results of the tests required by paragraph (a)(1) of this section shall be maintained for at least 30 days after the

work has been completed. Such records may be entered on any retrievable medium, and shall be available for inspection.

(3) The intakes of portable blowers and any exposed belt drives shall be guarded to prevent injury to employees.

(4) The frames of portable blowers shall be grounded at the source of the current by means of an equipment grounding conductor run with or enclosing the circuit conductors. When the vessel is the source of the current, the equipment grounding conductor shall be bonded to the structure of the vessel. Electric cords used shall be free from visible defects.

(b) *Fumigated grains.* (1) Before commencing to handle bulk grain in any compartment of a vessel in which employees will or may be present, the employer shall:

(i) ascertain from the elevator operator whether the grain has been or will be fumigated at the elevator; and

(ii) ascertain from the vessel's officers, agent, or other knowledgeable source whether those compartments, or any cargo within them that was loaded at a prior berth, have been treated with a fumigant or any other chemical.

(2) If such treatment has been carried out, or if there is reason to suspect that such treatment has been carried out, it shall be determined by atmospheric testing that the compartment's atmosphere is within allowable limits. (See paragraph (b)(3) of this section.)

(3) A test of the fumigant concentration in the atmosphere of the compartment shall be made after loading begins and before employees enter the compartment. Additional tests shall be made as often as necessary to ensure that hazardous concentrations do not develop.

(i) Tests for fumigant concentration shall be conducted by a designated person, who shall be thoroughly familiar with the characteristics of the fumigant being used, the correct procedure for measurement, the proper measuring equipment to be used, the manufacturer's recommendations and warnings, and the proper use of personal protective equipment employed to guard against the specific hazards.

(ii) A record of the date, time, location and results of the tests required by paragraph (b) of this section shall be maintained for at least 30 days after the work has been completed. Such records may be entered on any retrievable medium, and shall be available for inspection.

(iii) At any time the concentration in any compartment reaches the level specified as hazardous by the fumigant manufacturer or by part 1910, subpart Z of this chapter, whichever is lower, all employees shall be removed from such compartments and shall not be permitted to re-enter until such time as tests demonstrate that the atmosphere is within allowable limits.

(iv) No employee shall be permitted to enter any compartment in which grain fumigation has been carried out, or any compartment immediately adjacent to such a compartment, until it has been determined by test that the atmosphere in the compartment to be entered is within allowable limits for entry.

(v) In the event a compartment containing a hazardous or unknown concentration of fumigants must be entered for the purpose of testing the atmosphere, or for emergency purposes, each employee entering shall be protected by respiratory protective equipment in accordance with the provisions of § 1918.102, and by any protective clothing or other personal protective equipment recommended by the fumigant manufacturer for protection against the particular hazards. At least two other employees shall be stationed outside the compartment as observers, to provide rescue services in the event of an emergency. The observers shall be equipped with similar personal protective equipment.

(vi) One or more employees on duty shall be equipped and trained to provide any specific emergency treatment stipulated for the particular fumigant.

(vii) Emergency equipment required by this subparagraph shall be readily accessible wherever fumigated grains are being handled.

(4) In the event that a compartment is treated for local infestation before loading grain by a chemical other than a fumigant, the employee applying the treatment, and any other employees entering the compartment, shall be provided with and required to use any personal protective equipment which may be recommended by the manufacturer of the product to protect them against the effects of exposure.

(c) *Fumigated tobacco.* The employer shall not load tobacco until the carrier has provided written notification as to whether or not the cargo has been fumigated. If break-bulk tobacco cargo has been treated with any toxic fumigant, loading shall not commence until written warranty has been received from the fumigation facility that the aeration of the cargo has been such to reduce the concentration of the fumigant to within allowable limits. Such notification and warranty shall be maintained for at least 30 days after the loading of the tobacco has been completed, and shall be available for inspection.

(d) *Other fumigated cargoes.* Before commencing to load fumigated cargo other than the cargo specifically addressed in paragraphs (b) and (c) of this section, the employer shall ascertain that such cargo does not contain a concentration of fumigants in excess of allowable limits found in subpart Z of part 1910 of this chapter

(e) *Grain dust.* When employees are exposed to concentrations of grain dusts in excess of allowable limits found in subpart Z of part 1910 of this chapter, they shall be protected by suitable respiratory protective equipment in accordance with the requirements of § 1918.102.

(f) *Catch of Menhaden and similar species of fish.* (1) The provisions of this paragraph shall not apply in the case of vessels having and utilizing refrigerated holds for the carriage of all cargo.

(2) After a vessel has arrived at berth for discharge of menhaden, but before personnel enter the hold, and as frequently thereafter as tests indicate to be necessary, tests shall be made of the atmosphere in the vessel's hold to ensure a safe work space. The tests shall be performed for the presence of hydrogen sulfide and for oxygen deficiency.

(3) Tests required by paragraph (f)(2) of this section shall be made by designated supervisory personnel, trained and competent in the nature of potential hazards and the use of test equipment and procedures.

(4) The hydrogen sulfide content of the atmosphere in a compartment, hold, or any enclosed space shall be maintained at not more than 10 parts per million (ppm) (0.0010%) as an 8-hour time weighted average. The short term exposure limit shall be 15 ppm (0.0015%) measured over a 15 minute period. The oxygen level must be maintained to at least 19.5 percent. Employees shall not be permitted in the hold unless these conditions are met and maintained.

§ 1918.95 Sanitation.

(a) *Washing and toilet facilities.* (1) Accessible washing and toilet facilities sufficient for the sanitary requirements of employees shall be readily accessible at the worksite. The number of toilet facilities shall be provided in accordance with the table found in this section. The facilities shall have:

(i) Running water, including hot and cold or tepid water at a minimum of one accessible location (when longshoring operations are conducted at locations without permanent facilities, potable

water may be provided in lieu of running water);

(ii) Soap;

(iii) Individual hand towels, clean individual sections of continuous toweling, or warm air blowers; and

(iv) Fixed or portable toilets in separate compartments with latch-equipped doors. Numbers of toilet facilities shall comply with the Toilet Facilities Table. Separate toilet facilities shall be provided for male and female employees except when toilet rooms will be occupied by only one person at a time.

(2) Washing and toilet facilities shall be regularly cleaned and maintained in good order.

TOILET FACILITIES TABLE

No. of employees	Minimum no. of facilities
20 or less	1 toilet seat.
20 or more	1 toilet seat and 1 urinal per 40 workers.
200 or more	1 toilet seat and 1 urinal per 50 workers.

(b) *Drinking water.* (1) Potable drinking water shall be accessible to employees at all times.

(2) Potable drinking water containers shall be clean, containing only water and ice, and shall be fitted with covers.

(3) Common drinking cups are prohibited.

(c) *Prohibited eating areas.* Consumption of food or beverages in areas where hazardous materials are stowed or being handled is prohibited.

(d) *Garbage and overboard discharges.* Work shall not be conducted in the immediate vicinity of uncovered garbage or in the way of overboard discharges from the vessel's sanitary lines unless employees are protected from the garbage or discharge by a baffle or splash boards.

§ 1918.96 Longshoring operations in the vicinity of maintenance and repair work.

(a) *Noise interference* (See also § 1918.1(b)(10)). Longshoring operations shall not be carried on when noise interferes with communications of warnings or instructions.

(b) *Falling objects.* Longshoring operations shall not be carried on in the hold or on deck beneath work being conducted overhead whenever such work exposes the employee to a hazard of falling objects.

(c) *Hot work.* Longshoring operations shall not be carried on where the employee is exposed to injurious light rays, hot metal, or sparks, as a result of welding or cutting.

(d) *Abrasive blasting and spray painting.* Longshoring operations shall not be carried on in the immediate vicinity of abrasive blasting or spray painting operations.

(e) *Non-ionizing radiation.* Longshoring operations shall not be carried on when there is a danger that non-ionizing radiation (electromagnetic radiation) from a vessel's radio or radar, or from radio or television transmitting towers ashore could harm employees that are involved in cargo handling operations.

§ 1918.97 First aid and lifesaving facilities.

(a) *Injury reporting.* The employer shall direct each employee to report every injury, regardless of severity, to the employer.

(b) *First aid.* A first aid kit shall be available at or near to each vessel being worked, and at least one person holding a valid first aid certificate, such as one issued by the Red Cross or other equivalent organization, shall be available to render first aid when work is in progress.

(c) *First aid kit.* First aid kits shall be weatherproof and shall contain individual sealed packages for each item that must be kept sterile. The contents of each kit shall be determined by a physician, based on the hazards anticipated at the worksite. The contents of the first aid kit shall be checked at least weekly. Expended items shall be promptly replaced.

(d) *Stretchers.* (1) There shall be available for each vessel being worked, one Stokes basket stretcher, or its equivalent, permanently equipped with bridles for attaching to the hoisting gear.

(2) Stretchers shall be kept close to vessels and shall be positioned to avoid damage.

(3) A blanket or other suitable covering shall be available.

(4) Stretchers shall have at least four sets of effective patient restraints in operable condition.

(5) Lifting bridles shall be of adequate strength, capable of lifting 1,000 pounds (454 kg) with a safety factor of five, and shall be maintained in operable condition. Lifting bridles shall be provided for making vertical patient lifts at container berths. Stretchers for vertical lifts shall have foot plates.

(6) Stretchers shall be maintained in operable condition. Struts and braces shall be inspected for damage. Wire mesh shall be secured with no burrs. Damaged stretchers shall not be used until repaired.

(e) *Life-rings.* (1) The employer shall ensure that there is in the vicinity of each vessel being worked, at least one U.S. Coast Guard approved 30 inch (76.2 cm) life-ring with no less than 90 feet (27.4 m) of line attached and at least one portable or permanent ladder which will reach from the top of the apron to the surface of the water.

(2) In addition to the provisions of paragraph (e) of this section, when working a barge, scow, raft, lighter, log boom, or carfloat alongside a ship, a U.S. Coast Guard approved 30 inch (76.2 cm) life-ring, with no less than 90 feet (27.4 m) of line shall be provided either on the floating unit itself or aboard the ship in the immediate vicinity of each floating unit being worked.

(f) *Communication.* Telephone or equivalent means of communication shall be readily available.

§ 1918.98 Personnel.

(a) *Qualification of machinery operators.* (1) Only those employees determined by the employer to be competent by reason of training or experience, and who understand the signs, notices and operating instructions, and are familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power operated cargo handling apparatus, or any power operated vehicle, or give signals to the operator of any hoisting apparatus. However, employees being trained and supervised by a designated person may operate such machinery and give signals to operators during training.

(2) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate the employee, shall be permitted to operate a crane, winch or other power operated cargo handling apparatus or a power-operated vehicle.

(b) *Supervisory accident prevention proficiency.* (1) After [insert date two years after promulgation of final standard], immediate supervisors of cargo handling operations of more than five persons shall satisfactorily complete a course in accident prevention. Employees newly assigned to supervisory duties after that date shall be required to meet the provisions of this paragraph within 90 days of such assignment.

(2) The accident prevention course shall consist of instruction suited to the particular operations involved.[6]

[6] The following are recommended topics: Safety responsibility and authority; elements of accident prevention; attitudes, leadership and motivation; hazards of longshoring, including peculiar local circumstances; hazard identification and elimination; applicable regulations; and accident investigations.

Subpart J—Personal Protective Equipment

§ 1918.101 Eye protection.

(a)(1) When employees perform work hazardous to the eyes, the employer shall provide eye protection equipment marked or labeled as meeting the manufacturing specifications of American National Standards Practice for Occupational and Educational Eye and Face Protection, ANSI Z87.1–1989, and shall require that it be used.

(2) For employees wearing corrective spectacles, eye protection equipment required by paragraph (a)(1) of this section must be of the type which can be worn over spectacles. Prescription ground safety lenses may be substituted if they provide equivalent protection.

(b) Eye protection shall be maintained in good condition.

(c) Used eye protection shall be cleaned and disinfected before issuance to another employee.

§ 1918.102 Respiratory protection.

(See § 1918.1(b)(12)).

§ 1918.103 Head protection.

(a) The employer shall require that employees exposed to impact, falling or flying objects, or electric shocks or burns wear protective hats.

(b) Protective hats shall bear identifying marks or labels indicating compliance with the manufacturing provisions of American National Standard Requirements for Protective Headwear for Industrial Workers, ANSI Z89.1–1986.

(c) Protective hats previously worn shall be cleaned and disinfected before issuance by the employer to another employee.

§ 1918.104 Foot protection.

(a) The employer shall require that employees exposed to impact, falling objects, or puncture hazards wear safety shoes, or equivalent protection.

(b) Protective shoes shall bear identifying marks or labels indicating compliance with manufacturing provisions of the American National Standard for Personal Protection—Protective Footwear ANSI Z41–1991.

§ 1918.105 Other protective measures.

(a) *Protective clothing.* (1) The employer shall provide, and shall require the wearing of special protective clothing for those employees engaged in work in which such protective clothing is necessary.

(2) When necessary, protective clothing shall be cleaned and disinfected before reissuance.

(b) *Personal flotation equipment.* (1) The employer shall provide, and shall require the wearing of personal flotation devices for those employees engaged in work in which they may fall into the water:

(i) When such employees are working in isolation; or

(ii) Where physical limitations of available working space creates a hazard of falling into the water; or

(iii) Where the work area is obstructed by cargo or other obstacles so as to prevent employees from obtaining safe footing for their work; or

(iv) When working on the deck of a barge.

(2) Personal flotation devices shall be United States Coast Guard approved Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or equivalent, in accordance with 46 CFR part 160 (Coast Guard Lifesaving Equipment Specifications) and 33 CFR part 175.23 (Coast Guard table of devices equivalent to personal flotation devices).

(3) Personal flotation devices shall be maintained in safe condition and shall be considered unserviceable when damaged so as to affect buoyancy or fastening capability.

Appendix I to Part 1918—Cargo Gear Register and Certificates (Non-mandatory)

Note: This Appendix is non-mandatory and provides guidance to part 1918 to assist employers and employees in complying with the requirements of this standard, as well as to provide other helpful information. Nothing in this Appendix adds or detracts from any of the requirements of this standard.

General

The tests, examinations and inspections indicated in this register are based on the requirements of I.L.O. Convention 152 and Recommendation 160. They are intended to ensure that ships having lifting appliances are initially certified by a competent person, and to establish periodically that they continue to be in safe working order to the satisfaction of a competent person acceptable to a competent authority.

A Register of lifting appliances and items of loose gear shall be kept in a form prescribed by the competent authority, account being taken of this model recommended by the International Labour Office. This Register and related certificates shall be kept available to any person authorized by the competent authority. The Register and certificates for gear currently aboard the ship shall be preserved for at least five years after the date of the last entry.

Instruction

1. *Initial Examination and Certification*

1.1. Every lifting appliance shall be certified by a competent person before being taken into use for the first time to ensure that it is of good design and construction and of adequate strength for the purpose for which it is intended.

1.2. Before being taken into use for the first time, a competent person shall supervise and witness testing, and shall thoroughly examine every lifting appliance.

1.3. Every item of loose gear shall, before being taken into use for the first time, shall be tested, thoroughly examined and certified by a competent person, in accordance with national law or regulations.

1.4. Upon satisfactory completion of the procedures indicated above, the competent person shall complete and issue the Register of lifting appliances and attach the appropriate certificates. An entry shall be made in part I of the Register.

1.5. A rigging plan showing the arrangement of lifting appliances shall be provided. In the case of derricks and derrick cranes, the rigging should show at least the following information.

(a) the position of guys;

(b) the resultant force on blocks, guys, wire ropes and booms;

(c) the position of blocks;

(d) the identification mark of individual items; and

(e) arrangements and working range of union purchase;

2. *Periodic Examination and Re-testing*

2.1. All lifting appliances and every item of loose gear shall be thoroughly examined by a competent person at least once in every twelve months. The particulars of these thorough examinations shall be entered in part I of the Register.

2.2. Re-testing and thorough examination of all lifting appliances and every item of loose gear is to be carried out;

(a) after any substantial alteration or renewal, or after repair to any stress bearing part, and;

(b) in the case of lifting appliances, at least once in every five years.

2.3. The retesting referred to in paragraph 2.2(a) may be omitted provided the part which has been renewed or repaired is subjected by separate test, to the same stress as would be imposed on it if it had been tested in-situ during the testing of the lifting appliance.

2.4. The thorough examinations and tests referred to in paragraph 2.2. are to be entered in part I of the Register.

2.5. No new item of loose gear shall be manufactured of wrought iron. Heat treatment of any existing wrought iron components should be carried out to the satisfaction of the competent person. No heat treatment should be applied to any item of loose gear unless the treatment is in accordance with the manufacturer's instruction; to the satisfaction of the competent person. Any heat treatment and the associated examination are to be recorded by the competent person in part I of the Register.

3. *Inspections*

3.1. Regular visual inspections of every item of loose gear shall be carried out by a responsible person before use. A record of these regular inspections is to be entered in part II of the Register, but entries need only be made when the inspection has indicated a defect in the item.

4. *Certificates*

4.1. The certification forms to be used in conjunction with this Register (Form No. 1) are as follows:

(Form No. 2)—Certificate of test and thorough examination of lifting appliance.

(Form No. 2[U])—Certificate of test and thorough examination of derricks used in union purchase.

(Form No. 3)—Certificate of test and thorough examination of loose gear.

(Form No. 4)—Certificate of test and thorough examination of wire rope.

Definitions

(a) The term "competent authority" means a minister, government department, or other authority empowered to issue regulations, orders or other instructions having the force of law.

(c) The term "competent person" means a person appointed by the master of the ship or the owner of the gear to be responsible for the performance of inspections and who has sufficient knowledge and experience to undertake such inspections.

(d) The term "thorough examination" means a detailed visual examination by a competent person, supplemented if necessary by other suitable means or measures in order to arrive at a reliable conclusion as to the safety of the lifting appliance or item of loose gear examined.

(e) The term "lifting appliance" covers all stationary or mobile cargo handling appliances used on board ship for suspending, raising or lowering loads or moving them from one position to another while suspended or supported.

(g) The term "loose gear" covers any gear by means of which a load can be attached to a lifting appliance, but which does not form an integral part of the appliance or load.

THE FOLLOWING ARE SAMPLE FORMS OF CERTIFICATES AS RECOMMENDED BY THE ILO

[Part I—Thorough Examination of Lifting Appliances and Loose Gear]

Situation and description of lifting appliances and loose gear (with distinguishing numbers or marks, if any) which have been thoroughly examined. (see note 1)	Certificate Nos.	Examination performed (see note 2)	I certify that on the date to which I have appended my signature, the gear shown in Col. (1) was thoroughly examined and no defects affected its safe working condition where found other than those shown in Col. (5) (Date and Signature)	Remarks (To be dated and signed)
(1)	(2)	(3)	(4)	(5)

Note 1: If all the lifting appliances are thoroughly examined on the same date it will be sufficient to enter in Col. (1) "All lifting appliances and loose gear". If not, the parts which have been thoroughly examined on the dates stated must be clearly indicated.

Note 2: The thorough examinations to be indicated in Col. (3) include:

(a) Initial.
(b) 12 monthly.
(c) 5 yearly.
(d) Repair/Damage.
(e) Other thorough examinations.

PART II.—REGULAR INSPECTIONS OF LOOSE GEAR

Situation and description of loose gear (with distinguishing numbers or marks, if any) which has been inspected. (See Note 1)	Signature and date of the responsible person carrying out the inspection	Remarks (To be dated and signed)

PART II.—REGULAR INSPECTIONS OF LOOSE GEAR—Continued

Situation and description of loose gear (with distinguishing numbers or marks, if any) which has been inspected. (See Note 1)	Signature and date of the responsible person carrying out the inspection	Remarks (To be dated and signed)

Note 1: All loose gear should be inspected before use.

Identity of National Authority or Competent Organization *Form No. 2*

Certificate No. _____
Name of Ship_____
Official Number_____
Call Sign_____
Port of Registry_____
Name of Owner_____

CERTIFICATE OF TEST AND THOROUGH EXAMINATION OF LIFTING APPLIANCES

Situation and description of lifting appliances (with distinguishing numbers or marks, if any) which have been tested and thoroughly examined (1)	Angle to the horizontal or radius at which test load applied (2)	Test load (tones) (3)	Safe working load at angle or radius shown in Col. 2 (tones) (4)

Name and address of the firm or competent person who witnessed testing and carried out through examination
I certify that on the date to which I have appended my signature, the gear shown in Col. (1) was tested and thoroughly examined and no defects or permanent deformation was found: and that the safe working load is as shown.
Date:
Place:
Signature:
Note: This certificate is the standard international form as responded by International Labour Office in accordance with ILO Convention No. 152.

Reverse of Form No. 2

Instructions

1. Every lifting appliance shall be tested with a test load which shall exceed the Safe Working Load (SWL) as follows:

SWL	Test load
Up to 20 tons	25 percent in excess.
20 to 50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

2. In the case of derrick systems, the test load shall be lifted with the ship's normal tackle with the derrick at the minimum angle to the horizontal for which the derrick system was designed (generally 15 degrees), or at such greater angle as may be agreed. The angle at which the test was made should be stated in the certificate

2.1. The SWL shown is applicable to swinging derrick systems only. When derricks are used in union purchase, the SWL (U) is to be shown on Form 2 (U).

2.2. In the case of heavy derricks, care should be taken to ensure that the appropriate stays are correctly rigged.

3. In the case of cranes, the test load is to be hoisted, slewed and luffed at slow speed. Gantry and traveling cranes together with their trolleys, where appropriate, are to be traversed and travelled over the full length of their track.

3.1. In the case of variable load-radius cranes, the tests are generally to be carried out with the appropriate test load at maximum, minimum and intermediate radii.

3.2. In the case of hydraulic cranes where limitations of pressure make it impossible to lift a test load 25 percent in excess of the safe working load, it will be sufficient to lift the greatest possible load, but in general this should not be less than 10 percent in excess of the safe working load.

4. As a general rule, tests should carried out using test loads, and no exception should be allowed in the case of initial tests. In the case of repairs/replacement or when the periodic examination calls for re-test, consideration may be given to the use of spring or hydraulic balances provided the SWL of the lifting appliance does not exceed 15 tones. Where a spring or hydraulic balance is used, it shall be calibrated and accurate to within ±2 percent and the indicator should remain constant for 5 minutes.

4.1. If the test weights are not used, this is to be indicated in Col. (3).

5. The expression "tone" shall mean a tone of 1000 kg. (2000 lbs)

6. The terms "competent person", "thorough examination", and "lifting appliance" are defined in Form No. 1.

Note: For recommendations on test procedures reference may be made to the ILO document "Safety and Health in Dock Work".

Identity of National Authority or Competent Organization *Form No. 2(U)*

Certificate No._____
Name of Ship_____
Official Number_____
Call Sign_____
Port of Registry _____

Name of Owner _____

CERTIFICATE OF TEST AND THOROUGH EXAMINATION OF DERRICKS USED IN UNION PURCHASE

Situation and description of derricks used in Union Purchase with distinguishing numbers or marks) which have been tested and thoroughly examined. (1)	Max. height of triangle plate above hatch coaming (m) or max. angle between runners (2)	Test Load (tones) (3)	Safe working load, SWL When operating in Unit Purchase (tones) (4)

Position of outboard preventer guy attachments:
(a) forward/aft* of mast _____
and (b) from ships centerline _____
Position of inboard preventer guy attachments:
(a) forward/aft* of mast _____
and (b) from ships centerline _____
*Delete as appropriate
Name and address of the firm or competent person who witnessed testing and carried out thorough examination
I certify that one the date to which I have appended my signature, the gear shown in Col. (1) was tested and thoroughly examined and no defects or permanent deformation was found: and that the safe working load is as shown.
Date:
Place:
Signature:
Note: This certificate is the standard international form as recommended by International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. (U)

Instructions

1. Before being taken into use, the derricks rigged in Union Purchase shall be tested with a test load which shall exceed the Safe Working Load (SWL (U)) as follows:

SWL	Test load
Up to 20 tons	25 percent in excess.

SWL	Test load
20 to 50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

2. Tests are to be carried out at the approved maximum height of the triangle plate above the hatch coaming or at the angle between the cargo runners and with the derrick booms in their working positions, to prove the strength of deck eye plates and the Union Purchase system. These heights or angles must not exceed the values shown on the rigging plan.

3. Tests should be carried out using test loads.

4. The expression "ton" shall mean a ton of 1000 kg. (2000 lbs.)

5. The terms "competent person", "thorough examination" and "lifting appliance" are defined in Form No. 1.

Note: For recommendations on test procedures, reference may be made to the ILO document "Safety and Health in Dock Work".

Identity of National Authority or Competent Organization

Certificate No. _____
Name of Ship _____
Official Number _____
Call Sign _____
Port of Registry _____
Name of Owner _____

CERTIFICATE OF TEST AND THOROUGH EXAMINATION OF LOOSE GEAR

Distinguishing number or mark	Description of loose gear	Number tested	Date of test	Test load (tons)	Safe work load (SW) (tones)

Name and address of makers or suppliers:
Name and address of the firm or competent person who witnessed testing and carried out thorough examination.
I certify that the above items of loose gear were tested and thoroughly examined and no defects affecting their SWL were found.
Date:
Place:
Signature:
Note: This certificate is the standard international form as recommended.

Reverse Form No. 3

Instructions

1. Every item of loose gear is to be tested and thoroughly examined before being put into use for the first time and after any substantial alteration or repair to any part liable to affect its safety. The test loads to be applied shall be in accordance with the following table:

Item	Test load (tones)
Single sheave blocks (see note 1).	4 × SWL
Multi sheave blocks (see note 2):	
SWL <25 Tones	2 × SWL
25 tones <SWL ≤160 tones.	(0,933 × SWL) + 27
SWL >160 tones	1,1 × SWL
Chains, hooks, rings, shackles, swivels, etc.:	
SWL <25 tones	2 × SWL
SWL >25 tones	(1,22 ×SWL) + 20
Lifting beams, spreaders, frames and similar devices:	
SWL ≤10 tones	2 × SWL
10 tones <SWL ≤160 tones.	(1,04 × SWL) + 9,6
SWL >160 tones	1,1 × SWL

Note: 1. The SWL for single sheave block, including single sheave blocks with beckets, is to be taken as one-half of the resultant load on the head fitting.

2. The SWL of a multi-sheave block is to be taken as the resultant load on the head fitting.

NOTE: For recommendations on test procedures reference may be made to the ILO document "Safety and Health in Dock Work".

2. This form may also be used for the certification of interchangeable components of lifting appliances.

3. The expression "ton" shall mean a ton of 1000 kg. (2000 lbs)

4. The terms "competent person", "thorough examination" and "loose gear" are defined in Form No. 1.

Identity of National Authority or Competent Organization *Form No. 4*

Certificate No._____
Name of Ship_____
Official Number_____
Call Sign_____
Port of Registry _____
Name of Owner _____

CERTIFICATE OF TEST AND THOROUGH EXAMINATION OF WIRE ROPE

Name and address of maker or supplier	
Nominal diameter of rope (mm)	
Number of strands	
Number of wires per strand	
Core	
Lay	
Quality of wire (N/mm²)	
Date of test of sample	
Load at which sample broke (tones)	
Safe working load of rope (tones)	
Intended use	

Name and address of the firm or competent person who witnessed testing and carried out thorough examination.

I certify that the above particulars are correct, and that the rope was tested and thoroughly examined and no defects affecting its SWL were found.

Date:
Place:
Signature:

NOTE: This certificate is the standard international form as recommended by the International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. 4

Instructions

1. Wire rope shall be tested by sample, a piece being tested to destruction.

2. The test procedure should be in accordance with an International or recognized National standard.

3. The SWL of the rope is to be determined by dividing the load at which the sample broke, by a coefficient of utilization, determined as follows:

Item	Coefficient
Wire rope forming part of a sling:	
SWL of the sling	5
SWL < 10 tones	10[5]
10 tones < SWL ≤ 160 tones	(8,85×SWL)+1910
SWL > 160 tones	3
Wire rope as integral part of a lifting appliances:	
SWL of lifting appliance	10[4]
SWL ≤ 160 tones	(8,85×SWL)+1910
SWL > 160 tones	3

Item	Coefficient
SWL > 160 tones	3

Note: For recommendations on test procedures reference may be made to the ILO document "Safety and Health in Dock Work".

These coefficients should be adopted unless other requirements are specified by a National Authority.

4. The expression "ton" shall mean a ton of 1000 kg. (2000 lbs)

5. The terms "competent person", "thorough examination" and "lifting appliance" are defined in Form No. 1.

Appendix II to Part 1918—Tables for Selected Miscellaneous Auxiliary Gear

(Non-mandatory)

Note: This Appendix is non-mandatory and provides guidance to part 1918 to assist employers and employees in complying with the requirements of this standard, as well as to provide other helpful information. Nothing in this Appendix adds or detracts from any of the requirements of this standard.

TABLE 1.—WIRE ROPE CLIPS

Improved plow steel, rope Inches (CM)	Minimum number of clips: Drop forged	Minimum number of clips: Other material	Minimum spacing: Inches
½ or less (1.3)	3	4	3 (7.6)
⅝ (1.6)	3	4	3¾ (9.5)
¾ (1.9)	4	5	4½ (11.4)
⅞ (2.2)	4	5	5¼ (13.3)
1 (2.5)	5	6	6 (15.2)

TABLE 1.—WIRE ROPE CLIPS—Continued

Improved plow steel, rope	Minimum number of clips		Minimum spacing
Inches (CM)	Drop forged	Other material	Inches
1⅛ (2.7)	6	6	6¾ (17.1)
1¼ (3.2)	6	7	7½ (18.1)
1⅜ (3.5)	7	7	8½ (21.0)
1½ (3.8)	7	8	9 (22.9)

TABLE 2

Natural Fibre Rope and Rope Slings

Load Capacity in Pounds (lbs.) Safety Factor=5

Eye and Eye Sling

Basket Hitch

Angle of rope to horizontal
90 deg. 60 deg. 45 deg. 30 deg.

Rope—Diameter nominal in.	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
½	550	250	1,100	900	750	550
9/16	700	350	1,400	1,200	1000	700
5/8	900	450	1,800	1,500	1,200	900
¾	1,100	550	2,200	1,900	1,500	1,100
13/16	1,300	650	2,600	2,300	1,800	1,300
⅞	1,500	750	3,100	2,700	2,200	1,500
1	1,800	900	3,600	3,100	2,600	1,800
1 1/16	2,100	1,100	4,200	3,600	3,000	2,100
1⅛	2,400	1,200	4,800	4,200	3,400	2,400
1¼	2,700	1,400	5,400	4,700	3,800	2,700
1 5/16	3,000	1,500	6,000	5,200	4,300	3,000
1½	3,700	1,850	7,400	6,400	5,200	3,700
1⅝	4,500	2,300	9,000	7,800	6,400	4,500
1¾	5,300	2,700	10,500	9,200	7,500	5,300
2	6,200	3,100	12,500	10,500	8,800	6,200
2⅛	7,200	3,600	14,500	12,500	10,000	7,200
2¼	8,200	4,100	16,500	14,000	11,500	8,200
2½	9,300	4,700	18,500	16,000	13,000	9,300
2⅝	10,500	5,200	21,000	18,000	14,500	10,500
Endless sling:						
½	950	500	1,900	1,700	1,400	950
9/16	1,200	600	2,500	2,200	1,800	1,200
5/8	1,600	800	3,200	2,700	2,200	1,600
¾	2,000	950	3,900	3,400	2,800	2,000
13/16	2,300	1,200	4,700	4,100	3,300	2,300
⅞	2,800	1,400	5,600	4,800	3,900	2,800
1	3,200	1,600	6,500	5,600	4,600	1,800
1 1/16	3,800	1,900	7,600	6,600	5,400	3,800
1⅛	4,300	2,200	8,600	8,600	6,100	4,300
1¼	4,900	2,400	9,700	8,400	6,900	4,900
1 5/16	5,400	2,700	11,000	9,400	7,700	5,400
1½	6,700	3,300	13,500	11,500	9,400	6,700
1⅝	8,100	4,100	16,000	14,000	11,500	8,000
1¾	9,500	4,800	19,000	16,500	13,500	9,500
2	11,000	5,600	22,500	19,500	16,000	11,000
2⅛	13,000	6,500	26,000	22,500	18,500	13,000
2¼	15,000	7,400	29,500	25,500	21,000	15,000
2½	16,500	8,400	33,500	29,000	23,500	16,500
2⅝	18,500	9,500	37,000	32,500	26,500	18,500

TABLE 3A

Polypropylene Rope and Rope Slings

Load Capacity in Pounds (lbs.) Safety Factor=6

Eye and Eye Sling

Basket Hitch

Angle of rope to horizontal

Rope—diameter nominal in.	Vertical—hitch	Choker—hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
1/2	650	350	1,300	1,200	950	650
9/16	800	400	1,600	1,400	1,100	800
5/8	1,000	500	2,000	1,700	1,400	1,000
3/4	1,300	700	2,700	2,300	1,900	1,300
13/16	1,600	800	2,600	2,300	2,200	1,600
7/8	1,800	900	3,100	2,700	2,600	1,800
1	2,200	1,100	3,600	3,100	3,100	2,200
1 1/16	2,500	1,300	4,200	3,600	3,600	2,500
1 1/8	2,900	1,500	4,800	4,200	4,100	2,900
1 1/4	3,300	1,700	6,700	5,800	4,700	3,300
1 5/16	3,700	1,900	7,400	6,400	5,300	3,700
1 1/2	4,700	2,400	9,400	8,100	6,700	4,700
1 5/8	5,700	2,900	11,500	9,900	8,100	5,700
1 3/4	6,800	3,400	13,500	12,000	9,600	6,800
2	8,200	4,100	16,500	14,500	11,500	8,200
2 1/8	9,700	4,800	19,500	16,500	13,500	9,700
2 1/4	11,000	5,500	22,000	19,000	15,500	11,000
2 1/2	12,500	6,300	25,500	22,000	18,000	12,500
2 5/8	14,500	7,100	28,500	24,500	20,000	14,500

TABLE 3B

Polypropylene Rope and Rope Slings

Load Capacity in Pounds (lbs.) Safety Factor = 6

Endless Sling

Basket Hitch

Angle of rope to horizontal
90 deg. 60 deg. 45 deg. 30 deg.

Angle of rope to horizontal

Rope—Diameter nominal in.	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
1/2	1,200	600	2,400	2,100	1,700	1,200
9/16	1,500	750	2,900	2,500	2,100	1,500
5/8	1,800	900	3,500	3,100	2,500	1,800
3/4	2,400	1,200	4,900	4,200	3,400	2,400
13/16	2,800	1,400	5,600	4,900	4,000	2,800
7/8	3,300	1,600	6,600	5,700	4,600	3,300
1	4,000	2,000	8,000	6,900	5,600	4,000
1 1/16	4,600	2,300	9,100	7,900	6,500	4,600
1 1/8	5,200	2,600	10,500	9,000	7,400	5,200
1 1/4	6,000	3,000	12,000	10,500	8,500	6,000
1 5/16	6,700	3,400	13,500	11,500	9,500	6,700
1 1/2	8,500	4,200	17,000	14,500	12,000	8,500
1 5/8	10,500	5,100	20,500	18,000	14,500	10,500
1 3/4	12,500	6,100	24,500	21,000	17,500	12,500
2	15,000	7,400	29,500	25,500	21,000	15,000
2 1/8	17,500	8,700	35,500	30,100	24,500	17,500
2 1/4	19,500	9,900	39,500	34,000	28,000	19,500
2 1/2	23,000	11,500	45,500	39,500	32,500	23,000
2 5/8	25,500	13,000	51,500	44,500	36,500	25,500

TABLE 4A.—RATED LOAD FOR GRADE 80 ALLOY STEEL CHAIN SLINGS [1]

[Chain per NACM]

Chain size nominal		Single leg sling—90 deg. to horizontal loading		Rated load double leg sling horizontal angle [2]					
				60 deg. ✓ double at 60 deg.		45 deg. ✓ double at 45 deg.		30 deg. ✓ double at 30 deg.	
in.	mm	lb	kg	lb	kg	lb	kg	lb	kg
8/32	7	3,500	1570	6,100	2700	4,900	2200	3,500	1590
2/8	10	7,100	3200	12,300	5500	10,000	4500	7,100	3200
1/2	13	12,000	5400	20,800	9400	17,000	7600	1,200	5400
5/8	16	18,000	8200	31,300	14200	25,600	11600	18,100	8200
3/4	20	28,300	12800	49,000	22300	40,000	18200	28,300	12900
7/8	22	34,200	15500	59,200	27200	48,400	22200	34,200	15700
1	26	47,700	21600	82,600	37900	67,400	31000	47,700	21900
1 1/4	32	72,300	32800	125,200	56800	102,200	46400	72,300	32800

Notes:
[1] Other grades of proof tested steel chain include Proof Coil (Grade 28), Hi-Test (Grade 43 Chain, and Transport (Grade 70) Chain. These grades are not recommended for overhead lifting and therefore are not covered by this Standard.
[2] Rating of multi-leg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load.

TABLE 4 B.—MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Nominal chain or coupling link size		Maximum allowable wear of cross-sectional diameter, In.
in	mm	
8/32	7	0.037
3/8	10	0.052
1/2	13	0.060
5/8	16	0.084
3/4	20	0.105
7/8	22	0.116
1	26	0.137

TABLE 4 B.—MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK—Continued

Nominal chain or coupling link size		Maximum allowable wear of cross-sectional diameter, In.
in	mm	
1 1/4	32	0.169

Note: For other sizes, consult chain or sling manufacturer.

TABLE 5—SAFE WORKING LOADS FOR SHACKLES

[In tons of 2,000 Pounds]

Material size (inches)	Pin diameter (inches)	Safe working load
1/4	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/2	5.6
1 1/2	1 1/4	6.7
1 1/4	1 3/8	8.2
1 5/8	1 1/2	10.0
1 1/2	1 5/8	11.9
1 3/4	2	16.2
2	2 1/4	21.1

WIRE ROPE TABLE—RATED LOADS FOR SINGLE LEG SLINGS 6 x 19 OR 6 x 37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH FIBRE CORE (FC)

[Rated Loads [1] Tons (2000 lb)]

Vertical				Chocker
Rope diameter, in.	HT	MS	S	HT. MS & S
1/4	0.49	0.51	0.55	0.38
8/16	0.76	0.79	0.85	0.6
3/8	1.1	1.1	1.2	0.85
7/16	1.4	1.5	1.7	1.2
1/2	1.8	2.0	2.1	1.5
9/16	2.3	2.5	2.7	1.9
5/11	2.8	3.1	3.3	2.3
3/4	3.9	4.4	4.8	3.3
7/8	5.2	6.0	6.4	4.5
1	6.7	7.7	8.4	5.9
1 3/8	8.4	9.5	11	7.4
1 1/4	10	12	13	9.0
1 3/8	12	14	16	11
1 1/2	15	17	18	13
1 5/8	17	19	21	15
1 3/4	20	22	25	17
2	26	29	32	22

HT=Hand tucked Splice
For Hidden Tuck Splice (IWRC), use values in HT (FC) columns
MS=Mechanical Splice
S=Poured Socket or Swaged Socket
NOTES:
(1) These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.

WIRE ROPE TABLE—RATE LOADS FOR SINGLE LEG SLINGS 6×19 OR 6×37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH INDEPENDENT WIRE ROPE CORE (IWRC)

[Rated Loads [1], Tons (2000 lb)]

Rope diameter, in.	Vertical			Choker	Vertical basket	
	HT	MS	S	HT, MS & S	[Note [2]] HT	[Note [3]] MS & S
3/4	0.53	0.56	0.59	0.31	1.1	1.1
5/16	0.82	0.87	0.92	0.64	1.6	1.7
3/8	1.2	1.2	1.3	0.92	2.3	2.5
7/10	1.5	1.7	1.8	1.2	3.1	3.4
1/2	2.0	2.2	2.3	1.6	4.0	4.4
9/16	2.5	2.8	2.9	2.0	4.9	5.5
6/8	3.0	3.4	3.6	2.6	6.0	6.8
3/4	4.2	4.9	5.1	3.6	8.4	9.7
7/8	5.5	6.6	6.9	4.8	11	13
1	7.2	8.5	9.0	6.3	14	17
1 1/8	9.0	10	11	7.9	18	20
1 1/4	11	13	14	9.7	22	26
1 3/8	13	15	17	12	27	31
1 1/2	16	18	20	14	32	37
1 5/8	18	21	23	16	37	43
1 3/4	21	25	27	19	43	49
2	28	32	34	24	55	64

HT=Hand tucked Splice
For Hidden Tuck Splice (IWRC), use values in HT columns of Table 3
MS=Mechanical Splice
S=Poured Socket or Swaged Socket
Notes:
[1] These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.
[2] These values only apply when the D/d ratio is 15 or greater.
[3] These values only apply when the D/d ratio is 25 or greater.
D=Diameter or curvature around which the body of the sling is bent
d=Diameter of rope

WIRE ROPE TABLE—RATED LOADS FOR SINGLE LEG SLINGS 6×19 or 6×37 CLASSIFICATION EXTRA IMPROVED PLOW STEEL GRADE ROPE WITH INDEPENDENT WIRE ROPE CORE (IWRC)

[Rated Loads [1], Tons (2000 lb)]

Rope diameter, in.	Vertical		Choker	Vertical Basket [Note [2]]
	MS	S	MS&S	MS&S
1/4	0.65	0.68	0.48	1.3
5/16	1.0	1.1	0.74	2.0
3/8	1.4	1.5	1.1	2.9
7/10	1.9	2.0	1.4	3.9
1/2	2.5	2.7	1.9	5.1
9/16	3.2	3.4	2.4	6.4
6/8	3.9	4.1	2.9	7.8
3/4	5.6	5.9	4.1	11
7/8	7.6	8.0	5.6	15
1	9.8	10	7.2	20
1 1/8	12	13	9.1	24
1 1/4	15	16	11	30
1 3/8	18	19	13	36
1 1/2	21	23	16	42
1 5/8	24	26	18	49
1 3/4	28	31	21	57
2	37	40	28	73

HT=Hand tucked Splice
For Hidden Tuck Splice (IWRC), use values in HT columns of Table 3
MS=Mechanical Splice
S=Poured Socket or Swaged Socket
Notes:
[1] These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.
[2] These values only apply when the D/d ratio is 15 or greater.

Appendix III to Part 1918—Container Top Safety (Non-mandatory)

Note: This Appendix is non-mandatory and provides guidance to part 1918 to assist employers and employees in complying with the requirements of this standard, as well as to provide other helpful information. Nothing in this Appendix adds or detracts from any of the requirements of this standard.

Due to the almost limitless physical possibilities dictated by such factors as vessel design; container type; container stowage; types of container hoisting gear, etc., there may be instances during vessel loading/discharge operations when it is not feasible to utilize container top fall protection devices. As a result, a case by case and event by event approach must be utilized in assessing the feasibility of providing such devices.

The following are examples of situations where fall protection *may* not be feasible:

- When hooking up to or disconnecting from an overheight container using "special" gear, where attaching fall protection to the cranes spreader bar is not allowed by the owner of the crane (for example a Port Authority).
- When handling containers, "in a chimney stow" on a break bulk vessel, with ships gear, when a personnel basket is not sufficient to be used as an anchorage point.

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