**DEPARTMENT OF LABOR**

**Occupational Safety and Health Administration**

**29 CFR Parts 1917 and 1918**

**[Docket No. S–025A]**

**RIN 1218–AA56**

## Longshoring and Marine Terminals; Vertical Tandem Lifts

**AGENCY:** Occupational Safety and Health Administration (OSHA), Labor.

**ACTION:** Proposed rule.

**SUMMARY:** OSHA published a final standard on July 25, 1997, revising all of the Longshoring Standard and related sections of the Marine Terminals Standard. In the preamble to the final rule, OSHA discussed the practice, hereafter referred to as ''vertical tandem lifts'' (VTLs), of lifting two empty intermodal containers together, one on top of the other, connected by semi-automatic twistlocks (SATLs). The final standard did not cover this practice because the rulemaking record contained insufficient information to enable OSHA to determine how to regulate the practice. The proposed standard published today would permit VTLs of two containers with a combined weight of the containers and cargo not exceeding 20 tons.

**DATES:** Comments and hearing requests must be submitted by the following dates:

*Hard Copy:* Comments and hearing requests must be submitted (postmarked or sent) by December 15, 2003.

*Facsimile and electronic transmission:* Comments and hearing requests must be sent by December 15, 2003. (Please see the Public Participation section provided under **SUPPLEMENTARY INFORMATION** for additional information on submitting comments and making hearing requests.)

**ADDRESSES:** *Written Comments and Hearing Requests:*

*Regular mail, express delivery, hand-delivery, and messenger service:* Submit three copies of your comments or hearing requests to the OSHA Docket Office, Docket No. S–025A, Room N–2625, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210. OSHA Docket Office and Department of Labor hours of operation are 8:15 a.m. to 4:45 p.m., e.s.t. Because of security-related problems, there may be a significant delay in the receipt of submissions by regular mail. Please contact the OSHA Docket Office at (202) 693–2350 for information about security procedures concerning the delivery of materials by express delivery, hand delivery, and messenger service.

*Facsimile:* If your submissions, including any attachments, are 10 pages or fewer, you may fax them to the OSHA Docket Office at (202) 693–1648. You must include the docket number of this notice, Docket No. S–025A, in your comments or hearing request.

*Electronic:* You may submit comments or electronic documents through the Internet at *http://ecomments.osha.gov.* If you have additional materials that you would like to send through the mail, you must submit three copies of them to the OSHA Docket Office at the address above. The additional materials must clearly identify your electronic comments by name, date, subject, and docket number so we can attach them to your comments.

All comments will be available for inspection and copying at the OSHA Docket Office at the address above. Comments posted on OSHA's Web page are available at *http://www.osha.gov.* OSHA cautions you about submitting personal information such as social security numbers and birth dates. Contact the OSHA Docket Office at (202) 693–2350 for information about materials not available through the OSHA Web page and for assistance in using the Web page to locate docket submissions.

**FOR FURTHER INFORMATION CONTACT:** For technical inquiries, contact Paul Rossi, OSHA, Office of Maritime, Directorate of Standards and Guidance, U.S. Department of Labor, Room N–3621, 200 Constitution Avenue, NW., Washington, DC 20210; telephone: (202) 693–2222. For general information and press inquiries, contact Ms. Bonnie Friedman, OSHA, Office of Communications, U.S. Department of Labor, Room N–3647, 200 Constitution Avenue, NW., Washington, DC 20210; telephone: (202) 693–1999. For additional copies of this **Federal Register** notice, contact OSHA, Office of Publications, U.S. Department of Labor, Room N–3101, 200 Constitution Avenue, NW., Washington, DC 20210; telephone (202) 693–1888. Electronic copies of this **Federal Register** notice, as well as news releases and other relevant documents, are available at OSHA's Web page on the Internet at *http://www.osha.gov.*

**SUPPLEMENTARY INFORMATION:** This preamble to the proposed rule for vertical tandem lifts in the Longshoring and Marine Terminals Standards discusses the events leading to the proposal, the necessity for the standard, and the rationale behind the specific provisions set forth in the proposal. The preamble also includes the Preliminary Economic Analysis, a summary of the paperwork issues under the Paperwork Reduction Act of 1995, and sections on other requirements necessary for an OSHA standard. The discussion follows this outline:

I. Background
II. Summary and Explanation of the Proposal
III. Issues for Discussion
IV. Preliminary Economic Analysis and Preliminary Regulatory Flexibility Analysis
V. Environmental Impact
VI. OMB Review under the Paperwork Reduction Act of 1995
VII. Public Participation
VIII. State Plan Requirements
IX. Federalism
X. Unfunded Mandates
XI. Authority and Signature

### I. Background

Since the 1970s, intermodalism (the containerization of cargo) has become the dominant mode of cargo transport in the maritime industry, replacing centuries-old, break-bulk cargo handling. In the marine cargo handling industry, intermodalism involves three key components: standardized containers with uniform corner castings; interbox connectors (such as SATLs) to secure the containers, either to each other at the four corners or to the deck of the ship; and a type of crane called a container gantry crane that has specialized features for the rapid loading and unloading of containers. Equipment and operational standards have been developed by the international community to facilitate intermodalism.

The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies whose mission is to promote the development of international standards to reduce technical barriers to trade. There are several ISO standards addressing the design and operational handling of intermodal containers and interbox connectors. In particular, ISO 3874 Freight Containers addresses the size and strength of containers and corner castings, the size and strength of the interbox connectors, and proper lifting techniques. During shipment, containers are secured by interbox connectors to each other and to the deck of the ship. In the conventional loading and unloading process, the container gantry crane lifts one container (either 20 or 40 feet long) at a time, using the crane's specially developed spreader beam. ISO 3874 Freight Containers also addresses the lifting of two 20-foot

containers end to end but, until recently, it has not addressed the practice of vertical tandem lifts (VTLs). A VTL is the practice of a container gantry crane lifting two or more intermodal containers, one on top of the other, connected by a particular type of interbox connector known as a semi-automatic twistlock (SATL).

The issue of vertical tandem lifting was first raised to OSHA by Matson Terminals, Inc. In 1986, through a series of meetings and correspondence with OSHA (Exs. 40–1, 40–2, 40–3, 40–4, 40–5, 40–6, 40–6–1, 40–7), Matson asked to be permitted to lift two containers at a time, connected by SATLs, either empty or with one or both containers containing automobiles. At that time, OSHA regulations did not directly address or prohibit this practice. The container handling regulation § 1918.85(c) stated, ''all hoisting of containers shall be by means which will safely do so without probable damage to the container, and using the lifting fittings provided.'' In November 1986, OSHA, in a letter to Matson (Ex. 40–8), allowed the company to lift containers, either empty or with one or both containers containing automobiles, in VTLs. The letter to Matson stated that:

> The CSHO (Compliance Safety and Health Officer) must be mindful of the manufacturer's specifications and endorsement, the Matson engineering technical specifications, the ABS Test Report, as well as, maintained conditions of the corner posts, the twistlocks, the cones, the containers and the hoisting and/or lifting devices. (Ex. 40–8)

At a 1998 OSHA public meeting on VTLs, a Matson representative testified that, since 1986, they had performed over 47,000 VTLs without incident (Tr. p. 173 (''Tr.'' refers to the transcript of the 1998 public meeting discussed below)).

In 1993, OSHA received a letter from Sea-Land Service, Inc. requesting that OSHA interpret its existing longshoring standards to allow the lifting of two empty 40-foot ISO freight containers that were vertically coupled using SATLs (Ex. 1). OSHA's standards had not changed since OSHA's letter to Matson. In its response, OSHA allowed Sea-Land to handle two empty containers vertically connected, provided that eight requirements were met (Ex. 2). The requirements were developed by OSHA's Directorate of Compliance Programs (now called the Directorate of Enforcement), taking into account applicable OSHA standards and related industry practices associated with container cargo handling operations. These eight requirements are: inspecting containers for visible defects; verifying that both containers are empty; assuring that containers are properly marked; assuring that all the SATLs operate (lock-unlock) in the same manner; assuring that the load does not exceed the capacity of the crane; assuring that the containers are lifted vertically; having available for inspection manufacturers' documents that verify the capacities of the SATLs and corner castings; and directing employees to stay clear of the lifting area.

In 1994, OSHA addressed VTLs briefly in a paragraph of the Preamble of the proposed revisions to the Marine Terminals and Longshoring Standards (59 FR 28602), stating: ''In those situations where one container is used to lift another container, using twistlocks, then the upper container and twistlocks become, in effect, a lifting appliance and must be certified as such.'' OSHA received comments on this issue only from the International Longshore and Warehouse Union (Exs. 4, 5, and 6). Although these comments favored the proposed interpretation and requested the Agency to include it as a requirement in the regulatory text, they included no specific information regarding the hazards of VTLs of two containers using SATLs. Sea-Land submitted a detailed six-page comment (Ex. 7) addressing a number of the proposed changes to the Marine Terminals and Longshoring Standards, but did not address VTLs. OSHA received a late, post-hearing submission from the International Longshoremen's Association, however, that alerted the Agency to what might be a serious problem with this type of lift, citing several incidents at U.S. ports where failures had occurred (Ex. 8). OSHA did not rely on this last letter in issuing the final rule because it was not a timely submission to the record. However, the letter made OSHA aware of safety concerns that might need to be addressed through supplementary rulemaking. Because of a lack of information on the safety considerations, cost impacts, and productivity effects of VTLs, as well as on the capability of containers and SATLs to withstand such loadings, OSHA reserved judgment on the appropriate regulatory approach to this practice, pending further study (62 FR 40152).

Up to the publication of the final Longshoring and Marine Terminals Standards in 1997, OSHA viewed the lifting of one container by another container using SATLs as similar to a container spreader picking up a single container using the spreader's twistlocks. Although the terms ''semi-automatic twistlocks'' and ''twistlocks'' appear similar, they refer to two very distinct items. SATLs were designed to connect and secure intermodal containers that are stowed on the deck of a vessel. They are generally made of a cast metal with a surface that has not been finely honed. By contrast, a twistlock is an integral part of a gantry crane's container spreader. It has a similar appearance to a SATL, but is made of forged metal with a machined surface. These twistlocks are locked and unlocked with hydraulic power, and used as part of the gantry crane to lift and move containers.

In lifting the bottom container in a VTL, the upper container serves the same role as a container spreader on a gantry crane, and the SATLs do the same job holding the bottom container as do the twistlocks on the container spreader.

A gantry crane's container spreaders are considered a ''lifting appliance,'' according to the International Labor Organization (ILO) Convention 152 Dock Work, portions of which OSHA incorporated or adopted in the Longshoring Standards in 29 CFR part 1918. The ILO is a specialized, independent agency in the United Nations which has a unique tripartite structure of business, labor, and government representatives. Its mandate is to improve working conditions (including safety), create employment, and promote workplace human rights, globally. Under ILO Convention 152, a lifting appliance, including the twistlocks, must be proof-load tested and inspected before initial use and periodically retested and re-inspected. However, applying that same requirement to a VTL situation would be much more difficult to accomplish. It would require a specific container (the one being used to lift another container) and four specific SATLs to be tested and inspected as a unit and to remain as a unit for retesting and reinspection. Given the millions of intermodal containers and millions more SATLs used in the maritime cargo handling industry, matching a specific container and four SATLs for VTL use over any length of time is nearly impossible. In view of this impracticality, OSHA sought an interpretation from the ILO, which is discussed below.

On October 9, 1997, OSHA re-opened the VTL record with a **Federal Register** notice that also announced a public meeting that was held in Washington, DC, on January 27, 1998 (62 FR 52671). The transcript for this public meeting is docket exhibit number ''22x.'' The transcript will be referred to in this Preamble as ''Tr.'' followed by a page

number (that is, as ''Tr. p. 33'' rather than ''Ex. 22x, p. 33''). At that public meeting, OSHA heard testimony from 25 witnesses, representing the U.S. Coast Guard, the ISO, national and international maritime safety associations, container and twistlock manufacturers, ship operators, stevedoring companies, and longshore unions.

Shortly after the public meeting, OSHA decided on a multi-faceted approach to resolve the questions raised during the January meeting:

a. Contract with the National Institute of Standards and Technology (NIST) to conduct engineering studies about the strength and durability of container corner castings and SATLs;

b. Meet with the International Cargo Handling and Coordination Association (ICHCA)[1] about international safety aspects of VTLs;

c. Meet with the ILO to clarify the ambiguity in existing interpretations of ILO Convention 152;

d. Monitor the ISO deliberations regarding VTLs; and

e. Form a workgroup within the Maritime Advisory Committee on Safety and Health (MACOSH) to address issues relating to VTLs and report back to MACOSH.

MACOSH was chartered by the Secretary of Labor to advise OSHA on matters relating to its occupational safety and health standards in the maritime industries. Committee members on MACOSH represent employers, employees, the States, the National Institute for Occupational Safety and Health (NIOSH), and other groups affected by maritime standards. During a MACOSH meeting held in Hampton, Virginia, on September 22 and 23, 1998, a VTL workgroup was formed consisting of the MACOSH longshore management and labor representatives, with participation by many other interested stakeholders. Over the next several years, the VTL workgroup discussed VTL issues at informal working group meetings and during MACOSH meetings.

On September 28, 1998, members of MACOSH's VTL workgroup met with ICHCA in Malmö, Sweden, to discuss the VTL issue. This was followed by a meeting with ILO in Geneva, Switzerland. The discussion with the ILO focused on the issue of determining whether the components of a VTL (the upper intermodal container and the SATLs) are either ''a lifting appliance'' or ''loose gear.'' On October 21, 1998, an ILO official indicated to OSHA that the ILO considers SATLs used for lifting to be ''loose gear'' (Exs. 31 and 32). The significance of this decision is that loose gear, under ILO Convention 152, must be tested and inspected before initial use and re-inspected on an annual basis, as opposed to a ''lifting appliance,'' which must be retested at least once every five years. Retesting of a lifting appliance in a VTL would require that a specific container and four specific SATLs used for VTLs be proof load tested before initial use and every five years thereafter. As mentioned previously, this would be almost impossible to do.

During a MACOSH meeting held at the U.S. Merchant Marine Academy, Kings Point, New York, in July 1999, Dr. H.S. Lew of NIST presented a report on the strength of SATLs, latchlocks (a device similar in usage to a SATL, but of a different design), and container corner castings (Ex. 40–10). Dr. Lew's study indicated that the SATLs he tested were very substantial with load capacities ranging from 562 kiloNewtons (kN) (126,400 pounds per square foot (lb/f$^2$)) to 802 kN (180,300 lb/f$^2$), and that the container corner castings were more likely to deform and fail before the SATLs. However, he expressed reservations about a particular type of interbox connector, called a single-sided latchlock, because of its smaller bearing surface contact with the corner casting. The smaller surface area makes it more likely that, if the spring-loaded latch does not extend fully inside the container corner casting, it could slip through the hole in the corner casting when under load, such as when lifting another container. Even when the lock of a single-sided latchlock was fully extended, the NIST study determined that its surface area was insufficient for doing VTLs. In regard to the strength of SATLs, the conclusions of the NIST study were similar to a Swedish study (Ex. 11–6 H) that was conducted in 1997 by the Swedish National Testing and Research Institute.

On September 8, 2000, the USA delegation to ISO Technical Committee Number 104 Freight Containers (ISO/TC 104) held a meeting in Washington, DC, primarily to discuss the U.S. position on VTLs for the ISO biennial meeting to be held in October. After this meeting, OSHA sent a letter to the Chairman of ISO/TC 104 addressing concerns such as safety factors, the use of latchlocks, and the lack of operational procedures (Ex. 40–11).

At their biennial meeting in Cape Town, South Africa, in October 2000, the ISO/TC 104 agreed that SATLs, which previously were only used for securing containers, could be used to lift containers. However, the ISO/TC 104 language did not address the question of how to use SATLs safely for such lifting, because ISO does not issue standards for operational procedures. In response to safety concerns in this area, ISO/TC 104 passed a resolution, requesting that ICHCA, a member of ISO/TC 104, develop operational guidelines for VTLs. ICHCA agreed to work on such guidelines.

In May 2002, ISO formally adopted language allowing SATLs that meet certain conditions to be used for lifting:

> The vertical coupling of containers that are not specifically designed as in 6.2.4 [ISO 3874] for lifting purposes, using twistlocks or other loose gear, is acceptable if forces of not greater than 75 kN[1)] act vertically through each corner fitting, and the twistlocks or other loose gear used are certified[2)] for lifting. The twistlocks or other loose gear shall be periodically examined (Ex. 40–9).

Footnote 1 states:

> The value of 75 kN prescribes the minimum structural capability of the lock/corner fitting combination. The 75 kN value includes an arbitrary constant wind load of 26 kN (corresponding wind speed of 100 km/h), regardless of the size of the containers. As an example, the balance of the 75 kN value equates to two 1 AAA containers with a combined tare of 22 kN and a maximum payload of 27 kN. A practical upper limit of three vertically-coupled containers is also envisaged (Ex. 40–9).

Footnote 2 states:

> The certification process envisaged is to use a safety factor of at least four based on the ultimate strength of the material (Ex. 40–9).

Essentially, this means that, based on the strength of the SATLs and the containers, the ISO standard would allow VTLs to consist of up to three containers with a total load weight of 20 tons.

In January 2001, an ICHCA VTL workgroup met in London to begin drafting operational guidelines for VTLs as agreed to at the Cape Town meeting. The ICHCA workgroup finalized their VTL guidelines in September 2002, and received final approval by ICHCA's Board of Directors in January 2003. OSHA has given careful consideration to the ICHCA guidelines in the drafting of this proposed rule. A copy of the guidelines is available in the docket (Ex. 41). The guidelines are available for purchase through ICHCA's Web site: *http://www.ichcainternational.co.uk/.*

*A. International Aspects*

As with all Federal agencies whose regulations influence international

[1] ICHCA is an independent, non-political international membership organization established in 1952, whose membership spans some 85 countries and comprises corporations, individuals, academic institutions and other organizations involved in, or concerned with, the international transport and cargo handling industry.

trade, OSHA has developed this proposal in light of international considerations. Through domestic law and international agreements, the United States has indicated its intention that wherever possible, standards-related activities should not be a barrier to trade. The Trade Agreements Act of 1979 (19 U.S.C. 2501 *et seq.*) addresses technical barriers to trade regarding federal regulation. Section 2532 of this Act states the following:

> Section 2532. Federal standards-related activities. No Federal agency may engage in 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:

> [U]ndertake to co-operate 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 in formalities, documentary requirements and procedures necessary to meet special requirements of a domestic nature. (Article 3)

Mindful of these international aspects, OSHA has sought to formulate a protective but flexible approach to VTLs. OSHA is confident that its proposed requirements for VTLs are consistent with the relevant provisions of ILO Convention 152 and with most of the provisions of the ISO standard and ICHCA guidelines.

*B. Risks and Benefits of VTLs*

VTLs can reduce the time it takes to load or unload containers from a ship. The productivity gain is reported to be 5 to 10 percent of the total time (see the Preliminary Economic Analysis below). Although there are some costs associated with extra engineering and work practice controls necessary to handle VTLs safely, the evidence indicates that these costs are outweighed by the overall cost savings to unload the ship. The fact that stevedores have requested OSHA's guidance in performing VTLs and that some are currently performing these lifts is further evidence that they provide cost savings. The cost savings come from reducing the time (labor costs) for the longshore operations (loading and unloading), and, perhaps more significantly, of hourly capital and labor costs for the cargo ship. VTLs appear to be more economically advantageous when ships are loading or unloading large numbers of empty containers. The extent of the use of VTLs may therefore be dependent on the pattern of trade; for example, when imports exceed exports resulting in more empty containers being shipped out of a U.S. port.

OSHA's current longshoring and marine terminal standards do not prohibit VTLs of empty containers. The Agency's standards also allow for lifting of loaded containers, without specifying whether they are handled singly or as a VTL, if the containers are ''handled using lifting fittings or other arrangements suitable and intended for the purpose * * *'' (29 CFR 1918.85(f)(1)(iv)).

The ISO's central criterion for VTLs is that the maximum total weight that can be safely lifted in a VTL is 20 tons. It would allow employers to perform VTLs of combinations of empty containers and loaded containers as long as they do not exceed 20 tons (total load weight). In setting a 20-ton limit, ISO evaluated the strength of containers, their corner castings, and the SATLS used for lifting, but did not evaluate the work practices and controls necessary to ensure safe handling . ISO based its limit on research (sponsored by OSHA) by NIST (Ex. 40–10), a study by the Swedish National Testing and Research Institute (Ex. 11–6 H), and ISO's own technical knowledge of containers and SATLs (Ex. 11–6–C). The 20-ton limit provides a margin of safety of a factor of five for strength. (A safety factor of five means that the SATLs and corner castings would not fail with a lift weighing 100 tons. It also means that for a VTL of two containers, if the bottom one was fully loaded, the corner castings and SATLs would still not fail.) OSHA preliminarily concludes that, based on the established strength of containers and liftlocks, VTLs up to 20 tons are safe. (Under the proposal, a SATL may be used as a liftlock only if it has been tested, inspected, certified, and marked with a safe working load.)

ISO concluded that VTLs with a 20-ton maximum weight would mean a ''practical'' limit for VTLs of three containers (Ex. 40–9). To the best of the Agency's knowledge, employers are not performing VTLs of more than two containers in the United States.

OSHA has preliminarily concluded that the strength of the containers and liftlocks constitutes one factor, but not the only factor to be considered in performing VTLs safely. Employers must also follow safe handling procedures, including the use of appropriate engineering controls [such as load indicating devices (LIDs)], work practice controls (such as pre-lifts), and administrative controls (such as annual inspection of liftlocks and containers) for handling VTLs. Many of these control measures address risks that were first identified in OSHA's 1994 letter to Sea-Land, permitting VTLs of two empty containers.

The ICHCA guidelines set forth a series of safe handling procedures. As discussed further below, OSHA's proposed rule incorporates many of these procedures, including: requiring annual and on-going inspections of liftlocks and containers; prohibiting spring-loaded latchlocks for VTLs; requiring stevedores to have a written VTL terminal plan for handling VTLs in the terminal; requiring each ship to use only a single type of liftlock; requiring LIDs on container gantry cranes; prohibiting VTLs when winds exceed 34 mph; and requiring pre-lifts to ensure that all liftlocks on the VTL are engaged and holding before raising the VTL unit higher.

VTLs have been performed in the United States since 1986. As noted earlier, Matson reported that they had performed almost 50,000 VTLs of two empty containers or two containers loaded with automobiles without an injury to employees or a documented accident between1986 and 1998 (Tr. p. 166). Sea-Land reported that by 1999, it had performed 300,000 VTLs of two empty containers without injury (Ex. 36). However, Sea-Land has reported three accidents. The cause of one was unrelated to the typical risk of VTLs—the crane legs did not have sufficient clearance for VTLs and the containers struck the crane legs, causing the lower container to separate from the top container and fall. Sea-Land reported that the crane operator and superintendent violated company rules in this instance (Tr. p. 208). In the second accident, two containers ''alligatored'' without completely separating when the two SATLs on one end were not engaged in the top corner castings of the bottom container. Following this incident, Sea-Land reported that they instituted a pre-lift test when performing VTLs. In a pre-lift, the combined containers are lifted a few feet up to ensure that all liftlocks are engaged in the corner castings before continuing the lift. A third accident occurred when spring-loaded latchlocks were used to secure containers together. The design of those latchlocks leaves

them susceptible to becoming fouled with dirt or other debris. If that occurs, they may not fully extend, causing them to have insufficient contact area with the corner casting. In the case of the third accident, there were no injuries and the accident would have been avoided by using regular SATLs which close positively when the containers are mated and have handles indicating their open or closed state (which is required by the Proposal). The Agency contracted with Robert Baron, an expert in the longshoring industry, to find other reported incidents or accidents involving VTLs, but none besides those mentioned above were found and verified (Exs. 42, 42–1, 42–2).

As will be discussed further below, provisions in OSHA's proposal would have prevented the second and third VTL accidents just discussed. (Normal operating procedures that prohibit the handling of containers that do not fit between the legs of a crane should have prevented the first accident.) The Agency preliminarily concludes that the procedures required in the proposal will substantially reduce the risk to employees of performing VTLs for these same reasons.

The Agency is concerned that lifting loaded containers in a VTL presents additional hazards to those involved with lifting empty ones. Loaded containers are more likely to have errors in weighing; so it is more likely that an overweight lift will be attempted—one weighing more than 20 tons. Secondly, loaded containers have loads that could shift during ocean transit or while being lifted by the container gantry crane (VTLs of containers with bulk and liquid cargoes would be prohibited for this reason). The Agency seeks comment on these issues and any other issues that pertain to the risk of lifting loaded versus empty containers.

The Agency is aware that containers fail even in single lifts, although this is very rare. The Agency has preliminarily concluded that, when the proper work practice precautions as specified in the proposed standard are followed, employers who follow the proposal will be able to perform VTLs safely. The industry's experience with VTLs of two containers (about 350,000 over 15 years) is substantial but relatively small when compared to the 13 million single lifts performed annually. In addition, to OSHA's knowledge, all VTLs performed in the U.S. to date have consisted of only two containers. Although the Agency has preliminarily concluded, based on the information in the record of this rulemaking, that VTLs can be performed safely with 2 containers, it has concerns about whether additional containers would increase the risk to employees and necessitate the use of additional controls and work practices. The Agency seeks comment on the relative risk of lifting VTLs of two versus three containers. What are the additional sources of risk in lifting three containers? Are there additional safety measures that would reduce the risk of VTLs of three containers? If VTLs of three containers separated or failed, they potentially could fall much further from the crane; that is they would have a bigger ''footprint'' than VTLs with two containers, and thus would expand the area in which longshore workers are exposed to the risk of falling containers.

Clearly the number of empty or loaded containers permitted in a VTL by this proposed standard is a central issue in this rulemaking. The Agency welcomes comment on this issue.

OSHA also solicits information on whether employers have had experience with VTLs of more than two containers, either in the U.S. or in other countries. The Agency has preliminarily concluded that the proposed standard is feasible and that it will protect employees. The Agency also requests comment on the issue of whether or not VTLs reduce the number of lifts and time longshoremen spend unloading a vessel, thus potentially reducing the risk of handling containers. The performance of VTLs is an option for employers, and OSHA's intent is to provide safe methods for employers who choose to exercise that option.

Based on the technical studies performed on containers and SATLs, and the safe work procedures required in the proposal, the Agency also concludes that the proposal is technologically feasible (see Preliminary Economic Analysis below). Indeed, VTLs of two empty or partially loaded containers have been performed for many years. In addition, since the proposal does not require the use of VTLs when handling containers, employers may choose to perform VTLs or continue to handle containers in single lifts.

In addition, based on the Agency's Preliminary Economic Analysis (below) that VTLs, if they are used, may result in overall cost savings in cargo operations, the Agency likewise concludes that the proposal is economically feasible and cost-effective.

## II. Summary and Explanation of the Proposal

OSHA is proposing to issue new provisions in the Longshoring and Marine Terminals Standards (29 CFR parts 1918 and 1917) to regulate the use of VTLs. These proposed provisions are based on objective research, industry experience with VTLs, ISO standards, the ICHCA VTL guidelines, and comment and testimony from the Agency's public meeting in January 1998. The proposed standards provide safe work procedures (engineering, work-practice, and administrative controls) for lifting two empty or partially loaded containers, with a total weight of up to 20 tons, connected by liftlocks. Testing has demonstrated that the liftlocks permitted by the proposal are substantially strong enough to lift 20 tons with a safety factor of five.

The proposed regulations for VTLs are contained in both the Marine Terminals Standard (29 CFR 1917) and the Longshoring Standard (29 CFR 1918). OSHA proposes that VTLs only be performed by a shore-based container handling gantry crane. In accordance with 29 CFR 1917.1(a), which states that cargo handling done by a shore-based crane is covered by part 1917, the proposed regulations that address the make-up of a VTL, such as the number of containers and maximum weight, would be in part 1917. Proposed regulations that address the certification and testing of liftlocks are in both parts 1917 and 1918. Liftlocks are vessel's gear, that is, gear owned and maintained by the vessel, and they would be addressed in part 1918. However, liftlocks can also be used in the marine terminal to assemble VTLs prior to loading on the vessel: therefore, the same certification and testing requirements for liftlocks that are proposed in part 1918 are also proposed in part 1917. The proposed VTL regulations for part 1917 are discussed first.

### A. Part 1917—Marine Terminals Standards

In § 1917.2 and § 1918.2 Definitions, OSHA is proposing to add the definition of a VTL as ''the operation of lifting two intermodal containers that are coupled together vertically (one on top of the other).'' OSHA is also proposing to include the definition of ''liftlock'' to both parts. This definition differentiates liftlocks, which are certified and used for lifting, from SATLs or other inter-box connectors, which are not certified and only used for securing containers on a vessel.

In § 1917.3(c), Incorporation by Reference, OSHA is proposing to add parts of ISO Standard 3864 that apply to VTLs.

Section 1917.46(a)(1)(viii) does not currently require a load indicating device (LID) for container handling gantry cranes. This is because the safe working load (SWL) of these cranes does

not vary with the location of the load. However, in using these cranes to perform VTLs, a LID is needed, both to prevent the crane from being overloaded by multiple containers and to assure the liftlocks and the containers used in the VTL are not overloaded. Accordingly, this proposal would revise paragraph 1917.46(a)(1)(viii) to require a LID when performing VTLs. OSHA has concluded this is necessary because if two containers weighing more than 20 tons are lifted in a VTL by mistake, the crane operator will realize this condition through the reading on the LID and be able to lower the load before overloading the liftlocks, upper container, or the crane itself. OSHA believes that the LID requirement is essential to the safe handling of VTLs.

The Marine Terminal Standards require that the employer know whether a container is empty or loaded before it is hoisted (29 CFR 1917.71(b)(1) and (b)(2)(ii)). For containers being discharged from a vessel, most employers and employees rely on the vessel cargo stowage plan, also called a stow plan, that shows: The location of each container on the vessel, the container's unique identification number, the weight of the container, and other information, such as if the container contains hazardous material. For containers being loaded onto the vessel, the same information is contained on a stow plan that shows where the containers are to be placed on the vessel. This method of determining the weight of a container is adequate for handling containers individually. This is because if the stow plan understates the weight of the container, the hoisting of a fully loaded container will not overload the crane. However, it is not adequate for handling a VTL, because if the weights of multiple containers are understated, the hoisting of those containers in a VTL could overload the crane. A crane operator testified that:

> I know I've picked up containers they told me were empty and I say it's a load. And they say, no, it's an empty. I tell them, listen, this is a load. And they don't know it until they get it down. (Tr. p.252).

The proposed LID requirement for VTLs is supported by comments already received by the Agency from the public meetings. One commenter observed:

> What concerns Peck and Hale as an American based company that supplies equipment to ships worldwide is that of safety. OSHA can approve empty lifting but no one can guarantee that these containers are empty. Containers are shifted in ports. Containers are mismarked and not accurate [sic] weighed. (Tr. p.161.)

Proposed paragraph 1917.71(b)(9) requires that a copy of the vessel cargo stowage plan be given to the crane operator. This paragraph also requires that the vessel cargo stowage plan be used to identify the location and characteristics of any VTLs to be lifted. Although crane operators may not be accustomed to referring to a vessel cargo stowage plan while handling containers, this requirement will help the crane operator to better anticipate and focus on the VTL operation. This provision would supplement existing § 1917.71(b)(1) and (b)(2)(ii), which require those in charge of loading to be notified of the location of all empty and loaded containers that are to be handled as VTLs.

Proposed paragraph 1917.71(b)(10) requires that the crane operator conduct a pre-lift before hoisting a VTL. A pre-lift is a pause in the VTL as the initial strain is taken and the lifting frame wires tensioned, which allows a physical testing of the liftlocks to ensure that they are engaged. This is consistent with the practice previously described by Sea-Land.

Existing paragraph 1917.71(f) addresses the normal handling of containers. OSHA is proposing to add additional operational requirements to this paragraph for performing VTLs, based on research studies, ISO Standard 3874, and the ICHCA VTL guidelines.

Proposed § 1917.71(f)(3)(i) limits a VTL to two ISO series 1 containers [2], with a total weight of 20 tons, which includes the weight of the container directly under the spreader bar.

Proposed § 1917.71(f)(3)(ii) requires that VTLs be handled only by container gantry cranes. This is necessary because this type of crane is specifically designed to handle intermodal containers and has the precise control needed for such lifts. While this control is important for handling single containers, it is even more important when handling VTLs, because the volume of the load and the sail area created by the VTL are greater.

Proposed paragraphs 1917.71(f)(3)(iii), (iv), (v), and (vi) are a listing of ''do nots'' when handling VTLs. Proposed paragraph 1917.71(f)(3)(iii) would prohibit VTLs for containers with hazardous cargo, liquid or solid bulk cargoes, or flexible tanks that are full or partially full. Any failure of a container with a hazardous cargo poses a very significant risk to employees. Bulk cargoes can quickly shift inside the container, causing a free surface effect that can move the weight of the container to one end. This would quickly increase the weight on two of the four liftlocks and could lead to failure. Containers loaded with such cargo must be handled individually. Containers holding liquids pose a similar hazard of shifting or spilling cargo.Paragraph 1917.71(f)(3)(iv) addresses platform containers, or ''flat racks.'' Platform containers are those that are open on the sides and top, but have panels on both ends. These end panels are either fixed or can be folded flat with the floor of the container, depending on the design of the flat rack. When the end panels are in the upright position, handling as a VTL is not allowed in proposed paragraph (iv) because the lack of sides and roof lessen the stability and strength of the container. However, under paragraph 1917.71(f)(3)(iv), if empty platform containers have the ends folded down, and have built-in connectors that are designed for the purpose of lifting multiple units, they may be handled in accordance with manufacturers' recommendations. This continues a current industry practice (Exs. 10–2, 10–2A, 10–2B, and 11–6C). Two flatracks with the ends folded down may be handled as a VTL if they are connected by liftlocks that are not built-in.

Paragraph 1917.71(f)(3)(v) would prohibit VTLs of any containers that are in the hold of a vessel. Containers are stacked in the hold in cell guides, which are steel beams constructed to secure stacks of containers. There is not enough clearance for the handle of a liftlock between the liftlock and the cell guide. If used, the handles of liftlocks would break off in the cell guide as containers were lowered into the guide. It would also be very difficult or even impossible for the crane operator or other observer to see whether the liftlocks are in the locked position, or to determine the condition of the containers or liftlocks.

Paragraph 1917.71(f)(3)(vi) prohibits the handling of VTLs when the wind speed exceeds 34 mph. At the request of the ICHCA VTL workgroup, an engineering analysis was conducted by a consultant to determine an appropriate maximum wind speed for VTLs (Ex. 41, Appendix 4). The 34-mph limit was calculated based on a three-container VTL with a total weight of 20 tons.

Existing paragraphs 1917.71(f)(3), (f)(4), and (f)(5) have been redesignated as 1917.71(f)(4), (f)(5), and (f)(6), respectively.

Proposed paragraph 1917.71(i) prohibits the movement of VTLs on flat bed trucks, chassis, bomb carts, or

[2] An ISO series 1 container is one that is intended for intercontinental use and is in compliance with relevant ISO standards.

similar type equipment, unless the equipment is specifically designed to safely handle VTLs or has been evaluated by a qualified person and determined to be a safe mode of operation. Moving two containers on such equipment raises the center of gravity higher than the equipment was designed for, increasing the possibility of turning over. A study was conducted at the request of the ICHCA VTL work group to determine the safe turning radius and speed with which VTLs may be moved in a terminal (Ex. 41, Appendix 6). This study provides chassis stability calculations for determining the speed at which a fifth wheel and chassis carrying VTLs will overturn while making a turn. These calculations could be used by employers to determine the safe operating speeds for transporting VTLs at a terminal. Safe transport of VTLs and safe operating speeds are part of the VTL terminal plan required in the next paragraph. Proposed paragraph 1917.71(i) defines a qualified person as ''one with a recognized degree or professional certificate and extensive knowledge and experience in the transportation of vertically connected containers who is capable of design, analysis, evaluation and specifications in that subject.'' This definition is similar to the one found in § 1918.85(k)(6) and (8) concerning fall protection systems.

Proposed paragraph 1917.71(j) requires, in conjunction with paragraph (i), that a written VTL terminal plan be developed and implemented to facilitate the safe movement of vertically connected containers in a marine terminal. The plan must include safe operating speeds, safe turning speeds, and any conditions unique to the terminal that could affect VTL operations.

Proposed § 1917.71(k) requires the employer establish a system that keeps damaged or defective liftlocks separate from working liftlocks. This is now typically done by having a separate storage bin marked for damaged or defective SATLs and instructing employees to put any that do not function normally into that bin. This will typically be part of regular, on-going inspections of liftlocks as they are handled.

Proposed paragraphs 1917.71(l)(1)(i) through (l)(1)(vii) and (l)(1)(ix) require that any liftlocks that are used to assemble VTLs ashore comply with the applicable standards of ISO 3874 and the loose gear requirements of ILO Convention 152 that are more fully discussed below in the section explaining the VTL proposed regulation for part 1918.

Proposed 1917.71(l)(1)(viii) is a requirement for liftlocks that is not repeated in part 1918. It requires that the liftlocks that are used to connect containers to be loaded as a VTL be the same as the liftlocks on the vessel to which the connected containers will be transferred. This requirement will ensure that VTLs made up on the terminal under the requirements of part 1917 are using certified liftlocks that are the same as those used on the vessel onto which the VTLs will be loaded. This is to eliminate the danger of having more than one type of liftlock on a vessel. Mixing different types of liftlocks could result in mismatched liftlocks on a container that do not all lock (or unlock) in the same direction. Longshore employees and crane operators look for the ''telltales'' (a part of the liftlock that indicates whether the liftlock is locked or unlocked), or the handles of the liftlocks, all to be facing in the same direction to determine whether or not containers are free to be lifted or, in a VTL, are locked together for lifting. Mixing types of liftlocks could cause a VTL to separate when being lifted because different liftlocks with reverse locking indicators could mistakenly appear to be locked when they are in fact unlocked.

Proposed paragraph 1917.71(l)(2) defines a competent person as ''a person familiar with the proper maintenance and use of liftlocks by training or experience. Such a person will be able to detect defects or weaknesses and be able to assess their importance in relation to the safe and continued use of the liftlocks.'' The proposed definition for competent person is more appropriate for VTL operations than the existing definition found in OSHA's shipyard standard, 29 CFR 1915.4, which is concerned with atmospheric hazards.

Proposed paragraph 1917.71(m) prohibits the use of manual twistlocks or latchlocks as liftlocks, which is further discussed below.

B. Part 1918—Longshoring

In 29 CFR part 1918, Safety and Health Regulations for Longshoring, OSHA proposes to add several definitions relating to VTL operations. In § 1918.2 Definitions, OSHA proposes to add the terms *competent authority, liftlock,* and *vertical tandem lift.*

The longshoring standards require certain equipment to be certificated by a competent authority. Currently, loose gear (which under this proposal would include liftlocks) in the U.S. is certificated by OSHA-accredited agencies under 29 CFR part 1919, Gear Certification. Foreign flag vessels carry certificates issued by the recognized body appropriate for that country. Often the recognized body issuing certifications is a classification society such as the American Bureau of Shipping, Lloyds Register, or Bureau Veritas.

For the purpose of this proposed VTL standard, OSHA is defining competent authority as ''the appropriate government agency having jurisdiction over VTL operations in each port of call where such operations are proposed.'' OSHA or the U.S. Coast Guard would be the competent authority for certifications in the United States. Other countries would have their own competent authority that would have jurisdiction over VTL operations in that country. Certification of liftlocks, which is verified by certificates issued by agencies authorized by a competent authority, is the primary way an employer will determine that liftlocks on a vessel (or ashore) can be used for lifting. These certificates are found in the vessel's cargo gear register.

OSHA is proposing in § 1918.2 to include the same definitions for *liftlock* and *vertical tandem lifts* as proposed and discussed previously for § 1917.2.

In § 1918.3(c), Incorporation by Reference, OSHA is proposing to add parts of ISO Standard 3874 that apply to VTLs.

Proposed § 1918.85(f)(3)(i), (ii), (iii), (iv), and (v) adopt provisions for liftlocks (as loose gear), including testing, inspection, and marking before initial use. Paragraph 1918.85(f)(3)(i) would require that liftlocks meet the applicable requirements found in ISO 3874. Paragraph 1918.85(f)(3)(ii) would require that each liftlock has ''been inspected by a competent person, certificated, and individually tested in accordance with requirements for loose gear in ILO Convention 152 before being used for the first time and after any substantial alteration or repair.'' Testing means that each liftlock has been tested to a SWL of 10,000 kg as required in paragraph (iv) discussed below.

Proposed paragraph 1918.85(f)(3)(iii) would require that liftlocks be thoroughly examined at least once a year by a competent person. It also states what is required by this thorough exam: A visual exam for obvious structural defects; physical operation of the parts to determine that the lock is fully functional with adequate spring tension on each head or latch; a check for excessive corrosion and deterioration; and immediate removal from service when found to be defective. This is consistent with ILO Convention 152 regarding loose gear.

Proposed paragraph 1918.85(f)(3)(iv) would require that liftlocks be regularly examined, including a visual inspection, which could be done by employees involved in the VTL operation, before each use. This is consistent with OSHA standards and with ILO Convention 152 and will help identify defective liftlocks on an on-going basis.

Proposed paragraph 1918.85(f)(3)(v) would require that liftlocks to be certificated with a SWL for lifting of at least 10,000 kg., in accordance with ICHCA guidelines (Ex. 41, Section 8).

Proposed paragraph 1918.85(f)(3)(vi) would require that every liftlock be clearly and durably marked with its SWL for lifting, together with a number or mark that identifies it as a liftlock and connects it with its test certificate. This marking and certification must be done before any liftlock is used for lifting. Although the ICHCA guidelines allow for batch testing, OSHA's proposal would require individual testing in accordance with ILO Convention 152, which is discussed in the next section.

Proposed paragraph 1918.85(f)(3)(vii) addresses the characteristics of the liftlock. All liftlocks on a vessel shall lock and unlock in the same manner. Some liftlocks lock and unlock in a horizontal direction, others in a vertical direction. What is important and required is that all the liftlocks on a vessel work in the same manner to allow employees involved in VTLs to know whether or not the locks are locked or unlocked before a lift is performed. In order for an observer to visually determine whether the liftlocks are locked or unlocked, they must have a ''telltale,'' which is typically a solid metal lever or a flexible wire, possibly painted to enhance visibility. This allows employees working with VTLs to see whether a liftlock is locked or unlocked.

Proposed paragraph 1918.85(f)(4) defines a competent person as ''a person familiar with the proper maintenance and use of liftlocks by training or experience. Such a person will be able to detect defects or weaknesses and be able to assess their importance in relation to the safe and continued use of the liftlocks.'' The proposed definition for competent person is more appropriate for VTL operations than the existing definition found in OSHA's shipyard regulations, 29 CFR 1915.4, which is concerned with atmospheric hazards.

Proposed paragraph 1918.85(f)(5) prohibits the use of manual twistlocks or latchlocks as liftlocks. Manual twistlocks, which have largely been replaced by SATLs due to OSHA's container top safety regulations and increased productivity (see discussions in 62 FR 40174, Longshoring and Marine Terminals Final Rule), do not have a positive locking mechanism. By contrast, SATLs have a locking device that uses spring tension to prevent it from unlocking. Manual locks could unlock through normal container handling while being used for lifting, making them unsuitable for lifting. The limits and weaknesses of latchlocks for VTLs was discussed earlier in this Preamble.

**III. Issues for Discussion**

1. In this **Federal Register** notice, OSHA is proposing to permit VTLs containing two containers with a total weight (containers plus cargo) of up to 20 tons. However, the Agency is aware that ISO standards and ICHCA guidelines on VTLs would allow up to three containers with the same total weight (up to 20 tons). Therefore, OSHA is seeking comment on whether three-container VTLs of up to 20 tons can be handled as safely as two-container VTLs with the same weight limitation. Are additional safeguards necessary for safety?

2. A fundamental issue of VTLs is the strength of the containers and liftlocks. As discussed above, OSHA contracted with another Federal agency, NIST, to conduct strength tests for SATLs. The report that NIST issued is Exhibit 40–10. It concluded that SATLs are very strong, noting that container corner castings fail before the SATLs (Ex. 40–10, pp. 43–44). Although the Agency has received considerable information on the topic, it welcomes further comments. Also, is there any scientific or engineering data that addresses maintenance testing and ''life'' of the components used for lifting purposes?

3. The NIST report also noted that a particular type of locking device known as a ''single-sided latchlock'' has insufficient surface area (that part of the lock that actually contacts the container corner casting and bears the weight of the lift) and that the strength of that kind of latchlock was less than that of a SATL. The design of the latchlock is such that the extent of the contact made by the lock relies on a spring that can become clogged by debris such as salt or grease which, in turn, can reduce significantly the contact area with the container corner casting (Ex. 20). In addition, by contrast with latchlocks, the handle of SATLs is designed as an integral part of the locking mechanism. The position of the handle allows the employees to be assured that, when the handle is in the locked position, the lock is engaged. Latchlocks are not designed in the same way. For these reasons, the NIST report, the ICHCA guidelines, and this proposal do not approve of the use of latchlocks for VTLs. OSHA realizes that there are also double-sided latchlocks that have more surface area than single-sided latchlocks; however, their locking mechanism is the same as that of single-sided latchlocks, with the same limitations for VTL purposes. OSHA seeks comment on whether double-sided latchlocks could be used for VTLs, and under what conditions.

4. OSHA seeks public comment on appropriate testing and examination requirements for existing SATLs that are to be used for lifting. OSHA believes that all liftlocks must be individually tested and examined before initial use in VTLs. However, ICHCA guidelines allow for batch testing instead. Batch testing means, instead of testing each liftlock, one liftlock out of every group (for example, 50) of liftlocks made during the same production run is tested and used as a representative sample of the group. If the selected liftlock fails the testing, the whole group of 50 fails. However, the ILO does not allow batch testing for loose gear and, in a response to ICHCA on this issue, has maintained this position specifically for liftlocks. Of particular note, in this regard, is the rough use that SATLs endure when used for securing containers on deck, along with their expected life expectancy of 7 to 10 years.

5. Under the ICHCA guidelines, liftlocks can comply with the ILO Convention 152 loose gear requirement to be inspected annually by using an Approved Container Examination Program-type (ACEP) plan that is used to inspect containers. The ACEP program is a part of the International Maritime Organization's (IMO) Convention for Safe Containers (CSC), which is enforced in the United States by the Coast Guard. Under the ACEP plan, containers are inspected frequently on an irregular basis as opposed to a set time period. This is generally done at the gate of a marine terminal, where containers are inspected as they are brought into the marine terminal, and the custody of the container is transferred from the over-the-road trucker to the marine terminal operator. The same inspection occurs when the over-the-road driver takes a container from the marine terminal, transferring custody of the container from the terminal operator to the truck driver. In both cases, the container is inspected for damage, and, when going out of the terminal, it is also inspected

for ''roadability,'' which is compliance with the Department of Transportation's regulations for equipment on public roads, such as brakes and lights. The OSHA proposal does not consider the ACEP program to be sufficient for liftlocks. Instead, it requires that liftlocks be inspected once every twelve months by a competent person. Liftlocks are subject to extreme weather conditions, exposure to salt water, cold temperatures, stresses through the movement of the vessel on the ocean, stresses when used for lifting, and rough handling when being removed during unloading operations. For these reasons, OSHA believes that an ACEP-type inspection program is inadequate and that the liftlocks must be inspected on an annual basis by a competent person. Vessel operators could use some kind of color coding to determine which liftlocks had been examined, as a positive visual indicator that a liftlock had been examined. OSHA seeks comment on this issue.

6. Currently, the inspection of intermodal containers is governed by the CSC, which is an international convention issued under the auspices of the IMO. In this country, the United States Coast Guard is responsible for overseeing compliance with the CSC. One of the provisions of the CSC is the periodic inspections of containers for wear and damage. This can be done in two ways. The first way is for an independent third party to inspect every container initially after 5 years and then every 30 months. The second way is to develop an ACEP plan as described above. During the 1998 VTL public meeting, a representative from the U.S. Coast Guard testified that the CSC container inspection programs have been successful, citing few container failures (Tr. pp. 31–48). A concern was raised by the unions about the inspection of the containers' bottom corner castings under the CSC (Exs.11–1B, 11–1G). The bottom corner castings have a greater importance when doing VTLs because they carry the load of the container below. The concern is that the bottom corner castings may be obscured by the equipment that is carrying the containers so that cracks and other damage to corner castings could be missed during the inspection. OSHA seeks comment on this issue. Do the current inspections adequately inspect the bottom corner castings, or are additional measures needed?

7. OSHA is requesting comment on whether or not the standard should include a reporting mechanism for VTL accidents and near-misses. As noted earlier, OSHA's experience with VTLs has primarily been with two empty containers. Given the relatively limited number of VTLs that have thus far been performed in this country, the Agency is considering whether to require employers to report to OSHA when any of the following events occur during VTLs: accidents, drops, near misses, and damage to containers or liftlocks. What would be an appropriate minimum threshold for reporting? Damage to equipment? What would be the appropriate authorities (OSHA or another Agency) to receive this information? For how long should the Agency receive this information?

8. Another issue is the effect of wind on a VTL operation, both when loading and unloading from a vessel and when moving VTLs in the terminal. The ICHCA guidelines and OSHA's proposed standard would prohibit VTL operations both at the vessel and in the terminal when wind speed exceeds 34 mph. OSHA seeks comment on the effect of wind on VTLs and on the maximum wind speed allowable in VTL operations. Is a permissible wind speed of up to 34 mph excessive for VTLs being transported and handled in a marine terminal? A wind speed that is appropriate when handling VTLs with a container gantry crane may not be appropriate for VTLs being transported to the crane on a chassis or flatbed. As discussed, the proposed 34 mph limit was based on research involving VTLs of three containers. Is that limit also appropriate for VTLs of two containers?

9. The Agency solicits comment on training that might be necessary for safe VTL operations. The current Marine Terminals and Longshoring Standards address crane operator training in § 1917.27(a)(1) and § 1918.98(a)(1), respectively. Those regulations require that only an employee ''determined by the employer to be competent by reason of training or experience, and who understands the signs, notices and operating instructions and is 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.'' Thus far, VTLs have been performed by crane operators with no specific required off-site training in VTLs. In addition, making up and breaking down VTLs is little different from the work already performed by longshore employees. Is it necessary to provide specialized training for VTLs? How much, in what topics, and for whom?

10. To what extent are vertically coupled containers currently being lifted and by whom? What are the potential productivity gains associated with lifting VTLs?

11. What information (both recorded data and anecdotes) is available on incidents involving vertically coupled containers that have fallen? Have any employees been injured or killed in VTL incidents? Have there been ''near-misses,'' and if so, what were the causes?

12. What should be in the terminal VTL handling plan? Do VTLs introduce into the workplace new hazards other than those discussed in this notice? What safe practices are necessary to ensure safe transport of stacked containers via ground transport?

13. OSHA requires the employer to ascertain that the certification of the liftlocks are in accordance with ILO requirements, but does not require that the certification records be available for inspection. Historically, in parts 1917 and 1918, OSHA requires that the records produced by the employer be available for inspection at the request of representatives of the U.S. Department of Labor. However, with liftlocks, the records are not currently the responsibility of or in the possession of the employer, but of the vessel owner. Does OSHA need to require the employer to make certificates available for inspection?

14. OSHA is seeking comment on whether to require, when some containers on a vessel are handled as VTLs, that all the containers on the deck of the vessel be interconnected by liftlocks, regardless of whether they are lifted in VTLs or single-container lifts. The Agency is concerned that, if SATLs are used to interconnect containers to be lifted in single-container lifts and liftlocks are used on the same vessel to interconnect containers to be lifted in VTLs, SATLs may sometimes be used instead of liftlocks in VTLs. Requiring a vessel using VTLs to only employ liftlocks and not SATLs onboard would eliminate this safety hazard. OSHA is aware that container vessels use a different type of lock to secure the bottom container on the deck to the hatchcover. This lock is different from SATLs and liftlocks and cannot be used for lifting due to its design (it is flat on one end). The Agency intends that these flat-ended locks should continue to be used to secure bottom containers to the hatchcover.

## IV. Preliminary Economic Analysis and Preliminary Regulatory Flexibility Analysis

The Agency is proposing to incorporate provisions in its Marine Terminal and Longshoring Standards that permit VTLs of two containers with

a total weight of 20 tons, and incorporate comprehensive VTL work practices that are similar to those developed by ICHCA. The changes that OSHA is proposing to make are expected to benefit the regulated community by increasing productivity for those who choose to make use of VTLs. In order to make use of VTLs, the affected employers will need to incur some additional costs. However, this action does not constitute a ''significant regulatory action'' for the purposes of Executive Order (EO) 12866. That is, this proposal does not impose costs or have benefits to the regulated community in excess of $100 million.

Only those employers who choose to use VTLs will incur costs and realize productivity gains. If employers decide that VTLs will be beneficial to their operations, then the costs imposed by the regulation result from the following activities: (1) Ensuring that the cranes used for VTLs have LIDs; (2) developing and implementing plans for handling and transporting VTLs in a terminal; (3) notifying the crane operator through a cargo plan of the location and characteristics of all VTL units being handled; (4) ensuring that damaged and defective liftlocks are separated from operating liftlocks; and (5) ensuring that all liftlocks used to make up a VTL at a terminal are the same certified liftlocks that are on the vessel onto which the VTLs will be loaded.

*Industrial Profile*

According to a Dun & Bradstreet's 2002 Report (D&B, 2002), the total number of establishments and employees potentially affected by the proposal are grouped in NAICS 488310 (Port & Harbor Operations), NAICS 483111 (Deep Sea Freight Transportation), and NAICS 483113 (Coastal & Great Lakes Freight Transportation). The last two are the NAICS codes governing shippers of goods by water, and the first is the NAICS code (OMB, 1997) for establishments engaged in loading and unloading ships (see Table 1).

The Agency estimates that only a portion of the establishments in the affected industries will be able to or choose to adopt the option this proposal makes available (see Table 2). OSHA estimates that the affected establishments will be the larger employers that will choose to incur the costs associated with performing VTLs (certifying liftlocks (for ship owners only), ensuring that cranes have load indicating devices, ensuring damaged liftlocks do not get mixed with operating liftlocks, ensuring that the crane operator is aware of the VTL locations and characteristics, and developing a plan for transporting VTLs in the terminal). Stevedoring establishments (in NAICS 488310) with more than 100 employees are most likely to encounter situations where they could usefully perform VTLs.

TABLE 1.—INDUSTRIAL PROFILE FOR THE PROPOSED STANDARD

| | NAICS 488310 Port & Harbor Operations | NAICS 483111 Deep Sea Freight Transportation | NAICS 483113 Coastal & Great Lakes Freight Transportation | Total all affected sectors |
|---|---|---|---|---|
| Establishments | 212 | 507 | 301 | 1,020 |
| Employees | 6,037 | 15,663 | 8,393 | 30,093 |
| Revenues | $643,203,331 | $15,455,878,053 | $4,270,754,490 | $20,369,835,874 |
| Profits (7%) | $45,024,233 | $1,081,911,464 | $298,952,814 | $1,425,888,511 |
| Establishments w/<20 Employees | 179 | 379 | 223 | 781 |
| Employees in Establishments with <20 Employees | 850 | 2,152 | 223 | 3,225 |
| Revenues Per Establishment | $571,677 | $3,802,768 | $3,023,502 | ..... |
| Profits Per Establishment | $40,017 | $266,194 | $211,645 | ..... |
| Establishments w/100 to 499 Employees | 5 | 36 | 15 | 56 |
| Employees in Establishments with 100 to 499 Employees | 1,052 | 6,575 | 3,293 | 10,920 |
| Revenues Per Establishment | $77,808,832 | $155,591,006 | $39,740,515 | ..... |
| Profits Per Establishment | $5,446,618 | $10,891,370 | $2,781,836 | ..... |
| Establishments w/>500 Employees | 3 | 5 | 2 | 10 |
| Employees in Establishments with >500 Employees | 3,231 | 3,388 | 1,400 | 8,019 |
| Revenues Per Establishment | $33,305,333 | $301,600,000 | $357,800,000 | ..... |
| Profits Per Establishment | $2,331,373 | $21,112,000 | $25,046,000 | ..... |

Source: Office of Regulatory Analysis.
Profit rates taken from *Robert Morris Associates*, 1998–1999 (RMA, 1998).
Employees, establishments, and revenues taken from Dunn & Bradstreet, 2002.

Owners of the ships that transport containers (in NAICS 483111 and 483113), and have more than 100 employees, may ship containers organized for VTLs. OSHA assumes that smaller shipping lines will not choose to incur the expense of loading or unloading containers via VTLs which includes the costs of certifying liftlocks.

Only those companies operating in major ports will engage in transporting containers using VTLs. Thus, the Agency assumes, for the purposes of this preliminary estimate, that all of the establishments in NAICS 488310, 483111, and 483113 with greater than 100 employees will choose to incorporate VTLs into their workplaces. The resulting number and characteristics of establishments likely to adopt VTLs are shown in Table 2. However, nothing prevents others from using VTLs. The Agency seeks comment on these estimates concerning the number and kinds of establishment likely to adopt VTLs.

TABLE 2.—AFFECTED ESTABLISHMENTS AND EMPLOYEES

| | NAICS 488310 Port & Harbor Operations | NAICS 483111 Deep Sea Freight Transportation | NAICS 483113 Coastal & Great Lakes Freight Transportation | Total all affected sectors |
|---|---|---|---|---|
| Total Affected Establishments | 8 | 41 | 17 | 66 |
| 100 to 499 employees | 5 | 36 | 15 | 56 |
| Employees | 1,052 | 6,575 | 3,293 | 10,920 |
| Revenues Per Establishment | $77,808,832 | $155,591,006 | $39,740,515 | |
| Profits Per Establishment | $5,446,618 | $10,891,370 | $2,781,836 | |
| > 500 Employees | 3 | 5 | 2 | 10 |
| Employees | 3,231 | 3,388 | 1,400 | 8,019 |
| Revenues Per Establishment | $33,305,333 | $301,600,000 | $357,800,000 | |
| Profits Per Establishment | $2,331,373 | $21,112,000 | $25,046,000 | |

Source: Office of Regulatory Analysis.
Profit rates taken from *Robert Morris Associates*, 1998–1999 (RMA, 1998).
Employees, establishments, and revenues taken from Dunn & Bradstreet, 2002.

*Technological Feasibility*

The Occupational Safety and Health Act (OSH Act) mandates that OSHA, when promulgating standards for protecting workers, consider the feasibility of the new workplace rules. Court decisions have subsequently clarified ''feasibility'' in economic and technological terms.

Consistent with the legal framework established by the OSH Act, Executive Order 12866, and Court decisions, OSHA has assessed the technological feasibility of the proposed standard on vertical tandem lifting of containers. The proposed provisions are consistent with current industry practice and have been developed based on industry recommendations and international standards. Therefore, OSHA has preliminarily determined that the proposal is technologically feasible.

On ships, the process of lifting two secured containers that are coupled together vertically (a VTL) can only be done with containers on the deck level of the ship. For containers stored below deck, SATLs cannot be used to connect the containers. Ships use cell guides below deck instead of SATLs. On average, about one-third of the containers are stored above deck and the other two-thirds below deck. Only a few establishments now use VTLs to move containers. Most establishments do not use VTLs at all, and many probably will continue not to use them even after the final standard is promulgated. However, VTLs will allow some companies to realize substantial cost savings.

*Model Container Ship Profile*

In order to model cost savings and costs for the VTL rule, OSHA developed a model for an average container ship loading or unloading operation with VTLs.

According to 1992 data (Longshoring & Marine Terminals FEA, 1997), vessels carrying containers docked 1,564 times at U.S. ports, with a combined total carrying capacity of 1.76 million Twenty-foot Equivalent Units (TEUs) at U.S. ports. One TEU is equivalent to a 20-foot container. This estimate of vessels includes all classes of vessels that carry containers either in liner service or in non-liner service. Vessels in liner service operate on fixed routes to advertised ports on published schedules (OSHA, 1997). The Agency estimates that only 10 percent of the 1,564 dockings of vessels at U.S. ports would use VTLs in the loading or unloading operations, or 156 jobs. This estimate of 156 VTL jobs was used in estimating the industry costs for this analysis. The Agency seeks comment on this assumption.

To develop parameters for the model container ship, the Agency divided the total carrying capacity of all vessels (1.76 million TEUs) by the total number of dockings of vessels carrying containers at U.S. ports (1,564) in 1992, results in 1,125 TEUs per vessel. This estimate is based on the 1992 data. Today, however, container ships are being built with carrying capacities of five to six thousand TEUs. Therefore, the Agency feels that it is more realistic to increase the model ship's carrying capacity to 3,000 40-foot containers for estimating costs. The model is described further in the following sections.

OSHA thus estimated that the typical ship to use as a model for analytic purposes is a ship carrying 3,000 40-foot containers. A ship of this size would have about 2,000 containers below deck that are not able to be moved as VTLs. The remaining 1,000 containers would be stored above deck. Of these, roughly one-third are estimated to be moved via VTLs (333). The Agency assumes that the cycle time for a crane to lift a container from the dock, load it on the ship, and return to the dock to pick up another container is about 2 minutes for moving one container at a time. This includes time needed for the dockside longshoremen to apply or remove liftlocks to the bottom corner castings. For the unloading or loading of 333 containers stowed above deck via VTLs, the productivity gains are estimated by taking the estimated time that it would take moving the containers one at a time and subtracting the time it would take using VTLs. Table 3 presents the model container ship used in OSHA's analysis.

TABLE 3.—MODEL CONTAINER SHIP

| | Above deck | Below deck |
|---|---|---|
| Total Storage [1] | 1000 | 2000. |
| Storage Using VTLs | 333 | 0. |
| Total Liftlocks [2] | 4000 | 0. |

TABLE 3.—MODEL CONTAINER SHIP—Continued

| | Above deck | Below deck |
|---|---|---|
| Loading/Unloading VTL Profile [3] | 333 (2 at a time)<br>637 (1 at a time) | 2000 (1 at a time). |

Source: Office of Regulatory Analysis.
[1] VTLs can only be used above deck.
[2] Since liftlocks can only be used for VTLs, the Agency assumes that all locks used to store containers will be certified liftlocks.
[3] The costing will be based on a full unloading of the ship.

*Benefits*

This section reviews the populations at risk of occupational injury or death during the vertical tandem lifting of containers. OSHA anticipates that the proposed standard will decrease the time associated with moving containers from vessel to dock and vice versa and may decrease risk by reducing the total number of lifts per job. To assess the benefits of the proposed standard, OSHA has conducted an historical analysis of the frequency of VTLs and the time associated with such lifts, using a model container ship. These data were used to calculate the reduced time needed to complete a job using VTLs as opposed to lifting one container at a time. The following section estimates the increase in productivity OSHA expects affected employers to realize and describes the methodology used to develop these estimates.

*Cost Savings Due to Productivity Gains*

This analysis begins with the model container ship, as described above in Table 3. The cycle time estimates used to calculate cost savings are two minutes per container for single lifts (30 containers per hour) and 2.6 minutes for two containers (a total of 45 containers per hour) using VTLs. The actual amounts of time could vary considerably from port to port and across crane operators. These productivity gains are based on moving only two containers in a VTL. The Agency is assuming that the cycle time for loading or unloading a ship with containers is approximately the same. For the loading of the ship, the cycle time includes applying liftlocks to the bottom corner castings so that when they are put on the ship, they automatically lock into place. For the unloading of the ship, this time includes removing the liftlock from the containers. The actual time is dependent on the skill of the crane operator and the cargo plan. An experienced crane operator can move about 30 forty-foot containers per hour, one at a time, depending on the crane, characteristics of the ship, terminal, wind, *etc.* The Agency is assuming that by using a VTL, the same experienced crane operator can move about 45 forty-foot containers per hour. Using the model container ship, there are about 333 containers stored above deck that could be moved using a VTL. The productivity gains are represented by the difference between moving the containers one at a time and two at a time.

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## Table 4

## VTLs Benefits Assessment For the Model Container Ship

Assumptions and Parameters

Containers potentially moved as VTLs - 333

Rate of Movement without VTLs=30 containers per hour

Rate of Movement with VTLs=45 containers per hour

Total Hours Needed to Move Containers that can potentially be moved by VTLs:

| | |
|---|---|
| 1 at a time | 333 (total containers) ÷ 30 (estimated containers per hour) = 11.1 hours per job |
| 2 at a time (VTLs) | 333 (total containers) ÷ 45 (estimated containers per hour) = 7.4 hours per job |

Crane Hourly Rental Cost = $500

Total Rental Cost of Crane not Using VTLs =11.1 hours times $500 per hour =$5,550

Total Rental Cost of Crane when Using VTLs =7.4 hours times $500 per hour=$3,700

**Total Savings on Crane Rental from Using VTLs =$1,850 ($5,550 without VTLs minus $3,700 with VTLs)**

Average Gang Size without Using VTLs = 15 employees

Average Gang Size Using VTLs = 18 employees

Average Employee Hourly Wage Rate = $47.30

Total Labor Cost without Using VTLs =11.1 Hours times 15 employees times $47.30 per hour =$7,875

Total Labor Cost Using VTLs =7.4 Hours times 18 employees times $47.30 per hour=$6,300

**Total Savings on Labor Costs from Using VTLs =$1,575 ($7,875 without using VTLs minus $6,300 using VTLs)**

**Total Saving in Longshoring Cost from Using VTLs =$3,425 ($1,850 in crane rental savings plus $1,575 in labor savings)**

**Other Savings: 3.7 hours in shipping time, 3.7 hours worth of port rental charges**

Source: Office of Regulatory Analysis

There are several factors that will influence the cost estimate of moving containers one at a time versus using VTLs. Based on the model container ship, there are 333 containers stored above deck that can be moved via VTLs. Therefore, dividing the 333 containers by the total number of containers that the crane operator can move in an hour (30), it will take the crane operator about 11.1 hours for these containers. On the other hand, if the crane operator were moving the containers by VTLs, it would take about 7.4 hours, a 3.7 hour difference. This is the decrease in labor time needed for the unloading by VTLs instead of one at a time.

Other gains in productivity will be the decreased land and crane rental time needed by the stevedoring companies, which is a direct result of the 3.7 hour

decrease in time using VTLs. There may also be a cost saving from shorter dock or pier rental time for the ship.

As mentioned earlier, stevedoring companies rent the land and the cranes from the port authorities to load and unload ships. OSHA assumes that the crane costs $500 per hour with a 4-hour minimum rental. In this case, as shown in Table 4, 3.7 hours less of crane rental results in cost savings of $1,850 per ship unloaded using VTLs.

In addition to the crane rental savings, changes in labor costs must also be considered. Without using VTLs, the container handling involves a labor cost of $7,875 (15 persons times 11.1 hours times the wage rate of $47.30). VTL unloading requires an estimated three additional crew members beyond that required for normal unloading, but for a shorter period of time. Since performing the VTL unloading will take 7.4 hours (based on the container ship model), the cost of unloading using VTLs will be $6,300 (the cost of 18 employees times $47.30 per hour times 7.4 hours). Comparing the two, the savings in labor costs is $1,575 per ship unloaded using VTLs ($7,875 minus $6,300).

There may be substantial productivity gains to be realized by other parties. The shipping line gains a 3.7 hour reduction in time to deliver cargo, which translates to a higher return to capital for the ship owners. In addition, the shipper receives the goods 3.7 hours sooner, which could reduce inventory and other costs. The Agency did not estimate savings in port charges paid to unload the ship or in inventory costs to shippers. However, the Agency believes these efficiency cost savings may be significant and seeks comment.

The table below on productivity gains assumes that the containers are pre-stacked VTLs prior to the ships docking to ensure that the productivity gain stems solely from the act of moving the containers and not from any other source. Based on the table of productivity gains, moving two containers at one time would yield the highest marginal productivity gain. Based on the model and assumptions of cycle times, higher total productivity gains may be possible with VTLs of more than two containers. When moving more than two containers simultaneously, the gain diminishes for each added container. This diminishing gain stems solely from the assumptions in the model of the number of containers per hour and the minutes per lift variables. This analysis is dependent on the estimate of the number of containers per hour that can be moved. The ''decreased lifts per hour'' column captures a possible measure of where some effect on risk may occur. Fewer lifts may result in less risk. The Agency has preliminarily concluded that, when the proper work practice precautions as specified in the proposed standard are followed, the relative safety risk of two-container VTLs and single lifts are approximately the same. The Agency does not have any data to quantify this portion of risk. The Agency seeks comment on this approach.

TABLE 4b.—PRODUCTIVITY GAINS

| Number of containers per lift | Containers per hour | Lifts per hour | Minutes per lift | Decreased lifts per hour | Marginal gain from lifts (minutes) |
|---|---|---|---|---|---|
| 1 | 30 | 30 | 2 | ..... | ..... |
| 2 | 45 | 22.5 | 2.7 | 7.5 | 0.7 |
| 3 | 55 | 18.3 | 3.3 | 4.2 | 0.6 |
| 4 | 65 | 16.25 | 3.7 | 2.1 | 0.4 |
| 5 | 75 | 15 | 4.0 | 1.3 | 0.3 |

Source: Office of Regulatory Analysis.

Based on the model container ship profile, the Agency preliminarily estimates the benefits of using VTLs are $3,425 in direct cost savings for stevedoring costs for each VTL related operation. If, as estimated in the next section, VTLs are used for 156 jobs per year, then the total annual cost savings in stevedoring costs would be $534,300 per year. In addition, the shipper receives the cost saving associated with 3.7 hours less time needed to load or unload containers. This 3.7 hours translates into faster shipping service to shipper and improved productivity for shipping capital. The benefits also include decreased dock, or marine terminal, rental time and port fees associated with loading or unloading the ship. Due to the lack of data, the Agency has not quantified these benefits. The estimates are based on a ''per job'' basis; that is for a single loading or unloading operation of a container ship.

*Costs of Compliance*

This section presents OSHA's analysis of the estimated costs of compliance to be incurred by affected employers. This cost analysis is primarily based on the profile of affected workers and industries presented in the Industrial Profile section of this Preliminary Economic Analysis. The first section outlines the provisions of the proposed standard that are expected to impose costs on employers and describes the nature of those costs. The next part presents OSHA's assumptions and preliminary assessments with regard to current compliance, unit costs, life of equipment and programs, baseline data, and other data required to make compliance cost estimates. This section also describes OSHA's model container ship profile. Following the discussion of analytical assumptions and baseline data, this section examines, requirement by requirement, the expected costs of compliance by the model container ship and for the Marine Cargo Handling and Longshoring industries.

Performing VTLs is not mandatory. Employers could avoid using VTLs altogether by simply continuing to lift containers one at a time. Thus, a case can be made that this is a no cost rule with only net productivity gains. The proposal requires liftlocks to be inspected before using them for lifting and annual examinations thereafter. These requirements reflect ILO's loose gear requirements. Many of these costs of the proposal's initial inspection and annual examinations of liftlocks would be absorbed by vessel owners rather than the stevedores (who are the employers of longshoremen).

*Provisions in the Proposal With Major Cost Impacts*

The most important provisions of the proposal are reviewed in the following paragraphs. Although many new provisions are being proposed, only five may create costs on the regulated community. A proposed provision in § 1917.46(a)(1)(viii)(A) requires container gantry cranes that handle VTLs to be fitted with a LID. This would

allow the crane operator to know precisely the weight of the load.

Proposed § 1917.71(b)(9) requires the employer to notify the crane operator through a cargo stowage plan of the location and characteristics of all VTL units being handled. This is important so that the crane operator is aware of what he/she will be lifting and when.

Proposed § 1917.71(j) requires employers to develop and implement a plan for transporting VTLs in a terminal. This plan must include safe operating speeds; safe turning speeds; and any conditions unique to the terminal that could affect VTL operations.

Proposed § 1917.71(k) requires that the employer have a means of keeping damaged or defective liftlocks separate from operating liftlocks. This is currently being done for SATLs for lifts of single containers. Therefore, the Agency did not estimate additional compliance costs for this requirement.

The proposed § 1917.71(l) requires employers to ensure that liftlocks used to make up VTLs at a terminal are the same type of certified liftlocks that are on the vessel onto which VTLs will be loaded. This requirement will impose compliance costs not on the stevedore but on the ship owner. This cost is attributed to proposed § 1918.85(f)(3)(i) & (ii), which requires the ship owner to get the SATLs inspected prior to initial use as a liftlock for VTLs, and annually examined thereafter, based on ILO 152 convention requirements for loose gear. The requirements of initial testing, marking, and numbering the liftlocks with the safe working load (SWL) are tasks that will usually be done by the manufacturer, but for existing SATLs may be done by another company or the vessel owner. The logistics of testing, inspecting, and certifying liftlocks is difficult (for the employer/stevedore) since the ship owner has control of the locks and most of the locks are in nearly continuous use. The Agency seeks comment on this issue. The overall breakdown of costs by sector are as follows:

TABLE 4c.—PROVISIONS WITH POTENTIAL COST IMPLICATIONS BY SECTOR

| 1917 Marine terminals | 1918 Longshoring |
|---|---|
| § 1917.46(a)(1)(viii)(A)—Load Indicating Devices<br>§ 1917.71(b)(9)—Notify crane operator of cargo plan for VTLs<br>§ 1917.71(j)—Plan for transporting VTLs in the terminal.<br>§ 1917.71(k)—Means for keeping damaged or defective liftlocks from operating liftlocks.<br>§ 1917.71(l)(a)(vii) and (viii)—Liftlocks must be identical. | § 1918.85(f)(3)(i)—Initial Testing of SATLs.<br>§ 1918.85(f)(3)(ii)—Annual inspection of liftlocks by a competent person. |

Source: Office of Regulatory Analysis.

Not all of the requirements in Table 4c will incur compliance costs on employers. Specifically, the requirement for keeping damaged liftlocks separated from operating liftlocks is currently being done for all single lifts, thus no compliance costs are being estimated. The employer (shipper) could either replace his/her existing locks with new already certified liftlocks or have existing SATLs certified to be liftlocks. If the employer chooses to have existing SATLs certified, the Agency estimated that this activity will cost the employer $1 per lock to perform the initial testing of the lock. The SATLs would be sent to an independent testing company for these tests to be done. The testing company would also develop the certification record for the employer. The annual inspection of the liftlocks would also be done by an independent testing company at the same rate of $1 per lock.

A higher cost alternative is that the owner of the ship would simply buy new liftlocks. This would impose an enormous initial cost burden on the ship owner. Since these locks will come directly from the manufacturer, already tested, marked, inspected, and certified for lifting, the unit cost is $30 per lock. Thus, in considering the model container ship that is using 4,000 SATLs, the cost per ship would be $120,000. This cost would only be realized if the ship owner feels that it would be easier to purchase new liftlocks to enable the cargo handlers to comply with the proposal. Also, even with the model, if the ship owner is going to prepare containers for handling as VTLs, all SATLs on board need to be certified liftlocks, and they must be of a uniform type throughout the ship. The Agency believes that this is already industry practice based on the Agency's knowledge of the industry and information in the public meetings on VTLs.

*Estimated Cost Using the Model Container Ship*

For simplicity, the Agency is assuming that two container gantry cranes will load the empty model container ship with all 3,000 40-foot containers (the ship's full carrying capacity). Based on the specifications in Table 1, the containers being loaded will be a mix of 20 and 40-foot containers. (For purposes of space on container ships, two 20-foot containers, can be stored in the space of one forty-foot container.) However, for the purposes of this analysis, only the 40-foot containers will be used in VTLs. Forty-foot containers are more common and the analysis would not be essentially different with twenty-foot containers. Of the 3,000 40-foot containers, only 333 containers will be lifted in a VTL.

Since about half of the overhead container gantry cranes currently in operation already have LIDS, there will be little difference in the average rental cost for stevedoring companies renting the cranes. The cost of retrofitting a crane with a LID is estimated to be $10,000. When this cost is discounted over 10 years at a 7 percent discount rate, the annualized cost of the LID is $1,424. In a worst-case scenario, this total annualized cost would be passed along in full to the stevedoring company whose longshoremen are performing the VTLs. So for the purposes of this analysis, the Agency is assuming that the cranes being used for VTLs already have a LID; thus, the Agency did not estimate any additional compliance costs for this requirement.

Also, the stevedoring supervisor must inform the crane operator of the vessel cargo stowage plan, which shows the location and characteristics of all VTL units to be handled (proposed in § 1917.71(b)(9)). The Agency estimates that it will take ten minutes (0.1667 hours) to perform this task. Thus, multiplying the hourly wage rate ($60.92) by this fraction of one hour, the cost is $10.

According to the proposed standard, employers are required to develop a plan for transporting vertically connected containers in a terminal (§ 1917.71(j)). The Agency assumes that this plan would be developed by the

stevedoring supervisor along with information from the port authority (the owner of the land) prior to the ship's arrival in port. OSHA estimates that it will take four hours of supervisory time to develop this plan. The cost of this task is estimated by multiplying the supervisor's average wage rate of $60.92 per hour (PMA, 2003) by the four hours to complete this task. This totals $244 per establishment. In addition to the time to develop the plan, the Agency estimates that it will take employers one hour each to maintain and update the plan as necessary. The second and recurring cost year for this requirement is $61 annually per plan.

The employer would also need to ensure that the liftlocks used to make up VTLs at a terminal are the same type of certified liftlocks that are on the vessel. The ship owner and stevedore must ensure that the liftlocks are certified. The ship owner owns the liftlocks. The Agency estimates that the 4,000 SATLs needing to be certified on the model container ship will cost about $1 per lock for testing, certification, and annual examination. Thus, the cost to comply with this requirement for the model container ship is $4,000. The Agency assumes that each affected shipper will have at least one ship that will do VTLs and need to have all of its SATLs certified. The Agency seeks comment on this assumption.

Table 5 presents the estimates for the total cost of performing VTLs using the model container ship operation. Performing VTLs actually results in a net cost saving; the savings are calculated in the Benefits section of this Preliminary Economic Analysis.

OSHA does not believe that the entire industry will use VTLs. At most ports, unions and stevedores must negotiate work practices, which may include the decision to perform VTLs. The potential for VTLs is also highly dependent on the pattern of trade in each port or the cargo of each ship. The majority of the costs would not be imposed directly on the stevedore (employer), because the ship owners would need to ensure that SATLs are certified before being used as liftlocks.

TABLE 5.—MODEL CONTAINER SHIP OPERATION COST AND TOTAL INDUSTRY COMPLIANCE COSTS

| | Model container-ship operation cost | Estimate industry compliance cost [1] |
|---|---|---|
| § 1917.46(a)(1)(viii)(A)—Load Indicating Devices | 0 | 0 |
| § 1917.71(b)(9) Notifying the crane operator of the VTLs | 10 | 1,584 |
| § 1917.71(j) Plan for transporting VTLs in the terminal | 244 | 1,949 |
| § 1917.71(k) Means of Separating Damaged and Working Liftlocks [2] | 0 | 0 |
| § 1918.85(f)(3)(i)&(ii) Testing and Examining Liftlocks | 4,000 | 232,000 |
| Total Costs | 4,254 | 235,533 |

Source: Office of Regulatory Analysis.
[1] These estimates were calculated mostly by multiplying the model container ship operation cost by 156 (estimate of the number of VTL jobs).
[2] This practice is already being done whether VTLs are being done or not, as discussed in the text.

The costs of compliance in Table 6 illustrate total annualized compliance costs, estimated on a per establishment basis for each affected NAICS code. Table 6 assumes that each establishment would have at least one ship that would need to replace all of its SATLs to have them certified for the purposes of VTLs. OSHA recognizes that this assumption may overstate the costs. Based on this data and the discussion above in the Industry Profile section, the Agency is estimating that 58 vessels would have their ship's SATLs certified for VTLs.

TABLE 6.—ESTIMATED ANNUALIZED COMPLIANCE COST PER ESTABLISHMENT

| | NAICS 488310 Port and harbor operations | NAICS 483111 Deep sea freight transportation | NAICS 483113 Coastal and Great Lakes freight transportation |
|---|---|---|---|
| Affected Establishments Engaging in VTLs | 8 | 41 | 17 |
| Load Indicating Devices | $0 | $0 | $0 |
| Notifying the crane operator | $1,584 | $0 | $0 |
| Plan for Transporting VTLs | $278 [1] | $0 | $0 |
| Means of Separating Damaged and Working Liftlocks | $0 | $0 | $0 |
| Testing and Examining Liftlocks | $0 | $164,000 | $68,000 |
| Total Annualized Compliance Cost | $1,862 | $164,000 | $68,000 |
| Annual Compliance Cost Per Affected Establishment | $233 | $4,000 | $4,000 |

Source: Office of Regulatory Analysis.
[1] This total represents the cost for developing the plans for transporting VTLs in the marine terminal ($1,949) discounted by a 7 percent rate over 10 years, which totals $278.

OSHA estimates that for every dollar spent in NAICS 488310 to comply with the proposal, the employer would save approximately ten dollars by using VTLs. For the shippers, the cost invested in initially inspecting SATLs and annually examining liftlocks is estimated to reduce their shipping time by about 4 hours each for 156 cargoes in NAICS 483111 and NAICS 483113 (Table 6).

*Economic Impact Analysis*

This proposed rule presents no issues of economic infeasibility. The use of VTLs is an option available to the employers. Any employer that finds that using VTLs would result in an increase in its costs need not adopt this option, and thus need not incur any costs. OSHA has examined the economic impacts for those who incur the costs of using VTLs.

First, the Agency computed compliance costs on a per establishment basis, which required consideration of the number of potentially affected establishments. As indicated earlier in this analysis (see Table 6), approximately 66 establishments are potentially affected by this proposal. For the purpose of conducting the regulatory flexibility screening analysis, OSHA estimated that small firms will not bear the cost associated with performing VTLs. These costs may be incurred by the larger establishments in the industry, particularly the high volume ports.

TABLE 7.—ESTIMATED ECONOMIC IMPACTS FOR AFFECTED SECTORS

| NAICS | Description | Compliance cost per establishment | Compliance cost as a percentage percentage of revenues | Compliance cost as a of pre-tax profits |
|---|---|---|---|---|
| 488310 | Port and Harbor Operations | $233 | 0.00 | 0.01 |
| 483111 | Deep Sea Freight Transportation | 4,000 | 0.00 | 0.04 |
| 483113 | Coastal & Great Lakes Freight Transportation | 4,000 | 0.01 | 0.14 |

Source: Office of Regulatory Analysis.

The economic impacts outlined in Table 7 of this analysis are based on using the lowest estimate of revenues and costs from either the 100 to 499 size class or the >500 size class (see Table 2). The costs of the proposal are extremely small, and the proposed standard is economically feasible.

*Regulatory Flexibility Analysis*

According to the Small Business Administration (SBA), a small business in NAICS 483111 or 483113 is any firm with less than 500 employees (see references below). However, for NAICS 488310, SBA defines a small business by total sales of less than $21.5 million. Using the average sales per establishment, OSHA found that the firms with less than 250 employees earned less than $21.5 million in sales annually, while establishments with more than 250 employees exceeded that sales figure. For reasons discussed in the Industry Profile, establishments with less than 20 employees are unlikely to perform VTLs because of the size and kind of ships they service. Table 8 shows even under a worst-case scenario, the proposed requirements would have minimal impacts on small firms. Accordingly, OSHA certifies that this standard will not have significant impact on a substantial number of small entities.

TABLE 8.—ESTIMATED SMALL FIRM IMPACTS

| NAICS | Number of small firms potentially affected | Compliance cost per firm | Compliance cost as a percentage of revenues | Compliance cost as a percentage of profits |
|---|---|---|---|---|
| 488310—Port & Harbor Operations | 3 | $233 | 0.01 | 0.18 |
| 483111—Deep Sea Freight Transportation | 36 | 4,000 | 0.00 | 0.06 |
| 483113—Coastal & Great Lakes Freight Transportation | 15 | 4,000 | 0.11 | 1.62 |

Source: Office of Regulatory Analysis.

**References**

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**V. Environmental Impact**

*Finding of No Significant Impact.* OSHA has reviewed the proposed rule according to the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), the Guidelines of the Council on Environmental Quality (40 CFR parts 1500 through 1517), and the Department of Labor's (DOL) NEPA Procedures (29 CFR part 11). Based on this review, the Assistant Secretary for OSHA finds that the proposed rule will have no significant environmental impact.

The revisions and additions to 29 CFR parts 1917 and 1918 focus on the reduction of employee death and injury. OSHA will achieve this reduction through the updating of its regulations for longshoring and marine terminal operations to provide safe practices for employers who choose to perform VTLs. The new language of these rules does not affect air, water, or soil quality, plant or animal life, the use of land, or other aspects of the environment. Therefore, the new rules are categorized as ''excluded actions'' according to § 11.10(a)(1), of the DOL NEPA regulations.

**VI. OMB Review Under the Paperwork Reduction Act of 1995**

The proposed rule for VTLs for longshoring and marine terminals contains two new collections of information (paperwork) that are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (PRA 95), 44 U.S.C. 3501 *et seq.*, and its regulation at 5 CFR part 1320. In addition, the proposal redesignates a currently approved collection of information, § 1917.71(f)(4) to § 1917.71(f)(5). The collection of information is approved under OMB control number 1218–0196. PRA 95 defines collection of information to mean, ''the obtaining, causing to be obtained, soliciting, or requiring the disclosure to third parties or the public of facts or opinions by or

for an agency regardless of form or format'' (44 U.S.C. 3502(3)(A)).

The title, description of the need for and proposed use of the information, summary of the collections of information, description of respondents, and frequency of response of the information collection are described below with an estimate of the annual cost and reporting burden as required by § 1320.5(a) (1)(iv) and § 1320.8(d)(2). The reporting burden includes the time for reviewing instructions, gathering and maintaining the data needed, and completing and reviewing the collection of information.

OSHA invites comments on whether each proposed collection of information:

(1) Ensures that the collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility;

(2) Estimates the projected burden accurately, including the validity of the methodology and assumptions used;

(3) Enhances the quality, utility, and clarity of the information to be collected; and

(4) Minimizes the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, *e.g.*, permitting electronic submissions of responses.

*Title:* Vertical Tandem Lifts, 29 CFR Parts 1917 and 1918.

*Description:* The proposed standard is based on three primary sources: results of OSHA-sponsored research and comments from public meetings; the International Standards Organization's revised ISO 3874, Freight Containers, which permits VTLs with a total weight of up to 20 tons (20,000 kgs); and the VTL guidelines developed by the International Cargo Handling and Coordination Association (ICHCA). The standard's information collection requirements are essential components that will help employers and employees verify that containers and their contents in a VTL weigh 20 tons or less and assure that the vertically connected containers are handled safely in the terminal.

*Summary of the Collections of Information:* The proposed rule contains two collections of information (paperwork) requirements. Proposed section 1917.71, paragraph (b)(9) would require that the crane operator receive a copy of the ship's cargo stowage plan. Paragraph (j) of this section would require employers to create a written terminal plan. The plan must include the following information for vehicles carrying vertically connected containers:

(1) safe operating speeds;

(2) safe turning speeds; and

(3) any conditions unique to the terminal that could affect the safety of VTL operations.

*Respondents:* Marine terminal and longshoring employers that perform VTLs.

*Frequency of Response:* The development of the written terminal plan is a first-year burden for those establishments that will use VTLs. The frequency of providing a copy of the ship's cargo stowage plan to the crane operator is determined by the number of ships using VTLs to unload cargo.

*Average Time Per Response:* OSHA estimates that establishments will spend 10 minutes to provide a copy of the cargo stowage plan to the crane operator, and 4 hours for establishments to develop, implement, and maintain the written terminal plan for transporting VTLs. OSHA estimates establishments will spend 1 hour to review and update the written plan for transporting VTLs in subsequent years.

*Total Burden Hours:*

Total Estimated Burden Hours in First Year: 59.

Total Estimated Cost in First Year: $3,594.

Total Estimated Burden Hours in Second and Subsequent Years: 39.

Total Estimated Costs in Second and Subsequent Years: $2,376.

The Agency has submitted a copy of the information collection request to OMB for its review and approval. Interested parties are requested to send comments regarding this information collection to the Office of Information and Regulatory Affairs, Attn: OSHA Desk Officer, OMB, New Executive Office Building, 725 17th Street, NW., Room 10235, Washington, DC 20503.

*Costs (purchase of capital/start up costs):* 0.

Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval of the final information collection request, and they will also become a matter of public record.

Copies of the referenced information collection request are available for inspection and copying in the OSHA Docket Office and will be provided to persons who request copies by telephoning Todd Owen at (202) 693–1941 or Theda Kenney at (202) 693–2444. For electronic copies of the Vertical Tandem Lifts in Longshoring and Marine Terminals information collection request, contact the OSHA Web page on the Internet at *http://www.osha.gov/.* Copies of the information collection request are also available at the OMB docket office.

## VII. Public Participation

Interested persons are requested to submit written data, views, and arguments concerning this proposal. These comments must be received by December 15, 2003. Comments may be submitted in hard copy or electronically. For more information and requirements on how to submit comments, see the **DATES** and **ADDRESSES** sections at the beginning of this notice.

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.

Additionally, under section 6(b)(3) of the OSH Act and 29 CFR 1911.11, interested persons may file objections to the proposal and request an informal hearing. Objections and hearing requests must be submitted in triplicate to the Docket Office (see **ADDRESSES** section) and must comply with the following conditions:

1. The objection must include the name and address of the objector;

2. The objections must be received by December 15, 2003;

3. The objections must specify with particularity grounds upon which the objection is based;

4. Each objection must be separately numbered; and

5. The objections must be accompanied by a detailed summary of the evidence proposed to be adduced at the requested hearing.

Interested persons who have objections to various provisions or have changes to recommend may, of course, make those objections and their recommendations in their written comments and OSHA will fully consider them. There is only a need to file formal ''objections'' separately if the interested person requests a public hearing.

OSHA recognizes that there may be interested persons who, through their knowledge of safety or their experience in the operations involved, would wish to endorse or support certain provisions in the standard. OSHA welcomes such supportive comments, including any pertinent accident data or cost information that may be available, in order that the record of this rulemaking may present a complete picture of the public response on the issues involved.

## VIII. State Plan Requirements

This **Federal Register** document issues a proposal for new and revised

rules addressing the handling of VTLs in marine cargo handling regulated in 29 CFR parts 1917 and 1918. The rules when final will be codified into the applicable section of the Code of Federal Regulations.

The 26 States or U.S. Territories with their own OSHA approved occupational safety and health plans must develop comparative standards applicable to both the private and public (State and local government employees) sectors within six months of the publication date of a permanent final Federal rule 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 new Federal standard. Three States and territories cover only the public sector (Connecticut, New York, and New Jersey).

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 (plan covers only State and local government employees), Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Jersey (plan covers only State and local government employees), New Mexico, New York (plan covers only State and local government employees), North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Virginia, Virgin Islands, Washington, and Wyoming. Until such time as a State standard is promulgated, Federal OSHA will provide interim enforcement assistance, as appropriate, in those States.

## IX. Federalism

The standard has been reviewed in accordance with Executive Order 13132 (64 FR 43255; August 10, 1999) regarding federalism. This Order requires that agencies, to the extent possible, refrain from limiting State policy options, consult with States before 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 Congressional intent for the agency to do so. Any such preemption is to be limited to the extent possible.

Section 18 of the 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 terminals operations address hazards which are not unique to any one state or region of the country. Nonetheless, those States that have elected to participate under section 18 of the OSH 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.

## X. Unfunded Mandates

For the purposes of the Unfunded Mandates Reform Act of 1995, as well as Executive Order 12875, this rule does not include any federal mandate that may result in increased expenditures by State, local, and tribal governments, or increased expenditures by the private sector of more than $100 million.

## List of Subjects

*29 CFR Part 1917*

Freight, Incorporation by reference, Longshore and harbor workers, Occupational safety and health, Reporting and recordkeeping requirements.

*29 CFR Part 1918*

Freight, Incorporation by reference, Longshore and harbor workers, Occupational safety and health, Reporting and recordkeeping requirements, Vessels.

## XI. Authority and Signature

This document was prepared under the direction of John L. Henshaw, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210. It is issued pursuant to sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657), section 41 of the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941), Secretary's Order 5–2002 (67 FR 65008), and 29 CFR part 1911.

Signed at Washington, DC, this 10th day of September, 2003.

**John L. Henshaw,**

*Assistant Secretary of Labor.*

For the reasons stated in the preamble, the Agency proposes to amend 29 CFR parts 1917 and 1918 as follows:

## PART 1917—MARINE TERMINALS

1. The authority citation for part 1917 is revised to read as follows:

**Authority:** Section 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); secs. 4, 6, and 8 of the 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), 9–83 (48 FR 35736), 6–96 (62 FR 111), or 5–2002 (67 FR 65008), as applicable; and 29 CFR part 1911.

Section 1917.28, also issued under 5 U.S.C. 553.

Section 1917.29, also issued under Sec. 29, Hazardous Materials Transportation Uniform Safety Act of 1990 (49 U.S.C. 1801–1819 and 5 U.S.C. 553).

2. In § 1917.2, add the definitions of *Liftlock* and *Vertical tandem lift* (VTL) in alphabetical order to read as follows:

### § 1917.2 Definitions.

* * * * *

*Liftlock* means a semi-automatic twistlock or other inter-box connector that is used to couple intermodal containers vertically together so that they may be handled as one unit.

* * * * *

*Vertical tandem lift* (VTL) means the operation of lifting two intermodal containers that are coupled together vertically (one on top of the other).

3. In § 1917.3, revise the first sentence of paragraph (a)(3) and the second sentence of paragraph (a)(4), and add new paragraph (c) to read as follows:

### § 1917.3 Incorporation by reference.

(a) * * *

(3) The materials listed in paragraphs (b) and (c) of this section are incorporated by reference in the corresponding sections noted as they exist on the date of approval, and a notice of any change in these materials will be published in the **Federal Register**. * * *

(4) * * * The materials are available for purchase at the corresponding addresses of the private standards organizations noted in paragraphs (b) and (c) of this section. * * *

* * * * *

(c) The following material is available for purchase from the ISO Central Secretariat, International Organization for Standardization (ISO),1, rue de Varembéé, Case postale 56 CH–1211 Geneva 20, Switzerland:

(1) ISO 3874, Freight Containers, Amendment 2, Vertical tandem lifting (2002); IBR approved for § 1917.71(l)(1)(i).

(2) [Reserved]

4. In § 1917.46, add a sentence to the end of paragraph (a)(1)(viii)(A) to read as follows:

**§ 1917.46 Load indicating devices.**

(a) * * *

(1) * * *

(viii) * * *

(A) * * * *Exception:* When this type of crane performs a VTL, a load indicating device in proper working condition is required.

* * * * *

5. Section 1917.71 is amended by:

a. Adding new paragraphs (b)(9) and (b)(10);

b. Redesignating paragraphs (f)(3) through (5) as paragraphs (f)(4) through (6) respectively;

c. Adding a new paragraph (f)(3); and

d. Adding new paragraphs (i), (j), (k), (l), and (m).

The additions read as follows:

**§ 1917.71 Terminals handling intermodal containers or roll-on roll-off operations.**

* * * * *

(b) * * *

(b)(9) *Vertical tandem lifts.* If VTLs will be performed, the employer shall use the vessel's cargo stowage plan required in paragraphs (b)(1) and (b)(2)(ii) of this section to determine the location and characteristics of all VTL units being handled and shall provide a copy to the crane operator.

(10) The employer shall ensure that the crane operator conducts a pre-lift before hoisting a VTL. A pre-lift means that the crane operator pauses the lift when the initial strain has been taken and the lifting frame wires tensioned in order to assure that all liftlocks are properly engaged.

* * * * *

(f) * * *

(3) *Vertical tandem lifts.* The employer shall ensure that each VTL is conducted in accordance with the following criteria:

(i) A VTL shall consist of no more than two ISO approved series 1 containers, with a total weight of cargo and containers not to exceed 20 tons;

(ii) Only shore-based container gantry cranes are used;

(iii) Containers containing the following may not be lifted as a VTL:

(A) Liquid or solid bulk cargoes;

(B) Hazardous cargo; or

(C) A flexible tank inside that is fully or partially loaded with a fluid cargo;

(iv) No platform container with its end frames erect may be lifted as part of a VTL unit. Empty platform containers with their end frames folded may be lifted in a VTL unit in accordance with the applicable regulations of this part. If the interbox connectors are an integral part of the platform container and are designed to lift other empty platform containers, they may be interlocked and lifted in accordance with the manufacturer's recommendations;

(v) Containers below deck may not be handled as a VTL; and

(vi) VTLs may not be conducted when wind speeds exceed 34 mph (55 kph) (30 knots).

* * * * *

(i) The employer shall not use flat bed trucks, chassis, bomb carts, or similar type equipment to transport containers that are vertically connected, unless such equipment is specifically designed to safely transport vertically connected containers or has been evaluated by a qualified person and determined to be a safe mode of operation. For the purposes of this paragraph, a qualified person means one with a recognized degree or professional certificate and extensive knowledge and experience in the transportation of vertically connected containers who is capable of design, analysis, evaluation and specifications in that subject.

(j) The employer shall develop and implement a written plan for transporting vertically connected containers in a terminal. The written plan shall establish safe operating speeds; safe turning speeds; and address any conditions unique to the terminal that could affect the safety of VTL-related operations. The employer shall review and update the plan as necessary.

(k) Damaged or defective liftlocks shall be removed from service and not used for lifting. A means of keeping damaged or defective liftlocks separate from operating liftlocks shall be established.

(l)(1) The employer shall ensure that each liftlock used in a marine terminal to connect VTLs:

(i) Is in compliance with the applicable standards of ISO 3874;

(ii) Is inspected by a competent person, certificated, and individually tested in accordance with requirements for loose gear in ILO Convention 152 before being used for the first time and after any substantial alteration or repair (''certificated'' means that the liftlock is accompanied by a certificate, issued by a recognized body that is approved by the competent authority, to conduct appropriate testing and thorough examination of liftlocks);

(iii) Is subjected to a thorough examination by a competent person at least once in every 12 months. A thorough examination shall include: a visual exam for obvious structural defects; physical operation to determine that the lock is fully functional with adequate spring tension on each head or latch; a check for excessive corrosion and deterioration; and immediate removal from service when found to be defective or damaged;

(iv) Is regularly examined, including visual inspection, before each use;

(v) Is certificated with a Safe Working Load (SWL) for lifting of at least 10,000 kg;

(vi) Is clearly and durably marked with its SWL for lifting and an identifying number or mark that will enable it to be associated with its test certificate;

(vii) Locks and releases in an identical direction and manner as all other liftlocks on the vessel onto which the VTLs will be loaded. They shall have a ''telltale'' incorporated in the design that indicates whether the liftlock is locked or unlocked in the corner fittings. This ''telltale'' shall be visible from deck level; and

(viii) Is the same type as the other liftlocks that are on the vessel onto which the connected containers will be loaded.

(2) For the purpose of this paragraph (l), a competent person means a person familiar with the proper maintenance and use of liftlocks by training or experience. Such a person will be able to detect defects or weaknesses and be able to assess their importance in relation to the safe and continued use of the liftlocks.

(m) Manual twistlocks or latchlocks shall not be used as liftlocks.

## PART 1918—SAFETY AND HEALTH REGULATIONS FOR LONGSHORING

1. The authority citation for part 1918 is revised to read as follows:

**Authority:** Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970, 29 U.S.C. 653, 655, 657; Sec. 41, Longshore and Harbor Workers' Compensation Act, 33 U.S.C. 941; Secretary of Labor's Order No. 6–96 (62 FR 111) or 5–2002 (67 FR 65008), as applicable.

Section 1918.90 also issued under 5 U.S.C. 553.

Section 1918.100 also issued under Sec. 29, Hazardous Materials Transportation Uniform Safety Act of 1990 (49 U.S.C. 1801–1819 and 5 U.S.C. 553).

2. In § 1918.2, add the definitions for *Competent authority, Liftlock,* and *Vertical tandem lift* (VTL), in alphabetical order, to read as follows:

**1918.2 Definitions**

* * * * *

*Competent authority,* for the purpose of VTLs, means the appropriate government agency having jurisdiction over VTL operations in each port of call where such operations are proposed.

* * * * *

*Liftlock* means a semi-automatic twistlock or other inter-box connector that is used to couple intermodal containers vertically together so that they may be handled as one unit.

* * * * *

*Vertical tandem lift* (VTL) means the operation of lifting two intermodal containers that are coupled together vertically (one on top of the other).

* * * * *

3. In § 1918.3, revise the first sentence of paragraph (a)(3), revise the second sentence of paragraph (a)(4), and add new paragraph (c) to read as follows:

**§ 1918.3 Incorporation by reference.**

(a) * * *

(3) The materials listed in paragraphs (b) and (c) of this section are incorporated by reference in the corresponding sections noted as they exist on the date of approval, and a notice of any change in these materials will be published in the **Federal Register**. * * *

(4) * * * The materials are available for purchase at the corresponding addresses of the private standards organizations noted in paragraphs (b) and (c) of this section. * * *

* * * * *

(c) The following material is available for purchase from the ISO Central Secretariat, International Organization for Standardization (ISO),1, rue de Varembéé, Case postale 56 CH–1211 Geneva 20, Switzerland:

(1) ISO 3874, Freight Containers, Amendment 2, Vertical tandem lifting (2002); IBR approved for § 1918.85(f)(3)(i).

(2) [Reserved]

4. In § 1918.85, add paragraphs (f)(3), (f)(4), and (f)(5) to read as follows:

**§ 1918.85 Containerized cargo operations.**

* * * * *

(f) * * *

(3) *Vertical tandem lifting.* Prior to a vertical tandem lift, the employer shall assure, using the vessel's liftlock certificate(s), that the liftlocks used in a VTL:

(i) Are in compliance with the applicable standards of ISO 3874;

(ii) Have been inspected by a competent person, certificated, and individually tested in accordance with requirements for loose gear in ILO Convention 152 before being used for the first time and after any substantial alteration or repair (''certificated'' means that the liftlock is accompanied by a certificate, issued by a recognized body that is approved by the competent authority, to conduct appropriate testing and thorough examination of liftlocks);

(iii) Have been subjected to a thorough examination by a competent person at least once in every 12 months. A thorough examination shall include: a visual exam for obvious structural defects; physical operation to determine that the lock is fully functional with adequate spring tension on each head or latch; a check for excessive corrosion and deterioration; and immediate removal from service when found to be defective or damaged;

(iv) Are regularly examined, including visual inspection, before each use;

(v) Have been certificated with a Safe Working Load (SWL) for lifting of at least 10,000 kg;

(vi) Have been clearly and durably marked with its SWL for lifting and an identifying number or mark that will enable it to be associated with its test certificate; and

(vii) Locks and releases in an identical direction and manner as all other liftlocks on the vessel. They shall have a ''telltale'' incorporated in the design that indicates whether the liftlock is locked or unlocked in the corner fittings. This ''telltale'' shall be visible from deck level.

(4) For the purpose of paragraph (f)(3) of this section, a competent person means a person familiar with the proper maintenance and use of liftlocks by training or experience. Such a person will be able to detect defects or weaknesses and be able to assess their importance in relation to the safe and continued use of the liftlocks.

(5) Manual twistlocks or latchlocks shall not be used as liftlocks.

* * * * *

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