

May 29, 2007

Mr. John MacLeod, Chairman  
Occupational Safety and Health Standards Board  
2520 Venture Oaks Way, Suite 350  
Sacramento, California 95833



Subject: CalOSHA Safety Order 4906

Dear Mr. MacLeod:

Please consider this letter a formal petition to change Section 4906(c) of the General Industry Safety Orders, either changing it back to its original form or modifying it in accordance with the wording suggested in Paragraph 7 below.

1. It is my understanding that on 8/29/86 Paragraph (c) was added to Section 4906 and read:

*4906(c) Container-handling, rubber-tired, gantry cranes shall be guarded with wheel fenders, bumpers, or skirt guards which shield each wheel to the front and rear extended to the lowest practical level above ground in such a manner as to push a person out of the way to prevent a person from being run over.*

and that on 6/01/95 Paragraph (c) of Section 4906 was amended to read, and presently reads:

*4906(c) Container-handling, rubber-tired, gantry cranes shall be guarded with wheel fenders, bumpers, or skirt guards which shield each wheel to the front and rear extended to the lowest practical level above ground.*

Basically, in its amended and present form, 4906(c) contains no requirement that the wheel guards on container-handling, rubber-tired, gantry cranes push a person out of the way to prevent their being run over.

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2. It is also my understanding that this amendment occurred as the result of a petition by Mi-Jack Products, a manufacturer of rubber-tired gantry cranes, to repeal Paragraph (c) in its entirety, and who supported their petition with a report by Triodyne Inc. issued in February of 1992, together with a video showing tests Triodyne had conducted.

2. I have reviewed the report by Triodyne, and accompanying video, and believe that several of the conclusions contained therein are faulty; that the report is misleading; and that the report and accompanying video have led or contributed to the injury of at least one longshoreman that I know of and, more likely than not, to the injury of others who work in close proximity to container-handling, rubber-tired, gantry cranes. Basically, Triodyne's report contends that, for rubber-tired gantry cranes:

a. Fixed wheel guards whose bottom edges are located six inches above the ground, should they run into a person, will push that person to the ground and enable the tires of the crane to run over them;

b. When loaded, the rubber tires on rubber tired gantry cranes compresses so much that six inches of clearance between the bottom of the guard and ground is needed to accommodate the downward movement of the crane between loaded and unloaded conditions; and

c. Six inches of ground clearance is "the minimum distance practical for operating conditions."

d. The possibility of protecting workers from contact with the wheels/tires of rubber-tired cranes by means of an "enclosing wheel guard is not practical if the presumption is that run over injuries will be prevented by this method."

3. I concur with the finding in "a" above. Triodyne's tests clearly show that fixed wheel guards whose lower edges are six inches off the ground will push a person to the ground, press that person to the ground, and run over them. In essence, fixed wheel guards whose bottom edges are six inches off the ground are not guards but instruments likely to insure injury to persons they contact.

4. I strongly disagree with "b," "c," and "d" above. Triodyne only considered fixed

guards. They conducted no studies with respect to alternate wheel guard designs which could accommodate tire compression. More importantly, the contention that six inches is as close to the ground as is practical has been proven to be untrue as discussed below.

5. Figure 1 shows a container-handling, rubber-tired, gantry crane built by Noell Crane Systems, GmbH which ran over and seriously injured a longshoreman in 2005. This crane was put into service in 2002. Figures 2 and 3 show the wheel guard on this crane at the location where the longshoreman was injured. The bottom edge of this wheel guard is approximately six inches off the ground. This accident verified Triodyne's test results that wheel guards with ground clearances of six inches, like the guard shown in Figures 2 and 3, instead of protecting a person, will push them to the ground and run over them. Clearly this type of wheel guard is not a guard in the sense of protecting a person from being run over. Nevertheless, the owner of this crane, who also owns seven other like cranes, believes that the "tests conducted by Triodyne in 1992 established that no wheel guard design for Rubber Tired Gantry Cranes exists which is capable of pushing a person out of the way," and in support of this belief, cites Board's amendment of 4906(c) wherein the requirement to push a person out of the way was eliminated. I believe, however, that wheel guards for container-handling, rubber-tired, wheel guards can be made, and have been made, which can greatly reduce the likelihood of the wheel(s) of a crane running over persons who may unknowingly be in the line of travel of the crane's wheels. In support of this contention -- i.e., that six inches is not as low as practicable -- please see Figures 4 thru 9 attached. Figures 4 and 5 show the wheel guard used on a container-handling, rubber-tired, gantry crane whose bottom edge is approximately one-half inch above ground. The lower portion of this guard is composed of a strip of heavy rubber sheet, or rubber like material. Figures 6 thru 9 show two cranes retrofitted with flexible, sheet rubber, wheel guards. It is my understanding that on at least one occasion a wheel guard like or similar to the wheel guards shown in Figures 6 thru 9 prevented a person from being run over. Reportedly, the person bounced off the guard and away from the crane.

6. Unfortunately, several manufacturers of container-handling, rubber-tired, gantry cranes continue to equip their cranes with fixed wheel guards whose bottom edges are six inches or more off the ground, thus placing persons whose jobs require them to work in close proximity to such equipment in danger of suffering serious injury, or death. Figures 10 and 11, recently taken from the internet, show two container handling cranes, from different manufacturers, equipped with fixed wheel guards whose bottom edges are six inches or more off the ground. The owners and manufactures of these machines, I fear, either believe that it

## **PRODUCT SAFE . / ENGINEERING**

is not possible to provide wheel guards which will protect persons from being run over; are simply following what other manufacturers are doing; and/or believe that, since 4906(c) contains no requirement that wheel guards push a person out of the way, fixed wheel guards six inches off the ground satisfy 4906(c).

7. In connection with this subject, I believe it is relevant to note Rule 1445 of Pacific Coast Marine Safety Code which reads:

“All transtainers shall be guarded with wheel fenders, bumpers, or skirt guards which shield each wheel to the front and rear extended to the lowest practicable level above ground and of sufficient height to push a person out of the way of the wheel.”<sup>(1)</sup>

and contains the requirement that the wheels guards “push a person out of the way of the wheel.”

7. As alternate wording, may I suggest that 4906(c) be changed to read:

Container-handling, rubber-tired gantry cranes shall be guarded with wheel fenders, bumpers, or skirt guards which shield each wheel to the front and rear and shall push a person out of the way and prevent a person from being crushed. Only the wheels at the far ends of each leg need be fully guarded as long as means are provided to prevent a person from walking or standing between sets of wheels, or sets of trucks. Any time the crane is operated in a manner, or in a direction, that any wheel is not guarded in a manner that the guard or guards for that wheel will push a person out of the way and prevent a person from being crushed by that wheel, a guard person shall be stationed on each side of the crane, in the direction of the crane’s travel, to warn and prevent persons in the path of the crane, or who might move into the path of the crane, from coming in contact with any part of the crane, and that such guard persons shall be in constant communication with the operator of the crane.

I hope that you will consider my petition and take appropriate action to prevent, to

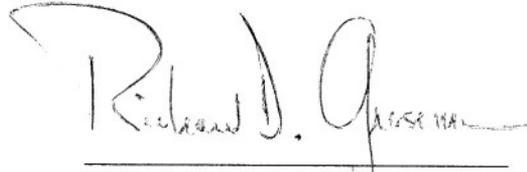
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<sup>1</sup> Transtainer is a synonym for Container-Handling, Rubber-Tired, Gantry Cranes.

**PRODUCT SAFE ENGINEERING**

the extent possible, future accidents where longshoremen and persons having to work in close proximity to the wheels of rubber tired cranes from being run over. I will be happy to provide, to the extent that I am able, any further information you or your staff may need. To facilitate your review, I have taken the liberty of attaching two copies of this letter, and forwarding a third copy to Mr. Michael Manieri.

Respectively,

A handwritten signature in black ink, appearing to read "Richard D. Grossman". The signature is written in a cursive style with a horizontal line underneath it.

Richard D. Grossman, P.E.

Licensed Mechanical Engineer,

California Registration No. M16068.

Licensed Safety Engineer,

California Registration No. SF2142

Attachments: Figures 1 through 11.