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FINAL STATEMENT OF REASONS

CALIFORNIA CODE OF REGULATIONS

TITLE 8: Division 1, Chapter 4, Subchapter 7, Article 7, Section 3336 and Article 25, Sections 3650 and 3653 of the General Industry Safety Orders

Powered Industrial Trucks – Seat Belts and Signaler

MODIFICATIONS AND RESPONSE TO COMMENTS RESULTING FROM THE 45-DAY PUBLIC COMMENT PERIOD

There are no modifications to the information contained in the Initial Statement of Reasons.

Summary and Response to Oral and Written Comments:

I. Written Comments

Mr. Ken Nishiyama Atha, Regional Administrator, Region IX, OSHA, U.S. Department of Labor by letter dated August 28, 2008.

Comment**:**
Mr. Nishiyama states that the proposed modification is at least as effective as the federal standard, and he notes that the proposal:

- Updates national consensus standard for the design and construction of powered industrial trucks (PITs);
- Improves clarity and consistency to ensure trucks and railcars boarded by powered industrial trucks are secured from movement during loading and unloading;
- Requires the development and use of a system to prevent trucks, trailers or railcars from pulling away from the loading dock before the loading or unloading operation is completed; and
- Requires the use of seat belts when provided by the manufacturer or the equipment includes rollover protection.

Response**:**
No further modification of the proposal is necessary as a result of this comment. The Board thanks Mr. Nishiyama for his comment.

Ms. Christina Cullinan, Director of Workplace and Fleet Safety, American Trucking Associations by letter dated September 8, 2008.
Comment #1:

Ms. Cullinan states that the proposal is not necessary, because PIT tip-overs are extremely rare occurrences in the trucking industry and that neither federal OSHA nor Cal OSHA have cited authority for the proposition that seat belts on PITs prevent or reduce the severity of operator injury. She then discusses a study conducted for forklift manufacturer Allis-Chalmers that concluded that seat belts are not only ineffective in tip-over accidents, their use increases the severity of head injuries in such accidents.[1] She states that the study measured the acceleration of the head of a dummy in simulated PIT tip-overs and the results show that the use of a seat belt actually contributes to the severity of head injuries. She further states that these experimental results, expressed as "average peak resultant accelerations (g's)" and "average head injury criterion (HIC)" indicate that the operator might not be able to overcome these "g-forces" while belted or restrained during a tip-over and therefore might be exposed to less risk of severe injury by exiting the vehicle before the forklift strikes the ground.

Response:
The study Ms. Cullinan references is one part of a five-part study conducted for Allis-Chalmers. A technical paper published by SAE International, reviewed the Allis-Chalmers study in addition to Phase I, Phase II, Caterpillar, Clark, Hyster, Toyota, and Entwistle forklift upset studies conducted with Hybrid II dummies, Side Impact Dummies, and stunt men.[2] The SAE paper, which summarizes each of these upset studies, notes that the fourth report from the Allis-Chalmers study concluded, in part, that: 1) the standard seat without seat belt frequently resulted in the dummy impacting or being crushed by the overhead guard, and 2) properly tightened seat belts prevented crushing from the overhead guard. The SAE paper goes on to say, in agreement with Ms. Cullinan, that the Allis-Chalmers study's results showed no difference in the recorded HIC values of the standard seat (with or without seat belts) and the wing seat without seat belts; while the wing seat with seat belts showed a higher mean HIC value of 2331. However, the SAE paper concludes that by not modeling operator self-restraint as other studies were doing, the Allis-Chalmers study ignored an important aspect of injury investigation. The SAE paper notes that the results of the Allis-Chalmers tests did not confirm other studies that were being conducted with actual forklifts, nor did they confirm tests conducted with human volunteers.

The SAE paper summarizes the results of the 1986 Toyota tip-over study as follows:

- It was found out that when a fork lift is about to tip over, the driver unconsciously tries to tilt his body to the opposite side of the inclination of the simulator driver's box with both hands held on to the steering wheel tightly and with both legs wide open to press against the box floor while the simulator driver's box was tilting.
- Volunteer's without seat belts received larger inertial forces when the tip-over plate stopped at the 45-degree position. The volunteers could hold onto the steering wheel but their hips slid off the seat completely and both hands were supporting the whole weight of the driver with significant force.

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[1] Institute for Advanced Safety Studies, "Static Overturns of Forklift Trucks: Safety Analysis & Testing Program of Operator Restraint Systems," December 1986, pp. i – A2.
[2] Fred H. Carlin and Anthony Sances, Jr., "Head Injury in Fork Lift Upsets", *SAE Technical Paper Series*, 200-01-2547.

- When the driver wore a seat belt, the sliding of the hip could be prevented. The sliding force of the hip was supported by the seat belt and the supporting force on the steering wheel for the upper body could be sharply reduced.
- It was found that human volunteers could take necessary measures to brace against the impact with ease if the seat belt was used.
- Tests of a Toyota restraint seat with seat belt using a dummy that grasped the steering wheel with a force estimated to be that of a 50th percentile male showed that containment of the upper part of the dummy inside the vehicle was deemed good, and, as a result, the dummy's head did not strike the ground directly. The mean HIC for waist restraint with seat belt was 47.

The SAE paper concludes that:

> *"Although accidents involving fork lift operators are comparatively rare, there is a high incidence of severe injury and mortality associated with accidents that involve tip overs. The comparatively small size of a fork lift belies its weight. In the evolution of a tip over incident, the operator may be tempted to jump free in an effort to avoid injury. Since the time sequence lasts somewhat longer than one second there is often time for the operator to initiate but not time enough to complete an escape. The operator would be expected to sustain fewer (if any) or a survivable injury by remaining in the protective structure of the fork lift.*

In 1992, Entwistle summarized the Field Experience with the Clark Equipment Company restraint system.[3] He reviewed 51 accidents involving Clark lift trucks during the 1984 to 1992 time period, and reached the following conclusions:

- No serious injuries were noted when belts were worn by operators. There is no evidence of head injury associated with seat belt usage when the Clark restraint is in place.
- Staying within the operator's position is more likely to result in avoidance of injury. Exiting the truck is more likely to result in serious or fatal injury.
- One fatal injury was noted of 21 instances where operators remained in operating position. This injury occurred in a machine in which the wing seat and overhead guard had been removed and the truck went off a dock.
- Operators continue to exit the truck during overturns and off the dock events in spite of warnings and instructions to the contrary. Of 28 events, 12 escaped serious injury, and 16 were seriously injured; of the 16, 9 were fatal injuries.

The Board concludes that the weight of scientific evidence demonstrates that operator restraint systems reduce the operator's risk of serious injury or death in the event of a tip-over; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment. Please see also the response to Gary Cross's Comment #1 and the response to Rob Neenan's Comment #1.

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[3] Fred H. Carlin and Anthony Sances, Jr., "Head Injury in Fork Lift Upsets", *SAE Technical Paper Series*, 200-01-2547.

Comment #2:
Ms. Cullinan states that it is unrealistic to believe that operators who are required to repetitively mount/dismount PITs will routinely use the seat belt – this will likely impede over all efficiency, or use of the seat belt may be forgotten. She notes that even the NIOSH Alert recognized this fact stating: "…operator compliance is less than 100% on forklifts equipped with restraint system."[4]

Response:
It is generally recognized that it takes a few seconds to fasten and unfasten a seat belt and that operators do not always use seat belts when provided on PITs; however this is not a compelling argument against requiring the use of a safety device that prevents operators from being seriously injured or killed. In this respect, the proposal to require the use of operator restraints/seat belts when provided on PITs is not unlike requirements pertaining to the use of fall protection, or, the use of seat belts on motor vehicles, which the ATA states it strongly supports even though operator compliance is less than 100%. The proposal is consistent with the following standards and guidelines regarding the use of restraint devices/seat belts on PITs:

- The Safety Standard for Low Lift and High Lift Trucks, ANSI/ITSDF B56.1– 2004, requires that counterbalanced, center control, high lift trucks that have a sit-down, non-elevating operator position shall have a restraint device, system, or enclosure that is intended to assist the operator in reducing the risk of entrapment of the operator's head and/or torso between the truck and ground in the event of a tip-over. The standard also requires warnings and instructions on the purpose and use of the operator protection provided shall be displayed in clear view on the truck and included in the operator's manual. The standard further requires that an active operator protection device or system, when provided shall be used.
- Section 3668 of the General Industry Safety Orders, Powered Industrial Truck Operator Training, requires that PIT operators receive training on any operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.
- Federal OSHA's enforcement policy relative to the use of seat belts on PITs is that employers are obligated to require operators of powered industrial trucks which are equipped with operator restraint devices, including seat belts to use the devices.[5] OSHA directs compliance officers to enforce the use of such devices under Section 5(a)(1) of the OSHA Act.

At the January 31, 2008, advisory committee meeting, Mr. Jeff Reynolds stated that his company has been dealing with the seat belt issue for years and that one of their employees was killed when the PIT he was operating tipped over. The operator was not using the seat belt. He said that

[4] National Institute for Occupational Safety and Health – Alert, "Preventing Injuries and Deaths of Workers Who Operate or Work Near Forklifts," June, 2001, http://www.cdc.gov/niosh/2001-109.html#1

[5] CPL 02-01-028 – CPL 2-1.28A – Compliance Assistance for the Powered Industrial Truck Operator Training Standards, Occupational Safety and Health Administration.

accident started a campaign to require that seat belts be used on all forklifts, in the distribution center and at job sites. He said one of the biggest obstacles to achieving full compliance with the requirement was that employees wanted to know where it is required in the OSHA standards that seat belts be used on PITs; and he could only respond by referencing the federal compliance interpretation.

The Board agrees with Mr. Reynolds that the proposed amendment would make it easier for employers to get employees to use restraints/seat belts. The Board concludes that it is practical and feasible for operators to use restraint systems/seat belts when provided on PITs; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment.

Comment #3:
Ms. Cullinan states that the Industrial Trucks Advisory Committee gave too little attention to driver posture and ergonomic issues and that expanded seat belt use could increase the number of lumbar and cervical soft tissue injuries.

Response:
See response to Ms. Cullinan's Comment #5.

Comment #4:
Ms. Cullinan states that the major causes for PIT injuries and fatalities arise when the forks are operated at excessive speeds, operated on unleveled/unimproved surfaces, or when the truck is being operated by poorly or untrained operators. She asserts that in the absence of these factors, PIT tip-overs are rare and do not constitute a recognized hazard in the trucking industry. She states that data submitted to federal OSHA in the late 1990's from eleven carriers reported only five PIT tip-over accidents from 1992 – 1996. She concludes that the use of seat belts will not address the "root cause" of PIT accidents and will not aid in the reduction or prevention of PIT related fatalities or injuries.

Response:
The use of seat belts is not intended to address the root cause of PIT accidents or PIT tip-overs. In the event of a tip-over, a seat belt prevents the PIT operator from jumping or being ejected from the operator compartment and being crushed by the fork lift or overhead guard, as discussed in the response to comment #2. As stated earlier in the response to Comment #1, the authors of an SAE technical report, which reviewed the major forklift tip-over studies, concluded that: "Although accidents involving fork lift operators are comparatively rare, there is a high incidence of severe injury and mortality associated with accidents that involve tip-overs." The 1992 Entwistle report, discussed in the response to comment #2, indicates that approximately half of tip-over accidents result in serious injuries and approximately half of those serious injuries are fatalities.

OSHA's Office of Data Analysis (ODA) examined 53 investigative case files involving powered industrial truck fatalities that occurred between 1980 and 1986.[6] Vehicle tip-overs accounted for 22% of the fatalities and were the single largest cause of fatal accidents. OSHA attributed these tip-overs to the following causes, which are listed according to frequency of occurrence:

1. Loss of control, speeding, elevated loads, mechanical problems, etc.;
2. PIT ran off/over the edge of the surface;
3. Made too sharp a turn, excessive speed, unbalanced load, etc.;
4. The PIT was being pulled by another vehicle;
5. The PIT skidded or slipped on a slippery surface;
6. The wheels on one side of the PIT ran over a raised surface or object; and
7. The PIT struck by another vehicle.

The OSHA Inspection Management and Information System (IMIS) database shows that there were 100 fatal forklift accidents investigated by CalOSHA during the most recent 5 ½-year period. The accident summary reports reveal that at least ten of these fatalities were caused by forklift overturns. The reports indicate that 4 tip-overs occurred in warehouses and 4 occurred outdoors on uneven terrain. Seven reports indicate that the operator either jumped or was ejected from the forklift and was crushed by the forklift or overhead guard. Five reports determined that the operator was not wearing a seat belt. There were no reported fatalities where the operator was determined to be wearing a seat belt.

The Board concludes that the risk of serious injury from tip-over accidents exists in all, or nearly all, industries that use PITs and that these injuries can be prevented by the use of operator restraints/seat belts; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment.

<u>Comment #5:</u>
Ms. Cullinan states that the rearward arc of vision of an operator using a seat belt can be reduced as much as 90 degrees, which creates a drastically increased blind spot when traveling backwards that poses a risk to the operator and others. She states that a seat belt also exposes the operator to an increased risk of musculoskeletal injuries by restricting the operator's ability to turn in the seat when traveling backwards. She asserts that this places the employer in jeopardy of being cited for violation of the CalOSHA ergonomics standard, Section 5110.

<u>Response:</u>
Manufacturers have been providing operator restraint systems on PITs for many years. ASME B56.1-1993 and current ANSI /ITSDF B56.1-2005 standards for low lift and high lift trucks require counterbalanced, center control, high lift trucks that have a sit-down, non-elevating operator position shall have a restraint device, system, or enclosure that does not unduly restrict the operation of the truck, e.g., the operator's mounting, dismounting, movement and/or visibility. At the September 2008 Public Hearing, Mr. Ronald Roensch, Vice President for Toyota Materials Handling USA, Inc., was asked by Board Member Frisch for his thoughts

[6] Preamble to OSHA Final Rule, 29 CFR 1910.178(l), PIT Operator Training, Docket S-008, RIN 1218-AB33, Section IV.A.2., April 27, 1999.

regarding the issue of operator restraints creating an ergonomic or vision problem. Mr. Roensch responded that Toyota PIT operator restraints address those concerns by providing an airplane-type seat belt buckle, rather than a self-tightening buckle, and a seat that swivels 15 degrees. Ms. Cullinan does not provide any information to support her statement that a seat belt can restrict the operator's rearward arc of vision 90 degrees. The second report of the Allis-Chalmers study, which is discussed in the response to comment #1, employed 38 operators in a variety of visibility and driving maneuvers to evaluate the effect of the Clark winged seat and seat belt on driver operation. The authors reported that experienced operators had a reduction in head rotation of 2.1 to 5.8 degrees when using the winged seat and seat belt.

The application of Section 5110, Repetitive Motion Injuries (RMIs), is limited to musculoskeletal injuries that have been objectively identified and diagnosed by a licensed physician and that occurred under the conditions specified in the standard. The standard also limits the employer's obligation to control the hazard, unless it is shown that a measure known to but not taken by the employer is substantially certain to cause a greater reduction in such injuries and that this alternative would not impose additional unreasonable costs. According to the OSHA IMIS database, there were 58 inspections conducted during the 5 ¼ year period between July 3, 1997 and September 30, 2002 that resulted in violations of Section 5110.[7] These inspections occurred in the following major industry groups: manufacturing (4), transportation/communications (7), retail trade (2), finance/insurance/real estate (2), services (25), and public administration (18). Few, if any, of these 58 citations are likely to have been related to the use of seat belts on PITs. As discussed in the response to comment #3, the IMIS database indicates that over the most recent 5 ½ year period there were at least 10 employees killed in forklift tip-over accidents.

The Board concludes that operator restraints/seat belts prevent serious injuries and deaths from tip-over incidents, and that this benefit greatly exceeds any potential negative effects such as an increased risk of RMIs or an increased risk of accidents related to a decrease in the operator's field of view or the risk of musculoskeletal injuries; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment

The Board thanks Ms. Cullinan for her comments.

<u>Mr. Ralph L. Barnett, Professor, Mechanical and Aerospace Engineering Chairman, Triodyne Inc., by letter dated September 16, 2008.</u>

<u>Comment #1:</u>
Mr. Barnett states that: "Overhead guards were mandated for forklifts with almost no research on unintended consequences (e.g. FMEA). The well-documented result of this malfeasance was the ascendancy of FOPS to number one killer in forklift accidents. To protect against lading that falls from the forks, it is sufficient to require that the backrests are taller than the load – FOPS are not needed." The Board "is once again embarking on a rule-making exercise to require seat

[7] DOSH Enforcement of Title 8 Section 5110 – Statistics, Presentation to 5110 Working Group, November 15, 2002, Oakland, CA.

belts be worn whenever FOPS are installed or when seat belts are provided by the PIT manufacturers. The research basis for such mandates is hopelessly impoverished." Mr. Barnett concludes that: "Rule-making without adequate research is a frightening specter. We may repeat the tragedy associated with the unnecessary and counter indicated introduction of FOPS that has taken so many lives and irreversibly injured scores of forklift operators."

Response:
Although Mr. Barnett does not state that he is requesting the Board modify the proposal, he does state that there is insufficient research to support the use of seat belts when provided on PITs. For the reasons stated in the response to Ms. Cullinan's comments, the Board believes there is sufficient research to support the proposal; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment.

Comment #2:
Mr. Barnett states that seat belts inhibit jumping from the forklift during loading dock excursions and on-board fires. He asserts that the effectiveness of jumping was established in the 1971 California hearings. He also states that studies conducted by the Institute for Advanced Safety Studies and the University of Michigan established that seat belts produce fatal HIC exposures when used with forklifts equipped with wing seats.

Response:
The Board believes there is sufficient research to support the proposal; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment (See response to Ms. Cullinan's comments.)

Comment #3:
Under the title: "Some random research comments," Mr. Barnett provides the following list of alleged deficiencies in the research and application of research related to operator restraints on PITs.

1. Extremely low seat belt usage has precluded any meaningful statistical analysis of downside effects.
2. Almost no statistical data is available relative to successful jumping maneuvers; misses and near-misses are not recorded.
3. The complications associated with rollover accidents are insignificant when compared to the problems encountered when driving off loading docks or piers.
4. In spite of the millions spent on the seat belt problem, almost nothing has been directed to loading docks.
5. The research on head injury criterion has been associated primarily with concrete surfaces. Asphalt surfaces may present an entirely different picture because of its forgiving nature.
6. With respect to forklift manufacturers, most of their research has been undertaken by engineers, not scientists.
7. Helmets, in their various forms, have not been addressed as a method for mitigating the flyswatter effect associated with forklifts.

8. Forklift research by manufacturers is compromised by product liability considerations.
9. Forklift research has been compromised by product cost restraints and the influence of a "level playing field" among manufacturers.
10. With respect to loading docks, no research has been devoted to the packaging of drivers such as that encountered in racecars.
11. The seat belt, as an operator restraint, fails decisively without significant operator input resistance (order of 100 to 175 lb).
12. The hazard associated with traditional FOPS and ROPS was eliminated by a German invention that was patented in England, France and Germany over 30 years ago (in the public). Triodyne provided the proof of concept and feasibility of this invention. It must be pointed out that the proposed seat belt language does not make provision for alternative concepts that are superior in every way to the seat belt.

Response:
Current research supports the conclusion that seat belts and operator restraint systems, when used, are effective in preventing or reducing operator injuries due to forklift tip-over accidents. This research is summarized in the SAE technical paper, "Head Injury in Fork Lift Upsets" as discussed in the response to Ms. Cullinan's comments. In regards to Comment No. 12, ANSI/ITSDF B56.1 requires that manufacturers provide an operator restraint system on certain PITs. The proposal requires that when provided on a PIT an operator restraint system such as a seat belt be used. The proposal allows for alternative restraint systems that are more effective than seat belts. The Board believes there is sufficient research to support the proposal; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment (See response to Ms. Cullinan's comments.)

The Board thanks Mr. Barnett for providing comments on the proposed rulemaking.

Mr. Gary Cross representing the Industrial Truck Association (ITA), by electronic mail dated September 15, 2008.

Comment #1:
Mr. Cross states that ITA strongly supports the requirement that operator restraint systems be used when driving PITs. He further states that ITA strongly disagrees with the position of the ATA that CalOSHA should rescind its proposal regarding operator restraint use on PITs. Mr. Cross attached a copy of an SAE technical report entitled "Head Injury in Forklift Upsets" and referred to several findings in the report to support ITA's position and refute ATA's position, which he claims relies on outdated and incomplete studies. Mr. Cross also asserts that a 1996 federal OSHA Seatbelt Enforcement Memorandum and OSHA's Inspection Guide for Forklift Operators require that seat belts must be used. Mr. Cross refers to data presented when OSHA promulgated its Operator Training Final Rule, which he states show that forklift tip-over accidents accounted for 24% to 42% of all fatal accidents involving PITs. Mr. Cross states that the accident data and analysis show, the risk of injury of overwhelming concern in the tip-over of a PIT is not the risk of a seated and/or restrained operator striking his head on the floor when the PIT tips, but rather the risk that the operator will leave the confines of the operator's

compartment, either by jumping of falling, and then be struck or crushed by a structural component of the PIT. Mr. Cross states there is no reason to believe the trucking industry is immune to the hazards that cause tip-over – inadequate training, driver inattention, driving and turning too fast, unstable loads, uneven surfaces, obstacles in the pathway, etc. He further states that operator restraints can provide protection in non-tip-over scenarios as well, such as preventing the operator from being thrown into the mast or other structural components of the PIT in the event of a frontal collision.

Response:
The Board thanks Mr. Cross for his comments in support of the proposed rulemaking.

Mr. Rob Neenan, Vice President, Government Affairs, California League of Food Processors, by letters dated September 11, 2008, and October 8, 2008.

Comment #1:
Mr. Neenan states that some members of his organization are concerned that the proposal may significantly increase the incidence of back and neck injuries to forklift drivers because: 1) the driver must turn to look backwards 50% of the time because most loads obstruct the operator's forward view, and Section 3650(t)(1) requires that in these circumstances the forklift travel with the load trailing; 2) seat belts restrict the operator's ability to turn in the seat to look to the rear, and 3) only the newest forklifts have inertia type seat belts. Mr. Neenan requests that the current proposal not be approved and that OSHA conduct a study to determine if wearing seat belts would result in more neck and back injuries.

Response:
According to the National Institute for Occupational Safety and Health (NIOSH), each year in the United States, nearly 100 workers are killed in forklift-related incidents. Forklift overturns are the leading cause of fatalities involving forklifts; they represent about 25% of all forklift-related deaths.[8] Studies show that seat belts prevent serious injuries and fatalities from forklift tip-over accidents.[9] Manufacturers have been providing operator restraint systems on PITs for many years. ASME B56.1-1993 and current ANSI /ITSDF B56.1-2005 standards for low lift and high lift trucks require counterbalanced, center control, high lift trucks that have a sit-down, non-elevating operator position that shall have a restraint device, system, or enclosure that does not unduly restrict the operation of the truck, e.g., the operator's mounting, dismounting, movement and/or visibility. During a tip-over accident, a seat belt can help contain the operator in the operator compartment without being adjusted so tightly that it unduly restricts the operator's hips from rotating. In addition, manufacturers provide many different types of seats and operator restraint systems that address operator comfort and ergonomics, including seats that swivel and inertia type seat belts. The Board concludes that the proven effectiveness of seat belts in

[8] National Institute for Occupational Safety and Health – Alert, "Preventing Injuries and Deaths of Workers Who Operate or Work Near Forklifts," June, 2001, http://www.cdc.gov/niosh/2001-109.html#1
[9] Fred H. Carlin and Anthony Sances, Jr., "Head Injury in Fork Lift Upsets", *SAE Technical Paper Series*, 200-01-2547.

preventing serious injuries and deaths from tip-over accidents greatly outweighs the potential increased risk of back or neck injuries that may result from their use; and therefore it is prudent to require the use of an operator restraint system when provided on a PIT. The Board does not believe that further modification of the proposal is necessary as a result of this comment.

Comment #2:
Mr. Neenan states that the vast majority of injuries seem to have taken place on loading docks or ramps, and therefore he requests that OSHA determine if a standard that only required the use of seat belts on loading docks and ramps would accomplish the same end result as the current proposal in respect to worker safety.

Response:
Mr. Neenan does not provide any data to substantiate his assertion that the vast majority of injuries occur on loading docks or ramps. It also is not clear if Mr. Neenan's statement is meant to apply to all types of forklift injuries or only those caused by tip-overs. The proposal to require the use of seat belts is primarily intended to prevent serious injuries and fatalities from forklift tip-over incidents. During development of the proposal, Board staff reviewed the IMIS database of the most recent 100 fatal accident investigations conducted by CalOSHA that involved PITs. These investigations covered a 5 ½-year period during which time there were 10 fatalities from PIT tip-over incidents. The review of the accident summaries indicates that three of these fatal accidents occurred in a warehouse. Only one of these accidents occurred on a loading dock or ramp and according to the accident investigation summary, that tip-over accident was caused when a forklift backed up and turned sharply with a 1500-pound carton-clamp attachment in full vertical position. The conditions that contributed to this tip-over fatality, i.e., speed, heavy forklift attachment, and traveling with forks or attachment in raised position, can occur in a warehouse as well as a loading dock. Because forklift tip-over accidents and the conditions that cause tip-over accidents occur in many environments other than loading docks and ramps, it is not reasonable to expect that modifying the proposal to only require the use of seat belts on loading docks and ramps would be as effective as the proposal; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment.

Comment #3:
Mr. Neenan states that the issue he raised regarding neck and back injuries could be addressed by using forklifts equipped with seats that pivot sufficiently; however this option may be limited because seat retrofit kits cost as much as $1300, not including installation, and are not available for all models of equipment. Swivel seats on new models usually cost less than retrofit kits, and some new models are equipped with interlock system that require the seat belt to be fastened or the engine will not start. Mr. Neenan states that a new California Air Resources Board (CARB) rule will require fleets with more than four forklifts to meet new emission standards for propane forklifts. He concludes that it would make no sense for equipment owners to retrofit an old forklift with a new swivel seat or ergonomic seat belts if the unit will be discarded in the next few years to meet CARB requirements. He suggests that delaying the implementation date of the proposed requirement regarding operator restraints/seat belts to 2013 would allow firms that are gradually replacing their forklifts to meet new CARB emissions standards the opportunity to

purchase equipment with swivel seats and other safety devices, and would result in more drivers using seat belts that reduce back and neck injuries.

Response:
The Board supports the use of ergonomically designed seats and restraint systems that manufacturers continue to develop and provide on new forklifts as well as retrofits to existing forklifts. The fact that some firms will gradually replace their forklifts to meet new CARB standards and would have an opportunity to purchase forklifts with ergonomically designed seats and/or restraint systems is not a compelling reason to delay implementation of the proposed requirement regarding the use of seat belts/restraints until 2013 in light of the injuries and deaths that could occur during the delay; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment. See response to Mr. Neenan's comment #1.

The Board thanks Mr. Neenan for providing comments on the proposed rulemaking.

Ms. Anne Katten, Pesticide and Work Safety Project, California Rural Legal Assistance Foundation (CRLA), by letter dated October 3, 2008.

Comment:
Ms. Katten supports the proposed amendment to require the use of seat belts when provided on tractors and forklifts. She states that the National Safety Council reported in 1997 that 2,191 deaths had resulted from tractor rollovers during an 11-year period. She personally reviewed a number of deaths from tractor and forklift rollovers, which could have been prevented by use of rollover protection and seat belts.

Response:
The Board thanks Ms. Katten for her comments in support of the proposed amendments.

Dr. Robert Harrison, MD, MPH, Chief, Occupational Heath Surveillance and Evaluation Program, California Department of Public Health (CDPH), by letter dated September 15, 2008.

Comment:
Dr. Harrison stated that the comment letter is being sent by the California Fatality Assessment and Control Evaluation (FACE) program in the CDPH. The FACE program identifies and studies occupational injuries and investigated over 180 fatalities since its inception in 1991. The California FACE program supports the proposed changes to Section 3653 requiring seat belt use. Since 1992, FACE investigated four cases where workers were killed while not wearing seat belts while operating a forklift:

- In 1995 a shop foreman died while carrying a load of cardboard with his forklift. As he was backing down a grade, the forklift overturned, he was thrown out of the seat, and his head was crushed by the rollover protective structure (ROPS).

- In 1999 an agricultural forklift driver was driving his saddle forklift back from an orchard. As the lift traveled down a slope, the worker was not able to negotiate a turn at the bottom of the hill and tumbled into a ravine. The worker was pinned under the lift.
- In 2004 a teenage worker at an agricultural supply store was carrying bales of hay with a forklift. As he backed over a rain gutter, the forklift tipped over and he was caught underneath.
- In 2004 a forklift driver leaned forward out of his seat to reach through his forklift mast. The worker struck the mast control, and the mast dropped down and crushed him.

The FACE program concluded that all of these deaths would most likely have been prevented had the workers involved been wearing seat belts.

Response:
The Board thanks Dr. Harrison for his comments in support of the proposed amendments.

Mr. Christopher Valadez, Director, Environmental & Regulatory Affairs, California Grape & Tree Fruit League, by letter dated October 13, 2008.

Comment:
Mr. Valadez states that the grape and tree fruit industry's concern with the proposed amendments to Section 3653 is that greater safety can be achieved at a lower cost through additional outreach and education. Mr. Valdez asks that the Board consider their concern and move to further engage industry stakeholders to provide effective outreach to further develop the important tools that industry can use to continue to train, educate, and reduce unnecessary workplace injury.

Response:
Mr. Valadez does not provide any evidence to support his assertion that providing forklift safety training would be less costly and more effective than the current proposal. Mr. Valadez does not identify any cost associated with using a seat belt that is already provided on a forklift. Forklift safety training is already required by Section 3668. The Board concludes that the proposed seat belt requirement, in conjunction with forklift operator safety training, would be more effective than solely relying on training to prevent injuries and fatalities from forklift tip-over accidents; therefore the Board does not believe that further modification of the proposal is necessary as a result of this comment

The Board thanks Mr. Valadez for providing comments on the proposed rulemaking.

Mr. Mont Smith, Director of Safety, Air Transport Association of America, Inc., by letter dated October 17, 2008.

Comment:
Mr. Smith requested an exemption be added to Section 3650(t)(33) that would specifically exclude applicability to airport operations.

Response:
On December 10, 2008, the Board received an electronic mail from Ms. Nobuyo Sakata, representing Mr. Smith and the Air Transport Association (ATA), requesting that the comments ATA submitted to the Board on October 17, 2008, be withdrawn. The Board agrees to withdraw ATA's comments; therefore no response is necessary.

II. Oral Comments

Oral comments received at the September 18, 2008, Public Hearing in San Diego, California.

Ms. Elizabeth Treanor, Director, Phylmar Regulatory Roundtable.

Comment:
Ms. Treanor expressed support for the proposal and urged the Board to adopt it. She went on to express concern regarding incorporation of ANSI/ASME standards by reference. She stated that some employers are unable to locate consensus standards, and when those standards are updated, the older standards are no longer available, although they are incorporated by reference in the California requirements. She suggested that it might be a good idea to convene an advisory committee to address this concern.

Response:
The Board recognizes Ms. Treanor's concern regarding Title 8 standards that incorporate ANSI, ASME and other consensus standards by reference. In this particular instance, the ANSI/ITSDF standards that the proposed amendment would incorporate by reference are available on the internet at http://www.itsdf.org/, and in any event, such considerations as copyright concerns and the volume of material at issue has made incorporation by reference necessary on many occasions; therefore the Board does not believe that further modification to the proposal is necessary as a result of this comment. The Board thanks Ms. Treanor for her comment in support of the proposed amendments and for her participation in the rulemaking process.

Mr. Bruce Wick, Director of Risk Management, California Professional Association of Specialty Contractors (CalPASC).

Comment:
Mr. Wick expressed support for the proposal; however, he is concerned that although an employer may provide seat belts and instruct employees on their use, there is a question when an employee is working alone without employer supervision as to whether or not that employee will actually use the seat belt. He asked that the Division, in its enforcement actions, pay close attention to the employer's training and safety procedures. He indicated that it is a difficult enforcement issue, and he wanted the Division to be aware of that.

Response:
Mr. Wick's concerns are not directed towards the text of the proposed amendments; therefore, the Board does not believe that further modification to the proposal is necessary as a result of this comment. The Board thanks Mr. Wick for his comment and his participation in the rulemaking process. Please also see the Response to Ms. Cullinan's Comment #2.

Mr. Kevin Bland, Granado Bland APC/California Framing Contractors.

Comment:
Mr. Bland expressed agreement with Mr. Wick's and Ms. Treanor's comments. He stated that when an employer does everything possible to encourage employees to use seat belts on PITs, that employer should not be penalized for an individual decision made by the employee.

Response:
Mr. Bland's concerns are not directed towards the text of the proposed amendments; therefore, the Board does not believe that further modification to the proposal is necessary as a result of this comment. The Board thanks Mr. Bland for his comment and his participation in the rulemaking process. Please also see the Response to Ms. Cullinan's Comment #2.

Mr. Ronald Roensch, Vice President, Legal Department, Toyota Material Handling U.S.A., Inc.

Comment:
Mr. Roensch stated that he was speaking on behalf of the Industrial Truck Association (ITA), which strongly agrees with the requirement that seat belts be used on lift trucks. He stated that statistics indicate that, while tip-overs are extremely rare, seat belt injuries are nonexistent. In accidents in which there had been tip-overs and the operators had been using seat belts, there had been no head injuries, and the operators had been able to walk away from the truck. Mr. Roensch stated that the alternative to an operator jumping off a lift truck in the case of a tip-over, whether or not the operator is wearing a seatbelt, is to hold on, brace the feet, and lean away. He indicated that jumping off is the worst thing to do in the case of a tip-over, as the operator can sustain substantial risk of a crush injury. Mr. Roensch stated that, to avoid conflicting with ergonomic requirements when the operator has to turn around to see behind the lift truck, manufacturers have implemented two devices. The first is to use the airplane-type seat belt as opposed to the controlling, ratcheting seat belt. The ratchet seat belt ratchets to the tightest position and does potentially obstruct the ability to look in the rear. The airplane-type seat belt, which is adjusted once manually and stays adjusted, eliminates that possibility. The second method is to provide swivel seats, in which the whole mechanism can turn 15 degrees, allowing the operator to turn and see in the rear.

Response:
The Board thanks Mr. Roensch for his comments in support of the proposed amendments and for his participation in the rulemaking process.

ADDITIONAL DOCUMENTS RELIED UPON

None.

ADDITIONAL DOCUMENTS INCORPORATED BY REFERENCE

None.

DETERMINATION OF MANDATE

These standards do not impose a mandate on local agencies or school districts as indicated in the Initial Statement of Reasons.

ALTERNATIVES CONSIDERED

The Board invited interested persons to present statements or arguments with respect to alternatives to the proposed regulation. No alternative considered by the Board would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the adopted action.