

## Draft Elevator Safety Orders, Group V: Briefing of Issues

Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA), August 26, 2015

The use of unsafe or defective conveyances imposes a substantial probability of serious and preventable injury to employees and the public. The prevention of these injuries and protection of employees and the public from unsafe conditions is in the best interest of the people of this state. *California Labor Code § 7300(b)*

Topic	Criticism of the Draft Elevator Safety Orders	Response to Criticism of the Draft Elevator Safety Orders	NEII COMMENTS Submitted to DOSH 11/2/15
1. Worker Safety	<p>In the process of developing the model consensus standard, ASME A17.1 – 2013, the committees drafting the provisions of the standard conducted hazard assessments analyzing the potential risks faced by elevator workers and consider those risks to be <u>fully addressed</u> by the provisions of the consensus standard.</p>	<p>Exhaustive Elevator Unit review has determined that many provisions of the current version of the model consensus standard are less protective of worker safety than the minimum requirements contained in the Title 8 General Industry Safety Orders (“GISO”) that apply to all places of employment in California and which are enforced by Cal/OSHA.</p> <p><u>The model consensus standard - ASME A17.1 – 2013 allows:</u></p> <ul style="list-style-type: none"> <li>• Critical elevator equipment to be installed in difficult or, in some cases, dangerous to reach locations at the top of the hoistway. This equipment is frequently maintained, examined, and inspected, but ASME A17.1 – 2013 does not require fixed ladders, stairways or safe platforms for access to these work spaces as is required by the minimum safety provisions contained in Title 8 GISO §3207 and §3270.</li> <li>• Permanent pit ladders that have rungs 9 inches in length (Title 8 GISO §3277 requires 16 inches) with 4½ inches from the center of the rung to the wall (Title 8 GISO §3277 requires 7 inches). This allows the installation of ladders that do not provide Elevator workers with the horizontal or vertical foothold space required by the GISO.</li> </ul>	<p>ASME A17.1/CSA B44 is an international model code covering the design, construction, operation, inspection, testing, maintenance, alteration and repair of elevator and escalator equipment. It is developed through a consensus process by experts from multiple disciplines including engineers, designers, inspectors, regulatory agencies and industry experts.</p> <p>NEII provided a detailed briefing to DOSH/DIR on the code development process and hazard assessment process. There was no statement by industry that the model code “fully addressed” the potential risks faced by workers, but rather that the process considers potential risks and addresses those as appropriate. The analyses conducted in the development of the standard encompasses a myriad of considerations, weighs the causes, likelihood, etc. and determines the appropriate course of action. The model code is not intended to replace or supersede safety regulations such as Occupational Safety and Health Act (OSHA) or CA GISO.</p> <p>While there may be areas where the GISO standards are more stringent, there are also areas where ASME A17.1/CSA B44 is more stringent. For example, the prescriptive requirement for guard rails for elevator car tops where the GISO §3210(c) permits only Fall Protection (PPE) and work practices.</p> <p>It should also be noted that the GISO§3270 contains an exception deferring to the elevator safety orders for requirements for equipment access, work space and work areas.</p>

		<ul style="list-style-type: none"> <li>Critical equipment that is frequently maintained, examined, and inspected to be located in locations in the hoistway that would be defined as a “confined space” under Title 8 GISO§5157. ASME A17.1 – 2013 allows such confined work spaces to be created, but does not establish confined space working procedures as required by Title 8 GISO§5157.</li> </ul> <p>The stricter provisions of the proposed Group V Elevator Safety Orders were drafted to re-establish equivalence (previous versions of ASME A17.1 were equivalent) with the Title 8 General Industry Safety Orders. The draft Elevator Safety Orders must provide for an installation that meets the minimum safety standards enforced by Cal/OSHA.</p>	<p>In response to the three bullet points:</p> <ul style="list-style-type: none"> <li>GISO §3207 contains the definitions. §3270 contains fixed ladder requirements. Elevator pit ladders are exempted. See also OSHA 29 CFR 3124.1053(a)(13).</li> <li>Elevator pit ladders are exempt in both GISO and Federal OSHA. See other comments.</li> <li>GISO§5157 addresses permit requirements for confined Spaces. A confined Space is defined by (§5157(b)). OSHA also defines confined spaces, but not all confined spaces require permits. Generally, elevator pits are not considered “permit required” confined spaces, unless a hazardous atmosphere or some other hazard is present. ASME A17.1/CSA B44 addresses the confined space issue with prescriptive requirements to have access for both the overhead and pit protected and restricted., Only elevator personnel are allowed to access these spaces following formal documented procedures (Also see the <i>Elevator Industry Field Employees’ Safety Handbook</i>).</li> </ul>
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2. Hoistways	ASME 17.1 – 2013 allows the installation of Machine Room-less elevators (“MRLs”) which have been installed and proven safe throughout the world. In a standard MRL installation, all elevator equipment is installed in the elevator hoistway.	<p>The elevator hoistway is the most dangerous place that an elevator mechanic can work. Nearly all the elevator mechanic deaths that have been investigated by the Division have occurred in the hoistway. The elevator mechanic trade is second only to iron workers in workplace fatality rates among the commercial building trades. Working in elevator hoistways routinely exposes elevator mechanics to falling, shearing, crushing and electrical hazards. In recent years, DOSH has investigated the following elevator mechanic fatalities resulting from accidents that occurred while working in an elevator hoistway:</p> <p><b>8/1/12 Paramount, CA</b> – An elevator mechanic</p>	<p>Restricting MRL products or the installation of elevator components in the hoistway does not guarantee worker safety. Elevator hoistways will continue to exist, and maintenance and repair work will continue to be performed in the hoistway whether elevators are configured as MRL or traditional, legacy elevators.</p> <p>The details of the incidents identified in this chart have not been provided nor is there any evidence of a connection between the incidents referenced and a MRL configuration. The fatalities are regrettable but should not be used as a basis for restricting MRL designs.</p> <p>To follow are comments specific to each incident reference:  8/1/12 Paramount, CA – The details of this incident are not presented nor is there any apparent connection between the</p>

		<p>working in the hoistway from the elevator car top fell four floors into the elevator pit and died.</p> <p><b>2/8/11 Santa Monica, CA</b> - An elevator mechanic was working from the car top of a stalled elevator. He couldn't reach the door above to get out of the hoistway, so he attempted to traverse from the stalled elevator to the adjacent running elevator. As the adjacent elevator continued to move up, the mechanic's body became entangled between the car top and the underside of a hoistway sill. His body was then thrown back down onto the stalled adjacent elevator car top where he was found dead.</p> <p><b>6/11/13 Santa Clara, CA</b> - An elevator mechanic was killed when his head was crushed between the elevator counterweight and a guide rail bracket while working in the hoistway.</p> <p><b>11/6/14 Beverly Hills, CA</b> - An elevator mechanic was electrocuted while making adjustments to energized parts of a car door operator in the hoistway. He was found dead on the elevator car top.</p> <p>Installing more equipment (<b>driving-machines, motors, tachometers, brakes, brake switches, governors, encoders and controller equipment</b>) in the hoistway that must be frequently maintained, examined and inspected means that elevator workers will spend more time in a dangerous work environment. The Elevator Unit's extensive experience with MRLs that have been installed in California indicates that locating this equipment in the hoistway is neither essential to the elevator's operation nor does it improve the performance or reliability of the elevator in any way that would justify the additional risk to elevator workers posed by elements of MRL design that are allowed under ASME 17.1 - 2013.</p>	<p>elevator configuration and the cause of this incident.</p> <p>2/8/11 Santa Monica, CA - Individuals "traversing" from one moving elevator to another in a hoistway containing multiple elevators are in serious violation of safe work practices and demonstrating serious disregard for personal safety. There is no apparent connection between the elevator configuration and the cause of this incident.</p> <p>6/11/13 Santa Clara, CA - It is NEII's understanding that this was <u>not</u> a MRL configuration.</p> <p>11/6/14 Beverly Hills, CA - It is NEII's understanding that this was <u>not</u> a MRL configuration.</p> <p>Working around any electro-mechanical equipment can be dangerous. Proper training and safe work practices are necessary regardless of equipment configuration or location. While some hazards present equal risk between non-MRL and MRL configurations, rotating equipment such as machine, sheaves and governors in non-MRL designs potentially present greater risks because of inadvertent contact that does not exist with MRLs due to their static state.</p> <p>The construction of a non-MRL configuration also poses potential safety risks. For example, in some cases the slab of the machine room is not poured and workers must work on only steel girders during construction.</p> <p>NEII's data indicates that between 2005 and 2014 MRL sales increased from 14% of the market to over 51% of the market. Over the same time period, however, the OSHA Recordable Accident Rate DECREASED by 64% and the Lost Time Accident Rate DECREASED by 77%.</p>
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3. New Technology	More restrictive Group V provisions would prohibit California building owners and businesses from installing the latest elevator technologies.	The proposed Elevator Safety Orders do not prohibit any new technologies currently allowed by ASME A17.1 – 2013, including, for example, permanent magnet a.c. gearless machines, state of the art elevator controllers with regenerative power capability, energy saving “sleep” modes, and alternate suspension residual strength monitoring means.	<p>The Group V proposal would eliminate the reference to ASME A17.7/CSA B44.7, which is specifically designed to provide an independent third party means to verify equivalent safety of new technology. Based on the current proposal, new designs will have to go through the CA variance process, which exists specifically to provide an avenue for the approval of equipment not covered by the code. NEII maintains its position that rather than decrease the number of variances in CA, this proposal will increase the need for variances by significantly. As a result, additional unnecessary costs will be incurred by the state, the industry and building owners and developers.</p> <p>The space saving equipment configurations of MRL systems are key elements in new technology and would be restricted, if not eliminated, by the proposed regulations.</p>
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4. New Designs	More restrictive Group V provisions will force private and public sector purchasers of conveyances to buy technology that is over 15 years old, moving California away from its role as a leader in the development and application of new designs and technology.	<p>As discussed above, the majority of MRL products currently marketed in California pose serious potential risks to elevator workers by making access to critical components for inspection and maintenance difficult and in many configurations unnecessarily dangerous. This warrants regulations stricter than the provisions of ASME 17.1 – 2013 to insure that elevator worker safety is equivalent to that which is already required by the General Industry Safety Orders that apply to all workers in California.</p> <p>DOSH acknowledges that the stricter regulations will require current MRL designs to be redesigned to become compliant with Group V. Based on the Elevator Unit’s experience with current MRL designs that have been installed in California under</p>	<p>Please see comments related to Topics 1 and 2. The ASME A17.1/CSA B44 is not intended to supplant OSHA requirements or those in the California GISO. Nor should the Elevator Safety Orders attempt to supplant, enhance or expand the GISO.</p> <p>There is no evidence to suggest that the incidents described in this document are related to MRL equipment configurations. Equipment in the hoistway is necessary regardless of the configuration. Safe work practices are a significant way to protect workers.</p> <p>NEII disagrees with the assertion that only minor redesign is needed. There are no current MRL designs that can meet the requirements of the Group V proposal. MRL machine reconfiguration and hoistway layout would need extensive redevelopment and engineering. These changes would be necessary only for the California market. Departure from pre-engineered models to custom elevators will increase the cost of the equipment to building owners and developers in California.</p>

		<p>permanent or temporary variances, this will require only minor redesign in many cases. In some cases, however, more significant redesign may be required.</p> <p>DOSH believes, however, that removing the floor between the hoistway and machine room does not constitute “new technology,” but rather a design choice which has the potential of creating unsafe working conditions for California workers. Accordingly, one of the major goals of the Group V proposal is to require elevators that are installed in California to be designed with worker safety foremost.</p> <p>Finally, review of on-line sales materials from all of the manufactures marketing MRL products in California indicates that they already offer the same energy efficient technologies in a safer machine room configuration which appear to meet all or most Group V requirements as designed.</p> <p><b>Note: The DOSH Elevator Unit’s proposed Group V Elevator Safety Orders have already led to changes to car top railing clearances in the proposed ASME A17.1 – 2016 model consensus standard. After considering the proposed Group V Elevator Safety Orders, ASME Hoistway Committee members asked the DOSH Elevator Unit to work with members of an ASME A17.1 task group that is re-considering car top clearances for the 2019 model consensus standard.</b></p>	<p>There will also be a delay in the availability of CA-specific designs and delivery of unique equipment. DOSH should include these costs in the Initial Statement of Reasons (ISOR)</p> <p>Although some energy-efficient technologies are available in multiple configurations, the statement that “they already offer the same energy efficient technologies in a safer machine room configuration . . .” is misleading. Empirical evidence suggests current MRL products are safer than older technology given the decline in accidents as the number of MRL installations have increased. In addition, company representatives have indicated that there are current products with traditional machine room configurations would not meet the proposed Group V requirements and would still require substantial re-design and re-engineering, similar to MRL products. In addition, there is no evidence to demonstrate that a machine room configuration is safer than a design that does not have a machine room.</p> <p>In response to the note at the end of the DOSH response: ASME A17.1/CSA B44 revised car top railing requirements for the 2016 edition of the Standard. The improved requirements were available to DOSH personnel during the development of the Group V regulations but they neglected to incorporate those changes into the Group V proposal. See A17.1 requirements 2.7.5.3.3 and 2.14.1.7.1 revised by Technical Revision TN14-505.</p> <p>NEII has encouraged DOSH personnel to participate in the ASME code development process for many years. During the February 2-3, 2015 meeting held in San Diego, CA, the NEII representative who chairs the ASME Hoistway Committee suggested a task group be formed rather than CA undertaking such significant changes outside the code development process. This suggestion was not based on support or opposition to the DOSH proposals, but rather promotion of the best forum for discussing and addressing such issues.</p>
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5. Energy Efficient Equipment	<p>More restrictive Group V provisions will hamper the ability of private building owners and other businesses to meet the Governor’s “green building” goals.</p>	<p>As discussed above in items 3 and 4, the proposed Group V Elevator Safety Orders would not prohibit any new or more energy efficient technologies and would thus have no effect on the energy efficiency of elevator equipment.</p> <p>The only potential impact that has been identified is the assertion by NEII representatives that air conditioning would be required if the equipment is located in a machine room rather than the hoistway. However, because ASME A17.1 – 2013 requires natural or mechanical ventilation for sensitive electronic equipment installed anywhere in the building, including the hoistway, air conditioning of hoistways would be required under ASME 17.1 – 2013 as written. Because the hoistway of a typical five story building is 3,520 cubic feet, versus 600 cubic foot for a typical elevator machine room, Group V requirements may be <u>more</u> energy efficient than requiring air conditioning in hoistways.</p>	<p>New technologies are the cornerstone to increased efficiencies, space savings and other inherent benefits. The combination of new technologies coupled with equipment reconfiguration affords the building owner and developer energy savings opportunities that far outweigh the benefits of the new technology on its own. These and other benefits including costs savings would be nullified by the requirements in the Group V proposal.</p> <p>Current technology would allow for the required cooling of the controller, wherever located, without cooling the entire hoistway.</p>
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6. Rentable Space	<p>More restrictive Group V provisions will requires larger hoistways and larger elevators that will lead to loss of rentable building space.</p>	<p>DOSH does not believe that the Group V requirements designed to protect workers from shearing and crushing hazards in the hoistway that are not addressed by ASME A17.1 – 2013 would require larger hoistways or larger elevators. Rather, Elevator Unit experience indicates that mitigation of these hazards by clearances and/or guarding as required by Group V can be achieved without making either hoistways or elevators larger.</p>	<p>DOSH is overlooking its requirements for car top railings and top emergency exits. In order to meet the proposed requirements, along with the other equipment and refuge space areas necessary on top of an elevator car, there is not enough room on the top of 2500 lbs and 2000 lbs cars.</p> <p>The Group V proposal has requirements for horizontal clearances (§3147.2207) in front of components that require maintenance. The proposal also has a maximum 21 inch “reach requirement” measured from the inside edge of the</p>

		As noted above in Item 4, Elevator Unit staff is working with an ASME task group to address these concerns in a future consensus standard.	car top railing (§3147.2207 (c)(b)) to the component. The combination of both requirements severely impacts the size of the component (e.g. machine) that has to fit into the “allowable” space.
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7. Elevator Cost	More restrictive Group V design requirements will create an additional cost of \$125,000 to \$225,000 per traction elevator.	<p>DOSH has been presented with no detailed <u>justification for the assertion that the proposed Elevator Safety Orders will double or triple the cost of a traction elevator in California.</u> To the contrary, a California small business enterprise that installs state of the art elevator equipment (supplied by independent manufacturers) has estimated that the proposed Group V requirements may result in a slight <b>decrease</b> in the overall cost of a traction elevator in California.</p> <ul style="list-style-type: none"> <li>DOSH estimates that initially, approximately 10% of all traction elevators will remain MRL (machine room-less) designs. Within a few years we anticipate that up to 30% of the traction elevators installed in the State of California will be MRL (machine room-less) designs.</li> <li>As noted above, all NEII manufacturers already have a standardized machine room design that incorporates all of their state of the art technologies.</li> <li>If a machine room is required, DOSH estimates that the additional building cost (vertically extending the hoistway approximately 5 feet, adding a door and a floor) to be between \$5,000 to \$20,000 per traction elevator.</li> <li>Moreover, if a machine room is required, the need for a control space in a rentable portion of the building will be eliminated</li> </ul>	<p>NEII has provided detailed cost estimates to DOSH, DIR and others. During at least two meetings, NEII walked through each of our cost estimates, including explanations of what factors were considered, time estimates for various tasks, how NEII calculated each impact, etc. DOSH, however, has provided no feedback or counter cost estimates to NEII or others that we are aware of.</p> <p>There are no current MRL designs that can meet the requirements of the Group V proposal, therefore the initial 10% referenced would have to be approved through the variance process. NEII reiterates its position that the Group V proposal will increase the number of variances required and associated costs for the state, industry and building owners and developers.</p> <p>Standard designs that utilize MRL technology in a non-MRL configuration do not exist for all products. Those that do exist are only because of California-mandated restrictions. Any future MRL products would be required to follow the same unique California non-MRL demand.</p> <p>Extending the hoistway approximately 5 feet may not provide the necessary 7 ft headroom in the machinery space as required by §3147.2207. This determination also ignores the cost of constructing the machine room and installation of appropriate supports, power and utilities.</p>

		because the elevator controller will be located in the machine room, which is typically on the roof of the building with other building equipment. This would result in a cost savings of approximately \$7,140 <b>per year</b> (17 sq.ft. x \$35/sq.ft. x 12 months) for building owners and managers.	
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8. Expert Input	The Group V proposal was developed without expert input	<p>DOSH Elevator Unit personnel have hosted numerous Advisory Committee Meetings and Subcommittee Meetings with industry experts from all affected stakeholders to obtain input that was relied on while developing the Group V proposal.</p> <ul style="list-style-type: none"> <li>• <b>12/18/12</b> - Proposed Group 4.5 Interim Adoption Advisory Committee Meeting</li> <li>• <b>2/6/13</b> - Meeting with elevator company representatives</li> <li>• <b>6/26/13</b> - Subcommittee Meeting with various stakeholders (elevator company representatives, elevator company engineers, elevator consultants, labor representatives) to discuss proposed car top and car top railing clearances</li> <li>• <b>4/17/14</b> - Meeting with elevator company representatives and engineers</li> <li>• <b>4/22/14</b> - Proposed Group V Advisory Committee Meeting</li> <li>• <b>7/14/14</b> - Meeting with building owner and building manager representatives</li> <li>• <b>10/9/14</b> - Meeting with elevator company representatives and engineers</li> <li>• <b>2/3/15 and 2/4/15</b> - Meeting with elevator company representatives and engineers</li> <li>• <b>4/9/15 and 4/10/15</b> - Meeting with elevator company representatives and engineers</li> <li>• <b>6/9/15</b> - Meeting with elevator company representatives and engineers</li> <li>• <b>6/10/15</b> - Meeting with building owner and building manager representatives</li> </ul>	<p>Meetings and presentations do not represent "Expert Input," especially when contributions from experts with decades of experience are dismissed.</p> <p>The meetings prior to April 2014 addressed only the limited set of issues being considered under the Group 4.5 proposal, and NEII was surprised to learn of the broader rulemaking efforts just two business days before the Advisory Committee meeting on 4/22/14.</p> <p>The meeting on 4/22/14 was not a working session. There were hundreds of attendees in a large room and no facilitation to exchange or discuss issues and ideas.</p> <p>Six (6) of the eleven (11) "meetings" listed (8 of 13, if each day is counted separately) were requested by NEII.</p> <p>The Elevator Unit has not been proactive in soliciting information from industry experts and has essentially dismissed all input that did not concur with the positions previously established by DOSH personnel.</p> <p>Changes made to the draft proposal following these "meetings" and other discussions have mainly consisted of the correction of typos and the elimination of conflicting regulations created by the elevator unit. Only a few minor changes have been incorporated since the pre-rule draft was first distributed in April 2014.</p>