Decision **PROPOSED DECISION OF COMMISSIONER PETERMAN**
(Mailed 9/3/2013)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Consider Roadway Worker Protections by Transit Agencies in California.	Rulemaking 09-01-020 (Filed January 29, 2009)

INTERIM DECISION ADOPTING GENERAL ORDER 175 FOR ROADWAY WORKER PROTECTIONS ON CALIFORNIA'S RAIL TRANSIT SYSTEMS

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INTERIM DECISION ADOPTING GENERAL ORDER FOR ROADWAY WORKER PROTECTIONS ON CALIFORNIA'S RAIL TRANSIT SYSTEMS

1. SUMMARY

This decision approves the transit roadway worker safety recommendations of the Commission's Consumer Protection and Safety Division (CPSD)[1], as reflected in the CPSD Report, dated January 15, 2010 (the 2010 Recommendation), attached to this decision as Attachment A, as modified in CPSD's Addendum to the 2010 CPSD Recommendation, dated October 19, 2012 (the 2012 Recommendation), attached to this decision as Attachment B and as further modified by decision. This decision adopts the General Order (GO) 175 attached to this decision as Attachment C. This decision also directs California's rail transit agencies[2] to begin the process of examining and planning for positive train control technology implementation.

The decision also adopts interim safeguards in addition to those rules previously recommended in the Proposed GO 175, subject to comment and pending the outcome of the investigation of the recent fatal accident that occurred on the Bay Area Rapid Transit District (BART) system on October 19, 2013. These interim safeguards we adopt today, in GO 175 attached to this decision as Attachment C, are pursuant to Commission's Rules of Practice and

[1] CPSD has been recently re-named the Safety and Enforcement Division. For convenience in this decision, we will continue to refer to CPSD except in the Order.

[2] Distinct from railroad agencies overseen by the federal government, the Commission has jurisdiction over rail transit agencies. Typical examples of the rail transit agencies include San Francisco Bay Area Rapid Transit District, San Francisco Municipal Transportation Authority (commonly referred to as Muni), Sacramento Regional Transit District, and San Diego Trolley, among others. Today's decision will therefore apply to the California's rail transit agencies.

Procedure, Rules 14.6(c)(1) and (c)(9), as interim provisions that are warranted due to public necessity and that provide temporary injunctive relief where failure to do so could cause significant harm to public health, safety and welfare.

This decision leaves the proceeding open for further proceeding to revisit GO 175 for additional modifications or enhancements, as necessary, upon review of the findings of the recent fatal BART accident.

2. BACKGROUND

On January 29, 2009, the Commission opened this Order Instituting Rulemaking (R.) 09-01-020 (OIR) to Consider Roadway Worker Protections (RWP) by Transit Agencies in California, R.09-01-020. It followed the roadway worker fatalities occurring on Bay Area Rapid Transit and Sacramento Regional Transit District in 2008. In fact, between 1997 and 2008, forty rail roadway workers from around the nation died after being struck by trains.[3]

Rail roadway workers are the men and women who perform all the routine maintenance and repair work on or near rail tracks. Their work is, by its very nature, hazardous because it involves the ever present possibility of being struck and killed by a moving train. An exceptionally high level of situational awareness therefore is required of train and roadway worker crews.

Federal regulations have been protecting the safety of rail roadway workers since 1997[4] when those workers are employed by any of the nation's freight railroads, intercity passenger railroads, or commuter railroads. However,

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[3] CPSD Report, dated January 15, 2010 (the 2010 Recommendation) at 3.

[4] Federal Railroad Administration's Roadway Worker Protection Regulations in 1997, 49 C.F.R. Part 214 C.

there are no equivalent federal or state regulations that provide for the protection and safety of California's rail transit agencies' roadway workers.[5]

To begin addressing this important rail transit roadway worker safety issue in California, the Commission issued R.09-01-020 to determine (1) whether current protections for rail transit agency (RTA) roadway workers are adequate, (2) whether the Commission should adopt a General Order (GO) implementing new rules for RTAs on protection of maintenance-of-way, track, signal, operating employees, and others engaged in roadway work, and (3) if new protections are needed, a description of the protections to be required by RTAs and included in the GO.

R.09-01-020 solicited comments from parties to the proceeding – the RTAs and their unions. Parties filed detailed comments on March 31, 2009, noting numerous concerns surrounding the OIR while also generally contending that no new rules should be required and that current protections of the RTAs' safety programs are adequate, so long as they are followed.

Thereafter, the Commission's Consumer Protection and Safety Division (CPSD) staff (Staff) began reviewing the merits and nuances of those initial comments and sought further information from parties in that process to better understand the RTAs' current roadway worker safety policies, practices, rules, training, and procedures. Parties responded to Staff's requests for information, and on September 29 and 30, 2009, Staff held a two-day public workshop to elicit additional input from parties on designing an effective GO that is responsive to R.09-01-020.

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[5] Each RTA in California currently has in place some form of its own roadway worker protection program. *Ibid.*

In addition to the information requests and workshops and to further gain expertise on the probable and contributing causes of the growing number of accidents involving rail roadway workers, CPSD conducted its own investigations or otherwise reviewed and analyzed third-party investigations of total of 12 roadway worker accidents listed below:[6]

(1) Bay Area Rapid Transit District's roadway worker fatality on October 14, 2008.

(2) Sacramento Regional Transit District's roadway worker fatality on July 24, 2008.

(3) Bay Area Rapid Transit District's roadway worker fatality on January 12, 2001.

(4) Chicago Transit Authority's roadway worker fatality on February 26, 2002.

(5) Massachusetts Bay Transportation Authority's roadway worker fatality on January 9, 2007.

(6) New York City Transit's roadway worker fatalities on April 24, 2007 and April 29, 2007.

(7) Washington Metropolitan Area Transportation Authority's roadway worker fatalities on August 9, 2009, November 30, 2006 and May 14, 2006.

On January 15, 2010, CPSD submitted to the assigned Administrative Law Judge (ALJ) the 2010 Recommendation, which included a draft proposed GO for roadway worker protection on California's rail transit systems. The 2010 Recommendation had set forth Staff's detailed research and analysis of the issues in this proceeding including the investigation findings and examination of twelve recent rail transit roadway worker accidents as well as analysis of all of

[6] The 2010 Recommendation at 6.

the comments to that point.[7] The ALJ circulated the 2010 Recommendation to parties and solicited comments.[8] Parties provided comments noting several areas where the 2010 Recommendation, including CPSD's then-proposed draft GO, maybe improved upon.

On July 30, 2010, the assigned Commissioner and ALJ issued a Scoping Memo Ruling, confirming the preliminary scope of the proceeding set forth in the OIR.[9]

In 2010, Staff and parties were focused on and wrapping up a successful collaborative effort leading to the development of GO 172 on another rail transit safety rulemaking proceeding,[10] R.08-10-007, and agreed a similar collaborative approach[11] would likewise suit this rulemaking proceeding. Staff and parties

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[7] The 2010 Recommendation.

[8] ALJ's January 27, 2012 Ruling.

[9] The most recent Amended Scoping Memo Ruling was issued on August 24, 2012 to revise the proceeding schedule to allow adequate time for CPSD and parties to complete their collaborative talks on the issues noted by parties in the comments to the 2010 Recommendation, including the various provisions of CPSD's then-proposed draft GO.

[10] R.08-10-007.

[11] That model consisted of several face-to-face meetings where parties worked together to resolve differences described in the spirit of pursuing effective safety provisions through constructive group discussions, innovation, and consensus decision-making best practices. The primary goal was to establish an effective safety regulation. An essential related goal was enforceability, since the Commission must ensure that staff can efficiently hold RTAs accountable for complying with the regulation. But parties also attended to the important goals of flexibility and fairness. Flexibility can be important in any regulation to avoid inadvertent consequences that unnecessarily interfere with the essential transportation service that RTAs provide. Fairness is important to ensure that one employee craft does not bear undue risk in its work, and

Footnote continued on next page

thereafter initiated the collaborative process used in R.08-10-007, to similarly work through several issues identified in the comments to the 2010 Recommendation, toward crafting a GO that effectively responded to this proceeding. The RTAs and their respective unions as well as various CPSD staff with extensive and varying backgrounds and expertise in transit safety issues, participated in this effort, and Staff facilitated this effort.

In addition to the original workshops held in 2009 and formal comments filed in this proceeding, nine days of multi-party meetings were conducted following circulation of the 2010 Recommendation, with 15 successive revised drafts of potential GO provisions distributed to parties, each addressing comments and requests from parties in each subsequent meeting.[12] To ensure the most up-to-date information is before the Commission's review, in addition to the original research set forth in the 2010 Recommendation, Staff reviewed recent National Transportation Safety Board (NTSB) recommendations for roadway worker protection.[13] Staff also reviewed the Federal Railroad Administration's Fatality Analysis of Maintenance-of-way Employees and Signalmen (FAMES) committee's recent analyses of 41 of the 44 fatalities occurring on railroads under Federal Railroad Administration (FRA) regulations that became effective in 1997.[14]

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that progressive and fair processes are most effective in ensuring respect for, and compliance with, the resultant regulation. The 2012 Recommendation at 3.

[12] *Id.* at 4.

[13] *Ibid.*

[14] *Ibid.*

Staff, with the participation of parties, made numerous improvements in the proposed GO, originally proposed in the 2010 Recommendation, consistent with the recent NTSB and FAMES reports.

On October 19, 2012, Staff submitted an Addendum to the 2010 Recommendation, along with a revised proposed GO (the 2012 Recommendation) for roadway worker protection on California's rail transit systems (the 2012 Recommendation)[15]. The 2012 Recommendation and the proposed GO attached thereto (Proposed GO 175)[16] are the culmination and resulting products of those collaborative efforts that worked through the issues raised in the comments filed by parties to the OIR and responsive to the 2010 Recommendation and a series of workshops and meetings. Staff's exemplary efforts as the facilitator in the workshops and meetings led the discussions in the past couple of years with a direction to craft and refine the provisions in the proposed GO provisions that, when implemented, are more effective, enforceable, efficient, flexible, and fair than those proposed in the 2010 Recommendation.

[15] Attached hereto as Attachments B and C are the corrected 2012 CPSD Recommendation and revised proposed GO, respectively, which were submitted to the assigned Administrative Law Judge on March 15, 2013. The corrections are few and either minor or non-substantive in nature.

[16] On September 3, 2013, the Proposed GO 175 was attached as Appendix C and mailed to the service list of this proceeding with the Proposed Decision.

3. JURISDICTION

The Commission has safety oversight jurisdiction over California's transit systems under California Public Utilities Code[17] § 99152, and under other Code sections establishing each individual RTA within California.

Specifically, § 99152 provides:

> Any public transit guideway planned, acquired, or constructed, on or after January 1, 1979,[ ]is subject to regulations of the Public Utilities Commission relating to safety appliances and procedures.
>
> The [C]ommission shall inspect all work done on those guideways and may make further additions or changes necessary for the purpose of safety to employees and the general public.
>
> The [C]ommission shall develop an oversight program employing safety planning criteria, guidelines, safety standards, and safety procedures to be met by operators in the design, construction, and operation of those guideways. Existing industry standards shall be used where applicable.
>
> The [C]ommission shall enforce the provisions of this section.

As for the RTAs in operation prior to January 1, 1979, Code sections specifically outline the Commission's jurisdiction. Examples of these jurisdiction-conferring statutes include § 29047 for Bay Area Rapid Transit, § 100168 for the Santa Clara Valley Transit Authority, and § 30646 for the Los Angeles County Metropolitan Transportation Authority.

§ 29047 provides, in pertinent part, that:

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[17] Unless specified otherwise, all references to Code in this decision refer to California Public Utilities Code.

> The [Bay Area Rapid Transit] district shall be subject to regulations of the Public Utilities Commission relating to safety appliances and procedures, and the [C]ommission shall inspect all work done pursuant to this part and may make such further additions or changes necessary for the purpose of safety to employees and the general public. The [C]ommission shall enforce the provisions of this section . . . .

§ 100168 is identical to the quoted portion of § 29047 and provides for the Commission's rail transit safety jurisdiction over the Santa Clara Valley Transit District (San Jose). § 30646 does likewise for the Los Angeles County Metropolitan Transportation Authority, adding that it: "… shall [also] be subject to the jurisdiction of the Public Utilities Commission with respect to safety rules and other regulations governing the operation of street railways."

Generally, as to all RTAs, § 778 provides: "The commission shall adopt rules and regulations, which shall become effective on July 1, 1977, relating to safety appliances and procedures for rail transit services operated at grade and in vehicular traffic…."

Consistent with the foregoing authorities, the Commission has adopted various rules and regulations concerning rail transit safety. For example, GO 95 sets forth, among other things, safety requirements for overhead electric/catenary lines; GO 127 provides for the maintenance and operation of automatic train control systems for the RTAs; GO 143-B addresses the design, construction, and operation of light rail transit systems; GO 164-D provides safety oversight for rail fixed guideway systems; and GO 172 provides rules to govern the use of personal electronic devices by the employees of the RTAs and rail fixed guideway systems under the Commission's jurisdiction.

The Commission continues to oversee and update these safety GOs. Moreover, the Commission has been identified by the Federal Transit Administration as the State Safety Oversight Agency for the RTAs in California under Title 49 C.F.R. Parts 659, *et seq*. As the State Safety Oversight Agency,[18] the Commission also has safety and security oversight responsibilities over rail fixed guideway systems, which requires the Commission to execute certain federally-mandated oversight responsibilities over the RTAs.

4. STANDARD OF REVIEW FOR SETTLEMENTS

The inclusive and collaborative process facilitated by Staff which ultimately led to CPSD's submission of the 2012 Recommendation and the recommendation for adoption of the Proposed GO 175, makes it sufficiently similar to a settlement agreement process such that we will review the 2012 Recommendation, including the recommendation for adoption of the Proposed GO 175, as a settlement. The Commission reviews all settlements under the criteria set forth in Article 12, Rules 12.1 – 12.7 of the Commission's Rules of Practice and Procedure (Rules). Specifically, Rule 12.1(d) provides that, prior to the Commission's approval, the Commission must find a settlement "reasonable in light of the whole record, consistent with law, and in the public interest." We will discuss the 2012 Recommendation, including Proposed GO 175, and determine whether it meets these criteria.

[18] *See* Governor Pete Wilson's letter to Commission President Daniel Fessler, dated October 13, 1992.

5. RECOMMENDATIONS

5.1. The 2010 Recommendation and then-proposed GO

Based on the review of the comments filed in response to the OIR, including CPSD's independent investigation, research and review of twelve rail transit roadway worker accidents, CPSD found that the affected rail transit employees, both roadway workers and train operators, were not sufficiently aware of the immediate hazards when they were working on or near the track. CPSD therefore concluded that rules should be designed to enhance the situational awareness of roadway workers and train operators, which in turn will improve these workers' safety and ultimately help save their lives. CPSD recommended, in its 2010 Recommendation, a GO that provides the following requirements:

- A fundamental requirement that each roadway worker performing work on or near tracks be accompanied by a lookout —an employee whose sole function and commitment is to protect those on or near the track from approaching trains.
- A requirement that roadway work locations be demarked by warning flags that ensure that train operators slow trains and prepare to stop in advance of roadway work.
- A requirement that roadway worker crews designate a predetermined safe refuge area.
- A requirement that RTAs adopt a program for reporting and recording near-hits.[19]
- A requirement that RTAs invest in electronic devices that provide roadway workers with an early warning of

[19] The term "near-hits" is synonymous with the term "near-misses" as used in the 2012 Recommendation.

approaching trains and, eventually, with devices that warn train operators of the presence of track workers.

- A requirement that RTAs adopt a separate roadway worker safety manual approved by Commission staff.
- Rules-compliance testing requirements.
- Training requirements linked to rules-compliance testing results.

CPSD also recognized, in its 2010 Recommendation, that in addition to the draft recommended GO, the implementation of collision-avoidance technologies, such as positive train control, will provide further added protection against train accidents of all kinds, including wayside worker accidents. Therefore, CPSD recommended that the Commission direct the RTAs to begin planning for the installation of this technology in the future.

5.2. Parties' Comments to the 2010 Recommendation (including the then-proposed GO)

The following list summarizes the highlights of parties' comments to the 2010 Recommendation and thus also highlights the areas that were subsequently revisited, discussed and/or modified, where appropriate to enhance those affected provisions, in the Proposed GO 175 as part of the 2012 Recommendation:[20]

[20] See the complete set of electronically filed comments at: http://docs.cpuc.ca.gov/advancedsearchform.aspx, entering R0901020 as the search entry in the "Proceeding Number" field.

- The 2010 Recommendation does not address different work conditions that warrant different safety measures. Requirements should be matched better to level of risk.
- The definitions and provisions, set forth in the 2010 Recommendation, for "fouling the track," "lone worker," and "self-protection," are unworkable.
- Uniform flagging rules, recommended in the 2010 Recommendation, would create RTA-specific confusion with long-standing RTA flagging and RWP operating rules. Overuse of flagging protection could put more workers, as flaggers, at risk out in track areas. Protection with flags alone is subject to human error. Too much dependence on flagging procedures would require more preparation before work can be conducted and thus either shorten available maintenance windows or shorten revenue service hours.
- Early-warning technology, recommended in the 2010 Recommendation, is not fail-safe, is not fully tested, and thus should not be ordered at this time. The requirement would be cost-prohibitive and duplicative.
- Training requirements, recommended in the 2010 Recommendation, are vague in some cases and over-specified in others.
- Positive train control technology, recommended in the 2010 Recommendation, is beyond the scope and capacity of the rulemaking, as its purpose is to prevent train collisions, and would be difficult to specify in the widely varying RTA operating and physical environments.
- Near-miss provisions, recommended in the 2010 Recommendation, should be narrowed to within the scope of RWP. A more broadly scoped near-miss program should be developed consistent with guidelines from other industry experience before being required.

- Various terms and definitions, used in the 2010 Recommendation, need clarification or redefining, and repetitive and conflicting provisions need to be removed.
- The herein rulemaking proceeding needs to proceed with collaborative process that builds on the RTAs' existing roadway worker safety policies, practices, rules, training, and procedures.

5.3. Summary of the 2012 Recommendation and the Proposed GO 175 and Changes to the 2010 Recommendation (including then-proposed GO)

In addition to the formal comments filed in this proceeding responding to the 2010 Recommendation, CPSD facilitated nine days of multi-party meetings with parties since circulation of the 2010 Recommendation, with 15 successive revised drafts of potential GO provisions distributed to those parties, each addressing parties' comments and requests from parties in each subsequent meeting.[21]

In addition to the original investigation, research and analysis set forth in the 2010 Recommendation, Staff also reviewed the most current NTSB recommendations for RWP.[22] Staff further reviewed FRA's FAMES committee's recent analyses of 41 of the 44 fatalities occurring on railroads under FRA regulations since they became effective in 1997.[23] Upon foregoing efforts, Staff, with the participation of parties, made significant improvements in the proposed GO, originally proposed in the 2010 Recommendation, consistent with the

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[21] The 2012 Recommendation at 4.

[22] *Ibid.*

[23] *Ibid.*

updated data and analysis and those recent NTSB and FAMES reports to present and recommend the adoption of the Proposed GO 175.

On October 19, 2012, Staff submitted its 2012 Recommendation, along with a revised GO, the Proposed GO 175, for RWP on California's rail transit systems.[24]

There are several notable enhancements or refinements from the 2010 Recommendation, including the then-proposed GO provisions, to the 2012 Recommendation, including the revised proposed GO, the Proposed GO 175, and those are discussed below.

5.3.1. Graduated Protection Provisions Based On Levels of Hazard

As detailed in the 2012 Recommendation, the one significant difference between CPSD's 2010 Recommendation and the 2012 Recommendation is the new graduated approach to RWP such that the levels of protections correspond to and match the levels of hazards. For instance, at each higher level of hazard, where workers need to pay more attention to the work and thus are less able to pay attention to their own safety and the approaching on-track vehicles and trains, GO provision(s) should anticipate and therefore provide more extensive or higher levels of protections for those circumstances consistent with the elevated risk/hazard facing those workers.

Reflecting that graduated approach, Section 6 of the Proposed GO 175, recommended here for adoption by CPSD, is structured reflecting levels of

[24] Attached hereto as Attachments A and B are the corrected 2012 Recommendation and revised proposed GO, respectively, which were submitted to the assigned Administrative Law Judge on March 15, 2013. The corrections are few and either minor or non-substantive in nature.

protections as matched to the levels of hazards. This structure was not previously proposed in the 2010 Recommendation. Instead, it was proposed by the RTAs following the circulation of the 2010 Recommendation to make the GO more easily implemented and better targeted to the hazards being addressed. This structured and graduated approach proposed by the RTAs and set forth in the Proposed GO 175 reflects the enhancements resulting from the collaborative dialogues and inputs from parties in this proceeding, and provides increasing protections for four basic categories of hazards, from simple movements up through the use of maintenance machinery, which presents the greatest hazard.

For example, minimal protections are required if a worker were to simply move from one side of the track to the other. In this case, before fouling the track[25], the worker must:

- Establish authorization from rail operations control (ROC) for the identified area and
- Be clear of approaching trains 15 seconds before a train moving at the maximum operating speed on that track can pass his/her the location.

If a worker is performing minor tasks, such as retrieving or removing an item from the right-of-way, lining switches, placing or removing flags, taking photographs with an RTA-issued camera, or visually inspecting at one specific fixed location for an immediate need, he or she must also follow the above protections, but must have additional protections to account for the increased activity. The ROC must notify train operators and must convey abnormal train

[25] *See infra* Section 5.3.2. ("Fouling the track literally means placing oneself on the track and thus obstructing movement by vehicles on the track. Most importantly, the term has been used to mean "placing oneself in an area where [one] could be struck by the widest equipment that could occupy the track.")

movements to the roadway worker. Trains must sound an audible warning and stop short of the worker's location or hold outside the location, unless the roadway worker signals the train to proceed or reports he or she is not fouling the track.

At a higher level of risk, for instance, if a worker is using machines to perform maintenance and repair work, he or she must have much greater protection. For example, on-rail vehicle movement into the work zone must be controlled by applying one or more of the following controls as appropriate: flags with speed restrictions and watchpersons, or restricted speed with watchpersons, or for single track, lining and locking switches, or otherwise physically preventing entry and movement of trains or on-track equipment, or for double adjacent track, lining and locking switches or otherwise physically preventing entry and movement of trains or on-track equipment.

In summary, the 2012 Recommendation supports the above enhancements reflected in the provisions of the Proposed GO 175 as affording greater roadway worker safety protection than those recommended in the 2010 Recommendation by better matching the protections to the risk and permitting more operational flexibility in the lowest levels of hazard, while requiring heightened protections in the higher and highest levels of hazards.

5.3.2. Modified Self-protection Provisions

Another difference between CPSD's 2010 Recommendation and its 2012 Recommendation involves roadway worker's self-protection provisions. The 2010 Recommendation, and then-proposed GO, did not allow roadway workers to foul the track with the dual responsibility to perform work and simultaneously provide the sole protection for their own safety. The Proposed

GO 175, recommended here for adoption by CPSD in the 2012 Recommendation, modifies that provision and creates minor exceptions.

As an exception, a worker is allowed to depend solely on him or herself for protection when a worker is simply "moving from one location to another with full attention on surroundings" and has established authorization for the identified area, and is able to comply with the 15-second rule.

In addition, the Proposed GO 175 also allows some minor tasks to be performed by a worker without a watchman, so long as other protections are provided, and these tasks can only be performed under certain conditions, as discussed above.[26]

By prescribing these few circumstances under which a worker is allowed to perform tasks without a watchman, the Proposed GO 175 is more protective than the FRA Roadway Workers Protection rules.[27]

In summary, the 2012 Recommendation supports the above minor exceptions and enhancements which are reflected in the provisions of the Proposed GO 175 as addressing the concerns of parties while ensuring roadway worker safety – even a greater level of safety than the current FRA rules – without unduly hampering or interfering with certain simple tasks.

5.3.3. Modified Flagging Provisions

Another difference between the 2010 Recommendation and its 2012 Recommendation involves flagging provisions. The 2010 Recommendation, and then-proposed GO, required additional flags, rules, and procedures for flagging

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[26] *See supra* Section 5.3.1. (Graduated Protection Provisions Based On Levels of Hazard)

[27] FRA rules permit work with some tools when a "lone worker" is using "individual train detection." The 2012 Recommendation at 6, 7.

such as requiring the use of flags as markers to stop trains and specified uniform and detailed procedures, colors, and placement of the flags.

The RTAs' current practices already involve varied use of different flags and procedures between the different RTAs. With that, there are some downsides to requiring additional flags, rules, and procedures for flagging. For instance, the additional flags and flagging rules would have to be learned and carried out which could cause some confusion and/or disruption to the ongoing daily maintenance activities and routines of the different RTAs.

CPSD, in the 2012 Recommendation and the Proposed GO 175, reviewed the comments concerning the flagging provisions since 2010 and ultimately concluded that safety is better served by allowing the RTAs to generally continue with their current flagging procedures, but without adding more flagging rules and procedures. Instead, CPSD concluded in its 2012 Recommendation that a better alternative would be to allow additional safety/protection options. Specifically, by providing flagging procedures as one of several required safety/protective methods/options from which an RTA could choose, the worker safety goal is met with flexibility needed in many of these situations and without introducing undue confusion associated with additional flagging rules and disrupting the ongoing daily maintenance routines and activities.

According to CPSD, additional flagging rules could lead not only to confusion and/or disruption but would also likely lead to imprudent over-dependence on flags as the only safety option/method, which may not always be the best safety/protective option/method in all RTA environments.

In summary, the 2012 CPSD Recommendation supports the above enhancements reflected in the provisions of the Proposed GO 175 as addressing the concerns of parties that safety in all RTA environments is best served, not by

adding even more flagging rules and procedures, but by allowing the RTAs the flexibility to continue with their current flagging procedures, with other additional and optional safety/protection, as necessary. Specifically, the Proposed GO 175 requires flagging procedures as one of several required safety/protective methods/options from which an RTA could choose.

5.3.4. Modified Definition of Fouling the Track

The 2012 Recommendation and the Proposed GO 175 also updated the definition of "fouling the track." Fouling the track literally means placing oneself on the track and thus obstructing movement by vehicles on the track. Most importantly, the term has been used to mean "placing oneself in an area where [one] could be struck by the widest equipment that could occupy the track."

The updated definition, in the 2012 Recommendation differs from that in the 2010 Recommendation and then-proposed GO. The 2012 Recommendation and the Proposed GO 175 propose a "track zone" wherein employees must be protected. The updated definition in the Proposed GO 175 provides that: 1) a "zone" with over a three-foot safety margin would be established where any occupancy would trigger required protections, and 2) depending on the nature of the space to be occupied and the nature of the work to be performed, provisions would be required that would protect workers consistent with the level of risk as described earlier section of this decision. Specifically, the Proposed GO 175 reads as follows:

- Track Zone means an area within six (6) feet of the outside rail on both sides of the track.
- The track zone definition is intended to provide a threshold that can be identified by workers as an area where a person or equipment could be struck, or has the potential to be struck, by the widest equipment that could occupy the track.

- The track zone provides additional space away from the widest revenue rail transit vehicle that could occupy the track to address the potential for inadvertent movement into the area where a person or roadway working equipment could be struck.
- This track zone should be widened, or extra safety provisions put in place, to safely accommodate any movement that might be anticipated into the area. Examples include equipment placed just outside the zone that has a bucket or swing boom that could extend far enough to be struck, or have the potential to be struck, or roadway maintenance machines that might be wider than revenue rail transit vehicles.

The above definition provides an absolute "zone" demarcation of six feet away from the track as measured from the outside of the near rail. This track zone provides safety area that is sufficiently wide enough to cover all potential for movement into any area adjacent to a track where a person could be struck by moving on-track equipment. Moreover, the above definition provides much greater safety distance than the FRA rule on the same critical issue. The FRA rule is only four feet from the outside rail, which provides a net margin of about 14 inches from the widest equipment to run on railroad tracks. The six-foot rule in the Proposed GO 175 here for rail transit systems provides between three and four feet depending on different RTA systems. Additionally, we have added a clause to the job-briefing section, Section 5.1 of the Proposed GO 175, to ensure that the briefing includes a discussion of any need to widen the track zone for wider-than-normal equipment.

Based on the foregoing and given that there is no accident history causally implicating the FRA's four-foot criterion, the 2012 Recommendation supports the above enhancements reflected in the provisions of the Proposed GO 175 and recommends this additional three to four-fold net increase in this safety margin

as added safety cushion to provide even greater safety for the California's rail transit roadway workers.

5.3.5. Early Warning Technology Requirements

Instead of including the early warning technology requirements in the GO as recommended in the 2010 Recommendation, Staff recommends that the Commission order the requirements separately in its decision. Staff proposes that the RTAs be ordered to develop a testing and implementation process as well as to submit a timeline for installation of wayside early warning alarm technology.

Staff believes that it is important to allow reasonable time for testing and evaluation of early warning technological device use by the RTAs because the available technology is in early stages of development and some devices have failed to work as intended. Staff also acknowledges the concern that, especially before the technology is thoroughly tested, workers may become overly dependent on the devices rather than other existing known safe practices. American Public Transportation Association (APTA) takes a similar position in advising its members:

> APTA recommends that RTAs consider one or more of the technologies available only as a backup or overlay to improve their roadway worker protection programs. However, APTA also makes this recommendation with three very strong caveats:
>
> - Use the technology in addition to—not in place of—the established roadway worker protection rules and procedures until such technology is proved to be superior to existing practices.
> - Do not employ the technology in a way that would put workers at risk in the event of a failure of the technology.

- Conduct a hazard analysis and thoroughly test and evaluate the performance of the technology in the specific physical and operating environments of the RTS." (Italics added for emphasis here.)[28]

Given that no system has yet been tested comprehensively enough to confidently implement as safe in California's rail transit systems, we are persuaded by the 2012 Recommendation that California's RTAs should not prematurely implement the early warning technology. Instead, the RTAs should first be directed to test the systems. Thereafter, if the testing results show that the early warning system provides added safety value and is consistent with the APTA recommendations for use, the RTAs should develop an installation and implementation process and plan, including timeline, and submit the plan to the Commission's CPSD Director and the Deputy Director of CPSD's Office of Rail Safety for approval. Alternatively, if the testing results show that the early warning system does not provide any added safety value and/or is inconsistent with the APTA recommendations for use,[29] the RTAs should develop and submit an alternative plan to test other new systems, including anticipated timeline for potential installation and implementation, to the Commission's CPSD Director and the Deputy Director of CPSD's Office of Rail Safety for approval.

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[28] The 2012 Recommendation at 9, citing APTA Rail Transit Standards Operating Practices Committee (2011). Roadway Worker Protection Program Requirements, American Public Transportation Association, Washington, D.C.

[29] Comments of San Francisco Bay Area Rapid Transit District (BART) Re: Proposed Decision of Commissioner Peterman Adopting General Order 175 for Roadway Worker Protections on California's Rail Transit Systems Dated September 3, 2013, submitted September 23, 2013, p. 2, (BART 2013 Comments): Comments of Sacramento Regional Transit District on Proposed Decision of Commissioner Peterman, September 23, 2013, p. 3, (SRTD 2013 Comments).

We delegate authority to the CPSD Director and the Deputy Director of CPSD's Office of Rail Safety to extend the implementation deadline, including need for any additional time to test any new systems. RTA's requests for extensions must be accompanied by a good-faith justification.

5.3.6. Modified Near-miss Reporting Provisions

In the 2012 Recommendation and the Proposed GO 175, the reporting requirements relating to roadway worker near-misses have been modified, consistent with the comments by parties responding to the 2010 Recommendation. Taking into consideration, the concerns raised by parties, the modified near-miss reporting requirements, in the 2012 Recommendation, is far less prescriptive, allows for more flexibility to tailor a program to the particular RTA's circumstances, and looks also to other industry experiences of effective reporting systems as guide for the RTAs to follow in devising a reporting program that fits each RTA. While the modified near-miss reporting requirements in the Proposed GO 175 are both less prescriptive and less detailed than those recommended in the 2010 Recommended, they are consistent with the NTSB's approach of allowing the RTAs to develop and implement such a reporting program.

In short, Staff reconsidered its prior position concerning the feasibility of a prescriptive, comprehensive and detailed full-blown "best practices" near-miss reporting program, it previously recommended in the 2010 Recommendation. Staff now opines such a program is neither feasible nor desirable at this time for several reasons, as discussed below. Instead, Staff recommends that the RTAs should be directed to develop and implement the near-miss reporting programs as directed in the Proposed GO 175, Section 9, *et seq*.

In recommending that the modified near-miss reporting requirements of the Proposed GO 175 be adopted today, Staff reminds us of the experience gained from the aviation and railroad industries and notes that one of the critical ingredients of a best practices near-miss reporting system, is confidentiality. An effective near-miss reporting system must be confidential, and secondarily, the confidentiality, in turn, will support a system that is both non-punitive and voluntary – voluntary on the part of the participating organizations through a memorandum of understanding[30] (MOU), and voluntary on the part of individuals who will report events and conditions that otherwise would not be known to supervisors and managers. Similar to the aviation industry experience, we can also look to similar experiences in the railroad industry and find that railroad pilot projects, called Confidential Close Call Reporting Systems, or "C3RS," use the Bureau of Transportation Statistics (BTS) for the report-receiving function since BTS has unique legal confidentiality protections.

Taking lessons from these experiences and industry practices, confidentiality is a key to a successful near-miss reporting program, and an MOU has proven to be one of the more effective tools in ensuring stakeholders that the system will be confidential and non-punitive. However, because the MOUs typically take several months, if not more, to finalize, it is something that some parties in this proceeding argued may be either inappropriate or otherwise infeasible at this time.

[30] In particular, the Federal Aviation Administration's near-miss reporting system, the Aviation Safety Reporting System (ASRS), uses National Aeronautics and Space Administration (NASA) personnel for receiving individual reports. NASA was chosen because of its independence and because there were legal mechanisms for protecting confidentiality. Also, NASA had the resources to conduct these activities.

Meanwhile, Staff has also been part of the development on the FTA's Transit Rail Advisory Committee for Safety's (TRACS) Close-Call Reporting Working Group. We find the TRACS report, with its recommendations, to also be helpful on this issue as an additional guide for best practices in this area.[31] Likewise, we are reminded that there are successful close-call or near-miss reporting systems, such as Sacramento Regional Transit District and New York City Transit,[32] that do not utilize all of the prescriptive and comprehensive elements of the above best practices of the aviation and railroad models, with the MOUs.

Recognizing that a prescriptive, comprehensive and detailed full-blown "best practices" near-miss reporting program, with an MOU, is neither feasible nor desirable in some circumstances, following the 2009 Fort Totten collision, the NTSB did not direct immediate implementation of a prescriptive, comprehensive and detailed full-blown "best practices" near-miss reporting program. Instead, it recommended that the Washington Metropolitan Area Transportation Authority and the FTA should "develop and implement" a near-miss reporting system.

Based on the above noted experiences and the comments filed by parties, Section 9, *et seq.*, of the Proposed GO 175 strikes a careful balance between the need for an effective near-miss reporting program with the needs of the individual RTAs to tailor a program that can work most effectively in each RTA's

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[31] Transit Rail Advisory Committee for Safety (TRACS) Letter Report, July 16, 2012, Establishing a Confidential, Non-Punitive, Close Call Safety Reporting System for the Rail Transit Industry, http://www.fta.dot.gov/12419_12502.html.

[32] Both of these systems were initiated following tragic accidents, and thus may not be easy to implement where the safety benefits and the immediate need for trust might be less evident.

setting. The Proposed GO 175 provisions recognize that some RTAs may already have in place successful near-miss reporting programs and allow parties the necessary flexibility of enhancing any existing successful near-miss reporting programs, while minimizing disruptions to any existing programs, or developing and implementing a new effective program tailored to each RTA. To order all RTAs implement prescriptive one-size-fits-all full-blown "best practices" model now without evaluating the existing programs and the different existing practices by RTAs could be highly disruptive to the RTAs' activities, and may even have negative impact on public safety. Moreover, while a full-blown detailed comprehensive model with an MOU might work best for larger RTAs to create a legal framework for trust between labor and management, this should not inhibit smaller RTAs with well-established trust between labor and management to continue an already-working near-miss reporting programs, enhance those programs where possible or to develop new programs where possible.

Toward enhancing an existing near-miss reporting program or developing a new one, Section 9, *et seq*. of the Proposed GO 175 is instructive and the TRACS report, close-call guidance document, will similarly be informative here since it is focused on rail transit systems.[33] Some of the issues each RTA would need to address, depending on the nature of the organization and its context, including but not limited to:

- Confidentiality, non-punitiveness. Employees have no incentive to report close calls if they expect discipline by

[33] Transit Rail Advisory Committee for Safety (TRACS) Letter Report, July 16, 2012, Establishing a Confidential, Non-Punitive, Close Call Safety Reporting System for the Rail Transit Industry, http://www.fta.dot.gov/12419_12502.html.

doing so. Confidentiality and protection from discipline remove this disincentive, and allow the rewards of labor/management cooperation and engagement in safety activities and innovation to prevail.

- Voluntariness. It cannot be forced, and employees will only "own" their efforts for safety if experienced as choice.
- Memorandum of Understanding (MOU). An MOU becomes the "contract" between all parties including labor, management, third parties, and regulators. It is essential to have written procedures and protections to which all agree.
- Exclusions. Intentional acts and drug and alcohol use are excluded from close call reporting systems. Acts or events that are already known to management are excluded to prevent the system from only being an after-the-fact disciplinary avoidance tactic, and to immediate encourage reporting.
- Timeliness. Limits to reporting time should be established to encourage immediate reporting.
- Data protection. Records containing identifying information must be kept by an independent third party free from public disclosure. Few mechanisms exist for this function since freedom-of -information statutes allow access to normal data repositories. The aviation system uses the data protection authority of the independent NASA, while the C3RS system uses the independence of BTS and the Confidential Information Protection and Statistical Efficiency Act (CIPSEA).
- Resources for causal and trend analysis. Reports need to be analyzed by skilled personnel who can identify multi-dimensional causation and maximize the utility of the reports. Trends are important to identify systemic problems, but even single reports can identify previously unknown risks. Collection of data across several RTA systems can more easily identify emerging trends, and

dissemination of safety information to all RTAs makes the best use of emerging safety information.

In summary, a close-call reporting system has been shown to be effective in soliciting safety information not otherwise reported when employees can report unsafe events and conditions even though they may have violated a rule. The purpose is to engage all possible "eyes and ears" regarding safety non-punitively, and in doing so communicate the primacy of safety and to establish the mutual trust that must exist to put safety first ahead of notions of punishment being the remedy for rule non-compliance and unsafe behavior. CPSD therefore believes and urges that it is time for the rail transit industry to benefit from what may be the benchmark safety innovation in commercial aviation. The Proposed GO 175 therefore requires the RTAs to develop and implement a near-miss reporting system.

5.3.7. Modified Rules for Yard Tracks

In the 2012 Recommendation and the Proposed GO 175, the rules for yard tracks were more clearly distinguished from the rules for main line tracks, and each RTA is required to submit its program for protection on yard tracks more tailored to the situations of each RTA to Staff for its review. The Proposed GO 175 requires each RTA to comply with its respective protection requirements for these two types of tracks.

In the 2012 CPSD Recommendation and the Proposed GO 175, the rules for yard tracks are not as prescriptive as the rules for main line tracks for three primary reasons. First, the need for such prescription was not established by the accident history documented in the 2010 CPSD Recommendation nor in subsequent research. Second, the nature of the tracks, how they are used, and the nature of roadway work on such tracks vary widely between RTAs, and it would

be especially difficult to adopt a GO covering all potential situations. Third, parties agreed that the best way to approach rule application in yard tracks was for a CPSD staff to visit each yard and review the safety practices.

Thus, instead of adopting a "one size fits all" regulation for yards as was recommended in the 2010 Recommendation, parties reasoned and reached a consensus that the most prudent approach would be for each RTA to be required to submit its own particularized set of rules, which would address the unique circumstances of each RTA's yards which differ greatly.

The Proposed GO 175 thereafter would require each RTA to comply with its submitted set of rules. Those rules would then become subject to individual review by CPSD staff in a position to informally or formally pursue changes to those rules, if the rules were deemed insufficient to provide reasonable protection in the particular RTA's yard. The Proposed GO 175 then provides that the resultant rules would then be enforceable by CPSD staff inspectors.

5.3.8. Need for Reconciliation/Update to GO 172

Staff proposes a meeting of stakeholders, including the parties to the personal electronic device prohibition rulemaking, R.08-10-007 (proceeding resulting in GO 172), and the present rulemaking, to discuss reconciliation of the GO 172 provisions that now might conflict with, and now are better addressed in the attached GO 175.

Upon implementation of GO 172 prohibiting personal electronic devices on rail transit systems, parties to this proceeding became aware of possible conflicts between the two GOs. Most importantly, there is some overlap between the two GOs, and GO 172 may also have covered some topics best addressed in the RWP GO, such as the use of electronic devices essential for roadway maintenance and construction activities. Staff recommends modifying GO 172

after further discussion with stakeholders to exempt roadway worker tools that might otherwise be defined as personal electronic devices in GO 172.

The Proposed GO 175 generally addresses use of tools and has safety provisions that will include use of electronic tools needed for roadway work, and thus is the appropriate place to address such use. We are advised that CPSD therefore intends to recommend necessary updates to GO 172 at a later time.

5.3.9. Back-up Safety Devices on Non-Revenue On-Track Vehicles

In its report on the 2010 wayside worker fatalities on the Washington Metropolitan Area Transit Authority in Rockville, Maryland, the NTSB concluded that an audible backup alarm might have helped prevent the accident. The NTSB recommended that the APTA "establish guidelines and standards to require that all existing and new hi-rail vehicle be equipped with an automatic change-of-direction or backup alarm…"

Addressing NTSB recommendation R-12-36 and 49 CFR 214.523, Staff proposed adding a backup alarm requirement to the proposed GO. However, following meeting discussions and recognizing that rail transit vehicle standards are found in GO 143 series, Staff proposes that it would be more appropriate to add the requirement to GO 143 when it is revised. Meanwhile, CPSD requested that the requirements be included in the decision for the Commission to order implementation of the requirement without waiting for the next GO 143 revision.

1. Within one year of the effective date of this decision, all existing and new non-revenue on-track vehicles shall be equipped with a backup alarm that when backing up provides an audible signal distinguishable from the surrounding noise.
2. The RTA shall have rules requiring each operator of a hi-rail vehicle to check the vehicle for compliance with this

subpart, prior to using the vehicle at the start of the operator's work shift.

3. A non-functioning back-up alarm that cannot be repaired immediately shall be tagged and dated in a manner prescribed by the employer and reported to the designated official.
4. Non-functioning backup alarms shall be repaired or replaced as soon as practicable, but at least within seven (7) calendar days.
5. In the case where a vehicle with a non-functioning alarm must be in service, and is permitted to be in service by this General Order, an alternate audible device must be used to sound back-up warnings.
6. The requirements ordered in Ordering Paragraphs 1 through 5 above shall be added to General Order 143 upon its next revision.

Staff recommends that the Commission order the above requirements in the decision separately from the Proposed GO 175. After its original 2010 proposal, Staff became aware of the above NTSB recommendation. Because this proceeding was initiated to address roadway worker safety issue, it is within the scope of this proceeding. Therefore, Staff has discussed this recommendation with parties, during the collaborative process leading to the 2012 Recommendation and the Proposed GO 175 and recommends that it be adopted as part of this proceeding. Moreover, while the above proposed requirements will satisfy NTSB Recommendation R-12-36, Staff recommends that during the next revision of GO 143, the following backup and change-of-direction warning devices be considered: an automatic change-of-direction alarm, a 360-degree intermittent warning light or beacon mounted on the outside of the vehicle, a rear-facing video camera system with a display in the vehicle cab that provides a

view to the rear of the vehicle, and a rear-facing strobe with a distinctive strobe pattern that is used only when backing up.

At least one RTA commented that due to noise restrictions in some residential areas, particularly during night times, use of loud alarms could be infeasible and that other warning devices could provide comparable or even superior safety protection, such as a 360-degree strobe combined with a rear-view video. We agree. In those and other circumstances, alternatives such as strobe/rear-view video option may provide comparable or even superior safety option. For instance, when the ambient noise is at a high level, particularly from any maintenance work, audible alarm may not be as effective. We therefore will order that vehicles be equipped with audible alarms, but also allow the option of installing additional alternative back-up warning devices that can be used simultaneously or instead of the audible alarm, depending on the circumstances. Any RTA wishing to use such optional alternative equipment instead of the audible alarm must obtain prior written approval from the CPSD Director or the Deputy Director of CPSD's Office of Rail Safety.

5.3.10. Positive Train Control

Staff's original report (the 2010 Recommendation) recommended some assessment and reporting regarding positive train control (PTC) systems. Staff continues its recommendation for an informal assessment of the current state of PTC on existing systems before recommending new PTC regulatory requirements. Staff believes that addressing PTC on rail transit systems is a considerable project on its own, and to have accomplished it within this OIR would have delayed important roadway worker provisions well into the future. Staff has been aware of problems with rail transit automated train control

systems, most infamously in the WMATA 2009 fatal collision, but elsewhere as well.

Staff believes attending to the safety of current systems while gathering more information generally and as could be specifically applied would be the best way to ensure critical safety needs. While continuing its support for eventual PTC implementation, Staff has focused more on the assessment of PTC implementation in its recommended requirements, and proposes the following ordering paragraphs in the Commission decision:

- Identify and assess technologically available collision-avoidance technologies for train collision avoidance as they might be applied for roadway worker safety as well as train collision avoidance.
- Assess different systems and their different operations, for example, underground and street-running, for collision-avoidance technology applications, and determine different levels of feasibility, implementation timelines, benefit, and cost, including roadway worker protections.
- Report by December 31, 2014, the results of the above elements of study.

The above proposed ordering paragraphs primarily extend the time for reporting to coincide with the completion and some experience of the Los Angeles Basin PTC railroad installation, the first in the nation. The paragraphs also drop the requirement for perpetual reporting, and instead will leave further action to be dependent on the results of those reports and further developments that may have occurred.

5.3.11. Regulatory Adaptability

As with any new regulation, there are likely to be some unanticipated features that will need improving or even correcting. Potential updates needed for the personal electronic device regulation, GO 172, illustrate this. GO 172 was

the first of its kind in several ways, and needs a few modifications as described above and others as will be analyzed and brought back to the Commission for review and consideration in a subsequent proceeding. However, those anticipated modifications are very limited in scope and can readily be implemented.

Here, the Proposed GO 175 is no exception. It too is first of its kind. It sets an excellent foundation and framework for rail transit safety regulations in California. It is a great starting point and it will evolve with time and ongoing lessons learned as time passes and experience continually gained. In this regard, the Commission constantly attempts to learn, innovate and improve from new research, technology, and experience to continually promote a safety culture. To that end, CPSD proposes to continually oversee and monitor the implementation of the Proposed GO 175 upon its adoption, and also proposes to set up information structures to capture such experiences, especially those that might suggest needed improvements. As necessary, CPSD further proposes to re-engage parties to address any new issues toward continually enhancing the rail transit safety rules, culture and practices, as necessary and appropriate, and brining those issues to the Commission's attention in timely fashion.

5.3.12. Conclusion

Based on the foregoing, CPSD presents the 2010 Recommendation, as updated by the 2012 Recommendation and the Proposed GO 175, for consideration. CPSD recommends the Commission's adoption of the Proposed GO 175 to promote safety for rail transit roadway workers and adoption of several ordering paragraphs designed to complement the Proposed GO 175 in furthering the goals of RWP GO. These recommendations follow CPSD's conclusions based on considerable work with parties to this proceeding, review

of new accident research and industry reports, additional investigation, and new and more comprehensive experience with RWP. CPSD and parties to this proceeding, including RTAs and union representatives, put in considerable work to maximize the effectiveness of the Proposed GO 175 while and the same time working to avoid and minimize confusions, disruptions and/or other unintended negative consequences of a new regulation.

In addition to the foregoing refinements, the Proposed GO 175 also reflects several other proposed modifications by the various parties to this proceeding, to the draft GO provisions originally proposed by CPSD in 2010. Mainly, the refinements and modifications consist of clarifications or updates to definitions and elimination of ambiguities or inconsistencies.

6. DISCUSSION

Overall, the Proposed GO 175 is a thoughtfully crafted response to the significant rail transit safety concern for which the OIR was issued. Through the collaborative process, the industry stakeholders worked with Staff to develop the Proposed GO 175 to effectively accommodate and address their respective concerns noted in the comments in this proceeding while also achieving the shared goal of the OIR, rail transit safety.

Here, we consider the Proposed GO 175 in light of the 2010 Recommendation, as updated by the 2012 Recommendation (the Recommendations) under the below specific criteria by which we review proposed settlements. As set forth in Rule 12.1(d), the criteria are whether a proposal is reasonable in light of the entire record, consistent with the law, and in the public interest.

6.1. The Recommendations and the Proposed GO 175 are Reasonable in Light of the Entire Record of this Proceeding

As noted earlier, the record in this proceeding is extensive and demonstrates a clear safety need and justifications for the Proposed GO 175, CPSD prepared the 2010 Recommendation, including the then-proposed draft GO, as well as the 2012 Recommendation, including the currently recommended Proposed GO 175, based on the record of this proceeding. Parties to the proceeding, with active CPSD facilitation, then collaborated on revisions to draft a GO that found workable solutions to the various issues presented in the OIR and presented in the comments while balancing and addressing the competing concerns.

In Section 5, above, we discussed the major recommendations of CPSD, including the 2010 and 2012 Recommendations, including the provisions of the Proposed GO 175, which were revised or otherwise updated since the 2010 Recommendation through the collaborative process. In general, we find that the resulting approach taken in the Proposed GO 175 is reasonable for these provisions. In fact, for most of the major concern raised in the comments, the Proposed GO 175 presents a well-reasoned approach to the corresponding concern that is reasonable, both in itself and as accommodation and recognition of important and unique concerns raised by stakeholders in the proceeding.

Our commitment to rail transit safety does not end with the adoption of the Proposed GO 175, as modified by this decision. However, we see it as an excellent framework for us to begin building an effective and ongoing regulatory response to a clear safety issue facing the transit industry. We further find the Proposed GO 175 to be coherent, practical and comprehensive response to the rail transit safety in California. Review of the record in this proceeding provides

support for the Recommendations, including the Proposed GO 175. Thus, we find the Recommendations, including the Proposed GO 175, as modified by this decision, are generally reasonable in light of the entire record.

6.2. The Recommendations and the Proposed GO 175 are Consistent with the Law

The Recommendations, including the Proposed GO 175 are consistent with the law. The Commission has safety oversight jurisdiction over California's transit systems under § 99152, as well as under other various Code sections establishing each individual RTA within California, as detailed in Section 3 of this decision. Specifically, as to all RTAs, § 778 also provides: "The commission shall adopt rules and regulations, which shall become effective on July 1, 1977, relating to safety appliances and procedures for rail transit services operated at grade and in vehicular traffic…." Consistent with these authorities, the Commission has adopted various rules and regulations concerning rail transit safety. The Commission continues to oversee and update various safety GOs.

Moreover, the Commission has been identified by the Federal Transit Administration as the State Safety Oversight Agency for transit agencies in California under Title 49 C.F.R. Parts 659, *et seq*. As such, the Commission also has safety and security oversight responsibilities over rail fixed guideway systems, which further requires the Commission to execute certain federally-mandated oversight responsibilities over the rail transit agencies. Based on the foregoing, we find that we have both the jurisdiction and authority to adopt the Proposed GO 175 as a safety regulation to protect the California's transit workers.

As for the process leading to the submission of the Proposed GO 175 and the 2012 Recommendation (which updated the 2010 Recommendation), we find

that it was substantially similar to a settlement process and the submission largely reflected the consensus of those involved in the collaborative process making it reasonable to review it, as we would a settlement agreement.

In sum, we find that the Recommendations, including the Proposed GO 175, as modified by this decision, are consistent with the applicable laws and therefore we should approve and adopt them.

6.3. The Recommendations and the Proposed GO 175 are in the Public Interest

The Recommendations, including the Proposed GO 175, are in the public interest. The Proposed GO 175 provides an excellent framework for RWP in sometimes varied setting of the multiple RTAs operating in California. It strikes a reasonable and careful balance between providing prescription where necessary and flexibility where the uniqueness of each RTA's settings and circumstances must be recognized. We also find the public interest to be served by this successful collaboration among the stakeholders in the transit industry to come together to jointly devise a safety response. Adoption of the Recommendations and the Proposed GO 175 resulting from this exemplary collaborative effort by the key stakeholders in this industry will show and demonstrate our support of their commitment to safety and further ensures speedier and smoother implementation by all those stakeholders who engaged in the process with diligence and passion for transit workers safety. Finally, adoption of the Recommendations and the Proposed GO 175 resulting from this collaborative effort will likely avoid any potential delays and costs of protracted litigation and will readily be accepted and deployed by the industry.

We therefore find that the adoption of the Recommendations, including the Proposed GO 175, as modified by this decision, would be in the public interest.

6.4. Approval of the Recommendations and Adoption of the Proposed GO 175, as Modified

Based on our review and the discussion above, the Commission finds the Recommendations, including the Proposed GO 175, are reasonable in light of the whole record, consistent with the law, and in the public interest.

Throughout this proceeding, Staff and parties followed the collaborative process used in the recent proceeding[34] resulting in the adoption of GO 172, to similarly craft a GO that responded to the instant rulemaking proceeding.

The Proposed GO 175 represents the collective best efforts of all parties in this proceeding including the RTAs and their unions who collaborated on the provisions of the Proposed GO 175 with the ultimate aim to improve and ensure roadway worker safety on California's rail transit systems. The Proposed GO 175 provisions have been crafted through a series of workshops and countless meetings, with Staff as an active facilitator, each step of the way. Parties successfully engaged in these workshops and meetings to improve upon the 2010 Recommendation, including the then-proposed GO provisions, with focus on enhancing effectiveness, enforceability, efficiency, flexibility, and fairness. CPSD recommends, in its 2012 Recommendation, that the Commission adopt the Proposed GO 175.

[34] R.08-10-007.

The 2012 Recommendation, including the Proposed GO 175, is technically not presented as a settlement. However, we find that the process leading to the formation of the recommendations contained in the 2012 Recommendation, including the provisions of the Proposed GO 175 being recommended therein, makes it sufficiently similar to a settlement process and agreement such that we will review it here as a settlement. In doing so, we find the 2012 Recommendation and the terms of recommended GO, the Proposed GO 175, as modified by this decision, are reasonable in light of the whole record, consistent with law, and in the public interest. Therefore, we approve and adopt the Recommendations, including the Proposed GO 175, as modified by this decision.

The Proposed GO 175 also reflects modification responsive to parties' comments in this proceeding as well as additional modifications, interim provisions, relating to the some of the rules concerning "watchpersons." We believe these interim provisions are necessary to provide even greater safeguards than those previously proposed.

The Proposed GO 175, as modified and attached hereto as Attachment C, establishes a solid foundation and framework for rail transit safety regulations in California. Ultimately, the Proposed GO 175, as modified and attached hereto as Attachment C, significantly enhances and promotes safe rail transit systems toward providing effective protection for California's rail transit roadway workers.

In addition to the proposed GO, the 2012 Recommendation notes that added roadway workers safety protection can be provided with positive train control and by equipping the existing and new non-revenue on-track vehicles with a back-up alarm that when backing up provides an audible signal and by

beginning a testing and evaluation process to begin implementing wayside early warning alarm technology.

We agree. This decision therefore directs California's RTAs to take actions ordered in this decision to begin the process of examining and planning for positive train control technology implementation, equip the existing and new non-revenue on-track vehicles with a backup alarm that when backing up provides an audible signal and to begin a testing and evaluation process to begin implementing wayside early warning alarm technology. The actions ordered in this decision are consistent with the transit roadway workers' safety goal of this rulemaking proceeding.

7. OTHER PROCEDURAL MATTERS

Rule 12.1(a) requires parties to submit a settlement for approval by filing a written motion within 30 days after the last day of hearing. There was no evidentiary hearing in this proceeding. Therefore, the time limits in Rule 12.1(a) are inapplicable here. Because the CPSD's recommendations, including the Proposed GO 175, was not technically finalized and presented as a settlement agreement, there was no Rule 12.1(b) public notice of a settlement conference although ample public meetings were held.

8. COMMENTS ON PROPOSED DECISION

The proposed decision of Commissioner Peterman in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the commission's Rules of Practice and Procedure. Comments were filed on September 23, 2013 by BART and SRTD. No reply comments were filed. We made the necessary clarifications, corrections, and revisions to the proposed decision and to the General Order 175,

Attachment C to this decision responsive to the comments. Some of the notable comments leading to revisions are discussed below.

SRTD, in its comment to the proposed decision, requests that we not adopt the 2010 Recommendation as part of this decision. SRTD disagrees with and objects to some of the Staff's characterizations and assertions in the 2010 Recommendation, relating to a 2008 fatality that occurred on SRTD's system. Today, we do not resolve this disagreement in this decision, as it is not material to the outcome of this decision. The 2010 Recommendation however does provide an important background and a preliminary set of recommendations which proved useful during the course of the proceeding. Ultimately, substantial components of the 2010 Recommendation were revised as reflected in the 2012 Recommendation. As such, we find the 2010 Recommendation, taken as a whole, provides necessary context and justification for this decision. Thus, we note that we do not adopt the 2010 Recommendation, but instead adopt that report's *recommendations,* as significantly modified by the 2012 Recommendation and as further modified by this decision.

BART and SRTD, in their respective comment to the proposed decision, both commented that it would not make sense to order installation and implementation of early warning technology system until and unless the testing process was complete and showed that such system provided added safety value and was consistent with the APTA recommendations for use.

We agree. We therefore revised Section 5.3.5. of this decision to direct the RTAs to first test the systems. Thereafter, if the testing results show that the early warning system provides added safety value and is consistent with the APTA recommendations for use, the RTAs should develop an installation and implementation process and plan, including timeline, and submit the plan to the

Commission's CPSD Director and the Deputy Director of CPSD's Office of Rail Safety for approval. Alternatively, if the testing results show that the early warning system does not provide any added safety value and/or is inconsistent with the APTA recommendations for use, the RTAs should develop and submit an alternative plan to test other new systems, including timeline, to the Commission's CPSD Director and the Deputy Director of CPSD's Office of Rail Safety for approval. We also delegate authority to the CPSD Director and the Deputy Director of CPSD's Office of Rail Safety to extend the implementation deadline, including additional time to test any new systems and require the RTA to submit any requests for extensions with showing of a good-faith justification.

BART, in its comment to the proposed decision, requests that alternatives to the audible back-up alarm requirement be allowed. At least one RTA commented that due to noise restrictions in some residential areas, particularly during night times, loud alarms could be infeasible and that other warning devices could provide comparable or even superior protection, such as a 360-degree strobe combined with a rear-view video. We agree. In those and other circumstances, alternatives such as strobe/video option may provide comparable or even superior safety option, especially when the ambient noise is at a high level, perhaps from any maintenance or other work. We therefore will order that vehicles be equipped with audible back-up alarms, but also allow the option of installing additional alternative back-up warning devices that can be used simultaneously or instead of the audible alarm, depending on the circumstances. Any RTA wishing to use such optional alternative equipment instead of the audible alarm must obtain prior written approval from the CPSD Director or the Deputy Director of CPSD's Office of Rail Safety.

Minor clerical or stylistic revisions and corrections have also been made throughout the decision and the text of GO 175, attached to this decision as Attachment C.

9. ADDITIONAL MODIFICATIONS TO THE PROPOSED GO 175

On Saturday, October 19, 2013, a BART train struck two BART roadway workers working on the track between the Walnut Creek and Pleasant Hill stations resulting in fatal injuries to both workers. This accident is currently under investigation and the cause has not yet been determined. However, we know that BART's current rules are either same or similar to the proposed rules relating to "watchpersons" in the Proposed GO 175. This accident therefore raises some concerns with respect to the proposed rules relating to "watchpersons" in the Proposed GO 175. Specifically, the particular proposed rules that we are concerned with are Proposed GO 175, Sections 2.19, 5.1, 6.3 and 6.4.

While those rules appear reasonable, out of abundance of caution, we believe safeguards in addition to those previously proposed in the Proposed GO 175 are necessary here on at least an interim basis, subject to comment and pending the outcome of the fatal BART accident investigation. We therefore modify those rules to also require a watchperson and three-way communication between the central controller, the train operator, and the wayside worker employee-in-charge. The communication must establish that no work will be performed, and no train may enter the work area, until all three individuals confirm their locations, the safety protections being used, and the actual implementation of those safety protections. Vehicle speed restrictions must be imposed in addition to warning flags in advance of the work area.

Accordingly, this decision and GO 175, Attachment C to this decision, reflect these additional safeguards and revised provisions. These rules are modified and adopted immediately, pursuant to Rules 14.6(c)(1) and (c)(9), as interim provisions that are warranted due to public necessity and that provide temporary injunctive relief where failure to do so could cause significant harm to public health, safety and welfare. The effect of the revisions, reflected in attached GO 175, is that GO 175 being adopted now reflects revised sections 2.19 and 5.1. It also reflects deletion of the former section 6.3 of the Proposed GO 175. Finally, the former section 6.4 of the Proposed GO 175 has now been revised and renumbered as section 6.3 in the attached GO 175.

GO 175 and all its provisions will take effect immediately. The interim provisions, the rules being adopted as modified today, will also take effect immediately and will stay in effect until and unless amended, modified or otherwise superseded by a subsequent Commission decision.

There will be further proceeding in this rulemaking following today's decision to monitor and further examine the interim provisions and to afford parties meaningful opportunity to be heard on these interim provisions. Once the current investigation of the recent BART accident is completed and as part of further proceeding following this decision, we expect to revisit GO 175 in light of any outcome of that investigation to determine whether GO 175 we adopt today can be further enhanced to promote even greater roadway worker protection.

10. ASSIGNMENT OF PROCEEDING

Carla J. Peterman is the assigned Commissioner and Kimberly H. Kim is the assigned ALJ in this proceeding.

Findings of Fact

1. Work conducted by rail transit agency roadway workers is, by its very nature, hazardous and involves the ever present possibility of those workers being struck and killed by moving transit vehicles.

2. Current federal or state regulations fail to adequately provide for the protection and safety of California's rail transit roadway workers.

3. The Commission constantly attempts to learn, innovate and improve from new research, technology, and experience to continually promote a safety culture.

4. On January 29, 2009, the Commission opened the rulemaking proceeding, R.09-01-020, to consider ways of improving roadway worker protections and safety on California's transit systems.

5. The Commission has safety oversight jurisdiction over California's transit systems under Code § 99152, as well as under other various Code sections establishing each individual RTA within California.

6. CPSD's independent investigation of twelve rail transit roadway worker accidents found that rail transit employees, both roadway workers and train operators, were not sufficiently aware of the immediate hazards when they were working on or near the track.

7. Staff elicited input from parties, including the RTAs and the unions, on designing an effective GO that is responsive to R.09-01-020.

8. On January 15, 2010, CPSD submitted to the ALJ the 2010 Recommendation, which included a draft proposed GO for roadway worker protection on California's rail transit systems.

9. The ALJ circulated the 2010 Recommendation to parties and solicited comments and parties provided comments noting several areas where the 2010 Recommendation, including CPSD's then-proposed draft GO, maybe improved upon.

10. CPSD facilitated multi-party meetings and discussions with parties after circulation of the 2010 Recommendation, with 15 successive revised drafts of potential GO provisions distributed to those parties, each addressing parties' comments and requests from parties in each subsequent meeting.

11. Staff, with the participation of parties made numerous improvements in the proposed GO, originally proposed in the 2010 Recommendation, and recommended the adoption of the GO proposed in its 2012 Recommendation, dated October 19, 2012.

12. The 2012 Recommendation and the Proposed GO 175 offer the following enhancements:

a. The Proposed GO 175 affords greater roadway worker safety protection than those recommended in the 2010 Recommendation by adopting a new graduated approach to roadway worker protections such that the levels of protections in the Proposed GO 175 correspond to and match the levels of hazard.

b. The Proposed GO 175 is more protective than the Federal Railway Administration Roadway Workers Protection rules in that it prescribes fewer circumstances under which a worker is allowed to perform tasks without a watchman.

c. The Proposed GO 175 addresses the concerns of parties that safety in all RTA environments is best served, not by adding more flagging rules and procedures, but by

allowing the RTAs the flexibility to continue with their current flagging procedures, with other additional safety/protection options.

d. The 2012 Recommendation and the Proposed GO 175 update the definition of "fouling the track."

e. The 2012 Recommendation and the Proposed GO 175, remove from the GO, the previously recommended requirement to use an early warning technology.

f. The 2012 Recommendation and the Proposed GO 175 modify the comprehensive reporting requirements relating to roadway worker near-misses, which remains consistent with the comments by parties responding to the 2010 Recommendation, yet still consistent with NTSB recommendations.

g. The Proposed GO 175 requires the RTAs to implement for roadway workers the National Transportation Safety Board's (NTSB's) recommendation to develop and implement a near-miss reporting system.

h. The 2012 Recommendation and the Proposed GO 175 clearly distinguish the rules for yard tracks from the rules for main line tracks.

i. The Proposed GO 175 generally addresses use of tools and has safety provisions that will include use of electronic tools needed for roadway work.

13. The Proposed GO 175 provisions have been crafted through a series of workshops and countless meetings, with Staff as an active facilitator, each step of the way.

14. Parties successfully engaged in these workshops and meetings to improve upon the 2010 Recommendation, including the then-proposed GO provisions, with focus on enhancing effectiveness, enforceability, efficiency, flexibility, and fairness.

15. The Proposed GO 175 and Attachment C to this decision, GO 175, reflect the collective best efforts of all parties in this proceeding including the RTAs and their unions who collaborated on the provisions of the Proposed GO 175 with the ultimate aim to improve and ensure roadway worker safety on California's rail transit systems.

16. The 2010 and 2012 Recommendations, including the Proposed GO 175, are technically not presented as a settlement, but we find that the process leading to the formation of the recommendations contained in those Recommendations, including the provisions of the Proposed GO 175 being recommended therein, makes it sufficiently similar to a settlement process and agreement.

17. GO 175, Attachment C to this decision, reflects modifications to the Proposed GO 175 in response to the comments filed in this proceeding.

18. We know that BART's current rules are either same or similar to the proposed rules relating to "watchpersons" in the Proposed GO 175; thus, the recent fatal BART accident raises some concerns with respect to the proposed rules relating to "watchpersons" in the Proposed GO 175.

19. While those proposed rules relating to "watchpersons" in the Proposed GO 175 appear reasonable, out of abundance of caution, we believe safeguards in addition to those previously proposed in the Proposed GO 175 are necessary here on at least an interim basis, subject to comment and pending the outcome of the fatal BART accident investigation.

20. This decision and the attached GO 175, Attachment C to this decision, reflect these additional safeguards and corresponding revised provisions.

21. These rules are modified and adopted immediately, pursuant to Rules 14.6(c)(1) and (c)(9), as interim provisions that are warranted due to public

necessity and that provide temporary injunctive relief where failure to do so could cause significant harm to public health, safety and welfare.

22. GO 175, Attachment C to this decision, significantly enhances and promotes safe rail transit systems and provides effective protection for California's rail transit roadway workers.

23. GO 175, Attachment C to this decision, sets an excellent foundation and framework for rail transit safety regulations in California.

24. No early warning technology system has yet been tested comprehensively enough to confidently implement as safe in California's rail transit system operating environments.

25. Given that no system has yet been tested comprehensively enough to confidently implement as safe in California's rail transit systems, we are persuaded by the 2012 Recommendation that California's RTAs should not prematurely implement the early warning technology.

26. In some instances, alternatives to audible alarms such as strobe/rear-view video option may provide comparable or even superior safety option.

27. Added roadway workers safety protection can be provided with positive train control and by equipping the existing and new non-revenue on-track vehicles with a backup alarm that when backing up provides an audible signal and by beginning a testing and evaluation process to begin implementing wayside early warning alarm technology.

28. Although SRTD disagrees with and objects to some of the Staff's characterizations and assertions in the 2010 Recommendation, relating to a 2008 fatality that occurred on SRTD's system, we do not resolve this disagreement in this decision, as it is not material to the outcome of this decision.

Conclusions of Law

1. Review of CPSD's 2010 and 2012 Recommendations, including the proposed GO 175, Attachment C to this decision, pursuant to Article 12 of the Rules is reasonable and justified.

2. Parties have substantially complied with Rule 12.1(a) and 12.1(b).

3. The 2010 and 2012 Recommendations and the Proposed GO 175 are reasonable in light of the whole record, consistent with the law, and in the public interest.

4. The 2010 and 2012 Recommendations and the Proposed GO 175, as modified by this decision, are reasonable in light of the whole record, consistent with the law, and in the public interest.

5. The 2010 and 2012 Recommendations (Attachments A and B to this decision) and the Proposed GO 175, , should be approved, as modified by this decision.

6. GO 175, Attachment C to this decision, should be adopted and should be effective immediately.

7. The RTAs should not implement the early warning technology at this time.

8. The RTAs should be directed to develop a testing and implementation process and timeline, with a goal of ultimately installing and implementing a wayside early warning alarm technology, if the testing results show that the early warning system provides added safety value and is consistent with the APTA recommendations for use.

9. The RTAs should take actions ordered in this decision to begin a testing and evaluation process for wayside early warning alarm technology.

10. The RTAs should develop an installation and implementation process and plan, including timeline, and submit the plan to the Commission's CPSD Director and the Deputy Director of CPSD's Office of Rail Safety for approval.

11. The RTAs should take actions ordered in this decision to install and implement early warning technology, if the testing results show that the early warning system provides added safety value and is consistent with the APTA recommendations for use.

12. The RTAs should take actions ordered in this decision to equip the existing and new non-revenue on-track vehicles with a back-up alarm that when backing up provides an audible signal.

13. In addition to the audible back-up alarm, the RTAs should be permitted the option of installing additional alternative back-up warning devices that can be used simultaneously or instead of the audible alarm, depending on the circumstances.

14. The RTAs should take actions ordered in this decision to begin the process of examining and planning for positive train control technology implementation.

15. Additional safeguards than those proposed in the Proposed GO 175 are necessary to enhance the RWP safety and effectiveness of those proposed rules.

16. The Commission's use of its authorities pursuant to Rules 14.6 (c)(1) and (c)(9) to modify the provisions of the Proposed GO 175, to add additional safeguards and revised provisions to GO 175 (Attachment C to this decision), as interim provisions, so that those rules may be modified and adopted immediately is reasonable.

17. These rules should be modified and adopted immediately, pursuant to Rules 14.6(c)(1) and (c)(9), as interim provisions, should take effect immediately

and should stay in effect until and unless amended, modified or otherwise superseded by a subsequent Commission decision.

18. Following the issuance of this decision and as part of this rulemaking proceeding, the Commission should monitor and further examine GO 175, including the interim provisions, as necessary.

19. Following the issuance of this decision and as part of this rulemaking proceeding, the Commission intends to afford parties meaningful opportunity to be heard on these interim provisions.

20. Following the issuance of this decision, as part of this rulemaking proceeding, and once the current investigation of the recent BART accident is completed, the Commission intends to reexamine GO 175 in light of any outcome of that investigation, to determine whether GO 175 we adopt today can be further enhanced to promote even greater roadway worker protection.

21. Rulemaking 09-01-020 should remain open for further proceeding to monitor and further examine GO 175, including the interim provisions, as necessary, to afford parties meaningful opportunity to be heard on these interim provisions and to revisit GO 175 for additional modifications or enhancements, as necessary, upon review of the findings of the recent fatal BART accident.

O R D E R

IT IS ORDERED that:

1. The transit roadway worker safety recommendations of the Commission's Safety and Enforcement Division (SED)[35], as reflected in the SED Report, dated January 15, 2010 (the 2010 Recommendation), attached to this decision as

[35] CPSD has been recently re-named the Safety and Enforcement Division. For convenience in this decision, we will continue to refer to CPSD except in the Order.

Attachment A, and as modified in SED's Addendum to the 2010 Recommendation, dated October 19, 2012 (the 2012 Recommendation), attached to this decision as Attachment B, are approved as modified in this decision.

2. General Order 175 and all its provisions, including the interim provisions, attached to this decision as Attachment C, are adopted.

3. General Order 175 and all its provisions, including the interim provisions, shall take effect immediately and shall stay in effect until and unless amended, modified or otherwise superseded by a subsequent Commission decision.

4. Within one year of the effective date of this decision, each rail transit agency shall develop a testing and evaluation process to implement wayside early warning alarm technology, such as a track-mounted portable train detector communicating with the portable light/horn, that warns roadway crews of approaching trains and, such as a cab-mounted audible and visual alarm to warn train operators of work sites and employees ahead.

5. Within one year of the effective date of this decision, each rail transit agency shall submit a report to the Commission's Safety and Enforcement Division, on its testing and evaluation process, including all safety features of the technology, and shall submit its plans to implement the technology no later than two years after the effective date of this decision.

6. Within four years from the effective date of this decision, each rail transit agency shall implement an early warning technology.

7. If and as soon as it becomes known that an extension for time to comply with the deadlines ordered in this decision is necessary, each rail transit agency shall submit a written request for extension of time to comply with one or more deadline(s) showing good cause, to the Safety and Enforcement Division (SED) Director and the Deputy Director of SED's Office of Rail Safety.

8. We delegate authority to the Safety and Enforcement Division (SED) Director and the Deputy Director of SED's Office of Rail Safety to extend the implementation deadlines ordered in this decision, including need for any additional time to test any new systems.

9. Within one year of the effective date of this decision, all rail transit agencies shall equip the existing and new non-revenue on-track vehicles with a back-up alarm that when backing up provides an audible signal distinguishable from the surrounding noise and shall have developed and put in place rules:

a. Requiring each operator of a hi-rail vehicle to check the vehicle to ensure it is equipped with a back-up alarm that when backing up provides an audible signal distinguishable from the surrounding noise;

b. Requiring that the foregoing compliance check (required by Ordering Paragraph No. 6a, is completed, prior to use of the vehicle at the start of each operator's work shift;

c. Requiring that when a non-functioning back-up alarm cannot be repaired immediately, it shall immediately be tagged and dated in a manner prescribed by the employer and reported to the designated official;

d. Requiring that a non-functioning back-up alarms shall be repaired or replaced as soon as practicable, but at least within seven (7) calendar days; and

e. Requiring that an alternate audible device must be used to sound back-up warnings, in the case where a vehicle with a non-functioning alarm must be in service, and is otherwise permitted to be in service by decision or Commission General Order(s).

f. Upon approval by the Safety and Enforcement Division (SED) Director or the Deputy Director of SED's Office of Rail Safety, an RTA may use an alternative back-up warning device that provides at least an equivalent level of safety as an alternative to the use of the installed audible back-up alarm. Such alternative device must follow the

same provisions for audible back-up alarms as specified in subparts "a" through and including "e" in this Ordering Paragraph.

10. The requirements ordered in Ordering Paragraph 6, and its subparts (a) through and including (f), shall be considered supplemental directives in addition to those set forth in General Order 143, until General Order 143 is next revised by the Commission.

11. Within one year of the effective date of this decision, each rail transit agency shall submit an individual report or shall join in submitting a joint report that includes the following:

a. Identifies and assesses technologically available collision-avoidance technologies for train collision avoidance as they might be applied for roadway worker safety as well as train collision avoidance; and

b. Assesses different systems and their different operations, for example, underground and street-running, for collision-avoidance technology applications, and determine different levels of feasibility, implementation timelines, benefit, and cost, including roadway worker protections.

12. Rulemaking 09-01-020 shall remain open for further proceeding.

This order is effective today.

Dated _____, at San Francisco, California.

ATTACHMENT A
TO RWP PROPOSED DECISION

THE 2010 CPSD RECOMMENDATION and PROPOSED 2010 DRAFT GENERAL ORDER

ATTACHMENT A TO RWP PROPOSED DECISION

California Public Utilities Commission
Consumer Protection and Safety Division

ROADWAY WORKER PROTECTION ON CALIFORNIA RAIL TRANSIT SYSTEMS

Consumer Protection and Safety Division Report for R.09-01-020

• Richard W. Clark, Director •

January 15, 2010

505 Van Ness Avenue
San Francisco, California 94102

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EXECUTIVE SUMMARY

Forty rail roadway workers from around the nation died after being struck by trains from 1997 to 2008. This staff report examines twelve of those tragedies, including three that happened in California, makes recommendations, and proposes regulations that the staff believes will significantly improve rail transit roadway worker safety.

Rail roadway workers are the men and women who perform routine maintenance and repair work on or near rail tracks. Their work is, by its very nature, hazardous because it involves the ever-present possibility of being struck and killed by a moving train. An exceptionally high level of situational awareness is therefore required of train and roadway worker crews.

Federal regulations have been protecting the safety of rail roadway workers since 1997 when those workers are employed by any of the nation's freight railroads, inter-city passenger railroads, or commuter railroads. There are no federal or state regulations that work to improve the safety of rail transit roadway workers. Each rail transit agency in California has its own roadway worker protection program.

Staff's review of twelve rail transit roadway worker accidents demonstrates that the affected rail transit employees, both roadway workers and train operators, were not sufficiently aware of the immediate hazards when the roadway workers were working on or near the track. Staff has concluded that rules that enhance the situational awareness of wayside workers and train operators will save lives, and therefore recommends a General Order that provides the following requirements:

- A fundamental requirement that each roadway worker performing work on or near tracks be accompanied by a lookout —an employee whose sole function and commitment is to protect those on or near the track from approaching trains.
- A requirement that roadway work locations be demarked by warning flags that ensure that train operators slow trains and prepare to stop in advance of roadway work.
- A requirement that roadway worker crews designate a predetermined safe refuge area.
- A requirement that rail transit agencies adopt a program for reporting and recording near-hits.
- A requirement that rail transit agencies invest in electronic devices that provide roadway workers with an early warning of approaching trains and, eventually, with devices that warn train operators of the presence of track workers.
- A requirement that rail transit agencies adopt a separate roadway worker safety manual approved by Commission staff.
- Rules-compliance testing requirements.
- Training requirements linked to rules-compliance testing results.

Staff also recognizes that the implementation of collision-avoidance technologies, such as positive train control (PTC), will provide increased protection against train accidents of all kinds, including wayside worker accidents, and recommends that the rail transit agencies begin planning for the installation of this technology.

INTRODUCTION

Forty roadway workers were struck and fatally injured by trains and on-track vehicles in preventable accidents between 1997 and 2008 nationwide.[1] These fatalities to Roadway Workers continue to occur with alarming frequency even after promulgation of the Federal Railroad Administration's Roadway Worker Protection Regulations in 1997,[2] with 2008 being the worst year since those regulations were issued in 1997.[3]

The railroad transportation industry has a fatal injury rate more than twice the all-industry rate.[4] Roadway workers' jobs within the railroad transportation industry are especially hazardous.[5] Rail transit systems accounted for "about half of the fatalities involving passenger railroading, while standard passenger trains [Amtrak] and commuter trains each accounted for about a quarter."[6]

Three rail transit roadway workers have been fatally injured in California in the last nine years. A San Francisco Bay Area Rapid Transit (BART) employee was fatally injured on January 12, 2001, in an area of a BART tunnel that has insufficient clearances to allow a BART train to pass without striking a wayside employee working in the area. A Sacramento Regional Transit District (SRTD) maintenance employee was struck by an SRTD train and fatally injured on July 24, 2008, while lubricating tracks. A BART employee was struck by a BART train and fatally injured on October 14, 2008, while he was working in the right-of-way.

Staff's investigations into these three accidents, and its examination of nine similar accidents nationally, revealed common themes that pose unacceptable risk to rail transit roadway workers. The fundamental problem underlying these fatal accidents was work that necessarily took workers' attention away from impending danger, namely, approaching trains or on-track equipment. These workers were required to focus on specific tasks, such as track and structures

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[1] *BMWED Journal*, Vol. 118, No. 1, January/February 2009, p. 2; see also: President's Perspective, Freddie N. Simpson, *BMWED Journal*—January/February 2009.

[2] 49 C.F.R. Part 214 C.

[3] Ibid.

[4] *The Monthly Labor Review*, July/August 2007, http://www.bls.gov/opub/mlr/2007/07/art2full.pdf *The Monthly Labor Review* was established in 1915 as the principal journal of fact, analysis, and research of the Bureau of Labor Statistics, an agency within the U.S. Department of Labor.

[5] Id. at p. 17.

[6] Id. at pp. 17-25. See also: id., footnote 17 at p. 25, "Monorails such as those used at airports also were involved in a small number of cases."

inspections and maintenance, and were not able to pay sufficient attention to their personal safety.

Staff believes that the proposed General Order is necessary to reduce the level of risk in this industry segment by targeting one of the greatest and most unacceptable risks posed to workers within this high-risk industry, and by targeting the most dangerous practices when facing these risks. Staff proposes the General Order included as Appendix A to this report. The proposal is based on Staff's accident investigations, examination of similar accidents nationwide, accident statistics, roadway worker operations analyses, and the human factors involved in roadway worker duties and safety. In summary, the staff proposes several regulatory measures that will require work assignments to be accompanied by affirmative, alert, vigilant, and dedicated persons and procedures that are independent of the work tasks.

BACKGROUND

The Commission opened this rulemaking, OIR 09-01-020, following the roadway worker fatalities occurring on BART and SRTD in 2008. The purpose of the rulemaking is to determine (1) whether current protections for rail transit agency roadway workers are adequate, (2) whether the Commission should adopt a General Order implementing new rules for rail transit agency protection of maintenance-of-way, track, signal, operating employees, and others engaged in roadway work, and (3) if new protections are needed, a description of the protections to be required by rail transit agencies and included in the General Order.

The Commission issued the OIR on February 2, 2009, and solicited comments from the parties to the proceeding – the RTAs and their unions. Parties filed comments on March 31, 2009, primarily stating that no new rules are required and that current protections are adequate if they are followed. Parties responded to Staff's requests for information regarding the agencies' current roadway worker safety policies, practices, rules, training, and procedures. Also, Staff discussed OIR issues with rail transit and transit worker representatives in workshops on September 29 and 30, 2009.

This report will be served on the parties and the service list. Comments will be due on March 1, 2010, and reply comments will be due March 16, 2010, according to the current schedule in the Administrative Law Judge's November 12, 2009, ruling.

This section describes the issues critical to the OIR, including the Commission's jurisdiction to regulate rail transit safety appliances and procedures in California, the accidents that inform the discussion and analysis, accident causes, roadway worker duties and procedures, and the issues the parties identified in their comments.

JURISDICTION

The Commission has safety and security oversight jurisdiction over rail fixed guideway systems[7] in the state under 49 C.F.R. Parts 659 et seq. Further, the Commission has safety oversight jurisdiction over California's transit systems under California Public Utilities (Cal. Pub. Util.) Code Section 99152, as well as under the Cal. Pub. Util. Code sections establishing each individual transit agency within California.

[7] 49 C.F.R. Part 633.5 defines fixed guideway system as "any public transportation facility which utilizes and occupies a separate right-of-way or rails. This includes, but is not limited to, rapid rail, light rail, commuter rail, automated guideway transit, people movers, and exclusive facilities for buses and other high occupancy vehicles."

> Any public transit guideway planned, acquired, or constructed, on or after January 1, 1979,[8] is subject to regulations of the Public Utilities Commission relating to safety appliances and procedures.
>
> The commission shall inspect all work done on those guideways and may make further additions or changes necessary for the purpose of safety to employees and the general public.
>
> The commission shall develop an oversight program employing safety planning criteria, guidelines, safety standards, and safety procedures to be met by operators in the design, construction, and operation of those guideways. Existing industry standards shall be used where applicable.
>
> The commission shall enforce the provisions of this section.
>
> Cal. Pub. Util. Code § 99152.

ROADWAY WORKER ACCIDENTS

CALIFORNIA

Three roadway workers have been fatally injured on California rail transit agency properties since 2001. The accidents are:

- Bay Area Rapid Transit District fatality on October 14, 2008.
- Sacramento Regional Transit District fatality on July 24, 2008.
- Bay Area Rapid Transit District fatality on January 12, 2001.

In each of these fatal accidents staff identified inadequate roadway worker protections as a contributory factor.

[8] Although much of the San Francisco Municipal Railway was constructed before January 1, 1979, the San Francisco Bay Area Rapid Transit District over which the Commission has safety jurisdiction under Cal. Pub. Util. Code § 29047, includes the City and County of San Francisco under Cal. Pub. Util. Code § 28600. *See also: Order Instituting Rulemaking to Incorporate Safety Standards for Rail Fixed Guideway Systems in a General Order*, D.96-09-081, in R.96-04-021, 1996 Cal. PUC LEXIS 954; 68 CPUC2d 156 (Sept. 20, 1996).

BAY AREA RAPID TRANSIT DISTRICT

BART'S OCTOBER 14, 2008 FATAL ROADWAY WORKER ACCIDENT

A BART train struck and fatally injured a BART structures inspector[9] while he was inspecting the fence along the BART right-of-way on October 14, 2008, as part of a two-man crew. The inspectors had requested and received a "Simple Approval" authorization from the control center to enter a restricted area consistent with existing BART rules and procedures.[10] Simple Approval allows inspectors to access trackways with their own vigilance for approaching trains as their only protection. (Discussed further in the Discussion section later in this report.)

Probable Cause

Staff has determined that the reliance on Simple Approval procedures and failure to comply with BART rules are the most probable causes of this accident.

Contributing Cause Factors

Additional contributing factors to this fatal accident were:

- No lookout or flagperson[11] was watching for approaching trains.
- Additional roadway workers were performing work on the adjacent track without knowledge and/or coordination with the structures inspectors.
- Trains were operating in single-track mode, taking turns operating on one track in opposing directions rather than in the usual and customary method of opposing trains operating on separate tracks. The Structures Inspectors were unaware of single-track operations.
- The toe path (walkway) adjacent to the right-of-way was partially obscured by overgrown vegetation which may have caused the victim to walk into the trackway and may have diminished the train operator's field of vision.
- No other technology was in use to warn roadway workers at the time of the accident.
- The structures inspector failed to comply with BART's rule which requires that inspector set his/her portable radio to "scan" mode[12] to monitor communications between trains, control operators, and/or other roadway workers.

---

[9] Wayside workers responsible for inspecting fences, vegetation, and structural buildings along the right-of-way.

[10] Section 6200 of the BART's Operations Rules and Procedures Manual. The request was made of the Power and Support Controller, a personnel position in the control center not responsible for train movement.

[11] Flagperson means personnel assigned to assist in the control of train movements by the display of hand signals, flags, or lights. BART Operations Rules and Procedures, revised January, 2008.

- BART's policy of allowing roadway workers to use personal cell phones as a means of communication between themselves, permits these workers to become distracted from the job being performed, a policy which may also effectively circumvent the BART rule to set portable radios to scan mode.
- The structures inspector was wearing a safety vest at the time of the accident, but it was not the required safety vest mandated in BART rules and procedures.[13] Reenactment of the accident findings revealed that the BART-approved safety vest provides a slight improvement with regard to the visibility of the wayside workers.
- BART did not have a compliance testing or safety rules testing program to insure workers' compliance with roadway safety rules and procedures.

Staff further determined that BART does not have a program to collect, review, or develop corrective action plans for near-collision and/or near-hit reports from roadway workers. Although BART does have an existing requirement that each "unusual occurrence" — such as an accident, disturbance, irregularity, or rule/procedure violation which might affect service or involve or threaten injury to persons or damage to equipment on BART Property — be documented on an *Unusual Occurrence Report,*[14] this requirement does not specifically require roadway worker near-hit reporting.

BART'S JANUARY 12, 2001 FATAL ROADWAY WORKER ACCIDENT

A BART electrician was struck and fatally injured by a BART train on January 12, 2001. The electrician was on the fourth day of his assignment in this capacity and was part of a two-man crew. The crew was walking between the rails and the wall inside a tunnel to investigate a report of a small fire on the track. The electrician was struck while facing the track with his back against the tunnel wall. The workers were authorized to be working on the trackway with Simple Approval authority.[15] The surviving crewmember stated he only had a few seconds to position himself safely against the tunnel wall and yell to the other crewmember to get out of the way before the train arrived.[16] The tunnel has insufficient clearance for a person to stand

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[12] BART Structures Inspection Procedure Section 6.1.11, Procedure #11: M-RK II Portable Radio Use revised 03/01/01.

[13] BART Maintenance and Engineering Safety Manual, Section III, 303.06: BART approved high-visibility safety vest is required to protect employees from hazards resulting from not being visible to equipment or vehicle operators. An approved light weight vest may be used during warm weather. Vest must meet ANSI 107-1999 Standard and BART System Safety Requirements. A high-visibility vest is required when:

- Working on or about the right-of-way, main line tracks and/or in yards.
- Working near highway vehicle traffic, station parking lots.

[14] BART System Safety Program Plan, February 1, 2008.

[15] BART Operations Rule Manual, Section 6200.

[16] BART Accident Investigation Final Report (Sept. 5, 2001), at p. 7.

along the wall while a train passes at the location where the roadway worker was struck by the train.[17]

Probable Cause

The accident investigation report[18] identified the most probable cause of this accident as the failure of the wayside maintenance crew to detect the approaching train and move to a safe location prior to its arrival.

Contributing Cause Factors

Contributing factors include the ambient noise from the approaching train and the sound from the ventilation fans, inattentiveness to surrounding conditions, reliance on Simple Approval rules, and the victim's inexperience with the work environment.

SACRAMENTO REGIONAL TRANSIT DISTRICT

SRTD'S JULY 24, 2008 FATAL ROADWAY WORKER ACCIDENT

A Sacramento Regional Transit District (SRTD) train struck and fatally injured a wayside maintenance worker just east of the Watt/I-80 West Station in Sacramento, California, on July 24, 2008. The train was operating normally in manual mode with no reported defects. The weather was sunny and clear and the view ahead was unobstructed. The wayside worker had walked to a point on the track between the rails with his back to the train when it was stopped approximately 260 feet away at the station platform, and was struck by the train as it left the station. Staff concluded from the operator's interview and the train's video recordings, that neither the wayside worker nor the train operator saw each other. The wayside worker was focused on lubricating the track[19] and the train operator had just received two text messages as the train departed the station and had been frequently using her cell phone during the trip.

Probable Cause

Staff has determined the most probable causes of this accident were:

- The requirement for the wayside worker to simultaneously attend to work tasks and approaching trains.
- SRTD's inadequate safety protection procedures, choices, and rules applicable and available to wayside workers.
- The wayside worker's choice of an inadequate level of protection, and his failure to detect approaching trains and move away from the track.

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[17] Id. at p. 14.

[18] BART System Safety Report, dated September 5, 2001

[19] "Lubricating the track" refers to the regular maintenance activity of placing grease on the curves of a track using a grease gun to reduce derailment potential and lateral forces, enhance wheel and rail life, increase fuel economy, and reduce noise and ground-borne vibration.

- The train operator's inattention to duties from use of her personal cell phone while operating the train.

Contributing Cause Factors

Additional contributing factors to this accident included:

- Absence of a program to collect, review, and develop corrective action plans for near-collisions and/or near-hit reports.
- Inadequate rules compliance testing of train operators.
- Lack of a rules compliance testing program for wayside workers.
- Setting working distance limits of approximately 6.5 miles in length for wayside workers. These long distances do not focus train operators' attention on the specific areas where workers are working at any one time, and likely decrease operator's ability to be sufficiently vigilant.
- Possible conflicting workload and scheduling incentives that may interfere with the choice of safe protection by wayside workers. Workers may be incented to choose protections that minimize schedule impacts but which do not maximize personal safety.
- Possible train operator inattention to duties from personal conversation with another SRTD employee on-board the train.

GEORGIA

The Metropolitan Atlanta Rapid Transit Authority (MARTA) fatal roadway worker accidents:

- MARTA'S fatalities on April 10, 2000.
- MARTA'S fatality on February 25, 2000.

MARTA'S APRIL 10, 2000 FATAL ROADWAY WORKER ACCIDENT

An unscheduled MARTA train struck the bucket of a self-propelled lift that was fouling the southbound main track at MARTA's Lenox Station, in Atlanta, Georgia, on April 10, 2000. Two MARTA contract workers who were repairing the station ceiling from the lift bucket were fatally injured when they were thrown from the bucket to the station platform.[20]

Probable Cause

The NTSB determined that the probable cause of the accident was MARTA's failure to require use of single-tracking safety procedures to protect the work site and the failure of the rail system control center assistant superintendent and the flagman to follow all MARTA safe clearance procedures for protecting workers fouling the track.

[20] NTSB Report Number RAB-03-02 (Aug. 18, 2003), http://www.ntsb.gov/publictn/2003/RAB0302.pdf.

Contributing Cause Factors

The NTSB also determined that MARTA's lack of an effective program to ensure that employees were complying with its safety rules contributed to the accident.

MARTA'S FEBRUARY 25, 2000 FATAL ROADWAY WORKER ACCIDENT

An eastbound MARTA train struck two automatic train control technicians who were inspecting signal equipment on the main track in Decatur, Georgia on February 25, 2000. One of the technicians was killed and the other sustained serious injuries.[21] The technicians had not placed flagging devices to warn train operators of their presence and had not placed shunts on the rail to activate the signal system warning approaching trains.[22] The technicians also failed to request a safe clearance restriction from the operation control center for the inspection.[23]

Probable Cause

The NTSB determined the probable cause to be the failure of MARTA to ensure that written safe clearance procedures were followed for employees doing inspections on the right-of-way.[24]

Contributing Cause Factors

Although not mentioned in the NTSB's Accident Report, the roadway workers' failure to place flagging devices and/or shunts and their failure to request a safe clearance restriction contributed to the accident.

ILLINOIS

CHICAGO TRANSIT AUTHORITY'S FEBRUARY 26, 2002 WORKER ACCIDENT

A Chicago Transit Authority (CTA) Green Line train struck two signal maintainers in the Chicago Loop on the night of February 26, 2002. One maintainer fell from the elevated loop structure onto a parked automobile and was seriously injured. The signal maintainers failed to place flashing yellow lights to warn train operators of the track work as required by CTA rules.[25] CTA did not have any written procedures requiring that a safety lookout be designated.[26]

Probable Cause

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[21] NTSB Report Number RAB-03-03 (Aug. 8, 2003), http://www.ntsb.gov/publictn/2003/RAB0303.pdf .

[22] Id. at p. 3.

[23] Id. at p. 1.

[24] Id. at p. 8.

[25] NTSB Report Number: RAB-03-04 (Feb. 6, 2004), http://www.ntsb.gov/publictn/2003/RAB0304.pdf .

[26] Id. at p. 3.

The NTSB determined that the probable cause of the accident was the failure of the signal maintainers to watch for approaching trains and their failure to obey the CTA's rule that they increase their visibility by displaying a flashing yellow warning light.[27]

Contributing Cause Factors

The NTSB further found that contributing to the maintainers' reduced awareness of oncoming trains was the absence of clear requirements regarding the designation of safety lookouts and the use of interlocking signals to protect work areas.[28]

MASSACHUSETTS

THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY'S (MBTA'S) FATAL ROADWAY WORKER ACCIDENT OF JANUARY 9, 2007.

A southbound Massachusetts Bay Transportation Authority passenger train operated by the Massachusetts Bay Commuter Railroad struck a track maintenance vehicle performing track work on January 9, 2007. Six maintenance-of-way employees were working on or near the track maintenance vehicle. Two employees were killed and two were seriously injured.[29] The accident caused significant service interruption. Property damage was also substantial, with the estimated damages to track and equipment totaling over $500,000.

Probable Cause

The NTSB determined that the probable cause of this accident was the failure of the train dispatcher to maintain blocking that provided signal protection for the track segment occupied by the maintenance of way crew, and the failure of the work crew to apply a shunting device that would have provided redundant signal protection for their track segment.

Contributing Cause Factors

The NTSB found the Massachusetts Bay Commuter Railroad's failure to ensure that maintenance-of-way work crews applied shunting devices as required was a contributing factor to the accident.[30] Finally, the NTSB found that maintenance-of-way crews on all railroads who depend on the train dispatcher for signal protection need redundant protection (e.g., shunting devices) to restrict train movements into work areas.[31]

NEW YORK

New York City Transit's (NYCT's) fatal roadway worker accidents:

- NYCT's fatality on April 24, 2007

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[27] Id. at p. 4.

[28] Ibid.

[29] NTSB RAR-08/01 (March 18, 2008), http://www.ntsb.gov/publictn/2008/RAR0801.pdf .

[30] Id. at p. vi.

[31] Id., Finding #6 at p. 22.

- NYCT's fatality on April 29, 2007

NYCT'S APRIL 24, 2007 FATAL ROADWAY WORKER ACCIDENT

A veteran NYCT track worker was struck by a train and killed while setting up lanterns to warn trains to slow down in advance of a trackside work area on April 24, 2007. A local train had stalled due to brake problems and a train behind it was diverted to the express track. Central control personnel did not know the trackside workers had begun work, and the diverted train could not stop in time to avoid hitting the worker.[32]

Probable Cause

A Board of Inquiry into the accident determined that the probable cause of the accident was the roadway worker's belief that southbound revenue service had ended.

Contributing Cause Factors

The Board of Inquiry found as a contributing factor that the job supervisor failed to properly follow flagging procedures. Further, not all roadway workers—supervisory or nonsupervisory—were supplied with radios.[33]

NYCT'S APRIL 29, 2007 FATAL ROADWAY WORKER ACCIDENT

Another veteran NYCT worker, a painter, was killed instantly on April 29, 2007, when struck by a train that had just come around a sharp curve. The view of the train operator was obscured by the station platform, and no warning signals or devices had been set to warn the train operator of the work being performed. The train also struck and seriously injured a second roadway crewmember. [34]

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[32] "Fatal Injury Track Worker Daniel Boggs, Pass # 080662, April 24, 2007, Board of Inquiry Final Report (July 31, 2007)", http://www.nytimes.com/packages/pdf/nyregion/city_room/20070802_boggsreport.pdf ; see also: *The New York Times*, Stalled Train May Have Played Part in Track Worker's Death (April 26, 2007), http://www.nytimes.com/2007/04/26/nyregion/26worker.html?scp=1&sq=NYCT%20accidents%20April%202007&st=cse .

[33] "Fatal Injury Track Worker Daniel Boggs, Pass # 080662, April 24, 2007, Board of Inquiry Final Report (July 31, 2007)", *supra*, p. 2 of 24.

[34] "Fatal Injury Track Worker Marvin Franklin, Pass # 291103, April 29, 2007, Board of Inquiry Final Report (July 31, 2007)", http://www.nytimes.com/packages/pdf/nyregion/city_room/20070802_franklinreport.pdf ; see also: *The New York Times*, Worker Is Killed by a G Train in Brooklyn (April 30, 2007), http://www.nytimes.com/2007/04/30/nyregion/30train.html?scp=3&sq=NYCT%20accidents%20April%202007&st=cse ; and *The New York Times*, After a Four-Day Safety Review, Subway Work Is Resuming (May 4, 2007), http://www.nytimes.com/2007/05/04/nyregion/04transit.html .

Probable Cause

The Board of Inquiry found that the probable cause of the accident was the supervisor's abandoning of his flagging responsibilities.[35]

Contributing Cause Factors

NYCT's investigation found "clear deficiencies in flagging activities, including adjacent track flagging, caution lights and portable train trip positioning relative to the work area, and poor compliance with flagging requirements identified during the pre-job inspection."[36] An NYCT employee survey also revealed a perception among employees that employees who only perform flagging jobs are much better flaggers and, as a result, flagging for contractors is stronger than flagging by NYCT employees. The employee survey also noted that near-hit incidents are frequent and most go unreported due to a fear of reprisal, a feeling that "nothing will get done," or a desire not to get a coworker in trouble.[37]

WASHINGTON D.C.

The Washington Metropolitan Area Transportation Authority's (WMATA's) fatal roadway worker accidents:

- WMATA's fatality on August 9, 2009
- WMATA's fatalities on November 30, 2006
- WMATA's fatality on May 14, 2006

WMATA's AUGUST 9, 2009 FATAL ROADWAY WORKER ACCIDENT

A Washington Metropolitan Area Transit Authority (Metro) roadway worker was struck and killed by ballast regulator vehicle on August 9, 2009, while he was replacing cross ties on the Metro system's roadway.

Neither the probable cause nor the contributing causes have yet been determined in this accident, although it is apparent that the worker was working on the track did not do what was necessary to avoid being struck by the approaching ballast regulator.

WMATA's NOVEMBER 30, 2006 FATAL ROADWAY WORKER ACCIDENT

A northbound Metro Yellow Line subway train struck and killed two Metro employees performing a walking inspection of the track on November 30, 2006. The northbound train was traveling along track normally used for southbound trains.

Probable Cause

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[35] "Fatal Injury Track Worker Marvin Franklin, Pass # 291103, April 29, 2007, Board of Inquiry Final Report (July 31, 2007)", *supra*, p. 2 of 33.

[36] FTA's Rail Transit Safety Quarterly Newsletter (Fall 2008), *supra*, p. 11.

[37] Ibid.

The NTSB determined that the probable cause of this accident was the failure of the walking track inspectors to maintain an effective lookout for trains and the failure of the train operator to slow or stop the train until she could be certain that the track workers were aware of the train's approach and had moved safely aside.[38] Both track workers had previously called the Metro Control Center to receive permission to walk on the track. The Control Center made blanket radio announcements to train operators notifying them of the work and the approximate location of the track workers. The operator of the northbound train which struck the track workers stated that she did not recall having heard the radio announcements.

Contributing Cause Factors

The NTSB also determined that Metro's announcement system for on-track work was insufficient to protect wayside workers.[39] Among other things, the NTSB determined that Metro's wayside worker rules did not consider the fact that "trains being operated at normal speeds may not be able to stop short of wayside workers who are unaware of the train's approach and have failed to move to a safe area."[40] More importantly, the NTSB criticized Metro's wayside worker rules and procedures because they did not require that a lookout be assigned to help protect the track inspectors who were performing their inspection while simultaneously watching for the approach of trains in both directions.[41]

WMATA's MAY 14, 2006 FATAL ROADWAY WORKER ACCIDENT

WMATA's southbound Metro Red Line subway train struck and killed an automatic train control mechanic at the interlocking north of the Dupont Circle station on May 14, 2006. Two other mechanics remained clear of this southbound Metro train traveling at 40 mph. The mechanic struck by the Red Line train did not clear the track.

Probable Cause

The NTSB determined that the probable cause of the accident was the mechanic's failure to stay clear of the approaching southbound train either because he was not aware of the presence of the train or because he lacked a physical reference by which to identify a safe area outside the train's dynamic envelope.[42]

Contributing Cause Factors

The NTSB determined that the contributing causes to this accident were the same as those referred to in the November 30, 2006 accident, *supra*.

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[38] Ibid.

[39] Ibid.

[40] Id. at p. 4.

[41] Ibid.

[42] NTSB R-08-01 through -04 (January 30, 2008), http://www.ntsb.gov/recs/letters/2008/r08_1_4.pdf .

COMMENTS TO THE RULEMAKING

The Rail Transit Agencies (RTAs) and BART's Service Employees International Union (SEIU) Local 1021 labor union submitted comments to the Rulemaking. Those comments are summarized below.

BART & SEIU 1021

SEIU Local 1021 submitted comments in this proceeding in which it noted that BART had received over 32 safety violation citations since 2003. SEIU 1021 recommended that the CPUC and California Department of Occupational Safety and Health (DOSH) join together to improve BART's safety record through more stringent enforcement of existing safety rules. SEIU 1021 emphasized that on January 30, 2008, in an incident that took place in the trackway near Daly City Station, eight DOSH citations were issued to BART because a roadway worker crew had been found working without any roadway work training.[43]

BART, on the other hand, stated that no new rules or protections are needed and that any rules other than those of the Federal Railroad Administration (FRA) or American Public Transportation Association (APTA) could result in duplication or conflict.[44] BART also opposes application of FRA roadway worker protection rules to its system and recommends the APTA draft rules apply instead with allowances for variances in RTA operations.[45]

LACMTA

The Los Angeles County Metropolitan Transportation Authority (LACMTA) states that new rules are not necessary, and further states that because the RTAs "have established the necessary protections for roadway workers . . . the adequacy of existing rules greatly depends" on the extent roadway workers obey the existing rules. (LACMTA Comments, March 30, 2009, at pp. 2-3.) Further, LACMTA questions the implementation of new technological roadway worker protections because it is a "one-size-fits-all" approach which fails to address each RTA's varying operating environments. Finally, LACMTA notes that two separate efforts are underway to develop roadway worker protection standards, the APTA draft rules and new proposals by the FTA.

SCVTA

The Santa Clara Valley Transportation Authority (SCVTA) states that no new roadway worker protections are necessary. SCVTA calls for strict compliance with existing protections.[46] However, SCVTA does note that ongoing reviews of RTA roadway worker protections are important and that "the adoption of new technologies is necessary to maintain high safety

[43] SEIU Comments (April 17, 2009) at pp. 2-3.

[44] BART Response to CPUC Data Request (Sept. 14, 2009) at p. 3.

[45] BART Response to Rulemaking (April 2, 2009) at p. 8.

[46] SCVTA Comments (March 31, 2009) at p. 3.

standards."[47] Finally, SCVTA states that if new rules are required by the Commission, that they should be consistent with both FRA and (the draft) APTA roadway worker rules and provide for a lead time before implementation of at least six months.[48]

SDTI

The San Diego Trolley's (San Diego Trolley Inc., or SDTI) position is that its current protections have "proven to be effective in providing [protection to] workers on or near the right-of-way... provided all the established rules/procedures are followed."[49] SDTI also notes that its Roadway Worker On-Track Safety Plan (Plan) was approved by the FRA.[50] SDTI is confident that if its Plan is followed every time, roadway worker incidents will be eliminated.[51] Staff notes that SDTI's Plan allows for Lone Workers but requires such single workers to be trained, qualified, and specially permitted to use self-protection. SDTI supervisors regularly observe flag personnel and meet with flaggers on a weekly basis to discuss roadway worker protections and procedures.[52]

SRTD

The Sacramento Rapid Transit District (SRTD) states that existing roadway worker protections are adequate.[53] If additional protections are required, SRTD recommends random periodic operational evaluations of roadway workers as a means of determining worker rules compliance, and states that such a program could be implemented within 60-90 days.[54] SRTD also contends that there are special circumstances and procedures specific to each RTA that "should be considered during any review and approval process" for new regulations.[55] SRTD has looked at technologies for early warning of approaching trains but concluded that this technology did not provide consistent and adequate warning of approaching trains.[56] Finally, SRTD recommends that "the Commission not adopt a specific roadway worker protection program which would be imposed on all RTA's . . . but, rather, "review and accept each RTA's roadway worker protection program" as it presently exists.[57]

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47 Ibid.

48 Id. at p. 4.

49 SDTI Comments (March 27, 2009) at p. 1.

50 Id. at p. 2.

51 Ibid.

52 Ibid.

53 SRTD Comments (March 31, 2009) at p. 2.

54 Ibid.

55 SRTD Comments to CPUC Data Requests (Aug. 13, 2009) at p. 3.

56 Id. at p. 4.

57 Id. at p. 6.

DISCUSSION

ACCIDENT ANALYSIS SUMMARY

The twelve accidents described in the Roadway Worker Accident section of this report demonstrate the futility of requiring roadway workers to attend to their personal safety at the same time that they are required to attend to a work task. These cases demonstrate that workers cannot dedicate sufficient attention to both tasks, and need protection that will allow them to perform the work itself without being responsible for two incompatible tasks.

Each accident would likely have been prevented if independent dedicated lookouts and proper flagging procedure protections were employed. Staff has tailored its recommendations to prevent recurrences of these types of accidents as described in the following sections.

SYSTEMS APPROACH

A systems approach to safety analysis requires that all possible aspects of an operation and organization be examined and assessed for accident prevention potential.[58] Unfortunately, organizations sometimes close accident investigations after finding that an existing rule had been violated. Examples of this short-sighted approach were expressed in more than one RTA's comments, where they assert that for accident prevention, workers just need to obey the existing rules. In contrast, a systems approach examines many different aspects of the situation, including not only the worker, but the work situation, task demands, the environment, human limitations and capabilities, and the certainty of human error. A systems approach would examine the task demands and ensure that they do not impede a worker's ability to follow the rules. Such an approach would examine incentives and disincentives for rule compliance, the existing safety culture, supervisor and peer behavior modeling, and all possible procedures and devices that might preclude the opportunity for human error, minimize any impact, or both.

FUNDAMENTAL ATTRIBUTION ERROR

Psychologists have long recognized that individuals tend to "blame the victim," or in their words, attribute too much outcome responsibility to the person. The "fundamental attribution error" is defined as the "pervasive tendency to 'overattribute' behavior to the personal dispositions" of those whose actions are being considered or observed.[59] Observers tend to focus on the individual's actions and not on the whole system. Accident investigators are likely to have the tendency to overlook human capabilities and limitations, conflicting demands, situation complexity, training effectiveness, and other factors that affect behavior. Investigators

[58] See, for example, *Basic Guide to System Safety*, by J. Vincoli, CSP, 2nd edition, March 2006, Wiley.

[59] Ross, L. The intuitive psychologist and his shortcomings. In L. Berkowitz (ed.), *Cognitive theories in social psychology*. New York: Prentice-Hall, 1978.

may tend to overlook the possibility that when all factors are considered, those factors may explain the accident cause better than the individual's actions.

Investigators may also focus on what is obvious after the accident has occurred and not on the victim's reasonably expected state and the entire situation leading up to the accident. The lay expression "hindsight is 20/20" has been researched and confirmed by psychologists as the "hindsight bias."[60] Investigators and policy makers must avoid this bias not only because it depends on an inadequate model of human behavior, but also because it discourages exploration of all the possibilities for prevention, and instead focuses on more simplistic singular after-the-fact attributions. Claims that workers "just need to follow the rules" reveal wishful thinking, not sound analysis on which policy should be based.

CONCLUSION

Roadway workers must be protected by the best procedures and devices, not by wishful thinking about perfect rules compliance, especially when the work assignment itself is a safety distraction.

UNOBSERVED APPROACHING TRAINS

In the accident descriptions presented in this report, a consistent reason that rail transit workers were hit by transit trains was workers' lack of awareness of approaching trains. Contributing to this cause in most cases was train operators' lack of awareness of workers' presence and insufficient time to slow and stop the train before striking those workers. Directing roadway workers or contractor employees to perform jobs on or near active track, while at the same time directing them to be conscious of possible approaching trains, has not worked to adequately protect roadway workers from being struck by trains. When job tasks divert attention away from safety vigilance, safety suffers. Self-protection is inadequate, dangerous, and has proven to have fatal consequences. Therefore, staff has determined that alternative protections are required.

Most of the RTAs' roadway worker protections were appropriated from the railroad industry. However, although similar, the railroad and rail transit industries are not identical. Rail transit systems are generally constructed in complex densely-populated urban environments. The construction and equipment of RTA trains are very different from railroad passenger and freight trains. They operate more frequently and commonly in areas congested with motor vehicles, pedestrians and/or bicycles such as Sacramento's "K" Street Mall. While they can stop in shorter distances than railroad trains, they also accelerate faster and sometimes operate in lanes adjacent to or shared with motor vehicle traffic. Few RTAs have automatic train control systems that provide central or dispatching offices with the location of the trains. RTAs often operate on aerial or in underground structures which have limited clearances for employees

[60] Fischhoff, B. (1975). Hindsight ≠ foresight: The effect of outcome knowledge on judgment under uncertainty. *Journal of Experimental Psychology: Human Perception and Performance*, Vol. 1, pp. 288 - 299. See also, Kahneman, D., Slovic, P., & Tversky, A. (Eds.), *Judgment under Uncertainty: Heuristics and biases*. Cambridge: Cambridge University Press, 1982.

working on or near track. The railroad industry has superior train control, better communications,[61] greater resources, and in many cases, superior roadway worker protection training.

Railroad rules for roadway workers, termed "Lone Worker,"[62] "Train Line-ups,[63] and "Definite Train Location,[64] rely on employees to protect themselves from being struck by approaching trains. RTAs utilize similar procedures requiring rail transit workers to protect themselves from being struck by trains. These self-protection procedures have not provided sufficient protection[65] for rail transit roadway workers and contractor employees and should be replaced by rules and procedures requiring the presence of lookouts, proper placement of flags, and the pre-establishment of safe refuge areas.

SELF-PROTECTION PROCEDURES

BART's Simple Approval Protection

BART's Simple Approval permits its roadway workers to access trackways[66] or restricted areas containing remotely controlled or monitored trains. The individual roadway worker requesting Simple Approval has the sole responsibility to perform the job function and simultaneously watch for approaching trains. No other protection is provided. The roadway worker depends exclusively on his/her own ears and eyes to avoid a collision with an approaching train. BART's

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[61] "Roadway workers communicate with dispatchers to obtain and release track occupancy authority, as well as to communicate track problems that may require speed restrictions to be put in place or track to be taken out of service." *Communication and Coordination Demands of Railroad Roadway Worker Activities and Implications for New Technology*, USDOT, FRA, Office of Research & Development (Nov. 2007), p. 2.

[62] "An individual roadway worker who is not being afforded on-track safety by another roadway worker, who is not a member of a roadway work group, and who is not engaged in a common task with another roadway worker." American Public Transportation Association's (APTA's) *Standard for Roadway Worker Protection Requirements* (May 2009 Draft), Rule 3.1.10. See also: APTA Draft Rule 4.5.7. *On-Track Safety for Lone Workers*; and 49 C.F.R. Parts 214.337(a) through 214.339.

[63] See 49 C.F.R. Parts 214.333 through 214.335. Informational train line-ups are to be discontinued by a date certain and a $5,000 penalty may be assessed for failure to discontinue its use. 49 C.F.R. Part 214, App. A.

[64] See 49 C.F.R. Part 214.331. The FRA's criteria for using "definite train location" precludes its use by transit agencies, i.e., definite train location may not be used if the number of trains exceeds three in any none-hour period.

[65] For example, the three California fatalities discussed *supra* were the result of the transit agency's reliance on employee self-protection.

[66] Trackway means the mainline portion of the BART system within protective fencing, tunnels, tubes, subways, stations or aerial structures where trains operate. BART Operations Rules and Procedures, Revised January, 2008.

Simple Approval rule prohibits the roadway worker from "fouling"[67] the track unless the worker is able to detect an approaching train or on-rail equipment with sufficient time to move to a predetermined location clear of the track[68] fifteen seconds before a train or on-rail equipment operating at the maximum authorized speed on that track could arrive. BART effectively relies on the rule to prevent trains from striking roadway workers. Thus, Simple Approval places the entire burden of safety on the roadway worker. There is no automatic train stop system or warning system to slow or stop trains for wayside workers nor any other automatic safety procedure to prevent injury to wayside workers. More importantly, neither human error nor worker distraction is taken into consideration. In short, there is no margin of error in BART's application of Simple Approval.

BART's Recent Changes to Simple Approval

Subsequent to their accidents, BART has included additional requirements for Simple Approval authority to limit its use by roadway workers. Roadway work that requires fouling the track may only be performed using Simple Approval when roadway workers are in a group of at least two persons with at least one person acting as a watchperson. After the 2001 accident, BART designated some areas as No Simple Approval areas, including tunnel areas similar to the 2001 accident site.

Additionally, roadway workers must be informed when working on the main line whenever trains are reverse-running[69] through the authorized work location with no more than two parallel tracks. However, Simple Approval for individual roadway workers continues to be permitted for work in areas with fewer than two parallel tracks, work on a designated walkway, or work that does not "require" fouling the track.

SRTD'S Wayside Procedure Advisory

The roadway worker involved in the July 24, 2008, accident described earlier in this report had requested and was granted Wayside Procedure 8.00 Advisory[70] in compliance with SRTD rules and procedures.[71] The use of this rule was the sole protection for the two workers during this

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[67] Fouling a track means placing an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or on-rail equipment. BART Operations Rules and Procedures, Revised January 2008.

[68] BART rules defines *clear of track* as "a location with at least 44 inches between you and the nearest running rail when a walkway with a handrail or other means of support/reference is present (wall, fences or in the case of yards and local control areas, a stationary train appropriately protected from movement). For all other conditions, Clear of Track is defined as a location with at least 60 inches between you and the nearest running rail. These dimensions are for straight track; on curved track, additional clearance needs to be added for carbody overhang." BART Operations Rules and Procedures, Revised January 2008.

[69] The operation of a train in other than the normal direction of travel.

[70] SRTD Rail Operations Rules, Section 8, Wayside Procedure 8.00 Advisory.

[71] SRTD Rail Operation Rules, revised 10/1/08.

incident. Wayside Procedure 8.00 Advisory provided the wayside maintenance employees the least amount of protection of any SRTD Wayside Procedure. As with BART's Simple Approval, the responsibility for protection against approaching trains under this rule rested solely with the wayside maintenance employee.

The Wayside Procedure 8.00 Advisory also requires the control center operator to radio notification to all trains in the area. However, train operators are not required to respond affirmatively or to record the Advisory in their logs. Thus the burden of safety lies with the wayside maintenance worker when the Advisory is used. The train operator in the 2008 accident later stated that she did not hear the Advisory. The controller announced the Wayside Procedure 8.00 Advisory at 12:11 pm. During that time, the train operator was operating the train on the Watt/I-80 to Meadowview route, having departed the Watt/I-80 Station at 11:29 a.m. The Wayside Procedure 8.00 Advisory notification to the trains in the area was only eight seconds in duration and covered any work occurring in 6.5 mile long stretch of track without any more detail regarding where the workers were located.

SRTD'S Changes to Wayside Worker Procedures

SRTD suspended the use of the Wayside Advisory 8.00 following this accident. Additionally, SRTD has made substantial changes to its wayside worker protection rules by eliminating advisory-only protection rules. All wayside work is currently announced in a bulletin which is recorded on the control log and acknowledged by all train operators. SRTD now requires a lookout or flagperson for all wayside work performed with the exception of tool-free inspections. All bulletins are now limited to one hour in duration, are re-issued if the work goes longer than one hour, and are specific to the work zone.

LOOKOUTS/WATCHPERSONS RULES

Many, if not all, of California's rail transit agencies use lookouts and watchpersons to protect roadway workers and contractor employees performing work on or near tracks. Procedures for the use of lookouts and watchpersons are described in both the C.F.R. for railroad workers (49 C.F.R. Parts 214.329, 214.349, and 214.353) and the American Public Transportation Association's (APTA's) Draft roadway worker protection procedures (watchperson/lookout rule sections 3.1.20, 3.1.21, and 4.4).[72] Most California rail transit agencies have written procedures for lookouts and watchpersons. However, the use of lookouts and watchpersons is not required by regulation as it is in the C.F.R. for railroads, and thus are not always used when they could provide safety benefit. Staff does not intend to modify these well-established rules and procedures except to require that lookouts and watchpersons be required whenever rail transit employees come within ten feet of track and within five feet of street-running track.

Further, the lookout/watchperson should be on duty to warn of approaching train at all times. If there is only one lookout/watchperson and he or she must leave this duty for any length of time, the roadway workers must move to the safe refuge area during the absence of the lookout/watchperson. No roadway work may be performed, and all roadway workers must move to a safe refuge area in the absence of an on-duty and observant lookout/watchperson. Finally, the lookout/watchperson requirement should apply at all times without regard to revenue or non-revenue service.

FLAGGING RULES

The RTAs' existing flagging rules, adopted from railroad flagging rules, are complex and cumbersome for rail transit purposes. Appendix B, *infra*, discusses these existing rules in comparison to those proposed here.

FLAGS

The different colored flags used in railroad roadway work: green, white, yellow, red,[73] and blue,[74] are confusing and not all of these color signals are necessary for rail transit operations.

Railways use a number of colored flags. When used as wayside signals they usually use the following meanings (exact meanings are set by the individual railroad company):

- Red = stop.
- Yellow = proceed with care.
- Green or white = proceed.

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[72] Standard for Roadway Worker Protection Program Requirements, prepared by the American Public Transportation Association's Rail Transit Standards Operating Practices Committee, dated May 4, 2009.

[73] "Flagman's signals means a red flag by day and a white light at night, and fusees as prescribed in the railroad's operating rules." 49 C.F.R. Part 218.5.

[74] See 49 C.F.R. Parts 218.21 et seq. and Appendix B, *infra*.

- A flag of any color waved vigorously means stop.
- A blue flag on the side of a locomotive means that it should not be moved because someone is working on it (or on the train attached to it). A blue flag on a track means that nothing on that track should be moved. The flag can only be removed by the person or group that placed it.
- At night, the flags are replaced with lanterns showing the same colors.

See: Wikipedia, *Railway Flags*.

The railroads, Union Pacific Railroad, BNSF, Amtrak, SRTD, and SCVTA, use these flags. However, not all of these color signals are necessary for rail transit operations. Likewise, there is no need to distinguish between track maintenance workers[75] and vehicle maintenance workers (those performing work on rail transit vehicles while on the road and away from the yard) for rail transit purposes. (See Appendix B, *infra*.) Staff proposes the use of the following colors for signal flags or cones in all rail transit operations.

- Yellow-Red: to warn the train operator to slow and be prepared to stop.
- Red: to signal the train operator to stop.
- Green: to signal the train operator to resume speed.

RTAs should use the following flags:

- A flag made of yellow and red material, a flag of red material, and a flag of green material—all of these flags must be clearly visible from a distance as a warning signal; and/or
- a plastic cone either yellow-red in color or topped with a yellow-red flag, a plastic cone either red in color or topped with a red flag, a plastic cone either green in color or topped with a green flag, and all of these cones and flags must be clearly visible from a distance as a warning signal; and/or
- a flashing light which is clearly observable from a sufficient distance to perceive, react, and stop movement.
- Roadway work performed after dark, in tunnels, or in locations with low ambient light levels shall consist only of flashing lights of the same color as required for flags, except yellow may be used to represent yellow-red, and shall be clearly visible from a distance as a warning signal.

[75] 49 C.F.R. Part 214.7 defines roadway worker as "any employee of a railroad, or of a contractor to a railroad, whose duties include inspection, construction, maintenance or repair of railroad track, bridges, roadway, signal and communication systems, electric traction systems, roadway facilities or roadway maintenance machinery on or near track or with the potential of fouling a track, and flagmen and watchmen/lookouts as defined in this section."

- These rules should apply at all times without regard to revenue or non-revenue service.

FLAG PLACEMENT

Yellow-Red Warning Flag Placement

The yellow-red warning flag should be placed in both directions on the track on which roadway work is being performed such that an approaching train will slow and be able to safely stop in advance of the workers on or near the track or adjacent track.

Red Warning Flag Placement

In situations where there is a machine on or fouling the track, or in circumstances in which roadway workers can not safely move to a safe refuge area before a train may arrive, or for any reason requiring trains to stop in advance of the roadway work being performed, a red warning flag shall be placed in both directions on the track such that an approaching train will be able to safely stop in advance of the work being performed.

Green Warning Flag Placement

A green flag may be placed outside the work area designated by the placement of yellow-red warning flags to signal to the train operator that normal speed may be resumed.

Adjacent Tracks Requiring Flag Placement

All adjacent tracks within ten (10) feet of either rail of a track where work is being performed shall also be flagged with yellow-red and green signal flags.

OTHER REGULATORY DEVELOPMENT

More than one RTA raised the prospect of Federal Transit Administration (FTA) roadway worker protection regulations as obviating the need for Commission regulation. However, the FTA currently does not have authority to directly regulate rail transit safety, and that legislation to give the FTA such authority is in the early stages, just having been introduced December 2008.[76] Additionally, proposed legislation that would require federal safety oversight of RTAs provides that the States may establish more stringent safety standards.[77] Finally, in the FTA's discussion of the direction of rail transit regulation, the agency states that California's rail transit regulatory program, which includes its rulemaking authority, is a model for regulation, the "gold standard" for state rail transit safety oversight.[78]

More than one RTA also suggested that APTA's roadway worker protection efforts should suffice. Staff maintains that independently developed and mandated minimum safety

[76] http://www.fta.dot.gov/regional_offices_10891.html

[77] See: http://testimony.ost.dot.gov/final/PelosiTransit.PDF

[78] See the statements of FTA Administrator Peter Rogoff in the video of the hearing on the new proposed FTA legislation at: http://transportation.house.gov/hearings/hearingDetail.aspx?NewsID=1060 .

requirements are essential for roadway worker safety. Voluntary guidelines, especially when modifiable by each agency, do not provide enough assurance that safety will be preeminent.[79]

ROADWAY WORKER PROTECTION RECOMMENDATIONS

RECOMMENDED PROTECTIONS

Staff recommends that RTAs adopt and include in their roadway worker protection rules and procedures the following:

1) LOOKOUTS/WATCHPERSONS: Adopt and enforce a rule or rules requiring the presence of "lookouts/watchpersons" to protect all employees performing work within ten feet of track (five feet for street-running track).

2) FLAGGING: Adopt and enforce a rule or rules requiring the "placement of flags or other easily observable warning devices" in advance of the roadway work being performed such that an approaching train operator can observe, react, slow, and be able to safely stop in advance of the workers on or near the track or adjacent track. Existing rules for flagging should be simplified and modified pursuant the discussion in FLAGGING RULES, supra.

3) SAFE PLACE OF REFUGE: Strictly enforce existing rail transit rules and procedures requiring the workers to predetermine a "safe place of refuge" the worker may move to at least 15 seconds before an approaching train would arrive.

4) SEPARATE ROADWAY WORKER MANUAL: Adopt and maintain a separate manual containing all necessary roadway worker safety procedures and rules, make them freely available to roadway workers, and ensure that roadway workers have easy access to the manual when performing job functions.

5) RIGHT TO CHALLENGE:[80] Provide and ensure that rail transit roadway workers have a right to challenge in good faith whether

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[79] The importance of independent safety oversight is described in *Analysis of Senate Bill SB-53: Submission to the California Research Bureau*, California Public Utilities Commission, Consumer Protection and Safety Division, Richard W. Clark, Director, March 20, 2009.

[80] The "Right to Challenge" is separate and distinct from the "Whistleblower" protections under Federal and California law (see *Burlington Northern & Santa Fe Ry. v. White*, 548 U.S. 53, 57 (2006)). Under whistleblower protections, every employee in California (with certain limited privilege exceptions) is entitled to disclose to government agencies any information that the employee has a reasonable cause to believe may disclose a violation of state or federal law, rule, or regulation. The employer may not retaliate against the employee for exercising disclosure under the law. If the

the on-track safety procedures to be applied provide adequate safety and comply with RTA safety procedures and rules.

6) TRAINING IMPROVEMENT: Improve the training of roadway worker supervisors and job foremen as described below. Improve the training of roadway workers as described below.

7) NEAR-HIT REPORTING PROGRAM: Establish a Near-hit Reporting Program as provided below.

8) TECHNOLOGICAL/ELECTRONIC WARNING DEVICES: Test, implement, and install "technological/electronic devices that warn roadway work crews of the imminent arrival of an approaching train."

Existing RTA rules and procedures that are inconsistent with these recommendations should be removed.

IMPROVED TRAINING REQUIREMENTS

Staff recommends that each RTA ensure that its on-track safety training program for roadway workers enables each worker to understand the hazards of the required job duties and the methods to safely carryout those duties.

Staff recommends that each RTA ensure that roadway worker safety trainers have adequate experience, understanding, and knowledge of safe roadway working rules and procedures to properly train and test less experienced roadway workers.

Staff recommends that each RTA adopt a "worker safety training program" to provide feedback from both the trainers and roadway workers to gauge the success of an on-track safety training program. Each RTA at a minimum shall perform safety training on a yearly basis.

Finally, staff recommends that each RTA adopt a "compliance testing program" to determine whether roadway workers fully comply with applicable roadway worker safety rules and procedures and to determine the adequacy and success of the on-track safety training program. Each RTA at a minimum should perform compliance testing monthly, quarterly and yearly at varying levels to determine worker compliance with the rules and procedures.

NEAR-HIT REPORTING PROGRAM

Current CPUC General Orders and the FTA's State Safety Oversight regulations, 49 CFR Part 659 et seq, require RTAs to implement hazard management programs, but the existing programs have not captured, analyzed and provided corrective actions for near-hits. Only two of the eleven RTAs in California stated they have near-hit programs. Other RTAs claim that they utilize internal programs but there is no evidence supporting the claim that those programs encourage reporting, result in an appropriate record of employee reports, or record the reports with the resultant corrective actions.

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employer retaliates, the employee may be entitled to reinstatement and back wages and the employer may be fined up to $10,000 in civil penalties and prosecuted criminally. (Cal. Lab. Code §§ 1102-1105.)

The FRA began implementing a close-call reporting program in December, 2008. The FRA's Confidential Close-Call Reporting System (C^3RS) is a trial program with the Union Pacific and the Canadian Pacific Railroads. C^3RS attempts to implement a collaborative problem-solving approach to improving safety.[81] It is a safety pilot program designed to give rail employees the ability to voluntarily and anonymously report "close call" incidents that could have resulted in an accident but did not. The FRA states that early indications are that it can be implemented successfully and that it does lead to root-cause analysis and corrective actions with respect to close-calls. The FRA further states that the program has had a positive effect on labor and management collaboration in safety improvement efforts and how organizations embrace a safety culture.[82] The FRA concludes that the program can be implemented successfully.[83]

U.S. Transportation Secretary Ray LaHood testified to the program's success, citing New Jersey Transit's participation in the C^3RS Project, and saying, "We are excited that New Jersey Transit is taking part in this voluntary program that has already proven to reduce injuries and save lives. We hope that others will follow suit and strengthen our efforts."[84]

Staff recommends that each RTA establish a Near-hit Reporting Program for reporting and recording near-hit incidents that could have caused significant injury to rail transit employees including, but not limited to, close-call collisions between trains and motor vehicles, pedestrians, and bicycles, close-call collisions between trains, close-call collisions with rail transit workers, and close-calls in the use of roadway/railway maintenance equipment. This program should encourage rail transit employees to report such close-calls and should be free of disciplinary repercussions to the extent reasonable under the relevant factual circumstances.

ELECTRONIC WAYSIDE WARNING DEVICES

NTSB'S RECOMMENDATION

Following WMATA's Metro Red Line accident of May 14, 2006, in which a subway train struck and killed an automatic train control mechanic near the Dupont Circle station, the NTSB issued corrective measures; among them was the recommendation to promptly implement new technologies to warn roadway workers of approaching trains.

> Promptly implement appropriate technology that will automatically alert wayside workers of approaching trains and will automatically alert train operators when approaching areas with workers on or near the tracks. (R-08-04)
>
> (NTSB R-08-01 through -04, January 30, 2008, *supra*, at p. 8.)

The NTSB further stated:

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[81] U.S.D.O.T., FRA, Research Results, RR08-33 (Dec. 2008), http://www.fra.dot.gov/downloads/Research/rr0833.pdf .

[82] The Report states that safety culture is the accepted beliefs about how safety should be improved. Id. at p. 4.

[83] Ibid.

[84] FRA Press Release, Nov. 19, 2009, http://www.fra.dot.gov/us/press-releases/333 .

Technology can provide additional protection for wayside workers, especially in a work environment in which a lapse of attention can quickly result in serious injury or death. In June 2006, the Federal Transit Administration provided funding to a manufacturer for early alarm system technology to automatically alert wayside workers of approaching trains, to alert train operators when they are approaching wayside work areas, and to detect train overspeed if the train operator does not respond appropriately to the work zone notification. There are two versions of early alarm technology presently available from this manufacturer.

One version utilizes a portable track-mounted unit that can alert wayside crews of approaching trains, but it does not alert the train operator. This system uses a portable train detector that is attached to the running rail near the track work area. The train detector communicates with a portable warning light/horn unit located near the work crew of flagman/lookout. The train detector also communicates with a personal pocket device that can be carried by each wayside worker. When the portable track-mounted unit detects a train on the track, the warning light/horn unit and the personal pocket devices are activated to alert the wayside workers of the approaching train.

The other version, mounted in the cab of the train, provides alerts to the train operator and the wayside workers. The system provides train operators with an audible and visual alarm when they are approaching wayside workers who are near the tracks and are wearing a personal pocket device. The system provides overspeed detection and alerts the wayside workers wearing a personal pocket device that the train is approaching. Pilot projects have been tested on several transit properties. The Massachusetts Bay Transportation Authority and the Maryland Transit Administration are installing this early alarm equipment system-wide.

(NTSB R-08-01 through -04 (January 30, 2008), *supra*, at p. 7.)

"On-size-fits-all" Early Warning Technology

LACMTA's voiced opposition to a "one-size-fits-all" technology requirement in their comments described earlier in this report. Staff does not intend to impose any one technology on all RTAs; the proposed General Order provides individual agency flexibility.[85]

Technology Efficacy

SRTD commented that its review of early warning technology indicated the technology was unsatisfactory. Staff contends that SRTD's testing was insufficient to thoroughly test the technology, which is identical to that employed by RTAs nationwide including SCVTA. This issue is addressed in the General Order, since it explicitly provides for a testing process and review, as well as a four year period for implementation.

The RTAs voiced resistance in the workshop to using this technological improvement on the grounds that the system was not fail-safe and could result in roadway workers becoming complacent in protecting themselves from approaching trains. RTAs also raised financial constraints as an obstacle to funding the investment.

Staff disagrees with the RTAs' resistance to implementation of this new wayside warning technology. To the contrary, staff agrees with the analysis of the NTSB that this early warning alarm technology could help prevent accidents caused by roadway worker and train operator lapses in attention. The fact that the system is not fail-safe is not a reasonable basis for rejecting the technology. Safety systems that are not perfect may nevertheless provide additional levels of safety that may be useful in accident prevention.

This technology will provide a significant improvement in roadway worker protection, even though it may not alone entirely solve the problem of roadway workers being struck by trains. Notably, it will be one element in a program including strict enforcement of flagperson/watchperson, flagging, rules compliance testing, and safe place of refuge requirements,. Staff strongly recommends that the RTAs develop a testing and implementation process for installation of wayside early warning alarm technology within a reasonable time not to exceed four (4) years.

POSITIVE TRAIN CONTROL RECOMMENDATIONS

NTSB'RECOMMENDATIONS

The NTSB determined that the MBTA's lack of Positive Train Control[86] was a major contributory factor to the accident which killed the operator of a train that ran into the back of a standing

[85] See Section 20 of the proposed General Order in Appendix A to this report.

[86] "Positive Train Control" (PTC) provides the train operator and the Operations or Control Center with the location of the train at all times through satellite relayed radio signals using a Global Positioning System. This constant stream of information permits an on-board computer to systematically/automatically stop a train before it runs into another train, a closed switch, or other

light rail train.[87] The NTSB notes that PTC "would have intervened to stop the train and prevent the collision."[88] In its discussion concerning PTC the NTSB writes:

> Four decades of NTSB investigations of railroad accidents have shown that the most effective means of avoiding train-to-train collisions is through use of a positive train control system that will automatically stop a train if the crew fails to comply with a signal indication. Previous investigations have identified a wide range of factors that can affect a train crew's response to signal indications, such as multiple simultaneous distractions, cell phone usage, dense fog, crew inattention, use of prescription medications, and fatigue.
> . . .
>
> The NTSB therefore concludes that this accident could have been prevented had the MBTA Green Line been equipped with a positive train control system that could have intervened to stop train 3667 before it could strike the rear of train 3681.
>
> The Rail Safety Improvement Act of 2008 requires each class I, intercity, and commuter rail carrier (carriers regulated by the Federal Railroad Administration) to develop and submit to the U.S. Secretary of Transportation, within 18 months, its plan for the implementation of a positive train control system by December 31, 2015. Transit agencies that operate trolley, light rail, and heavy rail systems are not included in the requirements of the Rail Safety Improvement Act of 2008. The NTSB therefore recommends that the FTA facilitate the development and implementation of positive train control systems for rail transit systems nationwide**.** [R-09-08] The NTSB further recommends the MBTA develop and implement a positive train control system for all its rail lines [emphasis added].
>
> *Collision Between Two Massachusetts Bay Transportation Authority Green Line Trains, Newton, Massachusetts, supra,* at pp. 30 and 34.

The need for PTC in the rail transit industry nationwide is most apparent in train collisions in which scores of passengers may be injured or killed along with train operators. However, the

known hazard. PTC supplants the present block signal system used to protect trains from entering hazardous track space.

[87] *Collision Between Two Massachusetts Bay Transportation Authority Green Line Trains, Newton, Massachusetts, May 28, 2008*, *supra*, at p. vii. See also http://www.ntsb.gov/publictn/2009/RAR0902.pdf

[88] Ibid .

hazard to roadway workers posed by moving trains is just as real and just as deadly. PTC may allow the train operator and the control center to know the location of roadway workers and automatically slow or stop the train when it approaches the vicinity. Likewise, PTC may allow roadway workers to know of the approach of all trains so that they can move to a safe place of refuge before the train arrives.

STAFF'S RECOMMENDATION FOR IMPLEMENTATION OF POSITIVE TRAIN CONTROL

Staff strongly supports the NTSB's recommendation to the FTA to begin the implementation of PTC on all rail transit systems in the nation. Staff recommends that the Commission order California rail transit systems to begin the process of examining and planning for PTC implementation. Staff recommends the following provisions in a Commission order requiring each RTA:

- To identify and assess technologically available collision-avoidance technologies for train collision avoidance as they might be applied for roadway worker safety as well as train collision avoidance.
- To assess their systems and their different operations, for example, underground and street-running, for collision-avoidance technology applications, and determine different levels of feasibility, implementation timelines, benefit, and cost, including roadway worker protections.
- To cooperate with, and learn from, Class I railroads in the Los Angeles Basin when implementation of PTC begins there in January 2013.
- To seek economies of scale with other RTAs with the purpose of identifying technology that could apply to other RTAs and realize cost savings.
- To report within 12 months of the effective date of a Commission order in this proceeding the results of the above elements of study, and annually thereafter.

CONCLUSION

Work in the rail transportation industry is hazardous.[89] The hazards to employees working on or near tracks posed by moving trains or maintenance machinery are significant and should be reduced to the greatest extent that rules, procedures, supervision, enforcement, and modern technology permit. Staff has recommended new, simplified rules that apply to all employees who come within ten feet of rail transit track and within five feet for street-running track.

First, employees who come within ten feet of rail transit track and five feet for street-running track to perform any job function for the rail transit agency must be accompanied at all times by a lookout or watchperson whose sole purpose and responsibility is to warn of approaching trains.

Second, clearly visible flags should be placed in both directions on the track being worked on sufficiently far from the work being performed to permit an approaching train to slow and stop in advance of the roadway work crew.

Third, RTAs should strictly enforce existing rail transit rules and procedures that:

- Require their employees to predetermine a "safe place of refuge" they may move to at least 15 seconds before an approaching train would arrive.
- Ensure roadway workers have the right to challenge in good faith a work assignment.

Fourth, RTAs should develop and implement a Near-hit (or Close-Call) Reporting and Recording Program.

Fifth, RTAs should improve their training programs for supervisors and job foremen and roadway workers generally.

Sixth, RTAs should adopt a "compliance testing program" to determine whether roadway workers fully comply with applicable roadway worker safety rules and procedures and to determine the adequacy and success of the on-track safety training program. At a minimum, each RTA should perform compliance testing monthly, quarterly, and yearly at varying levels to determine worker compliance with the rules and procedures.

Seventh, RTAs should test, implement, and install within four years "technological/electronic devices that warn roadway work crews of the imminent arrival of an approaching train and warn train operators of approaching roadway work sites and employees.

Finally, RTAs should begin planning for PTC so that installation of PTC will be completed no later than six (6) years from the date of the Commission's order in this proceeding.

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[89] See *The Monthly Labor Review*, July/August 2007, *supra*, at p. 17, referenced earlier in the *Introduction* to this Report.

SUMMARY OF STAFF RECOMMENDATIONS

1. Staff recommends that any rail transit employee who comes within ten feet of tracks (five feet of street-running track) should be accompanied by a lookout/watchperson.

2. Staff recommends that any work performed within ten feet of tracks (five feet of street-running track) shall be flagged to warn train operators of the presence of rail transit workers.

3. Staff recommends the use of the following colors for signal flags or cones in all rail transit operations: yellow-red to warn the train operator to slow and be prepared to stop, red to signal the train operator to stop, and green to signal the train operator to resume speed.

4. Staff recommends that warning flags used to warn train operators of approaching work on or near tracks should be made of yellow and red material, a flag of red material, and a flag of green material which is clearly visible from a distance as a warning signal; and/or should be a plastic cone either yellow-red in color or topped with a yellow-red flag, a plastic cone either red in color or topped with a red flag, a plastic cone either green in color or topped with a green flag, and all such cones and flags shall be clearly visible from a distance as a warning signal; and/or a flashing light which is clearly visible from a distance as a warning signal.

5. Staff recommends that roadway work performed after dark, in tunnels, or in locations with low ambient light levels shall consist only of flashing lights as the same color as the flags described above, except that a yellow flashing light(s) may be used in place of a yellow-red cone or flag, and these flashing light(s) shall be clearly visible from a distance as a warning signal.

6. Staff recommends that a yellow-red warning flags shall be placed in both directions on the track on which roadway work is being performed such that an approaching train will slow and be able to safely stop in advance of the workers on or near the track or adjacent track.

7. Staff recommends that in situations where there is a machine on or fouling the track, or in circumstances in which roadway workers can not safely move to a safe refuge area before a train may arrive, or for any reason requiring trains to stop in advance of the roadway work being performed, a red warning flag shall be placed in both directions on the track such that an approaching train will be able to safely stop in advance of the roadway workers.

8. Staff recommends that a green flag may be placed outside the work area designated by the placement of yellow-red warning flags to signal to the train operator that normal speed may be resumed.

9. Staff recommends that all tracks within ten feet of the work being performed shall also be flagged.

10. Staff recommends that RTAs should strictly enforce their existing rules and procedures requiring workers performing jobs within ten feet of tracks and within five feet of street-running tracks to predetermine a "safe place of refuge" to move to at least 15 seconds before an approaching train would arrive.

11. Staff recommends that RTAs maintain a separate Manual containing all necessary roadway worker safety procedures and rules, that RTAs make them freely available to roadway workers, and that RTAs ensure that roadway workers have easy access to the Manual when performing job functions.

12. Staff recommends that every rail transit roadway worker should be provided with the right to challenge in good faith whether the on-track safety procedures to be applied provide adequate safety and comply with RTA safety procedures and rules.

13. Staff recommends that RTAs should test, implement, and install "technological/electronic devices that warn roadway work crews of the imminent arrival of an approaching train."

14. Staff recommends that each RTA ensure that its on-track safety training program for roadway workers enables each worker to understand the hazards of the required job duties and the methods to safely carryout those duties.

15. Staff recommends that each RTA ensure that roadway worker safety trainers shall have adequate experience, understanding, and knowledge of safe roadway working rules and procedures to properly train and test less experienced roadway workers.

16. Staff recommends that each RTA adopt a "worker safety training program" to provide feedback from both the trainers and roadway workers to gauge the success of an on-track safety training program. At a minimum each RTA shall perform safety training on a yearly basis.

17. Staff recommends that each RTA adopt a "compliance testing program" to determine whether roadway workers fully comply with applicable roadway worker safety rules and procedures and to determine the adequacy and success of the on-track safety training program. At a minimum each RTA shall perform compliance testing monthly, quarterly and yearly at varying levels to determine worker compliance with the rules and procedures.

18. Staff recommends that each RTA establish a Near-hit Reporting Program for reporting and recording near-hit incidents that could have caused significant injury to rail transit employees including, but not limited to, close-call collisions between trains and motor vehicles, pedestrians, and bicycles, close-call collisions between trains, close-call collisions with rail transit workers, and close-calls in the use of roadway/railway maintenance equipment. This program should

encourage rail transit employees to report such close-calls and should be free of disciplinary repercussions to the extent reasonable under the relevant factual circumstances.

19. Staff strongly recommends that the RTAs develop a testing and implementation process for installation of wayside early alarm technology within a reasonable time not to exceed four (4) years.

20. Staff recommends that the Commission order California rail transit systems to begin the process of examining and planning for implementation of collision-avoidance technology implementation, and report annually to the Commission regarding their progress. The annual reports should include descriptions of progress indentifying roadway worker applications; different applications in different operating environments; feasibility, costs and benefits, and applications for roadway worker safety; economies of scale; and collaboration with railroads regarding PTC implementation experience.

APPENDIX A

Staff's Proposed General Order For Roadway Worker Protection On California's Rail Transit Systems

GENERAL ORDER NO. _____

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

RULES AND REGULATIONS GOVERNING ROADWAY WORKER PROTECTION PROVIDED BY RAIL TRANSIT AGENCIES AND RAIL FIXED GUIDEWAY SYSTEMS

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Rail Transit Agencies (RTA) and Rail Fixed Guideway Systems (RFGS) operating in California must comply with the following rules governing roadway worker protection.

1 GENERAL PROVISIONS

1.1 *Authority.* These rules and regulations are authorized by and implement the provisions of 49 U.S.C. § 5330; 49 C.F.R. § 659; and California Public Utilities Code Section 99152, as well as the California Public Utilities Code sections establishing each individual transit agency within California.

1.2 *Purpose.* The purpose of these rules and regulations is to ensure that each RTA is responsible for the safety, training, and briefing of its roadway workers so that each roadway worker understands and complies with the RTA's roadway worker safety rules and procedures. These rules and regulations are intended to ensure that each RTA adopts a program for roadway workers containing specific rules for protecting roadway workers.

1.3 *Applicability.* These rules and regulations are applicable to all RTAs in California. These rules do not prohibit RTAs from implementing rules that provide greater safety.

1.4 *Additional Rules.* The Commission may make such additional rules and regulations or changes to these rules and regulations as necessary for the purpose of safety.

1.5 *Exemptions or Modifications.* Requests for exemptions or modifications from these rules and regulations shall contain a full statement of the reasons justifying the request. A request must demonstrate that safety would not be reduced by the proposed exemption or modification. Any exemption or modification so granted shall be limited to the particular matter covered by the request and shall require Commission approval.

2 DEFINITIONS

2.1 *Contractor* means an entity that performs tasks on behalf of the RTA.

2.2 *Employee* means a person employed by an RTA in California, or a contractor working on behalf of such RTA.

2.3 *Lock-out* means a section of track made inaccessible by derail, disconnected track, or spiked or "plugged" switch, on both sides of the worksite, to prevent train or on-track roadway work vehicle movement into the worksite.

2.4 *Lookout/ Watchperson* means an employee who has been trained and qualified, and whose sole duty is to provide warning to roadway workers of approaching trains or on-track equipment. A Lookout/Watchperson must be on duty at all times and is required without regard to revenue or non-revenue service.

2.5 *Near-hit* means an incident infringing on the safety of the roadway worker on or near the tracks, but without contact or injury. A near-hit may include factors such as train speed and/or the proximity of trains to employees.

2.6 *Rail Fixed Guideway System (RFGS)* means any light, heavy, or rapid rail system, monorail, inclined plane, funicular, trolley, cable car, automatic people mover, or automated guideway transit system used for public transit and not regulated by the Federal Railroad Administration or not specifically exempted by statute from Commission oversight.

2.7 *Rail Transit Agency (RTA)* means the entity that plans, designs, constructs, and/or operates a RFGS.

2.8 *Rail Transit Vehicle* means an RTA's rolling stock, including but not limited to passenger and maintenance vehicles.

2.9 *Right of way* means a strip of land that is granted, through an easement or other mechanism, for transportation purposes which includes the RTA's rails, track, crossties, ballast, bridges, underpasses, tunnels, wayside signals, near-track communication facilities, and stations.

2.10 *Roadway work* means any work performed by transit employees within ten (10) feet of the track or within five (5) feet of street-running track.

2.11 *Roadway worker* means any RTA employee performing any work within ten (10) feet of the track or within five (5) feet of street-running track.

2.12 *Roadway work vehicle* means the RTA's on-track maintenance and hi-rail vehicles.

2.13 *Self-protection alone shall not be sufficient protection* means no employee shall be permitted within ten (10) feet of the track, or within five (5) feet of street-running track, without the accompaniment of another employee who will act as a Lookout/Watchperson and whose sole duty is to provide warning to roadway workers of approaching trains or on-track equipment.

2.14 *System Safety Program Plan (SSPP)* means a document adopted by an RTA detailing its safety policies, objectives, responsibilities, and procedures.

2.15 *Wayside early warning alarm technology* means technological/electronic devices that warn roadway work crews of the imminent arrival of an approaching train and/or warn train operators approaching roadway work sites and employees.

3 RTA RESPONSIBILITY

3.1 Each RTA shall adopt and implement a program that will afford on-track safety to all its roadway workers.

3.2 Each RTA shall adopt a training program to train roadway workers so that each worker understands the hazards of the required job duties and

the methods to safely carryout those duties by following the RTA's roadside worker safety program and rules.

3.3 The RTA's training program shall be sufficient to ensure competency in each job duty to be performed by the roadway worker and in the duties to be performed by those training roadway workers, with emphasis on roadway worker protection duties and responsibilities.

3.4 Each RTA shall adjust its training program to address compliance problems, based on the results of compliance testing.

3.5 Each RTA shall maintain a record-keeping system to retain training records. These records shall be maintained and made available to Commission Staff for a period no less than three (3) years.

3.6 Each RTA shall ensure that each roadway worker is competently trained in every job duty prior being given those duties, with emphasis given to roadway worker protection duties and responsibilities.

3.7 Each RTA shall maintain records of employee-reported unsafe acts or conditions that could result in an accident or incident.

3.8 Each RTA shall adopt and maintain a separate manual containing all necessary roadway worker safety procedures and rules, make them freely available to roadway workers, and ensure that roadway workers have easy access to the manual when performing job functions.

3.9 Each RTA shall ensure that the manuals for other crafts shall be reviewed and made consistent with the rules of this general order.

3.10 Each RTA shall submit their on-track safety manual to Commission Staff for approval and any subsequent modifications shall be approved by Commission Staff prior to RTA implementation.

3.11 Each RTA shall modify their SSPP in accordance with these rules and submit to Commission Staff for approval.

4 ROADWAY WORKER RESPONSIBILITY

4.1 Each roadway worker shall have participated in a job briefing and competent job training prior to the performance of, or change in, any job duty.

4.2 Each roadway worker shall be free to challenge, and/or refuse, any job duty he or she has reason to suspect is unsafe or dangerous.

4.3 Each roadway worker shall be free to challenge, and/or refuse, any job duty that would violate any RTA safety rule or procedure.

4.4 Each roadway worker shall have the responsibility of reporting unsafe acts or conditions to the RTA that could result in an accident or incident, and each RTA shall communicate and encourage this responsibility.

5 JOB BRIEFING

5.1 Any roadway work within ten (10) feet of the nearest rail of transit track, or within five (5) feet of street-running track, shall only be performed after a job briefing in which each roadway worker shall have the job function, rules, and procedures for carrying out job duties discussed and explained. The job briefing shall emphasize the following aspects:

- **a.** The general work plan.
- **b.** The means by which safety is to be provided to the roadway workers through compliance with these roadway worker safety rules and procedures.
- **c.** Proper Protective Equipment.
- **d.** Identification and location of key personnel such as Lookout/Watchperson, and employee-in-charge.
- **e.** Appropriate flags and proper flag placement.
- **f.** The existing or potential hazards involved in the job to be performed and the means to eliminate or protect against such hazards.

g. The predetermined "safe place of refuge" the worker may move to at least 15 seconds before an approaching train would arrive.

h. The means of communication among the roadway workers to be used in the job performance.

i. Acknowledgement and understanding by each roadway worker of the work to be performed and the safety procedures and protections to be used.

j. Any change in the work roadway worker shall have participated in a job briefing and competent job training prior to the performance of, or change in, any job duty.

6 RIGHT TO CHALLENGE

RTAs shall provide and ensure that transit roadway workers have the right and opportunity to challenge in good faith whether the on-track safety procedures to be applied provide adequate safety and comply with RTA safety procedures and rules.

7 WHISTLEBLOWER PROTECTION

Each RTA shall promote and adopt a whistleblower protection program consistent with State and Federal guidelines and regulations.

8 SELF-PROTECTION NOT ALLOWED

No transit employee shall be permitted to come within ten (10) feet of the nearest rail of transit track without the accompaniment of a Lookout/Watchperson whose sole duty is to provide warning to roadway workers of approaching trains or on-track equipment. (EXCEPTIONS: Transit employees shall not be permitted to come closer than five (5) feet of the nearest rail of transit track without the accompaniment of a Lookout/Watchperson when performing work on street-running transit track unless the track is

Locked-Out, or when crossing tracks, or when performing work performed on platforms in stations)

9 LOOKOUT/WATCHPERSON

9.1 Any work to be performed within ten (10) feet of the nearest rail of transit track which has not been Locked-Out shall require a minimum of two roadway workers one of whom shall be a Lookout/Watchperson whose sole duty is to provide warning to roadway workers of approaching trains or on-track equipment. (EXCEPTIONS: A Lookout/Watchperson shall not be required for roadway work on street-running transit trains unless the roadway worker is permitted to come within five (5) feet of the nearest rail of transit track when performing work and the track is not Locked-Out. Further, crossing the transit tracks shall not be considered work requiring a Lookout/Watchperson.)

9.2 The Lookout/Watchperson must be on duty to warn of approaching trains at all times. If there is only one Lookout/Watchperson and he or she must leave this duty for any length of time, the roadway workers must move to the safe refuge area during the absence of the Lookout/Watchperson. No roadway work may be performed, and all roadway workers must move to a safe refuge area, in the absence of an on-duty and observant Lookout/Watchperson.

9.3 The Lookout/Watchperson requirement shall apply at all times without regard to revenue or non-revenue service.

10 SIGNAL FLAGS

10.1 Any work to be performed within ten (10) feet of the nearest rail of transit track which has not been Locked-Out shall be performed only after signal flags or cones are placed to caution trains operating in both directions to slow and be prepared to stop. Crossing the transit tracks shall not require the placement of signal flags or cones. (EXCEPTIONS:

Signal flags or cones shall not be required for roadway work on street-running transit track unless the roadway worker is permitted to come within five (5) feet of the nearest rail of transit track when performing work and the track is not Locked-Out. Work performed on station platforms is also exempted.)

10.2 The following colors of signal flags or cones shall be used in all transit operations.

- **a.** Yellow-Red: to signal the train operator to slow and be prepared to stop.
- **b.** Red: to signal the train operator to stop and not proceed except under agency rules approved by Commission Staff.
- **c.** Green: to signal the train operator to resume speed.

10.3 RTAs shall use the following signal flags:

- **a.** A flag made of yellow and red material, a flag of red material, and a flag of green material—all of these flags must be clearly visible from a distance as a warning signal; and/or
- **b.** a plastic cone either yellow-red in color or topped with a yellow-red flag, a plastic cone either red in color or topped with a red flag, a plastic cone either green in color or topped with a green flag, and all of these cones and flags must be clearly visible from a distance as a warning signal; and/or
- **c.** flashing lights of same color as required for signal flags, except yellow may be used to represent yellow-red, and shall be clearly visible from a distance as a warning signal.

10.4 Roadway work performed after dark, in tunnels, or in locations with low ambient light levels shall consist only of flashing lights of same color as required for signal flags, except yellow may be used to represent yellow-red, and shall be clearly visible from a distance as a warning signal; and

10.5 These rules shall apply at all times without regard to revenue or non-revenue service.

11 SIGNAL FLAG PLACEMENT

11.1 Signal flags shall be placed a sufficient distance from the location of the work to be performed to allow the trains operating on the track to reduce speed and be prepared to stop in advance of the roadway work being performed, and shall be placed in the following manner:

a. The yellow-red flag shall be placed in both directions on the track on which roadway work is being performed such that an approaching train will slow and be able to safely stop in advance of the workers on or near the track or adjacent track.

b. In situations where there is a machine on or fouling the track, or in circumstances in which roadway workers can not safely move to a safe refuge area before a train may arrive, or for any reason requiring trains to stop in advance of the roadway work being performed, a red flag shall be placed in both directions on the track such that an approaching train will be able to safely stop short of the red flag, and proceed only according to RTA rules approved by Commission staff.

c. A green flag may be placed outside the work area designated by the placement of yellow-red flags to signal to the train operator that normal speed may be resumed.

d. All adjacent tracks within ten (10) feet of either rail of a track where work is being performed shall also be flagged with yellow-red and green flags.

12 SAFE TRAIN OPERATIONS IN FLAGGED TERRITORY

The Train Operator shall slow the train sufficiently upon entering a flagged area to be able to stop in advance of the roadway workers on or near the track. Further, the Train Operator shall sound the FRA horn when a wayside worker is observed.

13 SAFE PLACE OF REFUGE

Employees coming within ten (10) feet of transit track, or within five (5) feet of street-running track, shall at all times have a predetermined safe place of refuge that they may move to not less than 15 seconds before an approaching train would arrive.

14 LOCKED-OUT TRACK

If all track within (150) feet of the work performed by roadway workers is made physically inaccessible through portable derails, disconnected track, a spiked or “plugged” switch, on both ends of the worksite, or not connected by rail to the system track over which trains may operate, the Lookout/Watchperson and Signal Flag rules shall not be required.

15 TRAINING

15.1 Each RTA shall adopt an on-track safety training program for roadway workers providing each worker with an understanding of the hazards of the required job duties and the methods to safely carryout those duties. Employees providing safety training shall have sufficient training and experience to be capable of fully explaining and testing the safety hazards involved, the proper safety procedures to be used to adequately address those hazards, and the importance of complying with all relevant safety rules. This on-track safety training program shall be included in the RTA’s SSPP and made available to CPUC staff upon demand.

a. RTA Roadway Worker Requirements

i. No RTA shall assign an employee to perform the duties of a roadway worker, and no employee shall accept such assignment, unless that employee has received training in the on-track safety procedures associated with the assignment to be performed, and further, that employee must have demonstrated the ability to fulfill the responsibilities for performing that on-track job assignment.

ii. Each RTA shall train new roadway workers employees on the on-track safety rules and procedures that they are required to follow, before these employees assume any roadway job duties.

iii. Each RTA at least once every calendar year shall train all roadway workers on the on-track safety rules and procedures that they are required to follow.

iv. Each RTA shall maintain written or electronic records of each roadway worker's training and qualifications. Each record shall include the name of the employee, the type of qualification made, and the most recent date of qualification.

v. Each RTA shall adopt a worker safety training program for roadway workers to provide feedback and gauge the success of an on-track safety training program. At a minimum each RTA shall perform safety training on a yearly basis.

vi. Each RTA shall adopt a compliance testing program to determine roadway workers safety compliance and to ensure success of the on-track safety training program. At a minimum each RTA shall perform compliance testing monthly, quarterly and yearly at varying levels to determine compliance with rules and procedures.

vii. Each RTA shall align its training program based on compliance testing

b. Roadway Worker Training Requirements

i. The training of all roadway workers shall include, as a minimum, the following:

1. Recognition of railroad tracks and understanding of the space around them within which on-track safety is required.
2. The functions and responsibilities of various persons involved with on-track safety procedures.
3. Proper compliance with on-track safety instructions given by persons performing, or responsible for, on-track safety functions.
4. Signals given by a Lookout/Watchperson, and the proper procedures upon receiving a train approach warning from a Lookout/Watchperson.
5. The hazards associated with working on or near railroad tracks, including review of on-track safety rules and procedures.
6. Discussion of the efficiency testing and compliance program requirements.

c. RTA Roadway Worker Training-Personnel Requirements

i. Each Transit agency shall insure that their wayside training personnel have a minimum of four years experience with wayside protection.

ii. All training personnel will have a minimum of two years experience in the field using some form of wayside protection and must have working knowledge of the FRA requirements for track maintenance and inspections.

iii. All training personnel will be required to pass, with a score of 90% or better, a wayside protection exam consisting of the same material that wayside employees are required to know. Each agency will require the training personnel to take this

exam every calendar year while working in the wayside protection program. The exam scores will be documented and made available for regulatory review.

iv. Each RTA shall adopt a safety training program for training personnel to provide feedback and gauge the success of an on-track safety training program. At a minimum each RTA shall perform safety training on a yearly basis.

v. Each RTA shall adopt a compliance testing program to determine whether training personnel fully comply with applicable roadway worker safety rules and procedures and to determine the adequacy and success of the on-track safety training program. At a minimum each RTA shall perform compliance testing monthly, quarterly and yearly at varying levels to determine compliance with the rules and procedures.

vi. Each RTA shall align its training program based on compliance testing.

16 NEAR-HIT PROGRAMS AND RECORDS

16.1 Each RTA shall establish a program for reporting and recording near-hit incidents that could have caused significant injury to transit employees including, but not limited to, close-call collisions between trains and motor vehicles, pedestrians, and bicycles, close-call collisions between trains, close-call collisions with transit workers, and close calls in the use of maintenance equipment. Those records shall be retained by the RTA for a period of three (3) years and shall be made available to CPUC staff on demand.

a. The near-hit program shall include:

i. A policy statement supporting the near-hit program signed by the CEO.

ii. A training program.

iii. A process to convey responsibility to employees to report near-hits.

iv. A document, made readily available to all employees, to record details of the near-hit reporting.

v. A process for employees to submit near-hit reports.

vi. Method to store, easily access, and track near-hits and corrective actions.

vii. Detailed processes and timeframes to perform root cause analysis and identify and implement corrective actions.

b. RTAs shall submit a copy of their near-hit program to staff within thirty (30) days of the effective date of this order and within thirty (30) days of any subsequent modifications.

c. Each RTA shall incorporate their near-hit program into their SSPP and submit the SSPP to Commission Staff for approval within sixty (60) days of the effective date of this order.

d. RTAs shall report near-hits on a monthly basis to Commission Staff in the [an existing monthly report maybe]

e. Each RTA shall post a notice of its near-hit program at all locations where RTA employees report for duty.

17 SYSTEM SAFETY PROGRAM PLAN

Each RTA shall modify their SSPP to include a roadway worker safety plan compliant with these rules. The SSPP shall be modified and submitted to Commission Staff within 60 day's of the effective date of the rules.

18 PROPER PROTECTIVE EQUIPMENT

Any roadway worker within ten (10) feet of the track (five (5) feet for street running track) is required to wear proper head, eye, foot and high-visibility safety apparel, in compliance with the American National Standards Institute and International Safety Equipment Association requirements.

19 ON-TRACK ROADWAY WORKER SAFETY MANUAL

19.1 Each RTA shall adopt and maintain a separate On-Track Roadway Worker Safety Manual containing all necessary roadway worker safety procedures and rules so that each worker understands the hazards of the required job duties and the methods to safely carryout those duties by following the RTA's roadside worker safety program and rules.

19.2 Each RTA shall make them freely available to all employees including roadway workers, and ensure that all employees including roadway workers have easy access to the Manual when performing job functions.

19.3 Each RTA shall incorporate these On-Track Roadway Worker Safety Manual requirements into their SSPP and submit the SSPP to Commission Staff for approval within sixty (60) days of the effective date of this order.

19.4 Each RTA shall provide Commission Staff with copies of the RTA's Commission Staff approved On-Track Roadway Worker Safety Manual, and any subsequent modifications shall be approved by Commission Staff prior to RTA implementation. Additional copies shall be provided to Commission Staff upon request.

20 TECHNOLOGICAL/ELECTRONIC WARNING DEVICES

Each RTA shall develop a testing and implementation process and timeline for installation of wayside early warning alarm technology, such as a track-mounted portable train detector communicating with the portable light/horn, that warns roadway crews of approaching trains and, such as a cab-mounted audible and visual alarm to warn train operators of work sites and employees ahead. Each RTA shall install the technology no later than four (4) years from the effective date of this G.O. Each RTA shall submit a written report of their testing and implementation process and timeline to Commission Staff for review.

Appendix B

Flag Protection

Flag protection is used by Railroads for both track maintenance and vehicle maintenance crews.

TRACK MAINTENANCE FLAGS

Track maintenance crews use three different flags, a green flag, yellow flag, yellow-red flag, and a red flag. The green flag is used to inform the operator they can precede, usually at track maximum or authorized speed. The yellow flag is used to inform the operator that there is a restriction of some kind. The yellow-red flag informs the operator that a stop is required ahead. The red flag serves to inform the operator to stop. Any of these three flags can be use with each other. You could have a red flag followed by a yellow flag or a yellow flag followed by a green flag. The distance for track maintenance flag placement varies from one RTA to another and the yellow flags restrictions vary from one RTA to another.

VEHICLE MAINTENANCE FLAGS

Vehicle maintenance crews use a blue flag.[90] This is used by only two RTAs. The blue flag is used to flag equipment when vehicle maintenance crews are working on, under, or between Light Rail Vehicles (LRVs). Blue flags would be placed ahead and behind the LRV, there would also be a blue flag or blue tag put on the control stand that would be visible to the operator. Blue lights would be used at night in each location for visibility. The FRA rule, 49 C.F.R. Part 218.25, provides:

> When workers are on, under, or between rolling equipment on a main track:
>
> (a) A blue signal must be displayed at each end of the rolling equipment; and
>
> (b) If the rolling equipment to be protected includes one or more locomotives, a blue signal must be attached to the controlling locomotive at a location where it is readily visible to the engineman or operator at the controls of that locomotive.
>
> (c) When emergency repair work is to be done on, under, or between a locomotive or one or more cars coupled to a locomotive, and blue signals are not available, the engineman

[90] "This subpart prescribes minimum requirements for the protection of railroad employees engaged in the inspection, testing, repair, and servicing of rolling equipment whose activities require them to work on, under, or between such equipment and subjects them to the danger of personal injury posed by any movement of such equipment." 49 C.F.R. Parts 218.21 et seq.

> or operator must be notified and effective measures must be taken to protect the workers making the repairs.
>
> (49 C.F.R. Part 218.25)

The FRA regulations define a blue signal:

> Blue signal means a clearly distinguishable blue flag or blue light by day and a blue light at night. When attached to the operating controls of a locomotive, it need not be lighted if the inside of the cab area of the locomotive is sufficiently lighted so as to make the blue signal clearly distinguishable.
>
> (49 C.F.R. Part 218.5)

ATTACHMENT B
TO RWP PROPOSED DECISION

THE 2012 CPSD RECOMMENDATION and PROPOSED 2012 DRAFT GENERAL ORDER

ATTACHMENT B TO RWP PROPOSED DECISION

California Public Utilities Commission
Consumer Protection and Safety Division

ADDENDUM TO
January 15, 2010, Staff Report on Roadway Worker Protection On California Rail Transit Systems

Consumer Protection and Safety Division Report for R.09-01-020

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October 19, 2012

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APPENDIX 18

EXECUTIVE SUMMARY

This report presents the Consumer Protection and Safety Division's (CPSD) recommendation to satisfy the directives in R.09-01-020, "…to determine whether a General Order protecting rail transit roadway workers is necessary, and if so, the provisions of such protections." Staff recommends that the Commission adopt a new General Order, included herein as the Appendix, as the collective best effort of the staff, the rail transit agencies (RTAs), and their unions to ensure roadway worker safety on California's rail transit systems. This proposed General Order was crafted through a series of workshops and meetings, with CPSD staff (Staff) as an active facilitator. The workshops were guided by the following criteria: effectiveness, enforceability, efficiency, flexibility, and fairness. Staff believes this proposed General Order most importantly will be effective in establishing a safer working environment for roadway workers, and recommends adoption.

BACKGROUND

The Commission opened this rulemaking, OIR 09-01-020, following the roadway worker fatalities occurring on BART and SRTD in 2008. The purpose of the rulemaking is to determine (1) whether current protections for rail transit agency roadway workers are adequate, (2) whether the Commission should adopt a General Order implementing new rules for rail transit agency (RTA) protection of maintenance-of-way, track, signal, operating employees, and others engaged in roadway work, and (3) if new protections are needed, a description of the protections to be required by rail transit agencies and included in the General Order.

The Commission issued the OIR on February 2, 2009, and solicited comments from the parties to the proceeding – the RTAs and their unions. Parties filed comments on March 31, 2009, primarily stating that no new rules are required and that current protections are adequate if they are followed. Parties responded to Staff's requests for information regarding the agencies' current roadway worker safety policies, practices, rules, training, and procedures. Also, Staff discussed OIR issues with rail transit and transit worker representatives in workshops on September 29 and 30, 2009.

Staff filed a report on January 27, 2010, compiling research and proposing a General Order to satisfy the directives of the OIR. The present report is an addendum to the Staff's January 27, 2010, report. The following list summarizes the highlights of the comments to the Staff's 2010 proposal and thus also highlights the areas that were subsequently discussed and changed in the current proposed General Order.[1]

- The proposal would not address different work conditions that warrant different safety measures. Requirements should be matched better to level of risk.
- The definitions and provisions for "fouling the track," "lone worker," and "self-protection," would be unworkable.
- Uniform flagging rules would create RTA-specific confusion with long-standing RTA flagging and RWP operating rules. Overuse of flagging protection could put more workers, as flaggers, at risk out in track areas. Protection with flags alone is subject to human error. Too much dependence on flagging procedures would require more

[1] See the complete set of electronically filed comments at: http://docs.cpuc.ca.gov/advancedsearchform.aspx, entering R0901020 as the search entry in the "Proceeding Number" field.

preparation before work can be conducted and thus either shorten available maintenance windows or shorten revenue service hours.

- Early-warning technology is not fail-safe, is not fully tested, and thus should not be ordered. The requirement would be cost-prohibitive and duplicative.
- Training requirements are vague in some cases and over-specified in others.
- Positive train control technology is beyond the scope and capacity of the rulemaking, as its purpose is to prevent train collisions, and would be difficult to specify in the widely varying RTA operating and physical environments.
- Near-miss provisions should be narrowed to within the scope of roadway worker protections. A more broadly scoped near-miss program should be developed consistent with guidelines from other industry experience before being required.
- Various terms and definitions need clarification or redefining, and repetitive and conflicting provisions need to be removed.
- The rulemaking needs to proceed with collaborative process that builds on existing RWP protection.

Following these comments by the RTAs and their unions, staff proposed to follow the process used to craft the personal electronic device regulation now in force as General Order 172. That model consisted of several face-to-face meetings where parties worked together to resolve differences described in the spirit of pursuing effective safety provisions through constructive group discussions, innovation, and consensus decision-making best practices.[2] The primary goal was to establish an effective safety regulation. An essential related goal was enforceability, since the Commission must ensure that staff can efficiently hold RTAs accountable for complying with the regulation. But parties also attended to the important goals of flexibility and fairness. Flexibility can be important in any regulation to avoid inadvertent consequences that unnecessarily interfere with the essential transportation service that RTAs provide. Fairness is important to ensure that one employee craft does not bear undue risk in its work, and that progressive and fair processes are most effective in ensuring respect for, and compliance with, the resultant regulation. [3]

With these goals as the guiding principles, the staff sought and received participation from most RTAs and their respective unions, as well as from CPSD staff with different backgrounds. In addition to the original workshops and comment exchange noted and filed in the OIR's

[2] King, P. (2011). *Cell Phone Regulation on California's Rail Transit Systems.* PowerPoint presentation at the FTA's 15th Annual SSO Program Meeting, Novemeber 2, 2011. p. 13.

[3] See, for example, Harter, P. (1990). Negotiated Rulemaking Act (1990), in *Major Acts of Congress*, Woodbridge, CT: Macmillan Reference USA.

docket, nine days of negotiations were conducted, with 15 successive drafts distributed to the negotiating parties, each addressing comments and requests from the parties in each subsequent meeting. In addition to the original research in the January 27, 2010, staff report, staff reviewed recent NTSB recommendations for roadway worker protection. Staff also reviewed the FRA's Fatality Analysis of Maintenance-of-way Employees and Signalmen (FAMES) committee's recent analyses of 41 of the 44 fatalities occurring on railroads under FRA regulations since they became effective in 1997. Staff, with the participation of parties, made improvements in the proposed General Order consistent with the recent NTSB and FAMES reports.

DISCUSSION

Differences between Staff's Original Proposal and the Current Proposal

The fundamental difference between the staff's original proposal is the new graduated approach to roadway worker protections where the levels of protections are matched to the levels of hazard. At each higher level of hazard, where workers need to pay more attention to the work and thus are less able to pay attention to approaching on-track vehicles and trains, more extensive protections are required, matching the elevated risk. Significant changes were made to the self-protection, flagging, "fouling the track" definitions, early warning technology, and near-miss provisions contained in the proposed General Order.

Levels of Hazard and Protection

Staff's current proposed General Order is structured by levels of protections as matched to the levels of hazard. This structure was proposed by the RTAs to make the General Order more easily implemented and better targeted to the hazards being addressed. The presently proposed General Order provides increasing protections for four basic categories of hazard, from simple movements up through the use of maintenance machinery, which presents the greatest hazard.

For example, minimal protections are required if a worker were to simply move from one side of the track to the other. In this case before fouling the track, the worker must:

- Establish authorization from rail operations control (ROC) for the identified area and
- Be clear of approaching trains 15 seconds before a train moving at the maximum operating speed on that track can pass his/her the location.

If a worker is performing minor tasks, such as retrieving or removing an item from the right-of-way, lining switches, placing or removing flags, taking photographs with an RTA-issued camera, or visually inspecting at one specific fixed location for an immediate need, he or she must also follow the above protections, but must have additional protections to account for the increased activity. The ROC must notify train operators and must convey abnormal train movements to the roadway worker. Trains must sound an audible warning and stop short of the worker's

location or hold outside the location, unless the roadway worker signals the train to proceed or reports he or she is not fouling the track.[4]

A higher level of risk is characterized by use of hand tools, and the proposed General Order again requires higher levels of protection. With hand tool use, which requires more attention to the work and less attention to surroundings, a watchman must be used, for example. A watchman has no other duty but to look out for trains and ensure that those doing the work will receive a warning in time to clear the track before the arrival of any rail transit vehicle.

In contrast, at an even higher level of risk, if a worker is using machines to perform maintenance and repair work, he or she must have much greater protection. For example, on-rail vehicle movement into the work zone must be controlled by applying one or more of the following controls as appropriate: flags with speed restrictions and watchpersons, or restricted speed with watchpersons, or for single track, lining and locking switches, or otherwise physically preventing entry and movement of trains or on-track equipment, or for double adjacent track, lining and locking switches or otherwise physically preventing entry and movement of trains or on-track equipment.

In summary, in comparison to the original proposal, the current proposal allows more flexibility of operation in the lowest levels of hazard, but requires stricter protections in the higher levels of hazard. In total, staff believes the current proposal provides greater safety than the original one by better matching the protections to the risk.

Self-protection

Staff's original proposal would have never allowed roadway workers to foul the track with the dual responsibility to perform work and simultaneously provide the sole protection for their own safety. The current proposal has this same prohibition with one minor exception. The only time the a worker is allowed to depend solely on him or herself for protection is when a worker is simply "moving from one location to another with full attention on surroundings," and has established authorization for the identified area, and is able to comply with the 15-second rule.

Terms used in Federal Railroad Administration RWP rules are helpful here. [5] The FRA regulations use the terms Lone Worker and Individual Train Detection:

- Individual train detection means a procedure by which a lone worker acquires on-track safety by seeing approaching trains and leaving the track before they arrive and which may be used only under circumstances strictly defined in this part.

[4] The reader is cautioned to examine the proposed General Order in the Appendix and not depend on the very brief descriptions presented here. The descriptions here are simplified to provide illustrative examples without going into much detail.
[5] See 49 CFR Part 214, Subpart C., Definitions section.

- Lone worker means an individual roadway worker who is not being afforded on-track safety by another roadway worker, who is not a member of a roadway work group, and who is not engaged in a common task with another roadway worker.

The staff proposal allows some minor tasks to be performed by a worker without a watchman. However, other protections must be provided and these tasks can only be performed under some conditions, as described in the Levels of Hazard and Protection section above. In contrast, the FRA RWP rules even allow work with some tools when a "lone worker" is using "individual train detection." [6]

Staff believes that the currently proposed approach captures the concerns of the parties and provides safety – a higher level of safety than the FRA rules – without prohibiting simple tasks unnecessarily.

Flagging

The revised proposed General Order allows the RTAs to use their existing flags and flagging procedures, but in conjunction with other provisions and not in all situations. Other more affirmative protections may be used. Staff's original proposal required the use of flags as markers to stop trains. The proposal specified uniform and detailed procedures, colors, and placement of the flags. Given the varied use of different flags and procedures between the different RTAs, and the risks in prescribing new flags, rules, and procedures for flagging that would have to be learned without disrupting daily occurring maintenance activity, Staff believes that safety is best served by allowing the RTAs to continue with their current flagging procedures, but with additional protections, and by providing flagging procedures as one protection method among several required options. To do otherwise could create confusion in this safety-critical function, could allow too much dependence on flags, and may not be well-adapted in all RTA environments.

Definition of Fouling the Track

The current proposal addresses the issue behind the definition of "fouling the track" differently than the original proposal by proposing a "track zone" wherein employees must be protected. Fouling the track literally means placing oneself on the track and thus obstructing movement by vehicles on the track. Most importantly, the term has been used to mean "placing oneself in an area where it could be struck by the widest equipment that could occupy the track." After many proposals, and after considering how to best protect safety with this demarcation, the final proposal specifies that: 1) a "zone" with over a three-foot safety margin would be established where any occupancy would trigger required protections, and 2) depending on the nature of the space to be occupied and the nature of the work to be performed, provisions would be required that would protect workers consistent with the level of risk as described earlier in this report. While the definition provides an absolute "zone" demarcation of six feet

[6] See 49 CFR Part 214.337.

away from the track as measured from the outside of the near rail, the definition also addresses the potential for movement into the literal fouling area. The definition from the proposed General Order reads as follows:

- *Track Zone* means an area within six (6) feet of the outside rail on both sides of the track.
- The track zone definition is intended to provide a threshold that can be identified by workers as an area where a person or equipment could be struck, or has the potential to be struck, by the widest equipment that could occupy the track.
- The track zone provides additional space away from the widest revenue rail transit vehicle that could occupy the track to address the potential for inadvertent movement into the area where a person or roadway working equipment could be struck.
- This track zone should be widened, or extra safety provisions put in place, to safely accommodate any movement that might be anticipated into the area. Examples include equipment placed just outside the zone that has a bucket or swing boom that could extend far enough to be struck, or have the potential to be struck, or roadway maintenance machines that might be wider than revenue rail transit vehicles.

The definition used to cover this critical issue provides much greater safe distance than the FRA rule. The FRA rule is four feet from the outside rail, which provides a net margin of about 14 inches from the widest equipment to run on railroad tracks.[7] The six-foot rule in the General Order proposed here for rail transit systems provides between three and four feet depending on different RTA systems. Given that there is no accident history causally implicating the FRA's four-foot criterion, staff believes that the three to four-fold net increase in this safety margin provides even greater safety.[8]

Early Warning Technology

Staff removed the requirement to use an early warning technology from its proposed General Order, and recommends instead that the Commission order the requirements separately in its decision. Staff proposes that the RTAs be ordered to develop a testing and implementation process and timeline for installation of wayside early warning alarm technology. Staff believes that it is important to allow time for testing and evaluation of early warning technological device use by the RTAs because the available technology is in early stages of development and some devices have been unsafe because they have failed to work as intended. Staff also acknowledges the concern that especially before the technology is thoroughly tested, workers

[7] Exceptions are allowed for wider cars or loads on railroads, but those cars or loads must comply with additional safety provisions required in the Commission's General Order 26-D.

[8] Additionally, the freight on open-top railroad freight cars is often secured with chains or heavy metal straps that can come loose and flail about several feet out from the track and thus present extreme danger when moving by at any but the slowest speed. As a rule, such dangers are not present on rail transit systems.

may become overly dependent on the devices rather than attend to existing known safe practices. APTA takes a similar position in advising its members:[9]

> "APTA recommends that RTAs consider one or more of the technologies available only as a backup or overlay to improve their roadway worker protection programs. However, APTA also makes this recommendation with three very strong caveats:
>
> - Use the technology in addition to—not in place of—the established roadway worker protection rules and procedures until such technology is proved to be superior to existing practices.
> - Do not employ the technology in a way that would put workers at risk in the event of a failure of the technology.
> - Conduct a hazard analysis and thoroughly test and evaluate the performance of the technology in the *specific physical and operating environments* of the RTS." (Italics added for emphasis here.)

Given that no system has been tested comprehensively enough to confidently implement as safe in California's rail transit system operating environments, staff recommends instead that the following requirement be added in the decision as a ordering paragraphs:

1. Each RTA or group of RTAs shall develop a testing and evaluation process to implement wayside early warning alarm technology, such as a track-mounted portable train detector communicating with the portable light/horn, that warns roadway crews of approaching trains and, such as a cab-mounted audible and visual alarm to warn train operators of work sites and employees ahead, and shall report on its process within one year of the effective date of this decision, including all fail-safe features of the technology.
2. Each RTA shall submit its plans to Commission Staff to implement the technology no later than two years after the effective date of this decision.
3. Each RTA shall implement an early warning technology as an additional layer to the protections required in the RWP General Order no later than four years after the effective date of this decision.

Near-miss Reporting Provisions

The current proposal for near-miss reporting has been narrowed to address roadway worker near-misses, consistent with the comments received to the Staff's previous proposal. Additionally, in the negotiations staff discussed a more completely detailed "best practices" near-miss reporting program, but agreed that it would not be feasible for the Commission to

[9] APTA Rail Transit Standards Operating Practices Committee (2011). Roadway Worker Protection Program Requirements, American Public Transportation Association, Washington, D.C.

adopt such a complete "best practices" reporting requirement at this time for several reasons. Through a couple decades of experience in the aviation industry, several conditions are seen as essential for a best practices near-miss reporting system. The system must be confidential, non-punitive, and voluntary – voluntary on the part of the participating organizations through a memorandum of understanding (MOU), and voluntary on the part of individuals who will report events and conditions that otherwise would not be known to supervisors and managers. The Federal Aviation Administration's near-miss reporting system, the Aviation Safety Reporting System (ASRS), [10] uses NASA personnel for receiving individual reports. NASA was chosen because of its independence and because there were legal mechanisms for protecting confidentiality. Also, NASA had the resources to conduct these activities. Railroad pilot projects, called Confidential Close Call Reporting Systems, or "C^{3}RS," [11] use the Bureau of Transportation Statistics (BTS) for the report-receiving function since BTS has unique legal confidentiality protections.

An MOU must be established to ensure stakeholders that the system will be non-punitive and confidential. Historically these MOUs have taken months to finalize. This is something that the parties did not believe would be either appropriate or feasible for the Commission to order at this time.

After the 2009 Fort Totten collision the NTSB recommended that the Washington Metropolitan Area Transportation Authority (WMATA) and the FTA should "develop and implement" a near-miss reporting system.[12] Our proposed General Order implements this recommendation as a requirement. CPSD staff has been part of this development on the FTA's Transit Rail Advisory Committee for Safety's (TRACS) Close-Call Reporting Working Group. The TRACS report with recommendations is likely to be published soon, and will serve as a guide for best practices in this area. [13]

Staff recommends that near-miss requirements in the General Order be general enough to preclude disrupting existing successful programs. To order "best practice" without attending to existing programs and the different practices that might be best to achieve the goals now on different properties could negatively impact safety. For example, getting NASA or BTS to accept the responsibility for data de-identification and confidentiality, and crafting an MOU with all stakeholders including NASA or BTS with any related budget issues, could undermine current programs and inhibit roll-out of less than full-blown "best practices" models such as C^{3}RS and ASRS. Two examples of successful close-call or near-miss systems that do not utilize all the best

[10] http://asrs.arc.nasa.gov/

[11] http://www.closecallsrail.org/

[12] National Transportation Safety Board (2010). *Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains Near Fort Totten Station, Washington, D.C., June 22, 2009*. Railroad Accident Report NTSB/RAR-10/02. Washington, DC. See Recommendations R-10-4 and R-10-17.

[13] http://www.fta.dot.gov/12419_12502.html

practices of the aviation and railroad models are programs at the Sacramento Regional Transit District and New York City Transit.[14] Both of these systems were initiated following tragic accidents, and thus may not be easy to implement where the safety benefits and the immediate need for trust might be less evident.

While the full-blown model might be the best practice for large agencies without existing trust between labor and management, this should not inhibit small RTAs with well-established trust to continue an already-working program or to develop a new program. The decision text itself is better suited to provide this level of sophistication. Additionally, TRACS is soon to publish a close-call guidance document that will be especially informative here since it is focused on rail transit systems.

Many issues would need to be addressed, depending on the nature of the organization and its context, including but not limited to:

- Confidentiality, non-punitiveness. Employees have no incentive to report close calls if they expect discipline by doing so. Confidentiality and protection from discipline remove this disincentive, and allow the rewards of labor/management cooperation and engagement in safety activities and innovation to prevail.
- Voluntariness. It cannot be forced, and employees will only "own" their efforts for safety if experienced as choice.
- Memorandum of Understanding (MOU). An MOU becomes the "contract" between all parties including labor, management, third parties, and regulators. It is essential to have written procedures and protections to which all agree.
- Exclusions. Intentional acts and drug and alcohol use are excluded from close call reporting systems. Acts or events that are already known to management are excluded to prevent the system from only being an after-the-fact disciplinary avoidance tactic, and to immediate encourage reporting.
- Timeliness. Limits to reporting time should be established to encourage immediate reporting.
- Data protection. Records containing identifying information must be kept by an independent third party free from public disclosure. Few mechanisms exist for this function since freedom-of -information statutes allow access to normal data repositories. The aviation system uses the data protection authority of the independent NASA, while the C^3RS system uses the independence of BTS and the Confidential Information Protection and Statistical Efficiency Act (CIPSEA).

[14] Gertler, J., DiFiore, A., Hadlow, G., Lindsey, A., and Meenes, R. (2011). *Improving Safety-Related Rules Compliance in the Public Transportation Industry*, TCRP Report 149, Transportation Research Board of the National Academies, Washington, D.C.

- Resources for causal and trend analysis. Reports need to be analyzed by skilled personnel who can identify multi-dimensional causation and maximize the utility of the reports. Trends are important to identify systemic problems, but even single reports can identify previously unknown risks. Collection of data across several RTA systems can more easily identify emerging trends, and dissemination of safety information to all RTAs makes the best use of emerging safety information.

In summary, a close-call reporting system has been shown to be effective in soliciting safety information not otherwise reported when employees can report unsafe events and conditions even though they may have violated a rule. The purpose is to engage all possible "eyes and ears" regarding safety non-punitively, and in doing so communicate the primacy of safety and to establish the mutual trust that must exist to put safety first ahead of notions of punishment being the remedy for rule non-compliance and unsafe behavior. Staff believes it is time for the rail transit industry to benefit from what may be the benchmark safety innovation in commercial aviation. Sidney Dekker, a preeminent author and leader in the field of aviation safety and human-error prevention states the following regarding non-punitive reporting systems.

> "Getting people to report is about building trust: trust that the information provided in good faith will not be used against those who reported it. Such trust must be built in various ways. An important way is by structural (legal) arrangement. Making sure people have knowledge about the organizational and legal arrangements surrounding reporting is very important: disinclination to report is often related more to uncertainty about what *can* happen with a report, than by any real fear about what will happen."
>
> "If an organization wants to encourage reporting, it may actually have to curtail disclosure. Reporters will step forward with information about honest mistakes only when they feel they have adequate protection against that information being misused or used against them. This can mean that reported information must somehow remain confidential, which rules out disclosures (at least of that exact information)." [15]

Reconciliation of General Order 172

Staff proposes a meeting of stakeholders, including the parties to the personal electronic device prohibition General Order 172 rulemaking, R.08-10-007, and the present rulemaking, to discuss reconciliation of the General Order 172 provisions that might conflict with, and now are better addressed in, the proposed roadway worker protection General Order.

Upon implementation of General Order 172 prohibiting personal electronic devices on rail transit systems, negotiating participants working on the proposed RWP General Order became aware of possible conflicts between the two orders. Most importantly, General Order 172 may

[15] Dekker, S.W.A. (2007). *Just Culture: Balancing Safety and Accountability*. Lund University, Sweden: Ashgate. pp. 43-44, 48.

have covered topics best addressed in the roadway worker protection order, such as the use of electronic devices essential for roadway maintenance and construction activities. Staff recommends modifying General Order 172 after further discussion with stakeholders to exempt roadway worker tools that might otherwise be defined as personal electronic devices in G.O. 172. The present proposed General Order generally addresses use of tools and has safety provisions that will include use of electronic tools needed for roadway work, and thus is the appropriate place to address such use.

Rules for yard tracks

The revised proposed General Order proposes that the rules for yard tracks be crafted differently than the rules for main line tracks, and that each agency submit its program for protection on yard tracks to Staff for its review. The proposed General Order would then require each RTA to comply with its protection requirements for these tracks.

Staff proposes that the rules for yard tracks in the General Order not be as prescriptive as the rules for main line tracks for three primary reasons. First, the need for such prescription was not established by the accident history documented in the January 15, 2010, staff report nor in subsequent research. Second, the nature of the tracks, how they are used, and the nature of roadway work on such tracks vary widely between rail transit agencies, and it would be especially difficult to adopt a general order covering all situations. Third, negotiation participants agreed that the best way to approach rule application in yard tracks was for staff to visit each yard and review the safety practices.

Thus instead of adopting a “one size fits all” regulation for yards, participants proposed that each rail transit agency be required to submit its own set of rules, which would address the unique circumstances of each agency’s yard. The General Order would require each RTA to comply with its submitted rules. Those rules would then become subject to individual review by CPSD staff in a position to informally or formally pursue changes if the rules were deemed insufficient. The resultant rules would then be enforceable by Staff inspectors.

Back-up Safety Devices on Non-Revenue On-Track Vehicles

Staff recommends that the Commission order this requirement in the decision separately from the proposed General Order. After its original 2010 proposal, Staff became aware of this NTSB recommendation. In that this roadway worker safety is within the scope of this proceeding, Staff proposes that it be adopted as part of this proceeding. Staff has discussed this with the parties.

In its report on the 2010 wayside worker fatalities on the Washington Metropolitan Area Transit Authority in Rockville, the NTSB concluded that an audible backup alarm might have

helped prevent the accident.[16] The NTSB recommended that the American Public Transportation Association "establish guidelines and standards to require that all existing and new hi-rail vehicle be equipped with an automatic change-of-direction or backup alarm…"

Addressing NTSB recommendation R-12-36 and 49 CFR 214.523, Staff proposed adding a backup alarm requirement to the proposed General Order. However, following meeting discussions and recognizing that rail transit vehicle standards are found in the General Order 143 series, Staff proposes that it would be more appropriate to add the requirement to General Order 143 when it is revised. In the interim, staff requests that the following requirements be included in the decision as Commission orders to implement the requirement without waiting for the next G.O. 143 revision.

1. Within one year of the effective date of this decision, all existing and new non-revenue on-track vehicles shall be equipped with a backup alarm that when backing up provides an audible signal distinguishable from the surrounding noise.
2. The RTA shall have rules requiring each operator of a hi-rail vehicle to check the vehicle for compliance with this subpart, prior to using the vehicle at the start of the operator's work shift.
3. A non-functioning back-up alarm that cannot be repaired immediately shall be tagged and dated in a manner prescribed by the employer and reported to the designated official.
4. Non-functioning backup alarms shall be repaired or replaced as soon as practicable, but at least within seven (7) calendar days.
5. In the case where a vehicle with a non-functioning alarm must be in service, and is permitted to be in service by this General Order, an alternate audible device must be used to sound back-up warnings.
6. The requirements ordered in Ordering Paragraphs 1 through 5 above shall be added to General Order 143 upon its next revision.

While the above proposed requirements will satisfy NTSB Recommendation R-12-36, staff recommends that during the next revision of General Order 143, the following backup and change-of-direction warning devices be considered: an automatic change-of-direction alarm, a 360-degree intermittent warning light or beacon mounted on the outside of the vehicle, a rear-facing video camera system with a display in the vehicle cab that provides a view to the rear of the vehicle, and a rear-facing strobe with a distinctive strobe pattern that is used only when backing up.

[16] National Transportation Safety Board. 2012. *Washington Metropolitan Area Transit Authority Hi-Rail Maintenance Vehicle Strikes Two Wayside Workers Near the Rockville Station, Rockville, Maryland, January 26, 2010*. Railroad Accident Report NTSB/RAR-12/04/SUM. Washington, D.C.

Positive Train Control

Staff's original report recommended some assessment and reporting regarding positive train control (PTC). Staff continues its recommendation for an informal assessment of the current state of PTC on existing systems before recommending new PTC regulatory requirements. Staff believes that addressing PTC on rail transit systems is a considerable project on its own, and to have accomplished it within this OIR would have delayed important roadway worker provisions well into the future. Staff has been aware of problems with rail transit PTC systems, most infamously in the WMATA 2009 fatal collision, [17] but elsewhere as well. [18] Staff believes attending to the safety of current systems while gathering more information generally and as could be specifically applied would be the best way to ensure critical safety needs. While continuing its support for PTC implementation, staff has focused more on the assessment of PTC implementation in its recommended requirements, and proposes the following ordering paragraphs in the Commission decision:

- Identify and assess technologically available collision-avoidance technologies for train collision avoidance as they might be applied for roadway worker safety as well as train collision avoidance.
- Assess different systems and their different operations, for example, underground and street-running, for collision-avoidance technology applications, and determine different levels of feasibility, implementation timelines, benefit, and cost, including roadway worker protections.
- Report by December 31, 2014, the results of the above elements of study.

The above proposed ordering paragraphs primarily extend the time for reporting to coincide with the completion and some experience of the Los Angeles Basin PTC railroad installation, the first in the nation.[19] The paragraphs also drop the requirement for perpetual reporting, and instead will leave further action to be dependent on the results of those reports and further developments that may have occurred.

Regulatory Adaptability

As with any new regulation, there are likely to be some unanticipated features that will need improving or even correcting. Changes needed for the personal electronic device regulation, General Order 172, illustrate this. General Order 172 was the first of its kind in several ways,

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[17] National Transportation Safety Board (2010). *Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains Near Fort Totten Station, Washington, D.C., June 22, 2009*. Railroad Accident Report NTSB/RAR-10/02. Washington, DC.

[18] California Public Utilities Commission (2011). *OI I 11-02-017, Order Instituting Investigation on the Commission's Own Motion into the Operations, Practices, and Conduct of San Francisco Municipal Transportation Agency, Regarding Ongoing Public Safety Issues*. Filed February 24, 2011, San Francisco. p. 4.

[19] http://www.latimes.com/news/local/la-me-train-control-20120911,0,7251514.story

and needs a modification as described above. However, that modification is very limited in scope and can easily be implemented.

In this regard, the CPUC considers itself a learning organization, constantly improving and learning from new research, technology, and experience. Being a learning organization is a central element of many definitions of safety culture, such as those by safety culture pioneer James Reason.[20] Staff will be monitoring the implementation of the General Order upon its adoption, and will set up information structures to capture such experiences, especially those that might suggest needed improvements. Parties can be re-engaged to address new issues, and adoption of improvements may be being expedited without opening a formal proceeding.

[20] Reason, J. (1997). *Managing the Risks of Organizational Accidents*. Burlington, VT: Ashgate. pp. 195-196, 218-219.

CONCLUSION

Staff believes the proposed General Order should be adopted to promote safety for rail transit roadway workers. Staff makes its conclusion after considerable work with the parties, review of new accident research and industry reports, additional investigation, and new and more comprehensive experience with roadway worker protections. Staff and the parties, including rail transit agency and union representatives, put in considerable work to maximize the effectiveness of the proposed General Order while and the same time working to avoid unintended consequences from a new regulation. Staff recommends that the Commission adopt the new General Order, included herein as the Appendix.

APPENDIX

Staff's Proposed General Order For Roadway Worker Protection On California's Rail Transit Systems

GENERAL ORDER NO. _____

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

RULES AND REGULATIONS GOVERNING ROADWAY WORKER PROTECTION PROVIDED BY RAIL TRANSIT AGENCIES AND RAIL FIXED GUIDEWAY SYSTEMS

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Rail Transit Agencies (RTA) and Rail Fixed Guideway Systems (RFGS) operating in California shall comply with the following rules governing roadway worker protection.

1 GENERAL PROVISIONS

1.1 *Authority.* These rules and regulations are authorized by and implement the provisions of 49 U.S.C. § 5330; 49 C.F.R. § 659; and California Public Utilities Code Sections 778 and 99152, as well as the California Public Utilities Code sections establishing each individual transit agency within California.

1.2 *Purpose.* The purpose of these rules and regulations is to provide a safe working environment for RTA roadway workers. These rules and regulations are intended to ensure that each RTA adopts a program for roadway workers containing specific rules for protecting these workers from the danger of being struck by trains or other on-track equipment.

1.3 *Applicability.* These rules and regulations are applicable to all RTAs in California. These rules and regulations do not prohibit RTAs from implementing rules that provide greater safety. These rules and regulations do not apply to fire protection and law enforcement personnel. These rules and regulations exclude track that is being constructed until any RTA vehicles or employees occupy the construction area, except for RTA employees who must occupy the area to perform inspections needed during construction, and who will do so under the construction contractor's protections and regulatory obligations.

1.4 *Additional Rules.* The Commission may make such additional rules and regulations or changes to these rules and regulations as necessary for the purpose of safety.

1.5 *Exemptions or Modifications.* Requests for exemptions or modifications from these rules and regulations shall contain a full statement of the reasons justifying the request. A request must demonstrate that safety

would not be reduced by the proposed exemption or modification. Any exemption or modification so granted shall be limited to the particular matter covered by the request and shall require Commission approval.

2 DEFINITIONS

2.1 *Confirmed Hold* means holding rail transit vehicles including on-track equipment, out of a work location through the following procedure. The Control Center will instruct a rail transit vehicle operator to stop at a designated location, and the rail transit vehicle operator will confirm to the Control Center that the vehicle is actually stopped at the designated location. Roadway workers are not permitted to enter the work zone until the EIC receives notification from the Control Center that a Confirmed Hold has been verified for each approaching rail transit vehicle. The Confirmed Hold will not be lifted until the EIC has determined all roadway workers are safely clear of the tracks and confirms the release of the work location to the Control Center.

2.2 *Employee* means a person employed by an RTA in California, or a contractor working on behalf of such RTA.

2.3 *Employee in Charge (EIC)* means the RTA employee with responsibility for supervising and ensuring safety, including use of roadway worker protections, at a right-of-way worksite. In the case of a minor task as defined herein, the EIC would be the roadway worker performing the minor task if alone.

2.4 *Fifteen-second rule*, or *15-second rule*, means a rule that requires a roadway worker to be clear of approaching rail transit vehicles 15 seconds before a rail transit vehicle moving at the maximum operating speed on that track can pass the location of the roadway worker.

2.5 *Job Safety Briefing* means a meeting conducted at the job site by the employee in charge of the work that focuses on the hazards of the work to be performed and the provisions to eliminate or protect against those

hazards. The term is further defined through the requirements for a job safety briefing provided in this General Order.

2.6 *Minor tasks* are defined as those tasks without tools unless specified herein where an individual can continue to look out at least every 5 seconds for approaching rail transit vehicles and where they can be performed without violating the 15 second rule. Minor tasks are limited to the following:

- **a.** retrieving or removing an item from the right-of-way, or
- **b.** lining switches, including the use of a switch bar, or
- **c.** placing or removing flags, or
- **d.** taking photographs with an RTA-issued camera, or
- **e.** a visual inspection at one specific fixed location, deemed an immediate need.

Tasks and tools not listed herein may be performed and used upon written request to the Director with copy to the affected employees' representative(s) and written concurrence from the Director or Deputy Director of the Consumer Protection and Safety Division.

2.7 *Near-miss* means an incident infringing on the safety of a roadway worker on or near the tracks, but without contact or injury.

2.8 *On-track Equipment* is a subset of the comprehensive *Rail Transit Vehicle* definition herein, and means any equipment besides revenue vehicles used for any purpose, including but not limited to testing, inspection, and maintenance. The definition is included to avoid possible confusion in subsections herein where a Rail Transit Vehicle mistakenly might be assumed to be only a vehicle in revenue passenger service.

2.9 *Place of Safety* means a space where a person or persons can safely get sufficiently clear of any rail transit vehicle, including any on-track equipment, moving on any track.

2.10 *Rail Fixed Guideway System (RFGS)* means any light, heavy, or rapid rail system, monorail, inclined plane, funicular, trolley, cable car, automatic

people mover, or automated guideway transit system used for public transit and not regulated by the Federal Railroad Administration or not specifically exempted by statute from Commission oversight.

2.11 *Rail Transit Agency (RTA)* means the entity that plans, designs, constructs, and/or operates a RFGS.

2.12 *Rail Transit Vehicle* means an RTA's rolling stock, including but not limited to passenger and maintenance vehicles.

2.13 *Right-of-way* means a strip of land that is granted, through an easement or other mechanism, for transportation purposes which includes the RTA's rails, track, crossties, ballast, bridges, underpasses, tunnels, wayside signals, near-track communication facilities, and stations, excluding platforms.

2.14 *Roadway Worker* means any employee who performs any work on the right-of-way.

2.15 *RTA Contractor* means an entity that performs tasks on behalf of the RTA.

2.16 *RWP* – Roadway worker protection.

2.17 *System Safety Program Plan (SSPP)* means a document adopted by an RTA detailing its safety policies, objectives, responsibilities, and procedures.

2.18 *Track Zone* means an area within six (6) feet of the outside rail on both sides of the track.

The track zone definition is intended to provide a threshold that can be identified by workers as an area where a person or equipment could be struck, or has the potential to be struck, by the widest equipment that could occupy the track. The zone provides additional space away from the widest revenue rail transit vehicle that could occupy the track to address the potential for inadvertent movement into the area where a person or roadway working equipment could be struck.

This zone should be widened, or extra safety provisions put in place, to safely accommodate any movement that might be anticipated into the

area. Examples include equipment placed just outside the zone that has a bucket or swing boom that could extend far enough to be struck, or have the potential to be struck, or roadway maintenance machines that might be wider than revenue rail transit vehicles.

2.19 *Watchperson*, sometimes called a lookout, means an employee who has been trained and qualified on roadway worker protection rules and procedures, and whose sole duty is to provide effective warning in compliance with the 15-seocnd rule to roadway workers of approaching rail transit vehicles as defined herein, including trains or any on-track equipment.

3 RTA RESPONSIBILITIES

3.1 Each RTA shall adopt and implement a program that will afford safety to all its roadway workers.

3.2 Each RTA shall adopt RWP rules that satisfy the requirements of this General Order.

3.3 Each RTA shall adopt a training program in accordance with Section 8.

3.4 Each RTA shall maintain for a minimum of three years records of employee-reported unsafe acts or conditions that could result in a roadway worker accident or incident. Records may be kept as part of an RTA's *Near-Miss Program* and recordkeeping specified in Section 9.

3.5 Each RTA shall create and maintain a separate dedicated manual excerpting all necessary roadway worker safety procedures and rules from its rule book(s), make it freely available to roadway workers, and ensure that roadway workers have easy access to the manual when performing job functions.

3.6 Within 90 days from the effective date of this General Order, each RTA shall submit their new or revised roadway worker protection program, including the separate manual specified in Section 3.4, to Commission Staff.

3.7 Each RTA shall include RWP rules in its compliance testing program to ensure compliance, to assess the degree of compliance, and to make any necessary changes to enhance compliance.

3.8 If an RTA uses flag protection to provide roadway worker safety, it shall establish written flag protection procedures and rules and include those rules in the manual described in Section 3.5.

3.9 Each RTA shall establish what safety equipment a person working accessing the track zone is required to use. At a minimum each RTA shall require high visibility clothing (safety vests or jumpsuits) to be worn by all employees who access the track zone. Each RTA shall determine what is appropriate for high visibility clothing consistent with industry standards.

3.10 Anyone allowed access by request, easement, or other form of permission, shall either complete the required RWP training or be escorted by an RWP-trained employee.

4 RIGHTS AND RESPONSIBILITIES

4.1 Right to a job safety briefing. Each RTA shall require that a job safety briefing be performed prior to the performance of any job duty that may occur on the right-of way, and shall require that all roadway workers at the job participate.

4.2 Right to discuss and confirm understanding. In any job safety briefing provided prior to work on the right of way, an RTA shall grant each roadway worker the right to discuss and confirm understanding of the safety provisions to be provided.

4.3 Right to challenge. Each RTA shall provide every roadway worker the right to challenge, and/or refuse, in good faith, any RWP assignment he or she has reason to believe is unsafe or would violate any RWP rule or procedure. The roadway worker must describe the safety or rule concern and remain clear of the track until the challenge is resolved.

4.4 Right and responsibility to report unsafe acts or conditions. Each RTA shall provide opportunities for roadway workers to report to the RTA any unsafe acts or conditions that could result in an accident or incident, and shall not discourage such reporting.

4.5 Each RTA shall ensure that every roadway worker knows they have a responsibility to ascertain that track zone safety is established and understood prior to entering the track zone.

4.6 Each RTA shall ensure that every roadway worker knows they have a duty to warn other roadway workers and employees in an unprotected track zone to move to the clear.

4.7 Shared responsibility. Each RTA shall communicate to its roadway workers that each worker ultimately is responsible for his or her actions at a work site, and that compliance with the roadway worker protection rules are designed to require actions that will keep workers safe and must be followed consistent with this section.

5 JOB SAFETY BRIEFING

5.1 Each RTA shall require that an EIC provide a job safety briefing prior to any roadway work within the RTA right-of-way. The job safety briefing for each roadway worker must include a discussion and explanation of the job function, rules, and procedures for carrying out job duties. The job safety briefing shall include the following aspects as applicable:

- **a.** The general work plan.
- **b.** The hazards involved and the means by which safety is to be provided to the roadway workers through compliance with these roadway worker safety rules and procedures. Special attention shall be given to the presence of roadway maintenance machines and to the presence of any adjacent tracks.
- **c.** Personal Protective Equipment.
- **d.** Identification and location of key personnel such as a watchperson, and an employee-in-charge.

e. Appropriate flags and proper flag placement.

f. A "place of safety" shall be predetermined that will allow workers to move to the safe area at least 15 seconds before any approaching rail transit vehicle moving at the maximum speed authorized on that track can pass the location of the roadway worker.

g. The means for determining if and how the 15-second rule will be met shall be discussed including:

i. Determination of sight distance.
ii. Visibility conditions.
iii. Ambient noise interference.
iv. Maximum rail transit vehicle speeds.
v. Time needed to disengage from the work.
vi. Location of places of safety.
vii. Time to get to the place of safety.
viii. Adjacent tracks, the hazards associated, and provisions to address those hazards.

h. The means of communication among the roadway workers to be used in the job performance, including communication with any roadway maintenance machine operators.

i. Acknowledgement by each employee that they understand the rules to be used.

5.2 If there is any change in the scope of work or crew after the initial safety briefing, a follow-up job safety briefing shall be conducted.

5.3 In the case of an individual roadway worker moving from one location to another (Section 6.1) or performing a minor task (Section 6.2), the job safety briefing will be a discussion, between the roadway worker and the employee providing the authorization to enter the roadway, of the protection to be used.

6 MINIMUM CONTROLS/LIMITATIONS FOR EMPLOYEES PERFORMING DIFFERENT CATEGORIES OF WORK WHEN WITHIN THE TRACK ZONE ON ANY TRACK OTHER THAN YARD OR END-OF-LINE STORAGE TRACKS

Each RTA shall provide the protections specified in this section. The following categories of work and levels of protection proceed from low to high. A higher level of protection may be used for any category of work. Employees may occupy passenger platforms, except for the platform-edge warning strip, without the provisions in the sections below.

6.1 Moving from one location to another with full attention on surroundings. Does not apply to mixed traffic operations on surface streets and public areas such as pedestrian malls.

- **a.** Roadway worker/crew must establish authorization for the identified area, and
- **b.** Roadway worker(s) must be able to comply with the 15-second rule.
- **c.** Roadway workers may occupy General Order 143 series compliant walkways in tunnels and on elevated structures where there is insufficient clearance to remain clear of the track zone. Trains must be slowed to 25 miles per hour or less before roadway workers may occupy the track zone on the walkway.

6.2 Performing minor tasks, as defined in this General Order, with sufficient attention to surroundings.

- **a.** Roadway worker must establish authorization for identified work area, and
- **b.** Notification must be given to train operators, and

c. Notification of reverse direction and other abnormal train movement must be provided to roadway worker, and

d. Roadway worker must be able to comply with the 15-second rule, and

e. One of the following, i or ii:

i. Trains must stop short of the work location unless the roadway worker communicates visually or by radio to the train operator that the train may proceed. Trains approaching the work location must sound an audible warning until it is acknowledged by the roadway worker. Upon visual or radio communication between the train operator and roadway worker that the train is stopped, the roadway worker may enter the track zone. Upon visual or radio communication from the roadway worker that he or she is clear of the track zone or on a walkway under the provisions of Section 6.1.c, the train may proceed.

ii. Trains are held outside the work location under a Confirmed Hold as defined in this General Order.

6.3 Visual Inspections, Maintenance and Repair Using Hand Tools Only

a. Roadway worker/crew must establish authorization for identified work area, and

b. Notification must be given to train operators, and

c. Notification of reverse direction and other abnormal train movement must be provided to roadway worker(s), and

d. Roadway worker(s) must be able to comply with the 15-second rule, and

e. Train(s) approaching the work location must sound an audible warning until it is acknowledged by the roadway workers, and

f. Must have a watchperson prior to entering the track zone and until the work is completed and no workers are within the track zone.

6.4 Maintenance and Repairs Using Machines or Equipment

a. Roadway worker/crew must establish authorization for identified work area, and

b. Notification must be given to affected train operators, and

c. Notification of reverse direction and other abnormal train movement must be provided to roadway worker(s), and

d. On-rail vehicle movement into the work zone must be controlled by applying one or more of the following controls as appropriate:

i. flags with speed restrictions and watchpersons, or

ii. without flags, but with watchpersons, and all movements proceeding at a speed that will allow stopping within half the range-of-vision, limited also by a maximum miles-per-hour speed set by the EIC of 25 miles per hour or slower, or

iii. lining and locking switches or otherwise physically preventing entry and movement of rail transit vehicles, including on-track equipment, with a watchperson, or

iv. restricting work to times when propulsion power is down with verification from control that track is out of service, and barriers are placed that physically prevent rail transit vehicles, including on-track equipment, from entering the work zone, or

v. for RTAs with positive train control systems that are operating as designed across the entire system,

1) with a watchperson: the control center shall establish red signals or stop commands as applicable to the system, or

2) without a watchperson: the control center shall establish red signals or stop commands as applicable to the system and stop commands are physically locked in the field train room, by means such as a route prohibit, an imposed false occupancy, or other means that make it impossible for the

control center to inadvertently allow proceed signals or commands into the work limits. Exception: When any rail transit vehicle, including on-track equipment, without an operating positive train control system is operating in the vicinity of the work area limits, a watchman must be provided.

e. Rail transit vehicles, including on-track equipment, within working limits established by means of inaccessible track shall move only under the direction of the roadway worker in charge of the working limits, and shall move at a speed that will allow stopping within half the range-of-vision and also limited also by a maximum miles-per-hour speed set by the EIC of 25 miles per hour or slower.

7 MINIMUM CONTROLS/LIMITATIONS FOR EMPLOYEES PERFORMING DIFFERENT CATEGORIES OF WORK WHEN IN THE TRACK ZONE ON YARD AND END-OF-LINE STORAGE TRACKS

7.1 Each RTA shall have and submit to Commission staff its yard and end-of-line storage track RWP program within 90 days of the effective date of this General Order and each time the plan is changed.

7.2 Each RTA shall comply with its yard and end-of-line storage track RWP program.

8 ROADWAY WORKER PROTECTION TRAINING

8.1 Each RTA shall adopt an RWP training program for roadway workers so that each worker understands the hazards of working along the right-of-way and the methods to safely work on the right-of-way.

8.2 Each RTA shall adopt an RWP training program for any employee who may affect roadway worker safety, including their own safety. For example, the program shall cover employees such as rail transit vehicle operators, dispatchers, control center staff, and supervisors.

8.3 Each RTA shall make changes to its training program to address problems based on the results of compliance testing, near-miss reports, reports of unsafe acts or conditions, and comments received on the training program.

8.4 No RTA shall assign an employee to perform the duties of a roadway worker unless that employee has received training in the RWP procedures associated with the work assignment to be performed. Any person who is escorted and being provided RWP safety by an RWP-trained employee is exempt from these training provisions.

- **a.** Each RTA at least once every 24 months shall retrain all roadway workers and employees with RWP responsibilities on the RWP training program for roadway workers.
- **b.** Records showing compliance with the requirement in subsection a. above shall be maintained for a minimum of three (3) years.
- **c.** Each RTA shall provide an opportunity in its training program for roadway workers to raise and discuss issues regarding the effectiveness of the training program.

8.5 The training of all roadway workers at a minimum shall include:

- **a.** Classroom training with the opportunity to ask the RWP trainer questions and raise and discuss RWP issues.
- **b.** Experience in a representative field-setting.
- **c.** The RTA's RWP rules and procedures.
- **d.** Recognition of all tracks and understanding of the space around them within which RWP is required.
- **e.** The functions and responsibilities of various persons involved with RWP procedures.
- **f.** Checks or tests to ensure the ability to comply with RWP instructions given by persons performing, or responsible for, on-track safety and RWP functions.

g. Signals given by a watchperson, and the proper procedures upon receiving a rail transit vehicle approach warning from a watchperson, including applicable operating and flagging rules.

h. The hazards associated with working on or near all tracks, including review of RWP rules and procedures.

i. Flag protection rules and procedures and how they are applied to roadway worker protection.

j. Classroom discussion of the compliance testing program requirements.

k. Classroom discussion of the RTA's RWP near-miss program including, but not limited to how to report near-misses.

8.6 Each Transit agency shall insure that their RWP training personnel are competent to provide effective RWP training, and at a minimum will consider the following:

a. Experience and knowledge of effective training techniques.

b. Experience with the RTA's RWP rules

c. Knowledge of the RTA's RWP rules, program, operations, and operating environment, including applicable operating rules.

d. Knowledge of the training requirements specified in this General Order.

9 NEAR-MISS REPORTING PROGRAMS AND RECORDS

9.1 Each RTA shall develop and implement a program for reporting and recording near-misses regarding roadway worker protections.

9.2 RWP near-miss records shall be retained by the RTA for a period of three (3) years and shall be made available to CPUC staff on demand.

9.3 The near-miss program shall include:

a. A policy statement supporting the near-miss program signed by the CEO, and

b. A process to encourage and allow roadway workers to report near-misses, and

c. Methods to store, easily access, and track near-misses and corrective actions, and

d. Analyses to identify primary and contributory causal factors including root causes, and to implement corrective actions.

9.4 Each RTA shall submit a copy of its near-miss program to staff within 90 days of the effective date of this order and within 30 days of any subsequent modifications.

9.5 Each RTA shall reference their near-miss program in their SSPP.

9.6 Each RTA shall periodically review the effectiveness of its near-miss program taking into consideration industry practices and make adjustments if needed for increased effectiveness to achieve program goals.

***** **END** *****

ATTACHMENT C
TO RWP PROPOSED DECISION

PROPOSED
GENERAL ORDER 175
(including Interim Provisions)

ATTACHMENT C TO RWP PROPOSED DECISION

GENERAL ORDER NO. 175

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

RULES AND REGULATIONS GOVERNING ROADWAY WORKER PROTECTION PROVIDED BY RAIL TRANSIT AGENCIES AND RAIL FIXED GUIDEWAY SYSTEMS

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Rail Transit Agencies (RTA) and Rail Fixed Guideway Systems (RFGS) operating in California shall comply with the following rules governing roadway worker protection.

1 GENERAL PROVISIONS

1.1 *Authority.* These rules and regulations are authorized by and implement the provisions of 49 U.S.C. § 5330; 49 C.F.R. § 659; and California Public Utilities Code Sections 778 and 99152, as well as the California Public Utilities Code sections establishing each individual transit agency within California.

1.2 *Purpose.* The purpose of these rules and regulations is to provide a safe working environment for RTA roadway workers. These rules and regulations are intended to ensure that each RTA adopts a program for roadway workers containing specific rules for protecting these workers from the danger of being struck by trains or other on-track equipment.

1.3 *Applicability.* These rules and regulations are applicable to all RTAs in California. These rules and regulations do not prohibit RTAs from implementing rules that provide greater safety. These rules and regulations do not apply to fire protection and law enforcement personnel. These rules and regulations exclude track that is being constructed until any RTA vehicles or employees occupy the construction area, except for RTA employees who must occupy the area to perform inspections needed during construction, and who will do so under the construction contractor's protections and regulatory obligations.

1.4 *Additional Rules.* The Commission may make such additional rules and regulations or changes to these rules and regulations as necessary for the purpose of safety.

1.5 *Exemptions or Modifications.* Requests for exemptions or modifications from these rules and regulations shall contain a full statement of the reasons justifying the request. A request must demonstrate that safety

would not be reduced by the proposed exemption or modification. Any exemption or modification so granted shall be limited to the particular matter covered by the request and shall require Commission approval.

2 DEFINITIONS

2.1 *Confirmed Hold* means a specific procedure that can be used as specified in this General Order to hold rail transit vehicles including on-track equipment, out of a work location as follows: The Control Center will instruct a rail transit vehicle operator to stop at a designated location, and the rail transit vehicle operator will confirm to the Control Center that the vehicle is actually stopped at the designated location. Roadway workers will not be permitted to enter the work zone until the EIC receives notification from the Control Center that a Confirmed Hold has been verified for each approaching rail transit vehicle. The Confirmed Hold will not be lifted until the EIC has determined all roadway workers are safely clear of the tracks and confirms the release of the work location to the Control Center.

2.2 *Employee* means a person employed by an RTA in California, or a contractor working on behalf of such RTA.

2.3 *Employee in Charge (EIC)* means the RTA employee with responsibility for supervising and ensuring safety, including use of roadway worker protections, at a right-of-way worksite. In the case of a minor task as defined herein, the EIC would be the roadway worker performing the minor task if alone.

2.4 *Fifteen-second rule*, or *15-second rule*, means a rule that requires a roadway worker to be clear of approaching rail transit vehicles 15 seconds before a rail transit vehicle moving at the maximum authorized speed on that track can pass the location of the roadway worker.

2.5 *Job Safety Briefing* means a meeting conducted at the job site by the employee in charge of the work that focuses on the hazards of the work

to be performed and the provisions to eliminate or protect against those hazards. The term is further defined through the requirements for a job safety briefing provided in this General Order.

2.6 *Minor tasks* are defined as those tasks without tools unless specified herein where an individual can continue to look out at least every 5 seconds for approaching rail transit vehicles and where they can be performed without violating the 15 second rule. Minor tasks are limited to the following:

- **a.** retrieving or removing an item from the right-of-way, or
- **b.** lining switches, including the use of a switch bar, or
- **c.** placing or removing flags, or
- **d.** taking photographs with an RTA-issued or RTA-approved camera, or
- **e.** a visual inspection at one specific fixed location, deemed an immediate need.

Tasks and tools not listed herein may be performed and used upon written request to the Director with copy to the affected employees' representative(s) and written concurrence from the Director or Deputy Director of the Consumer Protection and Safety Division.

2.7 *Near-miss* means an incident infringing on the safety of a roadway worker on or near the tracks, but without contact or injury.

2.8 *On-track Equipment* is a subset of the comprehensive *Rail Transit Vehicle* definition herein, and means any equipment besides revenue vehicles used for any purpose, including but not limited to testing, inspection, and maintenance. The definition is included to avoid possible confusion in subsections herein where a Rail Transit Vehicle mistakenly might be assumed to be only a vehicle in revenue passenger service.

2.9 *Place of Safety* means a space where a person or persons can safely get sufficiently clear of any rail transit vehicle, including any on-track equipment, moving on any track.

2.10 *Rail Fixed Guideway System (RFGS)* means any light, heavy, or rapid rail system, monorail, inclined plane, funicular, trolley, cable car, automatic people mover, or automated guideway transit system used for public transit and not regulated by the Federal Railroad Administration or not specifically exempted by statute from Commission oversight.

2.11 *Rail Transit Agency (RTA)* means the entity that plans, designs, constructs, and/or operates a RFGS.

2.12 *Rail Transit Vehicle* means an RTA's rolling stock, including but not limited to passenger and maintenance vehicles.

2.13 *Right-of-way* means a strip of land that is granted, through an easement or other mechanism, for transportation purposes which includes the RTA's rails, track, crossties, ballast, bridges, underpasses, tunnels, wayside signals, near-track communication facilities, and stations, excluding platforms.

2.14 *Roadway Worker* means any employee who performs any work on the right-of-way.

2.15 *RTA Contractor* means an entity that performs tasks on behalf of the RTA.

2.16 *RWP* – Roadway worker protection.

2.17 *System Safety Program Plan (SSPP)* means a document adopted by an RTA detailing its safety policies, objectives, responsibilities, and procedures.

2.18 *Track Zone* means an area within six (6) feet of the outside rail on both sides of the track.

a. The track zone definition is intended to provide a threshold that can be identified by workers as an area where a person or equipment could be struck, or has the potential to be struck, by the widest equipment that could occupy the track. The zone provides additional space away from the widest revenue rail transit vehicle that could occupy the track to address the potential for

inadvertent movement into the area where a person or roadway working equipment could be struck.

b. This zone should be widened, or extra safety provisions put in place, to safely accommodate any movement that might be anticipated into the area. Examples include equipment placed just outside the zone that has a bucket or swing boom that could extend far enough to be struck, or have the potential to be struck, or roadway maintenance machines that might be wider than revenue rail transit vehicles.

2.19 *Watchperson*, sometimes called a lookout, means an employee who has been trained and qualified on roadway worker protection rules and procedures, whose sole duty is to provide effective warning in compliance with the 15-seocnd rule to roadway workers of approaching rail transit vehicles as defined herein, including trains or any on-track equipment, who does not perform or assist in any other work aside from the watchperson duty, and who remains clear of the track zone as defined herein.

3 RTA RESPONSIBILITIES

3.1 Each RTA shall adopt and implement a program that will afford safety to all its roadway workers.

3.2 Each RTA shall adopt RWP rules that satisfy the requirements of this General Order.

3.3 Each RTA shall adopt a training program in accordance with Section 8.

3.4 Each RTA shall maintain for a minimum of three years records of employee-reported unsafe acts or conditions that could result in a roadway worker accident or incident. Records may be kept as part of an RTA's *Near-Miss Program* and recordkeeping specified in Section 9.

3.5 Each RTA shall create and maintain a separate dedicated manual excerpting all necessary roadway worker safety procedures and rules from its rule book(s), make it freely available to roadway workers, and

ensure that roadway workers have easy access to the manual when performing job functions.

3.6 Within 90 days from the effective date of this General Order, each RTA shall submit their new or revised roadway worker protection program, including the separate manual specified in Section 3.5, to Commission Staff.

3.7 Each RTA shall include RWP rules in its compliance testing program to ensure compliance, to assess the degree of compliance, and to make any necessary changes to enhance compliance.

3.8 If an RTA uses flag protection to provide roadway worker safety, it shall establish written flag protection procedures and rules and include those rules in the manual described in Section 3.5.

3.9 Each RTA shall establish what safety equipment a person working accessing the track zone is required to use. At a minimum each RTA shall require high visibility clothing (safety vests or jumpsuits) to be worn by all employees who access the track zone. Each RTA shall determine what is appropriate for high visibility clothing consistent with industry standards.

3.10 Anyone allowed access to the track zone, by request, easement, or other form of permission, shall either complete the required RWP training or be escorted by an RWP-trained employee.

4 RIGHTS AND RESPONSIBILITIES

4.1 Right to a job safety briefing. Each RTA shall require that a job safety briefing be performed prior to the performance of any job duty that may occur on the right-of way, and shall require that all roadway workers at the job participate.

4.2 Right to discuss and confirm understanding. In any job safety briefing provided prior to work on the right of way, an RTA shall grant each roadway worker the right to discuss and confirm understanding of the safety provisions to be provided.

4.3 Right to challenge. Each RTA shall provide every roadway worker the right to challenge, and/or refuse, in good faith, any RWP assignment he or she has reason to believe is unsafe or would violate any RWP rule or procedure. The roadway worker must describe the safety or rule concern and remain clear of the track until the challenge is resolved.

4.4 Right and responsibility to report unsafe acts or conditions. Each RTA shall provide opportunities for roadway workers to report to the RTA any unsafe acts or conditions that could result in an accident or incident, and shall not discourage such reporting.

4.5 Each RTA shall ensure that every roadway worker knows they have a responsibility to ascertain that track zone safety is established and understood prior to entering the track zone.

4.6 Each RTA shall ensure that every roadway worker knows they have a duty to warn other roadway workers and employees in an unprotected track zone to move to the clear.

4.7 Shared responsibility. Each RTA shall communicate to its roadway workers that each worker ultimately is responsible for his or her actions at a work site, and that compliance with the roadway worker protection rules are designed to require actions that will keep workers safe and must be followed consistent with this section.

5 JOB SAFETY BRIEFING

5.1 Each RTA shall require that an EIC provide a job safety briefing prior to any roadway work within the RTA right-of-way. The job safety briefing for each roadway worker must include a discussion and explanation of the job function, rules, and procedures for carrying out job duties. The job safety briefing shall include the following aspects as applicable:

a. The general work plan.

b. The hazards involved and the means by which safety is to be provided to the roadway workers through compliance with these roadway worker safety rules and procedures. Special attention

shall be given to the presence of roadway maintenance machines, to the presence of any adjacent tracks, and to any need to widen the track zone according to the provisions of the track zone definition in section 2.18.b.

c. Personal Protective Equipment.

d. Identification and location of key personnel such as a watchperson, and an employee-in-charge.

e. Appropriate flags and proper flag placement.

f. A "place of safety" shall be predetermined that will allow workers to move to the safe area at least 15 seconds before any approaching rail transit vehicle moving at the maximum speed authorized on that track can pass the location of the roadway worker.

g. The means for determining if and how the 15-second rule will be met shall be discussed including:

i. Determination of sight distance.
ii. Visibility conditions.
iii. Ambient noise interference.
iv. Maximum rail transit vehicle speeds.
v. Time needed to disengage from the work.
vi. Location of places of safety.
vii. Time to get to the place of safety.
viii. Adjacent tracks, the hazards associated, and provisions to address those hazards.

h. The means of communication among the roadway workers to be used in the job performance, including communication with any roadway maintenance machine operators.

i. Acknowledgement by each employee that they understand the rules to be used.

j. If a watchperson is being used, each employee, including the watchperson, must receive a review of the watchperson's duties, at a minimum to include the information in the definition herein of a

watchperson, as follows: The watchperson's sole duty is to provide effective warning in compliance with the 15-seocnd rule to roadway workers of approaching rail transit vehicles, including trains or any on-track equipment, does not perform or assist in any other work aside from the watchperson duty, and remains clear of the track zone.

5.2 If there is any change in the scope of work or crew after the initial safety briefing, a follow-up job safety briefing shall be conducted.

5.3 In the case of an individual roadway worker moving from one location to another (Section 6.1) or performing a minor task (Section 6.2), the job safety briefing will be a discussion, between the roadway worker and the employee providing the authorization to enter the roadway, of the protection to be used.

6 MINIMUM CONTROLS/LIMITATIONS FOR EMPLOYEES PERFORMING DIFFERENT CATEGORIES OF WORK WHEN WITHIN THE TRACK ZONE ON ANY TRACK OTHER THAN YARD OR END-OF-LINE STORAGE TRACKS

Each RTA shall provide the protections specified in this section. The following categories of work and levels of protection proceed from low to high. A higher level of protection may be used for any category of work. Employees may occupy passenger platforms, except for the platform-edge warning strip, without the provisions in the sections below.

6.1 Moving from one location to another with full attention on surroundings. Does not apply to mixed traffic operations on surface streets and public areas such as pedestrian malls.

a. Roadway worker/crew must establish authorization for the identified area, and

b. Roadway worker(s) must be able to comply with the 15-second rule.

c. Roadway workers may occupy General Order 143 series compliant walkways in tunnels and on elevated structures where there is insufficient clearance to remain clear of the track zone. Trains must be slowed to 25 miles per hour or less before roadway workers may occupy the track zone on the walkway.

6.2 Performing minor tasks, as defined in this General Order, with sufficient attention to surroundings.

a. Roadway worker must establish authorization for identified work area, and

b. Notification must be given to train operators, and

c. Notification of reverse direction and other abnormal train movement must be provided to roadway worker, and

d. Roadway worker must be able to comply with the 15-second rule, and

e. One of the following, i or ii:

i. Trains must stop short of the work location unless the roadway worker communicates by radio to the train operator that the train may proceed. Trains approaching the work location must sound an audible warning until it is acknowledged by the roadway worker. Upon radio communication between the train operator and roadway worker that the train is stopped, the roadway worker may enter the track zone. Upon radio communication from the roadway worker that he or she is clear of the track zone or on a walkway under the provisions of Section 6.1.c, the train may proceed.

ii. Trains are held outside the work location under a Confirmed Hold as defined in this General Order.

6.3 Visual Inspections, Maintenance, and Repairs, Using Hand Tools, Machines, or Equipment

The provisions of this section must cover all roadway worker/crew activities not covered in sections 6.1 and 6.2.

a. Roadway worker/crew must establish authorization for identified work area, and

b. Communication between the controller, the train operator, and the EIC must be established, and the means by which protection is going to be provided documented and confirmed by these individuals, affirming that no worker will be permitted to enter the track zone until the provisions in this section are implemented, and

c. Notification of reverse direction and other abnormal train movement must be provided to roadway worker(s), and

d. On-rail vehicle movement into the work zone must be controlled by applying one or more of the following controls as appropriate:

i. with flags that indicate speed restrictions, advance warnings of stopping points, and stopping points: with watchpersons; and with all movements proceeding at a speed that will allow stopping within half the range-of-vision, limited also by a maximum miles-per-hour speed set by the EIC of 25 miles per hour or slower, or

ii. lining and locking switches or otherwise physically preventing entry and movement of rail transit vehicles, including on-track equipment, with a watchperson, or

iii. restricting work to times when propulsion power is down with verification from control that track is out of service, and barriers are placed that physically prevent rail transit vehicles, including on-track equipment, from entering the work zone, or

iv. for RTAs with positive train control systems that are operating as designed across the entire system,

1) with a watchperson: the control center shall establish red signals or stop commands as applicable to the system, or

2) without a watchperson: the control center shall establish red signals or stop commands as applicable to the system and stop commands are physically locked in the field train room, by means such as a route prohibit, an imposed false occupancy, or other means that make it impossible for the control center to inadvertently allow proceed signals or commands into the work limits. Exception: When any rail transit vehicle, including on-track equipment, without an operating positive train control system is operating in the vicinity of the work area limits, a watchman must be provided.

e. Rail transit vehicles, including on-track equipment, within working limits established by means of inaccessible track shall move only under the direction of the roadway worker in charge of the working limits, and shall move at a speed that will allow stopping within half the range-of-vision and also limited also by a maximum miles-per-hour speed set by the EIC of 25 miles per hour or slower.

7 MINIMUM CONTROLS/LIMITATIONS FOR EMPLOYEES PERFORMING DIFFERENT CATEGORIES OF WORK WHEN IN THE TRACK ZONE ON YARD AND END-OF-LINE STORAGE TRACKS

7.1 Each RTA shall have and submit to Commission staff its yard and end-of-line storage track RWP program within 90 days of the effective date of this General Order and each time the plan is changed.

7.2 Each RTA shall comply with its yard and end-of-line storage track RWP program.

8 ROADWAY WORKER PROTECTION TRAINING

8.1 Each RTA shall adopt an RWP training program for roadway workers so that each worker understands the hazards of working along the right-of-way and the methods to safely work on the right-of-way.

8.2 Each RTA shall adopt an RWP training program for any employee who may affect roadway worker safety, including their own safety. For example, the program shall cover employees such as rail transit vehicle operators, dispatchers, control center staff, and supervisors.

8.3 Each RTA shall make changes to its training program to address problems identified through the results of compliance testing, near-miss reports, reports of unsafe acts or conditions, and comments received on the training program.

8.4 No RTA shall assign an employee to perform the duties of a roadway worker unless that employee has received training in the RWP procedures associated with the work assignment to be performed. Any person who is escorted and being provided RWP safety by an RWP-trained employee is exempt from these training provisions.

- **a.** Each RTA at least once every 24 months shall retrain all roadway workers and employees with RWP responsibilities on the RWP training program for roadway workers.
- **b.** Records showing compliance with the requirement in subsection a. above shall be maintained for a minimum of three (3) years.
- **c.** Each RTA shall provide an opportunity in its training program for roadway workers to raise and discuss issues regarding the effectiveness of the training program.

8.5 The training of all roadway workers at a minimum shall include:

- **a.** Classroom training with the opportunity to ask the RWP trainer questions and raise and discuss RWP issues.
- **b.** Experience in a representative field-setting.
- **c.** The RTA's RWP rules and procedures.

d. Recognition of all tracks and understanding of the space around them within which RWP is required.

e. The functions and responsibilities of various persons involved with RWP procedures.

f. Checks or tests to ensure the ability to comply with RWP instructions given by persons performing, or responsible for, on-track safety and RWP functions.

g. Signals given by a watchperson, and the proper procedures upon receiving a rail transit vehicle approach warning from a watchperson, including applicable operating and flagging rules.

h. The hazards associated with working on or near all tracks, including review of RWP rules and procedures.

i. Flag protection rules and procedures and how they are applied to roadway worker protection.

j. Classroom discussion of the compliance testing program requirements.

k. Classroom discussion of the RTA's RWP near-miss program including, but not limited to how to report near-misses.

8.6 Each Transit agency shall insure that their RWP training personnel are competent to provide effective RWP training, and at a minimum will consider the following:

a. Experience and knowledge of effective training techniques.

b. Experience with the RTA's RWP rules

c. Knowledge of the RTA's RWP rules, program, operations, and operating environment, including applicable operating rules.

d. Knowledge of the training requirements specified in this General Order.

9 NEAR-MISS REPORTING PROGRAMS AND RECORDS

9.1 Each RTA shall develop and implement a program for reporting and recording near-misses regarding roadway worker protections.

9.2 RWP near-miss records shall be retained by the RTA for a period of three (3) years and shall be made available to CPUC staff on demand.

9.3 The near-miss program shall include:

- **a.** A policy statement supporting the near-miss program signed by the CEO, and
- **b.** A process to encourage and allow roadway workers to report near-misses, and
- **c.** Methods to store, easily access, and track near-misses and corrective actions, and
- **d.** Analyses to identify primary and contributory causal factors including root causes, and to implement corrective actions.

9.4 Each RTA shall submit a copy of its near-miss program to staff within 90 days of the effective date of this order and within 30 days of any subsequent modifications.

9.5 Each RTA shall reference their near-miss program in their SSPP.

9.6 Each RTA shall periodically review the effectiveness of its near-miss program taking into consideration industry practices and make adjustments if needed for increased effectiveness to achieve program goals.