



**ANNUAL RAILROAD SAFETY REPORT  
TO THE  
CALIFORNIA STATE LEGISLATURE**



**Pursuant to Public Utilities Code  
Sections 916, 916.1, 916.2, and 916.3**

**November 30, 2016  
for  
Fiscal Year 2015 - 16**

**CALIFORNIA PUBLIC UTILITIES COMMISSION  
SAFETY AND ENFORCEMENT DIVISION  
OFFICE OF RAIL SAFETY  
Railroad Operations and Safety Branch**

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**RAILROAD OPERATIONS AND SAFETY BRANCH**

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# Annual Railroad Safety Activity Report

## Fiscal Year 2015-2016

Pursuant to California Public Utilities Code Sections 916, 916.1, 916.2, and 916.3

### Executive Summary

The mission of the California Public Utilities Commission (CPUC) railroad safety program is to ensure the safe operation of freight, passenger, and commuter railroads in California. The CPUC performs these railroad safety responsibilities through its Safety and Enforcement Division (SED), Office of Rail Safety (ORS), Railroad Operations and Safety Branch (ROSB).

This report complies with California Public Utilities (PU) Code Sections 916, 916.1, 916.2, and 916.3.<sup>1</sup>

- *PU Code Section 916 requires the California Public Utilities Commission (CPUC)<sup>2</sup> to report to the Legislature on its rail safety activities on or by November 30 of each year. This report chronicles the operations of the CPUC Railroad Operations and Safety Branch during the previous fiscal year.*

During 2015-16, CPUC railroad safety inspectors conducted the following activities:

- Performed 3,406 inspections and follow-up inspections to monitor the railroads' compliance with federal and state laws, and CPUC General Orders and Public Utilities Codes.
- Cited 9,670 federal regulation non-compliant defects.
- Completed 299 CPUC General Order reports that identified 528 defects.
- Cited 6 violations of state regulations.
- Recommended civil penalties for 334 violations of federal regulations.
- Resolved 20 informal safety complaints.
- Performed 44 focused inspections.
- Performed 35 security inspections for risk assessment and to ensure each railroad that operates in California has a complete infrastructure protection plan.

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<sup>1</sup> Chapter 612, Statutes of 2015 (SB 697) moved the reporting requirements from PU Code Sections 309.7, 765.6, 7661, and 7711 to Sections 916, 916.1, 916.2, and 916.3.

<sup>2</sup> In this report, "Commission" refers to the five-member commission authorized by the California State Constitution, Article XII, Section 1. "CPUC" refers to the staff of the Commission, under the auspices of the executive director, appointed by the Commission pursuant to Public Utilities Code Section 308.

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- Investigated and resolved 22 additional railroad safety complaints from railroad employees, other public agencies, and the general public.
  - PU Code Section 916.1 requires the CPUC to annually report the results of its investigations of runaway trains or other uncontrolled train movement that threatens public health and safety.

Runaway or uncontrolled train movements are trending downward. This is due to more focused and effective train securement inspections being conducted by CPUC railroad safety inspectors in concert with the Federal Railroad Administration, especially since the proliferation of crude oil unit trains began entering California in 2014. This report includes the singular investigation of a runaway train, which occurred on January 20, 2016. The full report can be found in Appendix F: Examples of Accident Investigation Summaries.

- PU Code Section 916.2 requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous, and list all derailment accidents sites in the state on which accidents have occurred within at least the previous five years. In addition, Section 916.2 permits this report to be combined with the report required by section 916. The list of derailment sites are documented by calendar year.

The number of derailments at or near hazardous sites over the past fiscal year has decreased by more than 50%. This is the most significant drop in the past five years. This downward trend is due in part to increased track inspection team activities and more focused crude oil route inspections with the Federal Railroad Administration staff in California.

- PU Code Section 916.3 requires the CPUC to report on the actions the CPUC has taken to comply with section 765.5, which requires the CPUC to take all appropriate action necessary to ensure the safe operation of railroads in this state. In addition, Section 916.3 requires the CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of the CPUC's activities.

The CPUC has worked diligently to recruit and retain experienced staff to implement the requirements of section 765.5. Although it is difficult to keep inspectors on board, due to the pay disparity issues that have plagued the CPUC for more than 12 years, we have endeavored to proactively redraw territorial boundaries and regionalize to more effectively and efficiently apply our resources. Although our regionalization project is just beginning, we are confident that it will prove innovative and productive.

Regarding Section 916.3, the railroad user fees assessed in 2015-16 on Union Pacific Railroad (UPRR) and BNSF Railway (BNSF), the two largest contributors, represented just over one fourth of one percent of revenues (0.0025) and were unlikely to have had any effect on competition.

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## I. Introduction

The mission of the ROSB is to ensure that California communities and railroad employees are protected from unsafe practices on freight and passenger railroads by promoting and enforcing state and federal rail safety rules and regulations; performing proactive inspections; and identifying and mitigating risks and potential safety hazards before they create dangerous conditions.

The CPUC railroad safety program is one of the most comprehensive railroad safety programs in the nation. The Constitution of California declares that the Public Utilities (PU) Code is the highest law in the state, grants the Legislature plenary authority to regulate public utilities under the PU Code, and provides that the Constitution's provisions override any conflicting provision of state law which addresses the regulation of public utilities.

Federal law, Title 49 of the Code of Federal Regulations (CFR), Part 212, establishes the State Safety Participation Program with the FRA. The purpose of the state-federal partnership is to provide an enhanced investigative and surveillance capability by having state agencies assume responsibility for compliance investigations and other surveillance activities as a federal partner.

California state laws complement the federal State Safety Participation Program and provide even greater protection to railroad employees and the public. State laws require the CPUC to perform inspections, surveillance, and investigations of the railroads, and to advise the Commission on all matters relating to rail safety. A summary of applicable California PU Code sections and CPUC General Orders is provided in Appendix A.

The CPUC employs railroad safety inspectors who possess expertise in specific disciplines: hazardous materials (Hazmat), motive power and equipment (MP&E) which includes locomotives and rail cars, railroad operations (OP), signal and train control (S&TC), track, and bridges.<sup>3</sup> The inspectors also identify and address additional public safety risks associated with railroad systems.

The CPUC requires job applicants to have a minimum of five years of direct railroad experience within a specific discipline: hazardous materials, motive power and equipment, operating practices, signal and train control, or track. Most ROSB railroad safety inspectors have accumulated over 20 years, and some more than 40 years, of railroad experience. This experience is critical to understanding what constitutes safe railroad practices. The CPUC also requires each applicant to pass a written and oral exam.

The CPUC and FRA require all new hires to undergo about one year of on-the-job training, depending on their depth of experience. To gain the FRA certification, all ROSB railroad safety inspectors actively participate in at least two week-long classroom training sessions with the FRA to start, followed by at least one week of training every year thereafter. Newly hired ROSB railroad safety inspectors are each assigned an FRA on-the-job training manual. As they

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<sup>3</sup> The FRA certifies the inspectors as an expert in each of the disciplines, except for bridges. The CPUC proactively identified bridges as a risk to public safety and employs one track-certified inspector and one well-experienced bridge inspector to focus on bridges.

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complete specific required tasks, the CPUC or FRA railroad safety trainer signs off on the task. When the tasks are completed and the CPUC railroad safety inspector's supervisor believes that the inspector is ready to be an independent inspector, he or she must pass a certification field test. An FRA safety specialist (discipline specific) takes the CPUC railroad safety inspector out for a day or more in the field to test the person's knowledge and ability to perform as an independent railroad safety inspector.

The CPUC employs 43 FRA-certified railroad safety inspectors to perform safety inspections and investigations pursuant to the State Participation Program. The federally-certified inspectors enforce rail safety rules and regulations by performing inspections and accident investigations. The CPUC's rail safety responsibilities include:

- Inspect railroads for compliance with state and federal railroad safety laws.
- Investigate railroad accidents and safety-related complaints.
- Recommend railroad safety improvements to the Commission and federal government.

The CPUC can assess civil penalties for serious non-compliant conditions, depending on the egregious nature of the violation. During 2015-16, CPUC railroad safety inspectors wrote 334 civil penalty recommendations for violations of federal laws, and 6 citations for violations of state laws.

The Budget Act of 2015 appropriated \$7.6 million for the operations of the CPUC railroad safety program from a dedicated account within the CPUC Public Transportation Reimbursement Account. PU Code Section 309.7 requires the activities of the CPUC that relate to safe operation of common carriers by railroad, other than those relating to grade crossing protection, to be supported by the fees paid by railroad corporations. The fees paid by the railroad corporations are the sole funding source for the CPUC railroad safety program and do not fund any other state programs. PU Code Section 916.3 requires that the Annual Report include a determination of the impact on competition, if any, of these fees.

## **II. CPUC Safety Culture**

Safety culture improvement and proactive risk management are principal to the CPUC mission. CPUC railroad safety inspectors cite deficiencies of federal, state, and CPUC General Orders (GOs) and State laws. (See Appendix A for a list of state railroad safety laws and regulations). In addition to specific violations regarding state and federal regulations, CPUC railroad safety inspectors, as well as support staff, look beyond the regulations toward more comprehensive overall proactive safety oversight.

The CPUC strives to achieve a goal of zero accidents and injuries across all the utilities and businesses it regulates, and within all CPUC facilities. To achieve that goal, the CPUC embraces a comprehensive safety-management approach that integrates public policy, risk management, and compliance with federal and state laws and General Orders. This approach is used as a foundation for continuous improvement of the regulated utilities' safety as well as the CPUC's safety oversight role.

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The CPUC railroad safety inspectors identify public safety risks, “beyond the regulations.” The CPUC works to continuously enhance the safety culture of the railroad industry as well as its own safety culture. To promote a comprehensive safety culture, the CPUC uses proactive tools, cooperative engagement, and presentation methods, such as:

- Risk Management Status Reports
- Crude Oil Reconnaissance Team
- Railroad Bridge Evaluation Program
- Operation Lifesaver Presentations
- Near-miss Reporting and Analysis
- Positive Train Control Team
- High-Speed Rail Oversight

Additional proactive safety activities performed by the CPUC railroad safety inspectors and staff include:

- Collected and analyzed 4,100 near-miss incidents.
- Conducted 11 positive train control (PTC) field testing and demonstrations, performed 49 PTC surveillance observations, and attended 17 PTC status meetings.
- Performed 145 Operation Lifesaver presentations, which reached more than 10,000 people who live and/or work on or around railroad tracks.
- Developed monitoring procedures for the safe planning and construction of high-speed rail.

#### **A. Risk Management Status Reports**

The CPUC Office of Rail Safety utilizes a risk management process that enables staff to record any unsafe act, condition or situation they may find that are not addressed by regulations. During fiscal year 2015-16, CPUC railroad safety inspectors created 9 new Risk Management Status Reports (RMSR). A CPUC railroad safety inspector completes a RMSR when they identify a risk that may not be governed by an existing rule or law and makes a recommendation that will improve public safety.

In the course of field work, CPUC railroad safety inspectors identify items of concern that are either: (1) out of their area(s) of expertise; (2) outside of formal/official reporting and action protocols; or (3) despite prior formal or informal regulatory action, are still safety risks. A



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CPUC railroad safety inspector completes a RMSR when they identify a risk that may not be governed by an existing rule or law.

Once a RMSR is documented, the assigned inspector works with his or her supervisor to mitigate the risk. The inspector and supervisor meet with the responsible railroad, shipper or associated entity's responsible representative and convey the safety risk linked with the issue, and define a time period in which the risk should be addressed. The CPUC railroad safety inspector performs a follow-up inspection to determine whether the risk was mitigated. If the railroad fails to eliminate or sufficiently mitigate the risk, the CPUC Program Manager will pursue resolution with the responsible railroad officials, and if necessary may bring the issue up to the Deputy Director or to the full Commission for further enforcement action.

Examples of RMSRs are in Appendix B.

During 2015-16:

- 10 previous fiscal year RMSRs were closed out (i.e., the recommendations were implemented and or an alternative conclusion was reached with the railroad).
- 9 new RMSRs were created:
  - 3—Potential regulatory safety issues
  - 3—Issues related to CPUC General Orders or federal law requirements
  - 2—Miscellaneous safety concerns
  - 1—Right of Way Protection (fencing)

Seven of the new reports were closed; ROSB seeks to resolve the remaining two during the next fiscal year.

## **B. Crude Oil Reconnaissance Team**

The Crude Oil Reconnaissance Team (CORT) monitors the railroads' infrastructure related to the transportation of crude oil by rail and assesses and mitigates risks to public safety. The team identifies and resolves risks, incipient unsafe practices and regulatory infractions; provides mitigation guidance to the UPRR, BNSF, short line railroads, contractors, facility operators, and maintenance staff to more safely plan and transport crude oil by rail.

The Safety and Enforcement Division management established the CORT team in 2014 after an unattended 74-car freight train rolled down a slope, derailed, exploded, killed 47 people, and incinerated the town of Lac-Mégantic, Quebec, Canada. The rail industry planned to develop an infrastructure that would allow for steep increases in the quantity of crude oil to be transported via rail to California refineries. CORT was developed to closely monitor the rehabilitation and/or new construction of tracks and transfer facilities for new crude oil commerce that was expected for California.

The CORT actively monitors and inspects crude oil rail line rehabilitation projects and proactively monitors the full scope of railroad crude oil unit train handling procedures. The

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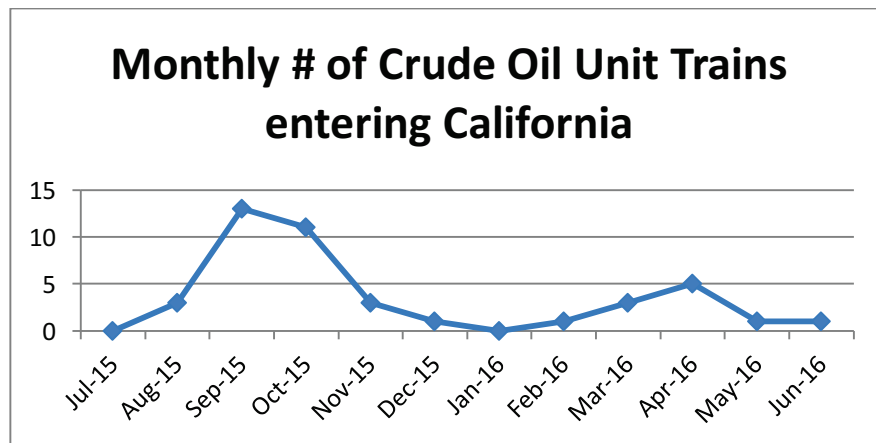
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CORT team reports that initial projections of participating railroads, estimated at upwards of one unit crude oil train per day for a single facility, have not panned out. In fact, over the past fiscal year only a total of 40 crude oil unit trains have been reported to the CPUC as having entered California. Twenty-four of those were in September and October of 2015. Only five unit-trains traversed through California during one four-month period. The price of oil per barrel has significantly decreased this FY. This is primarily causal for the decreased number of crude oil unit trains entering California. There has been no volatile Bakken crude oil transported by rail in California this FY.

The CORT team is an interdisciplinary team that includes CPUC railroad safety inspectors certified in the specialties of track, signal, hazardous materials, motive power & equipment and operating practices. They are joined by CPUC professional engineers who specialize in risk assessment and the Railroad Bridge Evaluation program's bridge inspectors.

CORT performs frequent observations of the crude oil transfer facilities and related infrastructure. They ensure all facility tracks are built to comply with federal laws, state laws, and CPUC general orders. They obtain monthly reports on actual and expected crude-by-rail California imports. This information is utilized to develop inspection plans that have included shadowing trains entering state jurisdiction, observing training of facility staff, and acting as a liaison with sister agencies such as the California Office of Emergency Services.

The initial projections of participating railroads, estimated at upwards of one unit crude oil train<sup>4</sup> per day for a single facility, have not panned out. In fact, over the past fiscal year, a total of only 40 crude oil unit trains have been reported to the CPUC as having entered California. Twenty-four of those were in September and October of 2015. A mere five unit-trains traversed through California during a four-month period between December 2015 and March 2016.



Source: California Public Utilities Commission CORT

Currently, there are only two active crude-by-rail facilities in the state. The most active continues to be the Plains All American facility in Bakersfield. The other is the Kern Oil

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<sup>4</sup> A unit train is a train that is composed of cars carrying a single type of cargo. As such, a unit crude oil train carries only crude oil.

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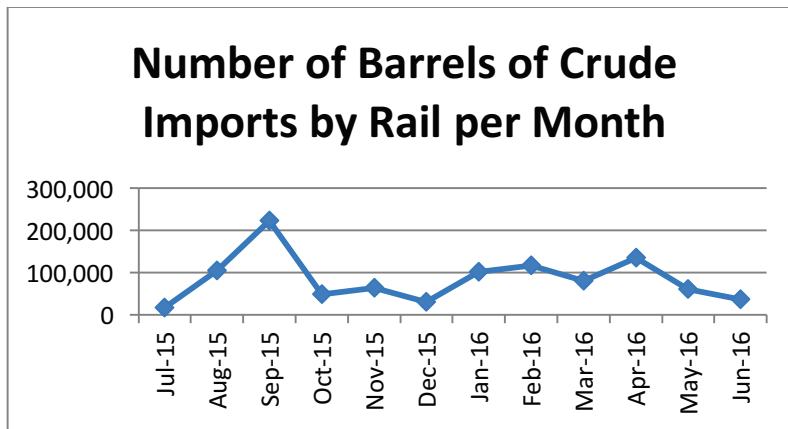
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Refining facility, also in Bakersfield. The Kinder Morgan facility that operated for a short time in Richmond has been shuttered. Plans for additional facilities in Benicia and Santa Maria remain under regulatory consideration and corporate development.



*Crude Oil Unit Train at Plains All American Facility in Bakersfield on September 11, 2015*

The demand for transporting crude oil by rail in the US has significantly decreased and is expected to continue its decline. The Wall Street Journal reports that BNSF used to transport as many as 12 trains daily filled with crude primarily from North Dakota’s Bakken Shale, carrying about 70 percent of all rail traffic out of the area. Now it is down to about five a day.<sup>5</sup> According to the Energy Information Administration, the first five months of 2016 experienced a decrease of 45 percent from the first five months of 2015.<sup>6</sup> About half of the decline is attributable to fewer shipments of crude oil by rail from the Midwest to the East Coast, which accounts for about half of the decline. Nevertheless, crude oil shipments by rail have generally decreased since last summer for several reasons, including narrowing price differences between domestic and imported crude oil, the opening of new crude oil pipelines, and declining domestic production in the Midwest and Gulf Coast onshore regions.<sup>7</sup>



*Source: California Energy Commission*

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<sup>5</sup> Wall Street Journal: *Crude Slump, Pipeline Expansion Mark End of U.S. Oil-Train Boom*. July 25, 2016.

<sup>6</sup> <http://www.eia.gov/todayinenergy/detail.php?id=27352>, August 3, 2016.

<sup>7</sup> Ibid.

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In spite of this declining trend in crude-by-rail transport, the CORT team will continue to monitor crude oil trains and facilities as well as identify risks to public safety posed by existing and planned operations associated with transporting crude oil by rail. While oil prices have dropped dramatically over the past year and shipments into California are down, CORT maintains a vigilant watch for all shipments that may come into the state. An increase in crude oil prices could create a surge in shipments to California. That is why CPUC railroad safety inspectors and CORT team members must remain alert for any such rail traffic increases.

### **C. Railroad Bridge Evaluation Program**

Railroad bridges pose potentially significant safety risks. These potential risks include structural integrity deterioration due to age. A number of these bridges are over a hundred years old. In addition, many of California's railroad bridges span large bodies of water, major highways, and/or areas of high population density, and are embedded within crude oil train routes.

The Budget Act of 2014 (SB 852, Chapter 25, Statutes of 2014) included two railroad track inspector positions who would specialize in bridge inspection. Those positions were filled in October of that year and since that time the CPUC has placed tremendous effort in establishing the Railroad Bridge Evaluation Program (RBEP). A bridge observation<sup>8</sup> (inspection) procedure and bridge inspection report was designed and implemented. There has been significant progress in OJT training for CPUC railroad bridge safety inspectors, increased collaboration with the Federal Railroad Administration (FRA) railroad bridge program and actual bridge observations performed in FY 2015/16.

During FY 2015-16, the CPUC railroad safety inspectors who specialize in bridges performed the following:

- 122 total bridge observations.
- 55 prioritized bridge observations.
- 2 bridge field activities held jointly with the FRA.
- 16 General Order reports identifying defects.
- 4 RMSRs (inquiries to railroads about bridge safety concerns).
- 1 response to a bridge-related informal complaint.

Moving forward, the CPUC staff will use the results of the initial bridge observations to re-prioritize observations for the remaining railroad bridges. The criteria will be adjusted based on information gathered during the initial observation efforts.

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<sup>8</sup> Instead of the word "inspection", "observation" is used to mirror the railroad bridge work description used by the FRA.

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Title 49 CFR, Part 237 requires railroad track owners to create a bridge management program, perform annual bridge inspections, and calculate load capacities. The CPUC and the FRA have agreed to work in concert to ensure that railroad track owners complete their bridge management programs and have conducted joint railroad bridge observations.



*CPUC Railroad Bridge Inspectors during field inspections in Southern California.*

In 2015-16 both of our CPUC bridge inspectors participated in a several bridge inspections with the FRA.<sup>9</sup> Opportunities to perform bridge observations with the FRA are beginning to increase and further solidify our continued working relationship with FRA's bridge program. The biggest problem with working with the FRA bridge program is that FRA has only 5 bridge inspectors for the entire United States.

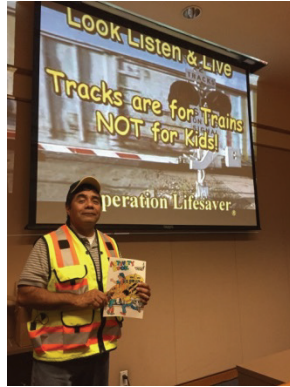
The CPUC railroad bridge safety staff held meetings with BNSF and UPRR to evaluate their bridge inspection training programs. Based on information acquired by CPUC risk assessment and bridge staffs, the CPUC railroad safety program has made progress in populating the CPUC railroad bridge database with the ages of bridges and the volume of traffic in order to rank the bridges by their risk level.

#### **D. Operation Lifesaver Presentations**

To further the CPUC culture of safety, CPUC rail safety staff present at Operation Lifesaver events. Operation Lifesaver's mission is to end collisions, deaths and injuries at highway-rail grade crossings and on rail property through a nationwide network of volunteers who work to educate people about rail safety. CPUC railroad safety inspectors and support staff volunteer throughout the state, providing presentations to schools, community organizations, drivers' education classes, bus driving workshops and trucking organizations, as well as educating the public at weekend events such as festivals and safety fairs.

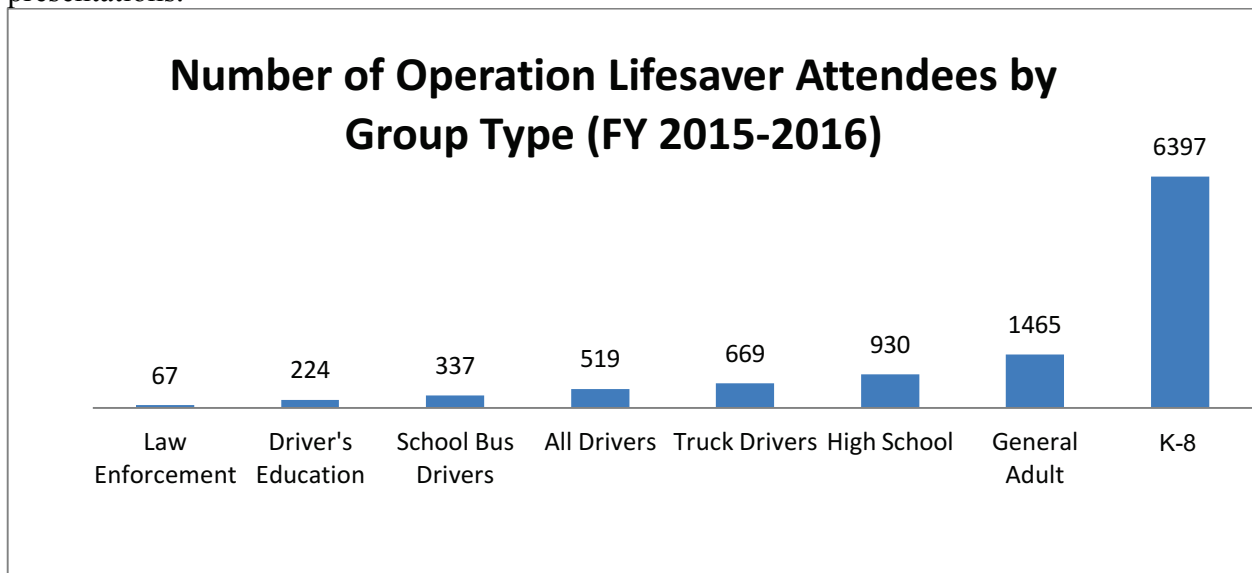
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<sup>9</sup> The FRA only has five railroad bridge inspectors to cover approximately 80,000 railroad bridges in the United States. One FRA inspector is assigned to California, as well as eleven other states



*A CPUC Operation Lifesaver presentation.*

During 2015-16, CPUC rail safety staff performed 145 Operation Lifesaver presentations, which reached more than 10,000 people. Appendix C provides examples of Operation Lifesaver presentations.



### **E. Near-Miss Reporting and Analysis**

PU Code Section 7711.1 requires the CPUC to collect and analyze near-miss data for incidents in California occurring at railroad crossings and along the railroad right-of-way. “Near-miss” is defined as including a runaway train or any other uncontrolled train movement that threatens public health and safety. In support of this requirement, the CPUC has developed a process for managing the risks discovered through the collection and analysis of near-miss data. Using near-miss data to identify locations where there are conditions which may pose a greater likelihood of accidents, and/or have greater consequences in the event of an incident, enables the railroad risk assessment team to improve railroad safety.

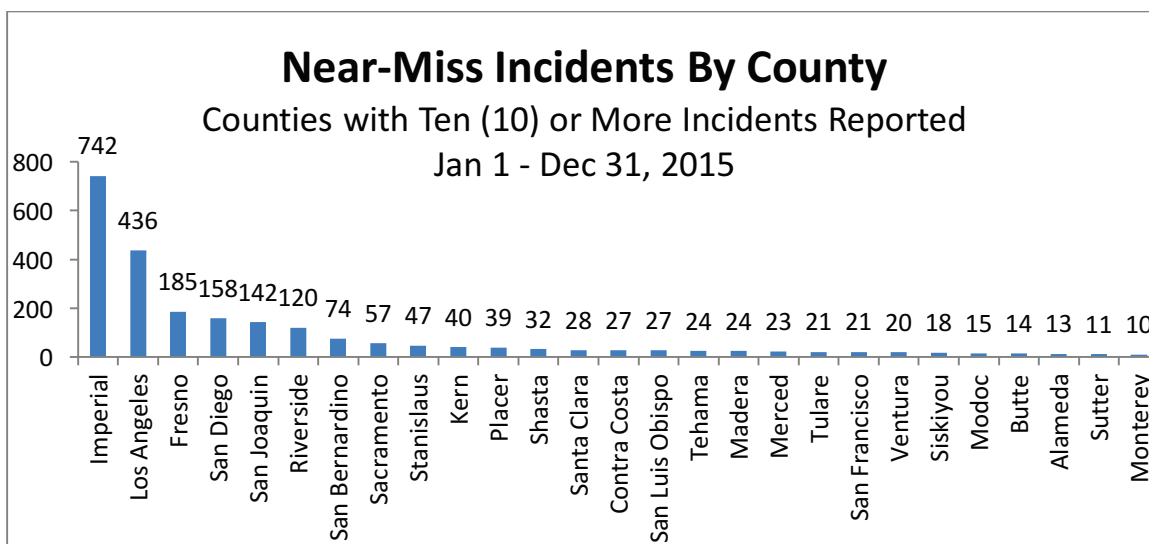
To proactively mitigate risks, the CPUC has broadly interpreted the term “near-miss” to include an incident that does not result in the occurrence of an accident, but presents an unintended

condition or exposure to a hazard that may have caused an unwanted incident. A negative incident may be preceded by one or more events, making near-miss data useful information for identifying potential threats to public health and safety.

Unfortunately, the data are not systematic or comprehensive. Reporting of most near-miss incidents is voluntary and railroad corporations in California do not equally report near-miss information in a standardized format and do not use a uniform threshold for determining what conditions qualify as near-miss incidents. As such, the reported near-miss data may not be useful for comparisons. Nevertheless, because the data may describe conditions that may be leading indicators of accidents and thus describe characteristics that can be addressed, the near-miss data possess considerable accident-prevention usefulness.

In 2015, there were just over 2,300 near-miss incidents reported, yet in 2014 there were over 4,100. There is no evidence to suggest that drivers or pedestrians have become increasingly safer around railroad property. For example, Imperial County experienced an increase in near-misses by nearly 300 percent—from 271 in 2014 to 742 incidents in 2015. The rise in near-misses in Imperial County may be attributed to the growth in population, which reported by the California Department of Transportation reports that the Imperial County’s population growth will continue to grow faster than the state average in the 2013 to 2018 period. Yet, there has been a significant decrease in the number of near-miss incidents reported in every other County. Notably, Los Angeles County with its population density and large number of railroad crossings and rail traffic experienced 890 fewer near-miss incidents in 2015. It appears that the decreases in near-miss reports may be associated with changes to UPRR and BNSF reporting criteria to the CPUC.

The following graph indicates near-miss incidents by county. It may be expected that Los Angeles County experienced the highest number of near-miss incidents due to the population density, the amount of rail traffic entering and exiting the ports, and the number of railroad crossings. Regardless, it is difficult to draw any real conclusions based on the randomness and inconsistent frequency of reporting near-miss incidents.



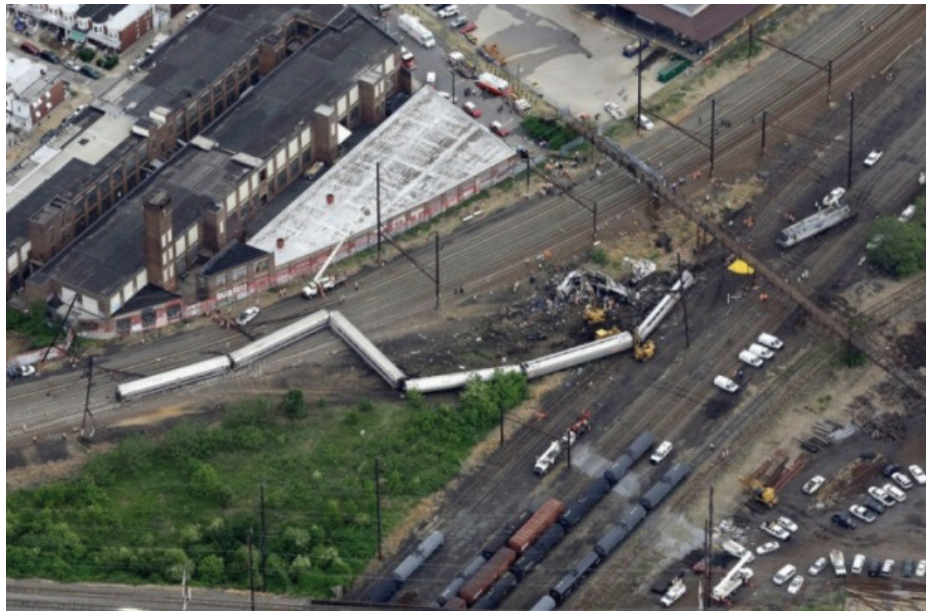
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## F. Positive Train Control

The Rail Safety Improvement Act of 2008 (P.L.110-432) requires all railroads to install PTC devices in specified areas by December 31, 2015. On October 29, 2015, President Obama signed H.R. 3819 – 114 “Surface Transportation Extension Act of 2015” which included a three-year extension of PTC implementation. Railroads now have until December 31, 2018 to implement PTC, and as late as 2020 under certain circumstances.

PTC is a global positioning system-based technology to provide real-time location and speeds of trains and avoid collisions, such as in the event of an operating rule violation, missing a signal whose indication requires a speed change, route change, or a stoppage. PTC systems are designed to avoid human error by providing computerized control of trains to ensure train separation (collision avoidance), rail line speed enforcement, temporary speed restrictions, and railroad worker wayside safety.<sup>10</sup>



*Overhead view of May 12, 2015 Philadelphia Amtrak accident.*

To highlight the consequences of delayed PTC implementation, the investigation of a May 12, 2015 Amtrak accident in Philadelphia found that PTC would have stopped the train, which was violating a speed limit restriction. PTC would have initiated the train’s emergency air brake system and would have slowed and/or stopped the train to avoid this deadly derailment.

CPUC has two PTC Specialist inspectors. They comprise the Positive Train Control Team (PTCT). One has expertise in railroad operations; the other has an extensive computer background, which is essential in understanding the complexities of PTC software user interface design. The PTC Team has been actively engaged in design review, component and wayside appurtenance testing, PTC system and train interface operations and inspections during the development and construction of PTC systems in California.

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<sup>10</sup> The 2014 and 2015 Annual Reports to the Legislature provide more detail on the PTC technology.

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*CPUC PTC Specialists experiencing a new PTC locomotive simulator at UPRR in Colton, CA.*

All California railroads are expected to meet the new 2018 deadline. The Southern California Regional Rail Authority (Metrolink) is likely to be the first passenger railroad to complete implementation and have their PTC system certified by the FRA before December 31, 2018. Both BNSF and UPRR continue to work with Metrolink to ensure interoperability of PTC between each company's equipment.

BNSF is the freight carrier most likely to complete functional demonstration of their PTC system, followed by UPRR. After these railroads, Caltrain, North County Transit District (NCTD), Sonoma Marin Rail Transit (SMART), Amtrak, and Altamont Corridor Express (which is dependent on UPRR functionality as they are a tenant and UPRR is host) are likely to follow. The Altamont Corridor Express (ACE) has not been able to conduct testing since UPRR has not commenced testing on the rail line that ACE operates on and the delay is a concern given the passenger service on this line.

FRA guidelines dictate mandatory PTC implementation on short line railroads<sup>11</sup> if specific criteria are met. If criteria are not met, the host railroad can require implementation in order to interchange with their railroad. As of this writing, only one short line has implemented PTC, Pacific Sun Railroad of San Diego out of over 29 short lines operating in California.

During 2015-16, the CPUC PTC Specialists performed the following:

- Conducted 11 field activities (PTC equipment testing and demonstrations).
- Performed 49 PTC surveillance observations.
- Monitored and participated in 17 PTC status meetings.

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<sup>11</sup> A short-line railroad is a Class II or Class III independent railroad company that operates over a relatively short distance. Class II carriers have annual operating revenues of between \$20 million and \$250 million and Class III carriers have annual operating revenues of \$20 million or less, after the deflator formula is applied to calculate current revenues to 1991 levels. The railroad revenue deflator formula is based on the Railroad Freight Price Index developed by the Bureau of Labor Statistics and uses the following formula: Current Year's Revenues × (1991 Average Index/Current Year's Average Index. 49 CFR 1201.

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- Provided ongoing correspondence with the railroads to determine status, challenges, and issues of implementation and compiles monthly reports of all activities.

### **G. California High-Speed Rail**

The California High Speed Rail (HSR) system will be the first high-speed rail system in the nation.<sup>12</sup> The California High Speed Rail Authority (CHSRA), located within the California State Transportation Agency, is responsible for planning, designing, building and operation of the system. On May 1, 2016, the CHSRA released its 2016 Business Plan<sup>13</sup> that includes a decision to select an initial northern route to connect San Francisco to Bakersfield.<sup>14</sup>

Under current plans, by 2029, the system will run from San Francisco to the Los Angeles basin in under three hours at speeds capable of over 200 miles per hour. Within that corridor, the Initial Operating Segment, connecting San Jose to a to-be-determined location in the Central Valley, will begin operations in 2025. More than 100 miles of the HSR system are under construction in the Initial Construction Segment, from Madera to north of Bakersfield. The system will eventually extend to Sacramento and San Diego, totaling 800 miles with up to 24 stations.



*CPUC HSR staff observing construction of the Cottonwood Creek bridge near Madera, CA.*

The HSR system will be double-tracked and operate primarily on dedicated track, with relatively small portions of the route shared with other existing passenger and freight rail operations. The

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<sup>12</sup> The International Union of Railways defines HSR as a system that is designed for speeds above 155 miles/hour (250 km/hour) and upgraded lines for speeds up to 124 – 136 miles/hour (200 - 220 km/hour). [www.uic.org/highspeed](http://www.uic.org/highspeed). The United States has two rail lines considered HSR. Amtrak’s Acela Express is the fastest train, with a normal maximum speed of 150 mph (241 km/h) on two sections of its route between Boston and New Haven, CT, and 135 mph (217 km/h) between New York, NY, and Washington, DC.

<https://www.amtrak.com/national-facts>. The Northeast Regional is a “higher-speed rail” service operated by Amtrak in the Northeastern and Mid-Atlantic United States and connects Washington DC, Philadelphia, New York and Boston. Trains regularly reach speeds of 125-150 mph (201-241 km/hour). <https://www.amtrak.com/national-facts>.

<sup>13</sup> PU Code 185033 requires the CHSRA to prepare, publish, adopt and submit a business plan to the California Legislature every two years.

<sup>14</sup> The report refers to the regions informally and broadly, i.e. “Silicon Valley” to the “Central Valley.”

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system will use high speed train technologies similar to those used in other countries, including steel-wheel-on-steel-rail, overhead electric power, safety and signaling systems, and automated train control.



*HSR viaduct construction over CA Highway 145 in Madera.*

With its high top speeds and hundreds of passengers on each train, HSR poses large potential accident risks. Even at low speeds, accidents can have significant consequences. The Office of Rail Safety, with its regulatory authority over high speed rail as a passenger rail system, has important responsibilities in helping to ensure the safety of HSR.

The CPUC has two dedicated HSR staff. One is a Senior Utilities Engineer Specialist (P.E.); and the other is a Public Utility Rate Analyst V, with a background in law. Other Office of Rail Safety personnel, including ROSB Inspectors, have HSR enforcement responsibilities. Applicable CPUC General Orders that are or will be enforced by staff include:<sup>15</sup>

- 22-B Accident Reporting
- 26-D Clearances
- 88-B Highway-Rail Crossings
- 118-A Walkways

Most of these General Orders are incorporated in HSR design criteria documents issued by the CHSRA. CPUC has reviewed numerous applications for alterations of railroad crossings under General Order 88-B. CPUC staff also has participated in discussions with rail carriers regarding the electrification of the Caltrain system running from San Jose to San Francisco, which will be used by the HSR system as well.

Once construction advances and operations are ready to begin, the CPUC also will have investigation authority over the HSR system under CPUC's agreement with FRA. Major FRA

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<sup>15</sup> General Order 176, Overhead 25 kV Electrification for HSR, is enforced by a different unit within the Safety and Enforcement Division, the Electric Safety and Reliability Branch.

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regulations governing HSR are contained in 49 CFR 213 Subpart G, Train Operations at Track Classes 6 and Higher.



*Construction work on the California High Speed Rail Fresno Trench.*

At the present time, CPUC staff are monitoring HSR developments and making sure that CHSRA planning is incorporating CPUC General Order requirements. Staff are obtaining and reviewing planning documents, and observing HSR construction activities as they proceed.

CPUC HSR Staff also are participating in CHSRA Fire and Life Safety & Security Committee meetings, which are attended by representatives of state and local agencies involved in security aspects of HSR regulation. Topics of discussion in these meetings have included:

- Lessons learned from railroad and rail transit accidents, including the Amtrak derailment in Philadelphia in 2015, the 2014 derailment of an HSR train in France, and tunnel fires in the BART system (1979) and Washington, DC (2015),
- Emergency response to a hypothetical wildfire in Kern County,
- CPUC is sharing its California rail map with the Committee,
- Safety aspects of HSR crossings near Fresno,
- Ways in which fencing and other security measures can reduce risks.

### **III. The Foundation of the Rail Safety Program**

The CPUC employs 43 railroad safety inspectors who are federally-certified in the five FRA railroad disciplines: hazardous materials, motive power and equipment, operations, signal and train control, and track. In addition, the CPUC has two PTC Specialist inspectors and two railroad bridge inspectors. There is no discipline specific FRA certification program for PTC inspectors or railroad bridge inspectors. However, CPUC does have one bridge inspector that is also FRA track certified; and one PTC Specialist that is FRA railroad operations certified. There are five Public Utility Rate Analysts and one Office Technician. Total numbers of staff are 52.

CPUC railroad safety inspectors perform regular inspections, focused inspections, accident investigations, security inspections, surveillance activities and complaint investigations. In addition to the individual inspections, the inspectors also perform overarching risk assessment

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and risk management to identify and address public safety risks that may not be a violation of a federal or state law. CPUC railroad safety inspectors perform compliance inspections of CPUC General Orders and Public Utilities Codes applicable to freight and passenger railroad operations.

### **A. Regular Inspections**

Over the past year, CPUC railroad safety inspectors have engaged in both proactive safety efforts and retroactive accident investigations to mitigate public safety risks. Examples of regular inspections are listed in Appendix D. The CPUC railroad safety inspectors:

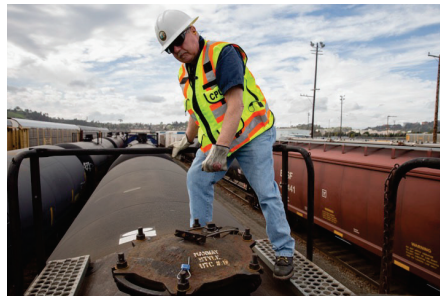
- Performed 3,406 inspections and follow-up inspections to monitor the railroads' compliance with federal and state laws, and CPUC General Orders.
- Cited 9,670 federal regulation non-compliant defects.
- Completed 299 CPUC General Order reports that identified 528 defects.
- Cited 6 violations of state regulations.
- Recommended civil penalties for 334 violations of federal regulations.
- Resolved 20 informal safety complaints.

The FRA certifies inspectors in the disciplines of: hazardous materials; motive, power and equipment; operating practices, signal and train control, and track.

### **CPUC Hazardous Materials inspectors:**

- Inspected or evaluated 21,816 units in 770 FRA inspection reports.
- Identified 1,274 CFR defects.
- Recommended 3 civil penalties for FRA violations.

Hazardous Materials units include each tank car, each record to ensure accurate documentation of the substance contained in a hazardous materials rail car or package, each evaluation of a hazardous materials unintended release mitigation plan, each inspection of the shipper's paperwork, and other similar items.



*A CPUC Hazmat Inspector at work in Richmond, CA.*

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CPUC hazardous materials inspectors conduct a variety of activities, including the investigation of accidents involving the actual or threatened release of hazardous materials as reported by the Governor's Office of Emergency Services (OES) 24-hour Warning Center. Inspectors also conduct unannounced inspections at the facilities of shippers, consignees, freight forwarders, intermodal transportation companies, and railroads. This includes inspection at the ports of Long Beach, Los Angeles and Oakland.

CPUC hazardous materials inspectors also inspect facilities to ensure compliance with CPUC General Order 161—Rules and Regulations Governing the Transportation of Hazardous Materials by Rail. For example, inspectors look for the appropriate grounding of cars to prevent dangerous static electricity buildup during unloading. GO 161 also has requirements for reporting the release or threatened release of hazardous materials where there is a reasonable belief that the release poses a significant present or potential harm to persons, property, or the environment. GO 161 also adopts the FRA Track Safety Standards for enforcement of minimum track safety standards within such facilities.

**CPUC Motive Power and Equipment inspectors:**

- Inspected or evaluated 54,621 units<sup>16</sup> in 784 FRA inspection reports.<sup>17</sup>
- Identified 1,715 CFR defects.<sup>18</sup>
- Recommended 16 civil penalties for FRA violations.<sup>19</sup>

Motive power and equipment units include each locomotive, each rail car, inspection records or specific components thereof.

PU Code Sec. 765.5(d) requires the CPUC to establish, by regulation, a minimum inspection standard to ensure that at the time of inspection, that railroad locomotives, equipment, and facilities located in the Class I railroad yards will be inspected not less frequently than every 120 days.<sup>20</sup>

During 2015-16, CPUC railroad safety inspectors did not satisfy the mandate. Of the 52 facilities, 42 sites were inspected three times or more during the fiscal year. Of the remaining 10 facilities, 5 were inspected twice and 5 were inspected once.

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<sup>16</sup> Down 23,680 units from 2014-15 due to the difficulty of retaining federally certified railroad inspectors.

<sup>17</sup> Down 223 reports from 2014-15 due to employee retention.

<sup>18</sup> Down 1,325 defects from 2014-15 due to employee retention.

<sup>19</sup> Down 9 violations from 2014-15 due to employee retention.

<sup>20</sup> UPRR and BNSF are the only Class I freight railroads operating in California. The Surface Transportation Board defines a Class I railroad as "having annual carrier operating revenues of \$250 million or more" after adjusting for inflation using the Railroad Freight Price Index developed by the Bureau of Labor Statistics. (49 CFR, Part 1201).

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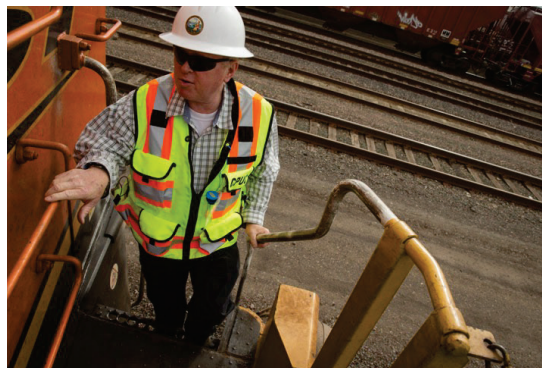
*Inspecting railroad equipment at a BNSF Railway yard.*

The primary reason for not meeting the mandate is employee retention. When a certified CPUC railroad safety inspector leaves, it takes at least one year to hire a new inspector, get the inspector appropriate training for federal certification, and train the inspector in the field using an experienced CPUC railroad safety inspector. During that period of time, CPUC's ability to meet the mandate is reduced. In addition, the experienced inspectors may miss their individually assigned mandate segments because they spend a significant amount of time training the new-hire on California-specific laws and CPUC General Orders.

**CPUC Operating Practices inspectors:**

- Inspected or evaluated 7,078 units in 837 FRA inspection reports.<sup>21</sup>
- Identified 723 CFR defects.
- Recommended 103 civil penalties for FRA violations.

Operating practices units include ensuring the accuracy of train consist records, observing crews performing switching operations, reviewing the accuracy and completeness of accident records, ensuring compliance with certifications and licenses, and other similar items.



*A CPUC Operating Practices Inspector preparing to inspect a locomotive.*

**CPUC Signal and Train Control inspectors:**

- Inspected or evaluated 723 units in 126 FRA inspection reports.<sup>22</sup>

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<sup>21</sup> Down 5,301 units from 2014-15 due to employee retention.

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- Identified 229 CFR defects.<sup>23</sup>
  - Recommended 4 civil penalties for FRA violations.

Signal and train control units include each signal system appurtenance, maintenance and testing records, warning devices at crossings, and other electronic or mechanical signaling systems.

### **CPUC Track inspectors:**

- Inspected or evaluated 17,600 units in 889 FRA submitted inspection reports.<sup>24</sup>
- Identified 5,729 CFR defects.
- Recommended 208 civil penalties for FRA violations.<sup>25</sup>

Track units include a mile of track, a switch, a Roadway Maintenance Machine, a record, and other similar items involving the track structure.

PU Code 765.5(d) requires the CPUC to establish by regulation a minimum inspection standard to ensure that all branch and main line track is inspected not less frequently than every 12 months.



*CPUC Track Inspectors taking a track guard check gage measurement in a rail yard.*

Inspectors use several methods to inspect track. Each method has its benefits and drawbacks depending on the terrain, steepness, traffic density and location.<sup>26</sup> The methods include:

- Physically walking the track.
- Riding in a hi-rail vehicle (motor vehicle outfitted with steel rail guide wheels).

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<sup>22</sup> Down 7,527 units from 2014-15 due to employee retention.

<sup>23</sup> Down 185 defects from 2014-15 due to employee retention.

<sup>24</sup> Down 7,881 units from 2014-15 due to employee retention.

<sup>25</sup> Up 88 violations from 2014-15 largely due to a focused inspection on the Lakeview Railway in Northern California.

<sup>26</sup> The 2013-14 Annual Report to the Legislature provides a detailed explanation about the methods of track inspections: <http://www.cpuc.ca.gov/rosb/>

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- Riding in a FRA “geometry car” (special rail cars equipped to identify, collect, and disseminate geometric track deficiencies and other potential accident causing conditions).

In 2015-16, CPUC railroad safety inspectors surveyed 4,428 miles of track in California aboard the track geometry vehicles. The track geometry vehicles identified 1,259 defective conditions. CPUC railroad safety inspectors conducted numerous follow-up inspections to monitor the railroads’ compliance and verify that the defects had been corrected.

### **B. Focused Inspections**

PU Code Section 765.5(e) requires the CPUC to conduct focused inspections of railroad yards and track, and to target the railroad yards and track that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density. Focused inspections involve inspectors from a variety of disciplines or multiple inspectors from a single discipline, working together at a specific location or rail facility. Typically, focused inspections are joint efforts between the FRA and CPUC, though PU Code Section 767.5 permits the CPUC to conduct the inspections as the Commission determines to be necessary.

Focused inspections allow CPUC railroad safety inspectors to evaluate all aspects of a railroad or railroad facility’s operational and maintenance practices and procedures. They also allow for close evaluation of railroad management and labor abilities, technical expertise and experience, and safety culture. If corrective actions are recommended by CPUC railroad safety inspectors, a follow-up inspection is performed to determine progress by the railroad entity in carrying out the recommended actions.

In 2015-16, CPUC railroad safety inspectors performed 44 focused inspections, which consisted of:

- 3 track inspections
- 14 hazardous materials inspections
- 10 operating practices inspections
- 3 motive power and equipment inspections
- 3 signal and train control inspections
- 11 cross-discipline inspections

Appendix D provides some examples of focused inspections.

### **C. Accident Investigations**

PU Code Sec. 315 requires the CPUC to investigate the cause of all accidents occurring within the state upon the property of any public utility directly or indirectly connected with its

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maintenance or operation, resulting in loss of life or injury to person or property damage. CPUC railroad safety inspectors evaluate each accident when reported to the CPUC (usually, by OES) and determine the appropriate investigative response based on accident severity criteria, including:

- Impact to the public (evacuations, injuries, fatalities).
- Injuries or fatalities to railroad employees or passengers.
- Environmental impact.
- Impact on commercial transportation (highway closures, commuter interruptions).
- Violations of state or federal railroad safety regulations or operating rules.

In 2015-16, there were 752 reported railroad related incidents. Of these totals, 345 were related to crossing or trespasser incidents, 264 hazardous material spills, 122 derailments, and 21 in other categories. These incidents resulted in a total of 168 fatalities and 94 injuries, mostly from trespassers. CPUC railroad safety supervisors reviewed all reported incidents and determined that 118 required further investigation.

Appendix F lists examples of accident investigations performed by CPUC railroad safety inspectors.

#### **D. Security Inspections**

PU Code sections 7665 through 7667 requires every owner, operator, or controller of each rail facility to provide a risk assessment to the CPUC for each rail facility, and prescribes the information that must be included. It also requires every rail operator to develop and implement an infrastructure protection program to protect rail infrastructure from acts of sabotage, terrorism, or other crimes. The code requires the CPUC to review the infrastructure protection program submitted by the rail operators, and permits the CPUC railroad safety inspectors to conduct inspections to facilitate the review. To facilitate compliance, the CPUC provided all railroads with a “Security Plan Guidance” document that incorporates concisely the codified specific requirements of the security plans.<sup>27</sup>

During 2015-16, CPUC railroad safety inspectors performed security reviews on 35 railroads.<sup>28</sup> Of the 35, 34 were in compliance with the mandates.

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<sup>27</sup> Genesee & Wyoming Company, which operates four railroads within California, has adopted the security plan guidance as a blue print to develop a standard format for each railroad.

<sup>28</sup> Amtrak, UPRR and BNSF produce national security plans that are reviewed annually by the FRA. To ensure compliance with state laws, the CPUC railroad safety inspectors who specialize in Security Plans review each railroad’s security plan at various locations within the state.

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Lake Railway, located in Alturas, was not in compliance with the law because it did not have a risk assessment or infrastructure protection plan. Lake Railway was provided with the statutory requirements and the Security Plan Guidance document. Lake Railway has completed their security plan and the CPUC railroad safety inspector has reviewed the plan to ensure compliance.

Below is a table identifying the railroad, inspection dates and compliance status:

| NAME                                 | DATE OF INSPECT. | COMPLIANT | COMMENTS  |
|--------------------------------------|------------------|-----------|---|
| Altamont Commuter Express            | 03/10/2015       | Y         |   |
| Santa Maria Valley RR                | 05/18/2015       | Y         |   |
| Fillmore Western                     | 05/26/2015       | Y         |   |
| San Joaquin Valley RR                | 03/09/2015       | Y         |   |
| Modesto & Empire Traction            | 03/10/2015       | Y         |   |
| Central California Traction Company  | 03/11/2015       | Y         |   |
| Stockton Terminal & Eastern Railroad | 03/11/2015       | Y         |   |
| Sacramento Valley Railroad           | 03/11/2015       | Y         |   |
| Quincy Railroad                      | 03/12/2015       | Y         |   |
| California Northern Railroad         | 04/07/2015       | Y         |   |
| Richmond Pacific Railroad            | 04/08/2015       | Y         |   |
| San Francisco Bay Railroad           | 04/08/2015       | Y         |   |
| Cal Train                            | 04/09/2015       | Y         |   |
| Napa Valley Railroad                 | 04/07/2015       | Y         |   |
| Niles Canyon Railway                 | 04/08/2015       | Y         |   |
| Santa Cruz Monterey Bay              | 04/09/2015       | Y         |   |
| Metrolink                            | 05/11/2015       | Y         |   |
| Amtrak Los Angeles                   | 05/20/2015       | Y         |   |
| San Diego & Imperial Valley          | 06/03/2015       | Y         |   |
| Ventura County Railroad              | 06/15/2015       | Y         |   |
| Trona Railway Company                | 05/19/2015       | Y         |   |
| National Switching Service           | 04/06/2015       | Y         |   |
| North County Transit District        | 05/26/2015       | Y         |   |
| Pacific Sun Railroad                 | 05/26/2015       | Y         |   |
| Pacific Southwest Railway Museum     | 06/19/2015       | N         | 7665.2, 7665.4, and 7665.8. PSRM was instructed to correct these deficiencies. They will be re-inspected within 60 days to determine their progress and compliance. |
| Baja California Railroad             | 06/03/2015       | Y         |   |
| West Isle Line                       | 05/05/2015       | Y         |   |
| Santa Cruz & Big Trees               | 04/09/2015       | Y         |   |
| Amtrak Oakland                       | 05/07/2015       |           |   |
| Sierra Northern Railroad             | 03/10/2015       | Y         |   |
| Pacific Harbor Lines                 | 05/11/2015       | Y         |   |

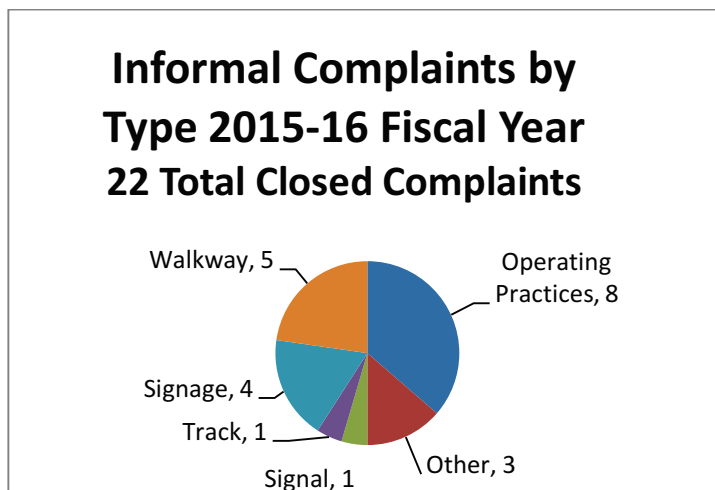
|                                      |            |   |  |
|--------------------------------------|------------|---|--|
| <b>Los Angeles Junction Railroad</b> | 04/10/2015 | Y |  |
| <b>BNSF</b>                          | 04/10/2015 | Y |  |
| <b>UPRR</b>                          | 06/17/2015 | Y | Phone Interview. Security manager is located in Omaha NE.  |
| <b>Lake Railway</b>                  |            | N | New railroad. Provided all PU codes and Security Plan Guidance and time to develop their plan. Railroad will be inspected in the near future to ensure compliance. |

### E. Safety Investigations

The CPUC receives safety concerns and complaints from various sources, including railroad employees, railroad unions [e.g., United Transportation Union (UTU) and the Brotherhood of Locomotive Engineers & Trainmen (BLET)], the general public, and government personnel. CPUC railroad safety inspectors initially contact the FRA to determine whether the complainant notified that agency as well. The CPUC and FRA amicably determine which agency will perform the investigation to eliminate duplication.

In 2015-16, CPUC railroad safety inspectors investigated and resolved 22 safety complaints.

For complaints investigated by the CPUC, an inspector discusses the issue with the complainant or a contact person. The inspector investigates the issue and relevant location and gathers data, including photographs and other pertinent information. The inspector discusses the issue with railroad managers in an effort to gain compliance by pointing out unsafe conditions, practices or risks pertinent to the complaint. A formal or informal action plan is discussed with railroad management, including a timeframe for remediation. The inspector then prepares a written response, with proposals for resolving the complaint, for review by his or her supervisor. A response letter is prepared by one of the CPUC railroad safety supervisors and mailed to the complaining party or his/her representative. A follow-up inspection is performed to ensure compliance and/or remedial action.



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## IV. Challenges for Rail Safety

### A. Reporting of Accidents and Incidents

In the CPUC's 2014 and 2015 Annual Railroad Safety Activity Reports,<sup>29</sup> the CPUC reported that one of the most significant challenges facing railroad safety in California is the inconsistency of many railroads with the requirements for reporting incidents and accidents to the OES and/or CPUC. Such inconsistency limits the CPUC's ability to comply with PU Code Sec. 309.7, which requires CPUC railroad safety inspectors to advise the Commission on rail safety issues, and propose regulatory remedies to address unsafe conditions. As a result, CPUC railroad safety inspectors may potentially be unaware of an unsafe condition, and thus may be unable to address such condition in a timely manner.

Railroads have demonstrated inconsistencies in their compliance with federal and state laws, and CPUC General Orders with regard to reporting accident/incidents and hazardous materials releases to the CPUC.

- PU Code Section 315 requires the CPUC to investigate the cause of all accidents that have occurred on the property of any public utility resulting in loss of life or injury to person or property and permits the CPUC to make an order or recommendation.
- PU Code Section 7661 requires the Safety and Enforcement Division to investigate any incident that results in notification of a runaway train or other uncontrolled train movement that threatens public health and safety, and report its findings concerning the cause or causes to the commission.
- PU Code Section 7662 requires railroads to provide immediate notification to OES<sup>30</sup> of accidents and incidents.<sup>31</sup>
- PU Code Section 7672.5 requires railroads to immediately report incidents resulting in a release or threatened release of a hazardous material to relevant agencies, including OES.<sup>32</sup>
- General Order 161 requires railroads to immediately notify the appropriate emergency-response agency in the event of a hazardous materials incident.

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<sup>29</sup> <http://www.cpuc.ca.gov/rosb/>

<sup>30</sup> The California Office of Emergency Services was formerly called the California Emergency Management Agency (CEMA).

<sup>31</sup> OES immediately notifies the CPUC.

<sup>32</sup> OES immediately notifies the CPUC.

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- General Order 22-B requires that railroads immediately furnish the Commission notification of all train collision and derailments resulting in loss of life or injury, all bridge failures, and all highway crossing accidents resulting in loss of life or injury.

Immediate reporting provides an opportunity to enhance safety. Information regarding an accident's circumstances and cause is often lost as time passes. This information is necessary for the CPUC to deploy inspectors to determine whether the railroad violated regulations or otherwise had unsafe operating or maintenance practices.

CPUC has quarterly meetings with UPRR, BNSF and the California Short Line Railroad Association. In these meetings, CPUC discusses reporting inconsistencies with railroad managers to improve their understanding of reporting requirements. Among other results, these discussions have produced more effective monitoring by railroads of their own reporting procedures so that the accident/incident information is disseminated back to the CPUC in a more timely manner.

## **B. Recruitment and Retention Problems**

Recruitment and retention were identified in the 2014 and 2015 CPUC Annual Railroad Safety Activity Reports as major obstacles to fulfillment of CPUC's mandated railroad safety duties. These continued to be challenges in 2015-16.

The 2013 Annual Report discussed the issue in detail.<sup>33</sup> In brief, the CPUC rail safety program has difficulty in attracting and retaining qualified personnel, in large part due to salary differentials between state service on the one hand, and both federal and private sector employers on the other.

When a certified railroad safety inspector leaves CPUC, inspection requirements are difficult or impossible to meet. During 2015-16, CPUC railroad safety inspectors did not satisfy the statutorily required inspection mandates. Of the 52 facilities, 42 sites were inspected three times or more during the fiscal year. Of the remaining 10 facilities, 5 were inspected twice and 5 were inspected once.

As a result of the ongoing recruitment and retention problem, there was a significant decrease in CPUC rail safety inspection activity in 2015-16 compared with previous fiscal years. Some of the hardest hit disciplines were Motive Power and Equipment, Operating Practices, and Signal and Train Control. Track and Hazardous Materials inspections also decreased but the decreases were less than the other disciplines.

- Motive Power and Equipment unit inspections decreased by 43 percent, CFR defect identifications decreased by 77 percent, and recommendations to the FRA for civil penalty violations decreased by 56 percent.
- Operating Practices unit inspections decreased by 75 percent.

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<sup>33</sup> <http://www.cpuc.ca.gov/rosb/>

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- Signal and Train Control unit inspections decreased by over 1,000 percent, CFR defect identifications decreased by 81 percent.
  - Track unit inspections decreased by 45 percent.

Decreased inspections often result in safety violations that are undetected, which can compromise employee safety and public safety.

## **V. Penalties and Citations**

The CPUC Office of Rail Safety can assess penalties depending on the jurisdiction over the non-compliant issue. For noncompliance with federal railroad safety regulations, railroad safety inspectors make recommendations to the FRA for the assessment of penalties. For noncompliance with certain General Orders<sup>34</sup> and PU Code Section 7662, CPUC Resolution ROSB-002 delegates Commission authority to the Director or Deputy Director of the Safety and Enforcement Division to issue citations to railroad carriers. The General Orders contain requirements for trackside walkways and clearances, and the PU Code provides requirements for wayside signage and certain railroad operating rules. A railroad issued such a citation may accept the fine or contest it through a process of appeal.

During 2015-16, CPUC railroad safety inspectors noted:

- 334 civil penalty recommendations for violations of federal laws.<sup>35</sup>
- 6 citations for violations of state laws.

## **VI. Regulatory Fee Impact on Competition**

PU Code Section 309.7 requires the activities of the CPUC that relate to safe operation of common carriers by railroad, other than those relating to grade crossing protection, to be supported by the fees paid by railroad corporations. In 2015-16 the Legislature appropriated \$7.6 million from the CPUC Transportation Reimbursement Account. The fees paid by the railroad corporations are deposited into a dedicated subaccount within the CPUC Transportation Reimbursement Account and are the sole funding source for the CPUC Railroad Operations and Safety Program. The fees do not fund any other CPUC programs.

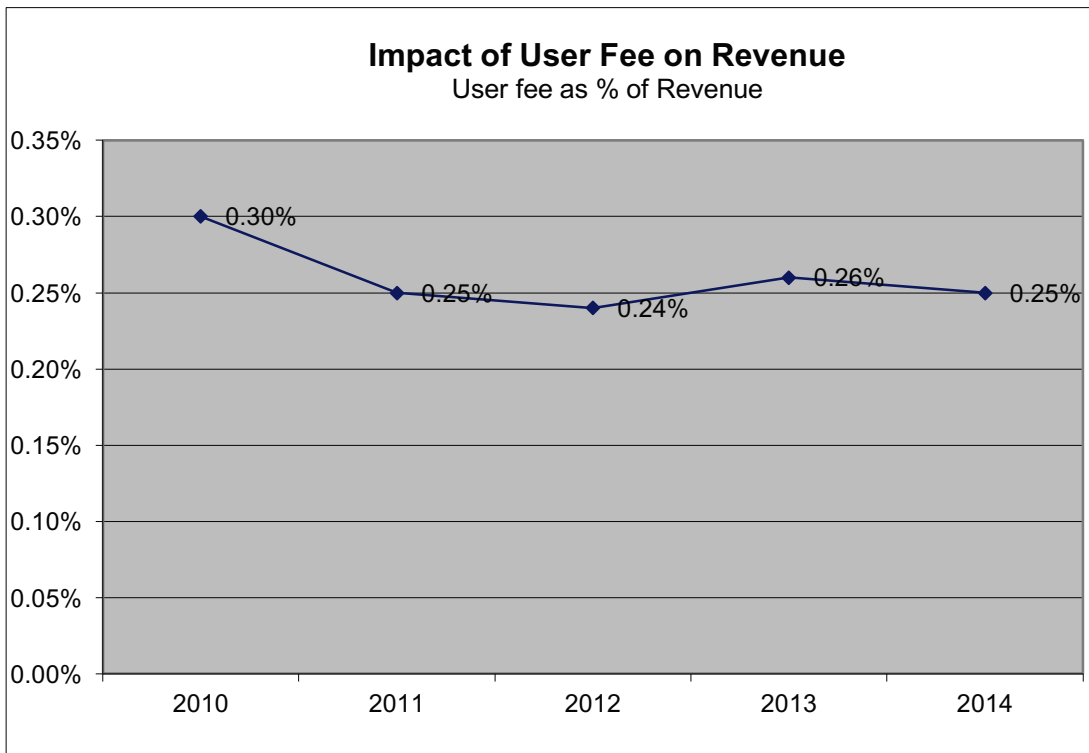
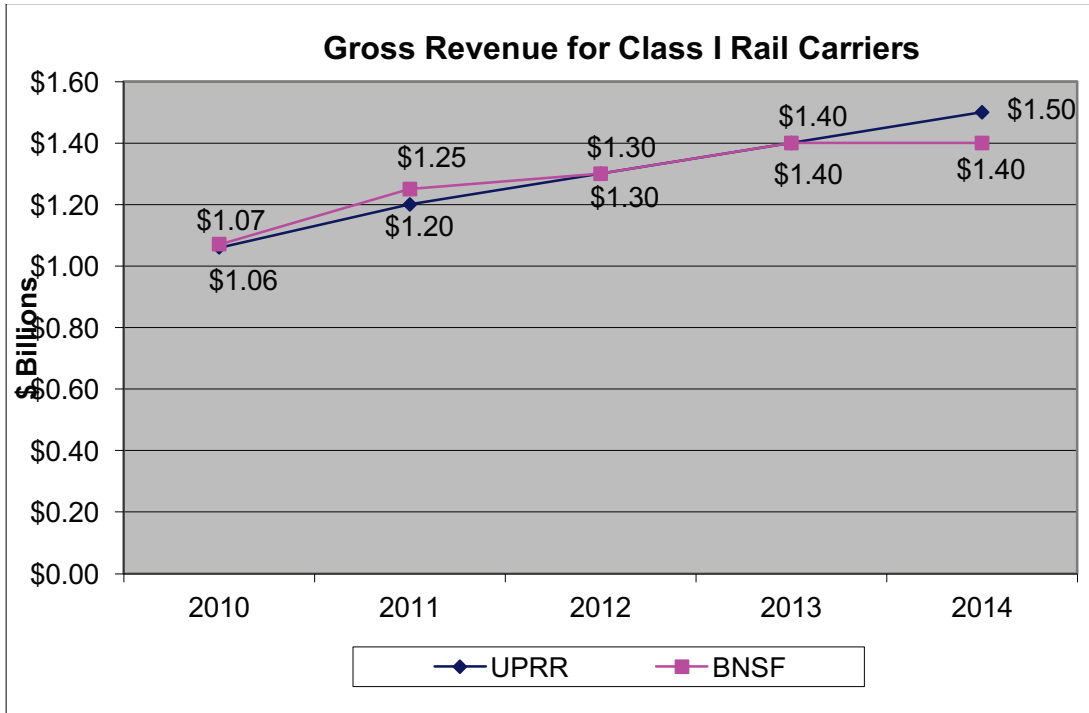
PU Code Section 916.3 requires the CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of the CPUC's activities requires that the Annual Report include a determination of the impact on competition, if any, of these fees. The railroad user fees assessed in 2015-16 on UPRR and BNSF just over one fourth of one percent of revenues (0.0025) were unlikely to have had any effect on competition.

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<sup>34</sup> GO 26-D and GO 118-A.

<sup>35</sup> Fines under federal regulations range from about \$1,000 to \$5,000 each, per day. The final penalty amount depends on the resolution of a claims conference between the railroad and the FRA.

The following two graphs show the percentage of user fee on railroad revenue last year. We do not expect a significant change for 2015-16.



Source of revenue: The railroads report their revenues to the CPUC annually in order to determine the user fee that funds the ROSB.



## VII. Local Safety Hazard Sites

PU Code Section 916.2 requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. The sites on railroad lines the CPUC identified as hazardous were identified in 1997 in a formal Commission Decision, D.97-09-045, and were termed Local Safety Hazard Sites (LSHS).<sup>36</sup> Two methods to determine sites were used: 1) sites determined by a statistically significant higher derailment rate than elsewhere on the line, and 2) sites determined by the operating railroad to require stricter operating practices than elsewhere on the line. For example, railroads place a limit on how much tractive effort (locomotive power) can be concentrated at any one point in a train in relation to the tonnage the locomotives are pulling on steep grade and tight curves. Too much tractive effort concentrated at any one point, such as the front or rear of a train, can cause cars to derail in tight curves.

Section 916.2 also requires the CPUC to include a list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years, describe the nature and probable causes of the accidents, and indicate whether the accidents occurred at or near sites that the Commission has determined to be hazardous. This report, in addition to the electronically available list of all railroad derailment accidents over the past five years and the causes, fulfills those requirements.<sup>37</sup>

Table 1 lists the accidents that have occurred “at or near” an identified local safety hazard site within the previous five years pursuant to PU Code subsection 7711(a). The original analysis identifying these sites was based on the higher risk main line and siding accidents.

Table 1—List of Local Safety Hazard Sites

| *LSHS # | Current LSHS Track Line      | Previous LSHS Track line at time of D.97-09-045 <sup>38</sup> | RR Milepost    | Number of Derailments 2011-15 | Overlap with Site #** |
|---------|------------------------------|---|----------------|-------------------------------|-----------------------|
| 16      | UPRR Mojave Subdivision      | SP Bakersfield Line   | 335.0 to 359.9 | 14                            |                       |
| 9       | UPRR Black Butte Subdivision | SP Shasta Line  | 322.1 to 332.6 | 2                             | #10                   |
| 10      | UPRR Black Butte Subdivision | SP Shasta Line  | 322.1 to 338.5 | 3                             | #9                    |
| 19      | UPRR Mojave Subdivision      | SP Bakersfield Line   | 463.0 to 486   | 2                             |                       |
| 12      | UPRR Roseville Subdivision   | SP Roseville District   | 150.0 to 160.0 | 3                             |                       |
| 6       | UPRR Yuma                    | SP Yuma Line  | 542.6 to       | 1                             | #3, #4                |

<sup>36</sup> The ROSB currently is using the term “high hazard areas” to distinguish from the legal term “local safety hazard” sites, as used in the preemption exemption language of the Federal Railroad Administration (49 U.S.C. § 20106).

<sup>37</sup> A list of all derailments is located at <http://www.cpuc.ca.gov/rosb/>

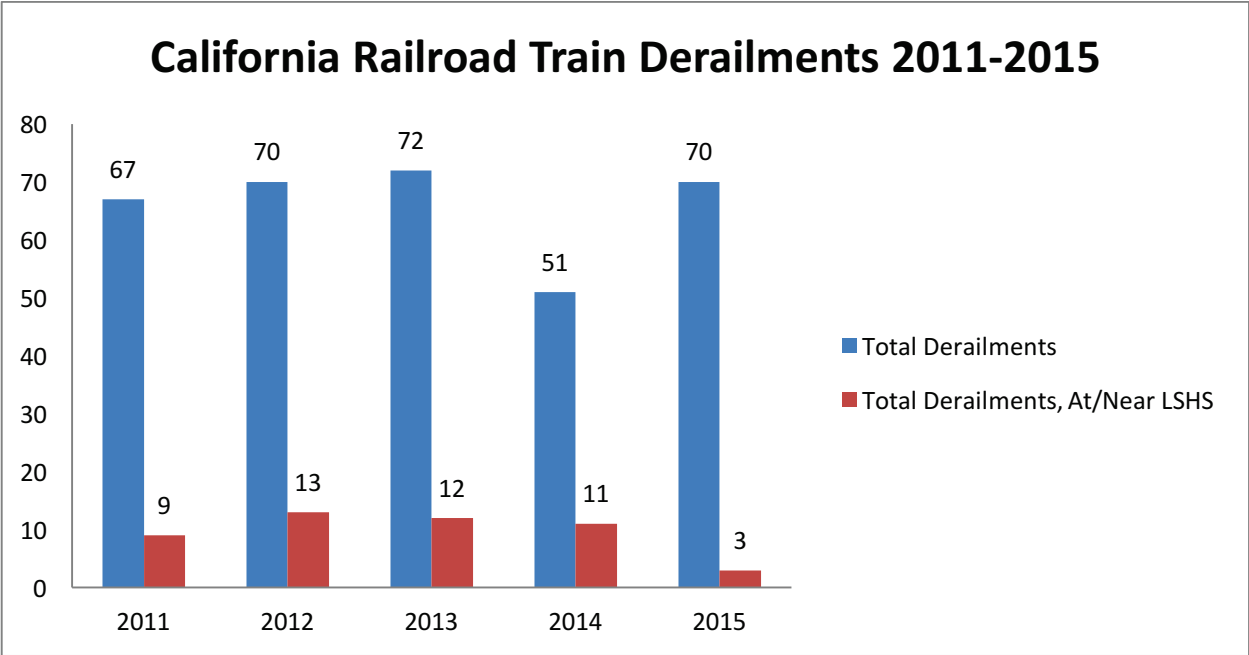
<sup>38</sup> In 1996, UPRR purchased Southern Pacific Railroad.

|    | Subdivision  |                           | 589.0          |   |             |
|----|--|---------------------------|----------------|---|-------------|
| 22 | UPRR Canyon Subdivision                                  | UP Feather River Division | 234.0 to 240.0 | 1 | #25         |
| 25 | UPRR Canyon Subdivision                                  | UP Feather River Division | 232.1 to 319.2 | 3 | #22,<br>#23 |
| 3  | UPRR Yuma Subdivision                                    | SP Yuma Line              | 535.0 to 545.0 | 0 | #6          |
| 23 | UPRR Canyon Subdivision                                  | UP Feather River Division | 253.0 to 282.0 | 1 | #25         |
| 4  | UPRR Yuma Subdivision                                    | SP Yuma Line              | 586.0 to 592.0 | 0 | #6          |
| 26 | BNSF Gateway Subdivision                                 | UP Bieber Line,           | 15.0 to 25.0   | 0 |             |
| 31 | BNSF San Diego Subdivision                               | ATSF San Diego            | 249.0 to 253.0 | 0 |             |
| 1  | UPRR Coast Subdivision                                   | SP Coast Line             | 235.0 to 249.0 | 0 |             |
| 7  | Central Oregon and Pacific Railroad Siskiyou Subdivision | SP Siskiyou Line          | 393.1 to 403.2 | 0 |             |
| 27 | UPRR L.A. Subdivision, Cima Grade                        |                           | 236.5 to 254.6 | 0 |             |
| 28 | BNSF Cajon Subdivision                                   | ATSF Cajon                | 53.0 to 68.0   | 0 |             |
| 29 | BNSF Cajon Subdivision                                   | ATSF Cajon                | 81.0 to 81.5   | 0 |             |
| 30 | BNSF Cajon Subdivision                                   | ATSF Cajon                | 55.9 to 81.5   | 0 |             |

\*The LSHS number (LSHS #) is for identification purposes only, and does not indicate any ranking.

\*\* Where a specific site's boundary overlaps with another site identified by the different method, the other site is listed in this column.

Within the previous five calendar years, California experienced 330 derailments. Of that total, 30 derailments, or 9 percent, occurred at or near local safety hazard sites. For this report, "at or near" includes any location of railroad track along the railroad right-of-way that is contained in the segment of railroad designated to be a local safety hazard site, including the distance of track one mile on each side of the local safety hazard site. Maps of local safety hazard sites are included in Appendix G.



Data source: Federal Railroad Administration, Office of Safety Analysis

## Appendix A – State Railroad Safety Laws and Regulations

| Authority              | Statutory Specified Tasks (paraphrased)  | CPUC-General Orders   |
|------------------------|--|---|
| PU Code Sec. 309.7 (a) | <p>SED responsible for inspection, surveillance, and investigation of the rights-of-way, facilities, equipment, and operations of railroads and public mass transit guideways, and for enforcing state and federal laws, regulations, orders, and directives relating to transportation of persons or commodities, or both, of any nature or description by rail.</p> <p>SED shall advise the commission on all matters relating to rail safety, and shall propose to the commission rules, regulations, orders, and other measures necessary to reduce the dangers caused by unsafe conditions on the railroads of the state.</p> |   |
| PU Code Sec. 309.7 (b) | <p>SED shall exercise all powers of investigation granted to the commission, including rights to enter upon land or facilities, inspect books and records, and compel testimony.</p> <p>The commission shall employ sufficient federally certified inspectors to ensure at the time of inspection that railroad locomotives and equipment and facilities located in class I railroad yards in California are inspected not less frequently than every 180 days, and all main and branch line tracks are inspected not less frequently than every 12 months.</p>  | GO 22-B: Requires railroad to report accidents to CPUC. Requires accident investigations on all incidents occurring on railroad property. |
| PU Code Sec. 309.7 (c) | SED shall, with delegated CPUC attorneys, enforce safety laws, rules, regulations, and orders, and to collect fines and penalties resulting from the violation of any safety rule or regulation.   | Resolution ROSB-002 established a civil penalty citation program for enforcing compliance with safety requirements for railroad carriers  |
| PU Code Sec. 309.7 (d) | <p>(d) The activities of the consumer protection and safety division that relate to safe operation of common carriers by rail, other than those relating to grade crossing protection, shall also be supported by the fees paid by railroad corporations.</p> <p>The activities of the division of the commission responsible for consumer protection and safety that related to grade crossing protection shall be supported by funds appropriated from the State Highway Account in the Public Transportation Fund.</p>  |   |
| PU Code Sec. 315       | The commission shall investigate the cause of all accidents occurring within this State upon the property of any public utility or directly or indirectly arising from or connected with its maintenance or operation, resulting in loss of life or injury to person or property and requiring, in the judgment of the commission, investigation by it, and may make such order or recommendation with respect thereto as in its judgment seems just and reasonable.   | GO 22-B (above).  |
| PU Code Sec. 421       | <p>(a)-(d) The commission shall annually determine a fee and is permitted to expend funds for specified purposes.</p> <p>(g) The commission shall hire four additional operating practices inspectors who shall become federally certified.</p>  |   |
| PU Code Sec. 761       | Whenever the commission finds that rules, practices, equipment, appliances, facilities, or service of any  | GO 27-B Filing and posting of railroad timetables and changes.  |

|                    |  |   |
|--------------------|--|---|
|                    | public utility are unjust, unreasonable, unsafe, improper, inadequate, or insufficient, the commission shall fix the rules.  |   |
| PU Code Sec. 765.5 | <p>(a) The purpose of this section is to provide that the commission takes all appropriate action necessary to ensure the safe operation of railroads in this state.</p> <p>(b) The commission shall dedicate sufficient resources necessary to adequately carry out the State Participation Program for the regulation of rail transportation of hazardous materials as authorized by the Hazardous Material Transportation Uniform Safety Act of 1990 (P.L. 101-615).</p> <p>(c) On or before July 1, 1992, the commission shall hire a minimum of six additional rail inspectors who are or shall become federally certified, consisting of three additional motive power and equipment inspectors, two signal inspectors, and one operating practices inspector, for the purpose of enforcing compliance by railroads operating in this state with state and federal safety regulations.</p> <p>(d) On or before July 1, 1992, the commission shall establish, by regulation, a minimum inspection standard to ensure, at the time of inspection, that railroad locomotives, equipment, and facilities located in class I railroad yards in California will be inspected not less frequently than every 120 days, and inspection of all branch and main line track not less frequently than every 12 months.</p> <p>(e) Commencing July 1, 2008, in addition to the minimum inspections undertaken pursuant to subdivision (d), the commission shall conduct focused inspections of railroad yards and track, either in coordination with the Federal Railroad Administration, or as the commission determines to be necessary. The focused inspection program shall target railroad yards and track that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density.</p> |   |
| PU Code Sec. 768   | <p>768. <u>The commission may, after a hearing, require every public utility to construct, maintain, and operate its line, plant, system, equipment, apparatus, tracks, and premises in a manner so as to promote and safeguard the health and safety of its employees, passengers, customers, and the public. The commission may prescribe, among other things, the installation, use, maintenance, and operation of appropriate safety or other devices or appliances, including interlocking and other protective devices at grade crossings or junctions and block or other systems of signaling. The commission may establish uniform or other standards of construction and equipment, and require the performance of any other act which the health or safety of its employees, passengers, customers, or the public may demand.</u></p>  | <p>GO 26-D: Establishes minimum clearances between railroad tracks, parallel tracks, side clearances, overhead clearances, freight car clearances, and clearances for obstructions, motor vehicles, and warning devices to prevent injuries and fatalities to rail employees by providing a minimum standards for overhead and side clearance on the railroad tracks.</p> <p>GO 72-B: Formulates uniform standards for grade crossing construction to increase public safety.</p> <p>GO 75-D: Establishes uniform standards for warning devices for at-grade crossings to reduce hazards associated with persons traversing at-grade crossings.</p> <p>GO 118-A: Provides standards for the construction, reconstruction, and maintenance of walkways adjacent to railroad tracks to provide a safe area for train crews to work.</p> |

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|                     |   | <p>GO 126: Establishes requirements for the contents of First-Aid kits provided by common carrier railroads.</p> <p>GO 135: Establishes regulations governing the occupancy of public grade crossings by railroads. (Pre-empted by federal government)</p> |
| PU Code Sec. 916    | Requires the CPUC to report to the Legislature on its rail safety activities annually, on or before November 30.  |  |
| PU Code Sec. 916.2  | Requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous, and list all derailment accidents sites in the state on which accidents have occurred within at least the previous five years.   |  |
| PU Code Sec. 916.3  | Requires the CPUC to report on the actions the CPUC has taken to comply with section 765.5, which requires the CPUC to take all appropriate action necessary to ensure the safe operation of railroads in this state.<br>Requires the CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of the CPUC's activities.   |  |
| PU Code Sec. 7661   | Requires Safety and Enforcement Division to investigate any incident that results in a notification to CEMA.  |  |
| PU Code Sec. 7662   | Requires a railroad to place appropriate signage to notify an engineer of an approaching grade crossing and establishes standards for the posting of signage and flags, milepost markers, and permanent speed signs.  |  |
| PU Code Sec. 7665.2 | By July 1, 2007, requires every operator of rail facilities to provide a risk assessment to the commission and the agency for each rail facility in the state that is under its ownership, operation, or control, and prescribes the elements of the risk assessment.   |  |
| PU Code Sec 7665.4  | (f) Requires the rail operators to develop an infrastructure protection program, and requires the CPUC to review the infrastructure protection program submitted by a rail operator. Permits the CPUC to conduct inspections to facilitate the review, and permits the CPUC to order a rail operator to improve, modify, or change its program to comply with the requirements of this article.<br>(g) Permits the CPUC to fine a rail operator for failure to comply with the requirements of this section or an order of the commission pursuant to this section. |  |
| PU Code Sec. 7665.6 | Requires every rail operator to secure all facilities that handle or store hazardous materials; store hazardous materials only in secure facilities; ensure that the cabs of occupied locomotives are secured from hijacking, sabotage, or terrorism; and, secure remote-control devices.<br>Prohibits every rail operator from leaving locomotive equipment running while unattended or unlocked, from using remote control locomotives to move hazardous materials over a public crossing, unless under   | GO 161: Establishes safety standards for the rail transportation of hazardous materials.   |

|                     |  |  |
|---------------------|--|--|
|                     | specified circumstances.   |  |
| PU Code Sec. 7665.8 | Requires every rail operator to provide communications capability to timely alert law enforcement officers, bridge tenders, and rail workers of the local or national threat level for the rail industry, i.e. sabotage, terrorism, or other crimes. |  |
| PU Code Sec. 7673   | Requires every railroad that transports hazardous materials to provide a system map showing mileposts, stations, terminals, junction points, road crossings, and location of pipelines in its rights of way.   |  |
| PU Code Sec. 7711   | Requires the CPUC to identify local safety hazards on California railroads   |  |
| PU Code Sec 7711.1  | Requires the CPUC to collect and analyze near-miss data.   |  |

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## Appendix B – Examples of Risk Management Status Reports (RMSR)

**February 17, 2016:** A CPUC railroad safety inspector investigated a report regarding an uncontrolled movement of railroad equipment on a private industry track within a hazardous materials shipping facility. This incident took place at Eco Services in Martinez, California.

Public Utilities Code Sec. 216 (c), under the definition of “Public Utility” states that a railroad is a public utility and subject to CPUC jurisdiction when a person or corporation delivers any commodity to anyone that in turn directly or indirectly delivers that commodity to the public. Although the uncontrolled train movement occurred on privately owned track, that track is connected to the railroad general system via the Union Pacific Railroad (UPRR). Therefore, such occurrences are a potential danger to railroad employees and the public.



*Rail tank cars and Eco Services employees during switching operations.*

Unsecured railcars, due to non-compliant hand brake applications specified in the Code of Federal Regulations (CFR), are subject to uncontrolled movements, often merely due to gravity. Such uncontrolled movements subject railcars containing hazardous materials to potential derailment, and could result in a hazardous materials release, collision with other railroad equipment, trains or motor vehicles, endangering the environment and risks to public health and safety.

The CPUC railroad safety inspector cited the railroad and the shipper for non-compliance with federal law. Specifically, 49 CFR, Part 232.103(n)(1), which requires the railroad, and the shipper who controls the railroad track, to review and develop a securement policy to prevent such an occurrence, and to annually self-audit the securement policy for compliance. The railroad and the shipper developed a standard operating practice plan for this facility, which was reviewed by the CPUC. The CPUC railroad safety inspector also completed an RMSR in conjunction with the 49 CFR defect report issued to the shipper, urging for more comprehensive railcar securement practices beyond the regulations. The RMSR prompted the railroad to impose additional securement measures at the facility by requiring an additional number of hand brakes, above the number that is required by federal law, to be set on standing railcars.

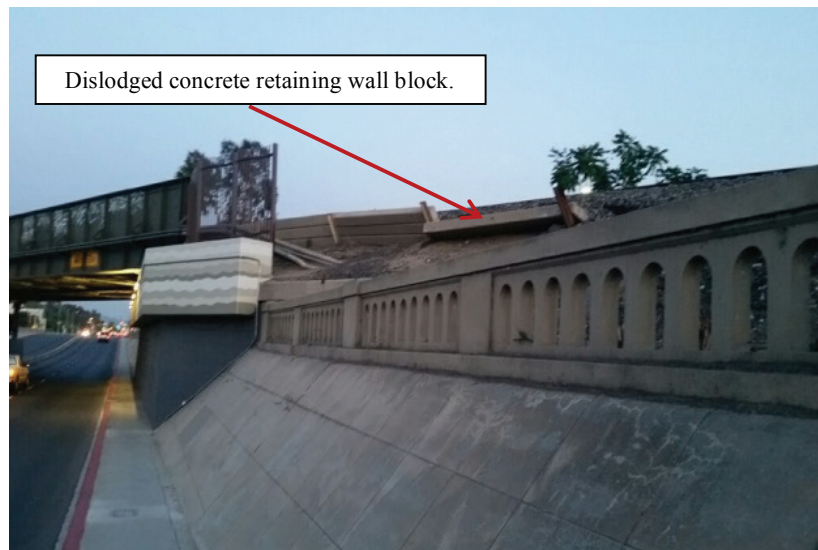
**May 12, 2016:** A CPUC railroad bridge safety inspector noticed a partially dislodged concrete block on a railroad bridge retaining wall, which was poised to fall from the bridge abutment and onto a roadway. This was at Whittier Boulevard in Pico Rivera on the Union Pacific Railroad (UPRR). The CPUC railroad bridge safety inspector investigated and determined that the walkway retaining wall block had likely come loose as a result of a recent severe storm. There is



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no specific regulation regarding this specific instance. Subsequently, the inspector notified UPRR managers of the potential risk and completed a RMSR. The concern being that, in the event of an earthquake or another severe storm, the concrete block could possibly dislodge and slide onto the sidewalk or roadway below. After several rounds of correspondence with the railroad, UPRR notified the CPUC that they had plans for a road/lane closure to repair the bridge. Subsequently, UPRR notified the CPUC that they had corrected and repaired the dislodged retaining wall. While this situation did take time to resolve, it must be noted once again that there is no specific regulation regarding the retaining wall that was violated by UPRR. However, the CPUC risk management process utilizing a RMSR was instrumental in resolving the potential risk.



*Top: "Before." Photo illustrates the concrete block from the retaining wall that could be dislodged in the event of an earthquake or adverse weather conditions. Bottom: "After" photo illustrating the repaired retaining wall.*

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## Appendix C - Examples of Operation Lifesaver Presentations

**January 14, 2016:** A CPUC railroad safety inspector conducted an Operation Lifesaver presentation for school bus drivers in the city of Santa Clarita. The Operation Lifesaver presentation was critically important to the Antelope Valley School administrator. The presentation was given to 71 school district bus drivers.

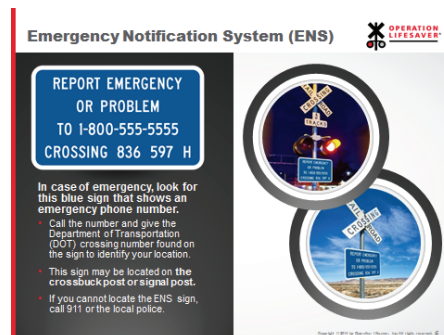
Bus drivers are one of the five target audiences identified by Operation Lifesaver due to the risks associated with transporting children in the vicinity of railroad tracks. This presentation focused on two safety issues associated with bus drivers. First, drivers may choose to re-route to avoid potentially being caught at a railroad crossing. Second, drivers may not know the length of their buses or other transport vehicles and need to ensure the front and rear end of the bus/vehicle stopped at a crossing is clear of oncoming trains. There have been cases when a vehicle or school bus has pulled up to a flashing intersection warning light where streets run across tracks and must stop where the road intersects with another parallel to railroad tracks, only to discover that the rear end of the vehicle did not clear the tracks. Such instances may result in a train/vehicle collision, often with subsequent injuries or fatalities.

The group asked questions about safer behaviors and procedures to transport children in vehicles that cross railroad tracks. The Operation Lifesaver video entitled “Decide Smart, Arrive Safe” was shown to the group. Many of the bus drivers and transportation administrators requested copies of the video for future viewings by new employees and to use as a refresher briefing for current employees.

**March 26, 2016:** CPUC railroad safety inspectors conducted an Operation Lifesaver presentation to the students at Nicolet Middle School in Banning, California. The inspectors provided three general information presentations in one day with an emphasis on young drivers. All 983 middle school students attended at least one of the presentations.

The inspectors reviewed the importance of heeding to the warning notifications and reviewed the elements of the Emergency Notification System, which is posted at all highway-rail grade crossings.

Sadly, the message of safety around the railroads was personally emphasized—one student shared that his cousin had been fatally hit by a train in 2015. The inspectors spent some thoughtful discussion time with this young man following the final presentation.



*Emergency Notification Sign, which is shown at every Operation Lifesaver presentation.*

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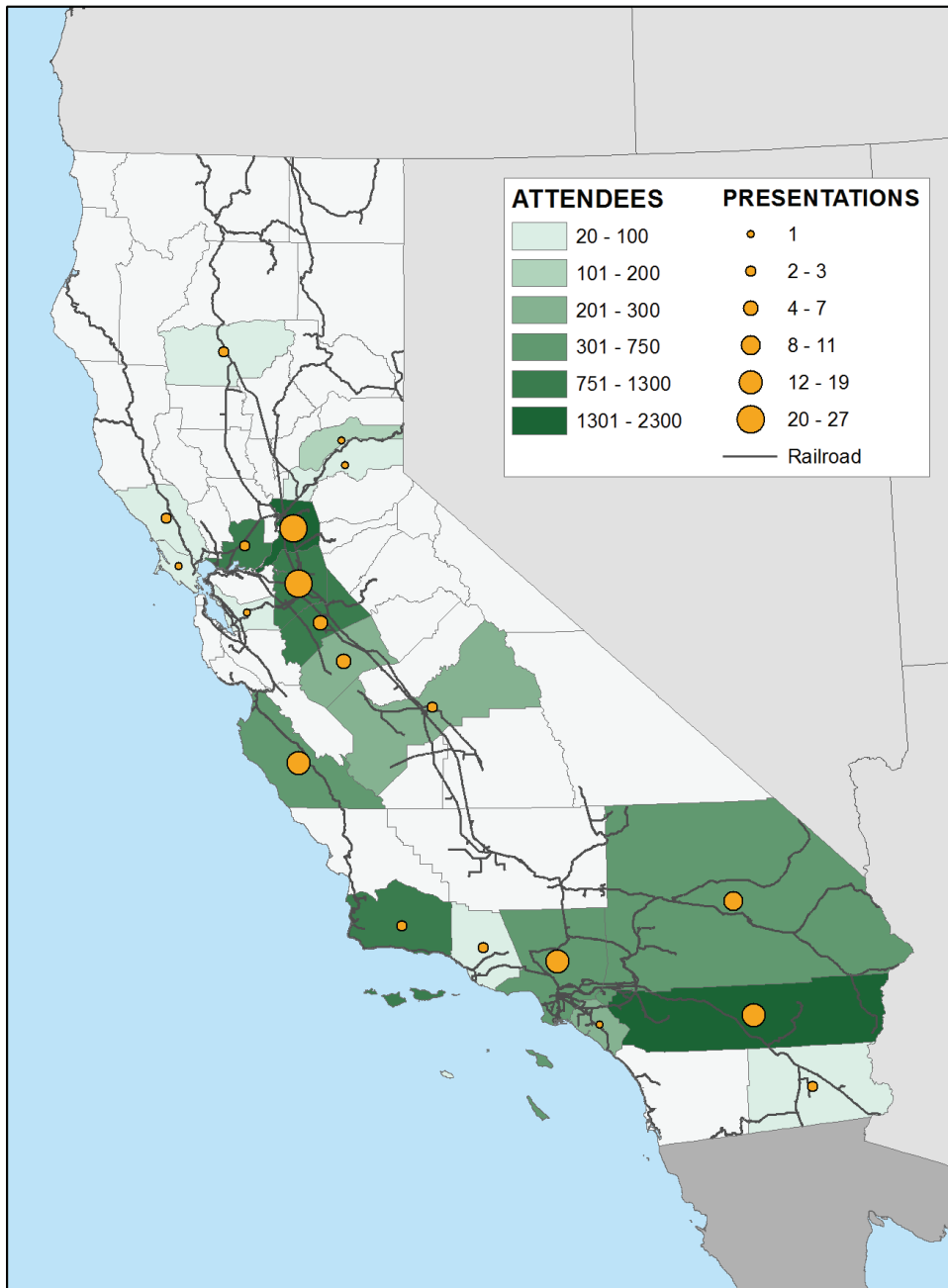
**June 25, 2016:** Two CPUC railroad safety inspectors participated in a community outreach for Operation Lifesaver in the city of San Clemente. The purpose of this outreach was to inform the local citizens of a noise-reduction effort that changed the way the citizens would be warned of an oncoming train. Instead of trains sounding a widespread horn blast at each highway-rail grade crossing, a “wayside horn” located at each crossing will emit a recorded horn sound only toward that vehicles and pedestrians approaching that at-grade crossing.

The wayside horns were placed on all four corners of the crossing, two on each side of the tracks. The volunteers staffed an information table, and walked the length of the trail that parallels the tracks and shared information with citizens throughout the day. Operation Lifesaver scheduled the event to coincide with the implementation of the wayside horns, which became operable at midnight the night before the outreach event.



*CPUC railroad safety inspectors participating as volunteers at an Operation Lifesaver event in San Clemente.*

## Operation Lifesaver Presentations by counties (FY2015-2016)



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## Appendix D - Examples of Regular Inspections

**March 9, 2016:** Five CPUC railroad safety inspectors (three in training and two FRA certified) performed routine inspections near the San Ardo oil fields at *Wunpost*, approximately 30 miles north of Paso Robles, in Monterey County. The Wunpost is a facility that has been shipping crude oil in unit trains between the San Ardo oil fields and Southern California for approximately 25 years. UPRR utilizes a dedicated fleet of tank rail cars that operate about three times a week between the two locations. The unit train normally operates with 78 loaded tank cars of crude oil from Wunpost to the Phillips 66 refinery in Long Beach. CPUC railroad safety inspectors not only enforce federal and state regulations, but they inspect for safe rail car to facility crude oil transferring procedures.

CPUC railroad safety inspectors also performed a routine hazardous materials inspection at the Santa Maria Valley Railroad (SMVR), which is approximately 40 miles south of Wunpost. The SMVR handles hazardous materials and other freight shipments between Santa Maria and an interchange with the UPRR in Guadalupe, CA.

On the following day, hazardous materials inspections were concentrated in the Ventura and Oxnard areas, with specific focus on interface operations between UPRR and Ventura County Railroad (VCY). CPUC railroad safety inspectors met with UPRR, SMVR and VCY management to discuss aspects of operational practices and procedures associated with hazardous materials transportation by rail. No serious defects were noted on this inspection.



*Tank cars containing hazardous materials located on the Santa Maria Valley Railroad.*



*Tank Car (above) missing a hazardous material placard. Placards are required on all four sides of tank cars.*

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**April 08, 2016:** A CPUC railroad safety inspector performed a walking inspection of the UPRR JR Davis Yard in Roseville. The inspector noticed three remote-control locomotives setting on a track without any employee activity around them. Further investigation by the inspector found that the locomotives were left unattended by railroad employees and not secured with locomotive hand brakes. The locomotives were also not safely parked clear of adjoining tracks, which could allow for a collision by other railroad equipment operating on the adjoining track. This situation was a violation of a federal regulations and the railroad’s own operating rules, including both the General Code of Operating Rules and Federal Air Brake and Train Handling Rules. These rules require railroad employees to secure unattended locomotives by tightening the hand brakes on each remote-control locomotive to prevent uncontrolled train movement and to be parked sufficiently in the clear of adjoining tracks.

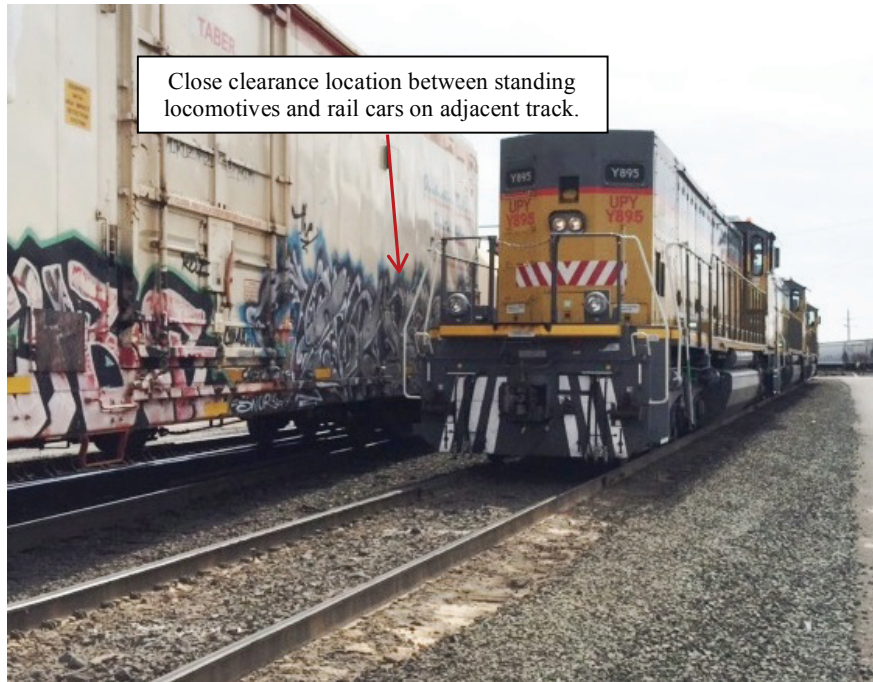
An uncontrolled train movement is a significant threat to public and employee safety. The railroad was notified immediately for remedial action, which was adequately completed in a timely manner. The railroad was cited with a federal civil penalty recommendation.



*Photo at the west end of the UPRR Inbound JR Davis Yard in Roseville. There were no hand brakes applied on any of the three remote-control locomotives.*



*This lead locomotive, in addition to two coupled locomotives in the three-locomotive consist, was left unattended and unsecured with hand brakes.*



*There is not enough clearance between the east-bound locomotives and the west-bound train cars on the adjacent track, which is a federal defect. Insufficient clearance could lead to serious fatality or injury if a trespasser or railroad employee were caught in between the locomotives and the rail car.*

**April 25-29, 2016:** Three CPUC railroad safety inspectors performed an inspection of the Plains American crude oil trans-loading facility in Shafter, California. The contractor, Plains American Pipelines, has approximately eight miles of track at this location. This inspection revealed several defective conditions, including clearance defects, loose, worn or missing track component defects, and defectively worn self-guarded frogs.<sup>39</sup> Side clearance defects can lead to injuries or fatalities for railroad or facility employees performing routine trackside duties and track defects can cause train derailments.

The CPUC railroad safety inspectors notified BNSF Railway (BNSF), which serves the Plains facility, and instructed the BNSF not to serve the facility, due to the side clearance issue not complying with CPUC General Order 26-D. BNSF contacted the management at Plains American and directed them to bring their tracks into compliance or face discontinuation of service. Plains American made the required corrective actions. Follow up inspections were made by CPUC railroad safety inspectors to ensure compliance.

**May 16, 2016:** Two CPUC railroad safety inspectors performed an inspection at the UPRR Newark Yard, noting an unusual and seriously dangerous track defect. First, some background on what was found: Rails lengths are held together with metal bars and bolts. The bars are often

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<sup>39</sup> A “frog” is a common crossing point of two rails. The frog is a component of a railroad track turnout. A turnout allows a train to be diverted from one track to another by a pair of moveable rails called switch points. The frog is designed to allow rail wheels to pass over adjoining rails when traversing from one track to another, such as at a railway junction or where a spur or siding branches off of a main track.

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referred to as angle bars. Holes are drilled through the rail ends and there are predrilled holes in the angle bars. Angle bars are applied in the webbing area and bolts go through the bars and rail ends to hold it all together. The entire assembly of angle bars and bolts is called a track joint assembly or simply a joint. It is not uncommon to find a single broken or missing bolt - that is not a serious condition. The unusual defect that was found was that *all* of the bolts holding the angle bars at a track joint had vibrated loose over time and fallen out of the joint. Consequently, the angle bars had fallen off of the rails and were lying on the ground (see photo) leaving no continuity on the surface or side of the rail head. Track joint assemblies prevent lateral and vertical movement of the individual rail ends where two rails are joined together, providing the needed rail head surface and side continuity. In addition to this defective condition, there were missing track spikes on both sides of the joint. Track spikes are used to hold the gage between two parallel sets of rails.

These conditions, left uncorrected, could have resulted in a train derailment during routine switching operations within the yard. The CPUC railroad safety inspectors notified UPRR managers who immediately put the track out of service and dispatched maintenance personnel to correct the condition. There was a discussion between CPUC railroad safety inspectors and UPRR managers regarding the need to review effective inspection practices by railroad personnel. CPUC railroad safety staff have conducted follow up inspections to ensure that proper inspections are being conducted by UPRR personnel.



*CPUC Rail Safety Inspector notes angle bars that are not bolted directly.*



*Close-up view of angle bars that were found lying on the ground.*



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**June 3, 2016:** A CPUC railroad safety inspector performed a routine inspection of the UPRR 4th Street Yard in Los Angeles. The inspector discovered that some asphalt repair work over some of the paved tracks within the yard had also been applied over some of the rail car wheel flange ways. The flange way allows a rail car flange wheel to traverse over paved roads at railroad grade crossings and other similar areas. Blocking a flange way, or creating a narrow flange way, could allow a rail car wheel to climb above the top of the rail and derail.

This condition was of significant concern, as hazardous materials cars are switched in the 4<sup>th</sup> Street Yard, as depicted in the photos below. If a hazardous materials rail car derailed under the 4<sup>th</sup> Street Bridge, a resulting toxic release, fire or even an explosion could be the result, creating a substantial safety risk to the motorists and pedestrians traversing the heavily travelled bridge above. The inspector cited UPRR for the non-compliant condition and UPRR immediately dispatched personnel to cut away the asphalt from the track to eliminate this specific potential risk. The CPUC railroad safety inspector also discussed the need for UPRR managers to educate their asphalt paving contractors performing such work of the danger they are creating, so as to avoid this unsafe practice in the future.



*The UPRR 4<sup>th</sup> Street Yard and 4<sup>th</sup> Street Bridge; hazardous materials tank cars where the pavement was improperly applied.*

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## Appendix E - Examples of Focused Inspections

**September 30-November 1, 2015:** CPUC railroad signal safety inspectors performed a focused inspection on the North County Transit District (NCTD) regarding the maintenance and testing practices and procedures by NCTD personnel who maintain and inspect at-grade crossings.

During the two-day inspection, CPUC railroad safety inspectors reviewed six at-grade crossings to ensure safe operations and compliance with the Code of Federal Regulations (CFR), CPUC General Orders and applicable California Public Utilities Codes.

Three federal civil penalty recommendations were issued to NCTD for incorrect circuit plans. Circuit plans embody all circuitry within the electrical structure that is a part of an at-grade crossing train warning system. If the circuit plan integrity is not tested for accuracy and precision, the grade crossing train warning system could malfunction and could be a causal factor in a train vs. vehicle accident.

A fourth civil penalty recommendation was issued for a wire that was not properly identified (tagged). An improperly tagged wire could be erroneously connected to a circuit board or other circuitry that could cause the at-grade train warning system to fail.

Three CPUC General Order defects were observed during this focused inspection:

- Uneven ballast that caused a tripping hazard.
- A pile of ballast that had spilled into a walkway that caused a tripping hazard.
- Emergency Notification Signs (ENS) improperly placed.

The CPUC railroad signal safety inspectors conducted a follow-up inspection within 30 days and found all identified federal and state deficiencies had been properly corrected and/or repaired.

**January 26, 2016:** Two CPUC railroad safety inspectors conducted a focused inspection of freight containers and intermodal portable tanks containing hazardous materials at the UPRR intermodal operation facility at the Port of Oakland. The inspectors opened and inspected 11 freight containers placarded as holding hazardous materials. Of the 11, three had improperly displayed placards. Accurate and legible placards provide first-responders with critical information in the case of a derailment, because some hazardous materials cannot be inhaled or touched, and each responds differently to fire suppression chemicals. It is imperative that the commodity is accurately identified and the hazardous materials placards are properly displayed. The inspectors found that all hazardous material containers that were inspected were appropriately blocked and braced. One defect was taken for an improperly displayed placard.



*CPUC railroad safety inspector properly placing a "safety" strap to guard against a shifted load which could force the doors to open uncontrollably.*

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*CPUC railroad safety inspector removing the seal which must be recorded and retained, along with recording the number of the new seal that will replace it.*



*Observing an opened UP freight container. No defects were noted, as the materials were adequately blocked and braced according to regulations.*

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**February 5, 2016:** Four CPUC railroad safety inspectors, and one FRA inspector, conducted a focused inspection of freight containers holding hazardous materials at the BNSF Mariposa (Stockton) intermodal facility and at the UPRR Lathrop intermodal facility at French Camp.

At the BNSF facility, the team inspected six freight containers, opening three of them.

Of the three containers opened, two containers had loads that had shifted during transportation. Unsecured loads are loads that can shift during transportation. Consequently, the unsecured loads can break a container seal and leak hazardous materials. Also, a shifted load could be resting on the container door. This is dangerous for when a receiver (person) opens the container, the hazardous materials could tumble onto the receiver and/or ground and cause serious or fatal injury and possibly environmental harm. Because of the small amounts of hazardous materials loaded in the two containers, and due to the way the contents were blocked, the shipper met the minimum federal requirements for hazardous materials shipping.

The inspectors also noted that one placard had faded in color, which made it difficult to determine whether the substance was an explosive (orange), compressed gas (4 different colors, depending on the gas), flammable liquid (red) or poisonous (white). Accurate and visible placards are necessary for first-responders, and those receiving the materials, in order to combat a fire or spill using appropriate chemicals and methods. The inspectors noted the defect and informed the railroad and the shipper. The placard was replaced.



*CPUC railroad safety inspectors preparing to inspect freight containers.*

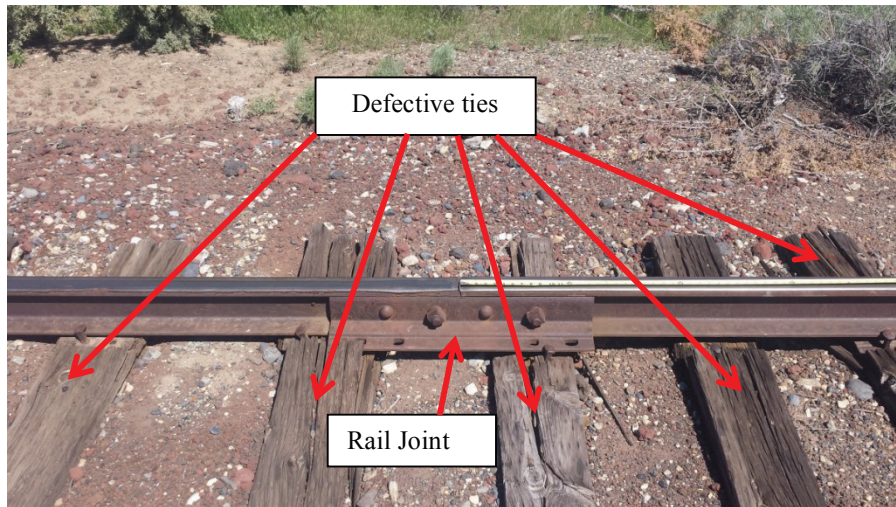


*Example of improper commodity markings on a tank rail car. The placard number references gasoline (1075); however, the label states “Liquefied Petroleum Gas.” Both gasoline and Liquefied Petroleum Gas would not be shipped the same tank car. Firefighters would not know how to deal with the materials in the case of a derailment because both materials react differently when released.*

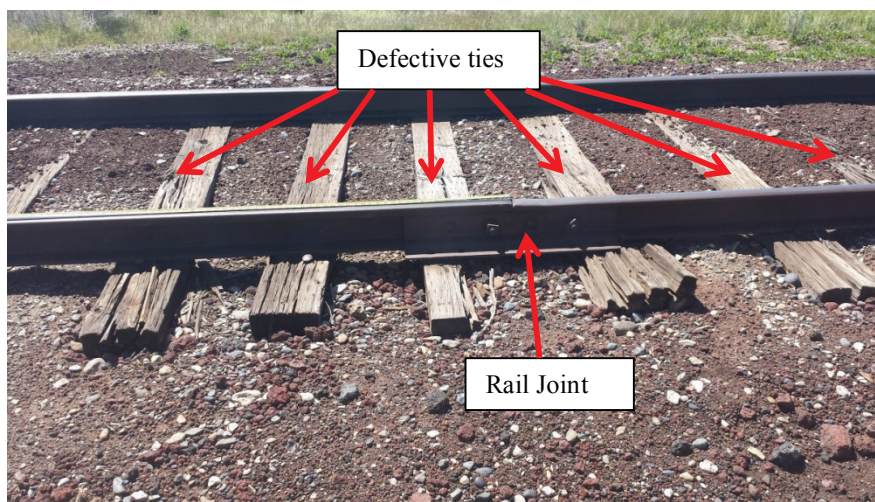
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**May 10, 2016:** Two CPUC railroad safety inspectors and two FRA inspectors conducted a focused inspection of the Lake Railway (LRY) in Lake County, California. Specifically, on the portion of the LRY Lakeview Subdivision between Alturas and the California-Oregon border.

The most significant defects found were poor wooden cross tie conditions at rail joint assemblies. The effective support of a rail joint (where two rail lengths meet, commonly referred to as a joint), in maintaining track surface and track gage integrity, relies on sound cross tie condition. Cross ties must not be broken, split or otherwise degraded so that they cannot effectively support vertical loading from trains and maintain track gage (hold track spikes firmly) under lateral train dynamic loading. There were several locations that warranted federal regulation civil penalty recommendations (violations). LRY developed an action plan to replace cross ties in all of the noted locations. CPUC railroad safety inspectors have performed follow up inspections and will continue to do so, until they are confident that LRY has developed a more effective track inspection program for their employees.



*Defective cross ties located at a rail joint on the Lake Railway.*



*Defective cross ties located at another rail joint on the Lake Railway.*

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## Appendix F – Examples of Accident Investigation Summaries

CPUC railroad safety supervisors review all reported rail incidents and determine whether they need to dispatch a railroad safety inspector or inspection team to investigate the accident. During 2015-16, CPUC railroad safety inspectors investigated 118 accidents and incidents. Examples include:

**July 29, 2015:** A UPRR northbound train derailed 14 cars just south of Galt, on the UPRR Fresno subdivision, approximately 20 miles south of Sacramento. There were no fatalities, injuries or release of hazardous materials.

A CPUC railroad safety inspector interviewed the locomotive engineer who stated that he had observed *wavy* sections of track as the train approached the location. Wavy track (undulations in long rail lengths) can indicate thermal rail expansion, which can abruptly force the track out of alignment and lead to a derailment. Consequently, the locomotive engineer appropriately reduced train speed due to the conditions he was seeing. Wavy track conditions are not uncommon during the hot summer months and do not always lead to track misalignments. But, close observance of established thermal expansion tolerances by railroad maintenance personnel is imperative in such hot conditions. The locomotive engineer said that after he had passed over the first of two bridges at this location, the emergency train air brake system automatically engaged to stop the train. The brake application was a result of the derailing cars.

A CPUC railroad safety inspector concluded that the unusually hot conditions indeed caused a thermal misalignment, also known as a track buckle and/or sun kink. Locations such as bridges, at-grade crossings, and track turnouts are locations where thermally expanding rail can exert great expansive pressure, as these locations are fixed points and allow little room for absorbing such expansive forces. Rail expansion can cause the track to lift up vertically and move out laterally becoming severely misaligned ahead or under a moving train, causing the train to derail. As a result of the investigation, UPRR made repairs to correct the misaligned track conditions by cutting out enough rail portions to allow for thermal expansion, thus reducing the chances for another misalignment.



*CPUC railroad safety inspectors briefing at the Galt derailment site.*

**January 20, 2016:** Twelve unsecured rail cars rolled away in an uncontrolled movement and subsequently derailed. This took place at a hazardous materials industry, on the industry track within the facility, which connects to the Union Pacific Railroad (UPRR) main line. The incident occurred at Eco Services in Martinez. There were no fatalities or injuries; no hazardous materials were released.

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The UPRR main line at this location is heavily traversed by Amtrak passenger trains. Such an incident could have subjected an Amtrak passenger train to a collision with the unsecured rail tank cars, seriously endangering public safety.

This was a human factor caused incident. The incident occurred due to Eco Services employees, who were switching rail cars within the facility, failing to apply a sufficient amount of rail car hand brakes to keep rail cars stationary after separation from an industry operated rail car mover.

The investigating CPUC railroad safety inspector recommended that UPRR management and Eco Services management review federal regulations regarding the securement of unattended equipment. CPUC staff further suggested that both entities develop an effective rail car securement policy to prevent similar future occurrences, and advance an annual self-audit securement policy for compliance assurance.

UPRR and Eco Services agreed that Eco Services employees engaging in rail car switching procedures must be trained in standard railroad industry operating practices and procedures. These practices and procedures consist of testing handbrakes prior to cutting away from standing rail car equipment to ensure the rail car equipment remains stationary and avoid unintentional rail car movement. CPUC railroad safety staff will continue to assist and advise both entities and ensure the training program adopted is proven effective.



*Photo of derailed cars at the Eco Services facility in Martinez.*

**March 7, 2016:** Two CPUC railroad safety inspectors conducted an investigation of an Altamont Corridor Express (ACE) train that derailed, and partially came to rest in Alameda Creek, near Sunol. The train originated out of San Jose and had been traveling east towards Stockton. The train was traveling cab car forward on the Union Pacific Railroad (UPRR) Oakland Subdivision, with 214 passengers on board, when it struck a significant mud slide on the track and derailed part of the train. Due to the derailment, the cab car ended up on its side, partly in Alameda Creek. The second car derailed and remained upright. The remaining three cars and the locomotive (at the rear of the train) stayed on the rail.

There were no fatalities. There were a total of 14 confirmed injuries, four of which were serious but non-life threatening.

The cause of the accident was due to the unfortunate timing that the mud slide occurred directly

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in the train's path. The close timing of the mud slide into the path of the oncoming train rendered any stopping attempt by the train's crew, prior to impact, nearly impossible. The mud slide contained a large tree, rock and other debris sufficient in size to derail the approaching train. Subsequently, the UPRR has performed an engineering ground study of the area and has identified and remediated other potential mud slide locations in the area based off of that study. CPUC railroad safety staff continues to work with ACE and UPRR to ensure that practical and effective mud slide precautionary measures are adapted at this location.



*A CPUC railroad safety inspector investigating the ACE derailment site.*

**April 29, 2016:** A southbound UPRR freight train, traveling at a recorded speed of approximately 5 MPH, derailed seven empty rail cars approximately one mile north of Dunsmuir. The location is approximately 50 miles north of Redding. The UPRR freight train was on a descending grade that traverses along and over the Sacramento River and adjacent to Interstate 5.

At approximately 4:49 PM, the UPRR freight train experienced an emergency air brake system application and came to a stop just over a mile North of Dunsmuir. A freight train crewmember investigated the unexpected stop, which revealed that seven empty rail cars had derailed.

A CPUC railroad safety inspector concluded that the cause of the derailment was human factor, attributed to a braking error by the locomotive engineer. No contributing causes were uncovered during the investigation. Federal post-accident train crew drug and alcohol testing was conducted by UPRR. The test results were negative. The locomotive engineer was evaluated on his competency and subsequently received additional training before reinstatement.



*The April 29, 2016 seven car derailment on the UPRR Black Butte Subdivision, MP 324.1, near Dunsmuir, CA.*



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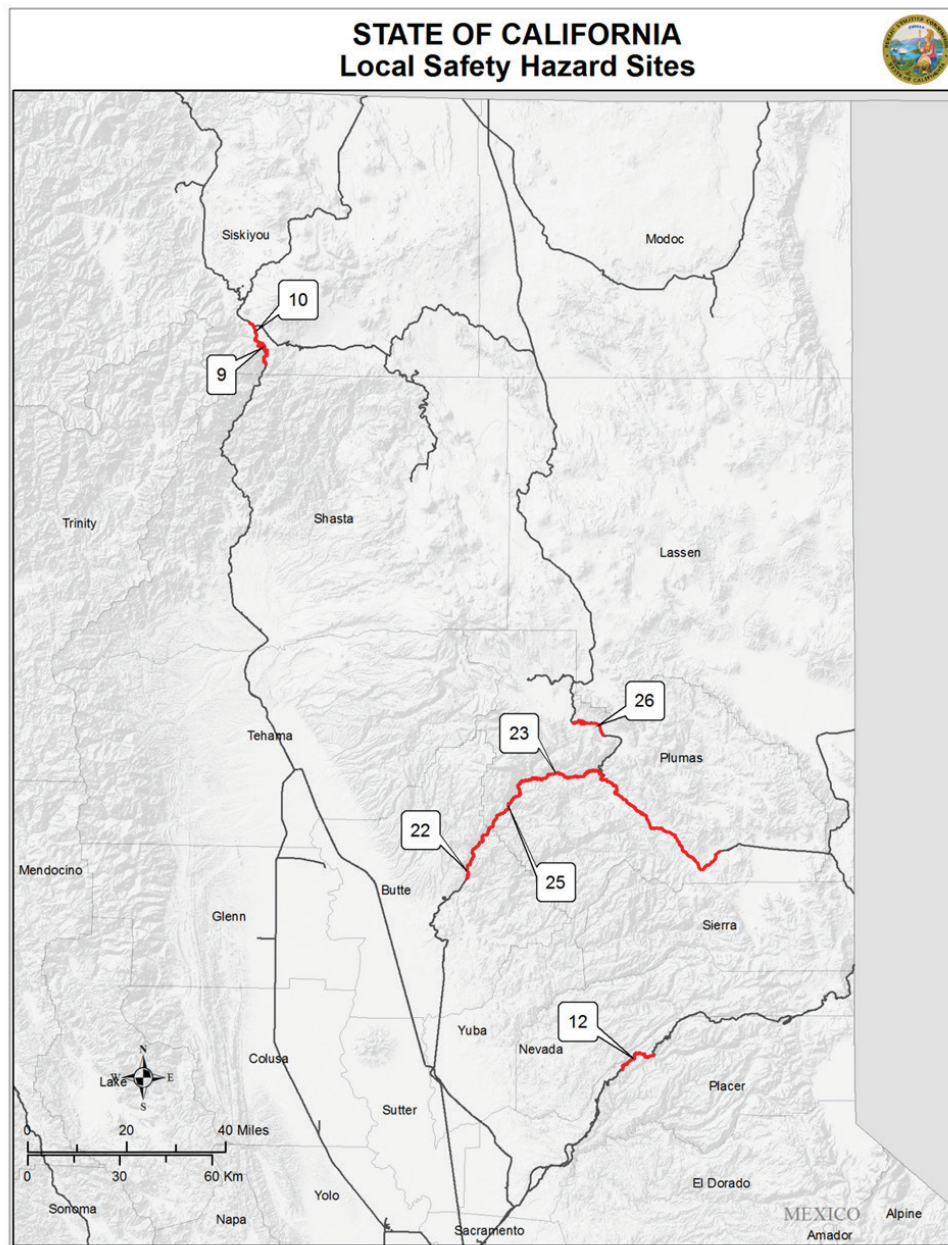
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## Appendix G – Local Safety Hazard Site Maps

Notes:

Maps are broken down into three areas: 1) Northern California, 2) California Central Coast/Desert Valley, and 3) Southern California and are listed on pages 70-72 in that order.

These maps are being updated, and soon should be available as interactive maps on the CalOES website. For information on accessing those maps, legislators should contact the CPUC’s Office of Government Affairs.



# STATE OF CALIFORNIA Local Safety Hazard Sites



# STATE OF CALIFORNIA Local Safety Hazard Sites



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## Appendix H - Acronyms

|           |  |
|-----------|--|
| BLET      | Brotherhood of Locomotive Engineers and Trainmen                                 |
| BNSF      | BNSF Railway   |
| CFR       | Code of Federal Regulations  |
| CORT      | Crude Oil Reconnaissance Team  |
| CPUC      | California Public Utilities Commission   |
| FRA       | Federal Railroad Administration  |
| GO        | General Order  |
| HSR       | High Speed Rail  |
| LSHS      | Local Safety Hazard Site   |
| MP&E      | Motive Power and Equipment   |
| OES       | Office of Emergency Services   |
| OL        | Operation Lifesaver  |
| PTC       | Positive Train Control   |
| PTCT      | Positive Train Control Team  |
| RBEP      | Railroad Bridge Evaluation Program   |
| RMSR      | Risk Management Status Report  |
| ROSB      | Railroad Operations and Safety Branch  |
| SED       | Safety and Enforcement Division  |
| SMART     | Sonoma-Marín Area Rail Transit   |
| UPRR      | Union Pacific Railroad   |
| UTU/SMART | United Transportation Union/Sheet Metal, Air, Rail, Transportation International |