



**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, 2018
for
Fiscal Year 2017 - 18**

**CALIFORNIA PUBLIC UTILITIES COMMISSION
SAFETY AND ENFORCEMENT DIVISION
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RAILROAD OPERATIONS AND SAFETY BRANCH**

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List of Abbreviations

ACE	Altamont Corridor Express
BNSF	BNSF Railway
CCT	Central California Traction
CFR	Code of Federal Regulations
CHSRA	California High Speed Rail Authority
CNR	California Northern Railroad
CORT	Crude Oil Reconnaissance Team
CPUC	California Public Utilities Commission
DOT	Federal Department of Transportation
FRA	Federal Railroad Administration
GO	General Order
HSR	High Speed Rail
LAJ	Los Angeles Junction Railway
LATC	Los Angeles Transportation Center
LPG	Liquefied Petroleum Gas
LSHS	Local Safety Hazard Site
NCTD	North County Transit District
NVRR	Napa Valley Railroad
OES	Office of Emergency Services
ORS	Office of Rail Safety
PTC	Positive Train Control
PU Code	California Public Utilities Code
RBEP	Railroad Bridge Evaluation Program
RMSR	Risk Management Status Report
ROSB	Railroad Operations and Safety Branch
RSAC	Rail Safety Advisory Committee
RTEP	Railroad Tunnel Evaluation Project
SCRRA	Southern California Regional Rail Authority - Metrolink
SED	Safety and Enforcement Division
SMART	Sonoma-Marín Area Rail Transit
UPRR	Union Pacific Railroad

Annual Railroad Safety Activity Report Fiscal Year 2017-2018

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 Operations and Safety Branch (ROSB) is to ensure the safe transportation of freight and passengers by rail in California. The CPUC performs statewide railroad safety responsibilities through its Safety and Enforcement Division (SED), Office of Rail Safety (ORS).

This report complies with California Public Utilities (PU) Code Sections 916, 916.1, 916.2, and 916.3.

- California Public Utilities Code (PU Code) Section 916 requires the CPUC¹ to report to the Legislature on its rail safety activities on or by November 30 of each year. In addition, 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. This report chronicles the rail safety activities of the ROSB and identifies the proactive efforts CPUC's railroad safety inspectors take to promote the safe operation of railroads during the previous fiscal year.
- PU Code Section 916.1 requires the CPUC to annually report the results of its investigations of runaway trains or other uncontrolled train movements that threaten public health and safety. All results of investigations into runaway trains or other uncontrolled train movements are included in this report.
- PU Code Section 916.2 requires the CPUC to report to the Legislature regarding sites on railroad lines in California it finds to be hazardous and list all derailment accidents sites in the state where 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 is documented by calendar year.
- 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. This report includes the assessment.

ROSB protects California communities and railroad employees from unsafe practices on freight and passenger railroads by promoting and enforcing rail safety laws, rules and regulations; performing inspections; and identifying and mitigating risks and potential safety hazards before

¹ 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.

they create dangerous conditions.

Public safety and risk management are paramount to the CPUC culture and mission. CPUC inspectors cite violations of federal and state laws and CPUC General Orders (see Appendix A for a list of state railroad safety laws and regulations). In addition to specific violations, CPUC inspectors, as well as all ROSB staff, look beyond the regulations toward more comprehensive overall proactive safety oversight.

Proactive Safety Efforts

The CPUC performs proactive safety efforts to mitigate risks associated with railroads. CPUC inspectors complete Risk Management Status Reports (RMSRs), and perform additional safety activities to mitigate threats to public safety.

CPUC inspectors complete RMSRs when they identify risks that may not be addressed by existing railroad rules or regulations and make recommendations to reduce or eliminate such risks. During 2017-18, CPUC inspectors created 11 new RMSRs.

The CPUC's Crude Oil Reconnaissance Team (CORT) is another example of the proactive safety activities undertaken by the ROSB. The Team was created in 2013 after an unattended 74-car freight train rolled down a slope and derailed in Quebec, Canada, resulting in an explosion that killed 47 people and destroyed large portions of the town of Lac-Mégantic. At that time, U.S. railroads had been planning on developing an infrastructure capable of transporting large amounts of very volatile crude oil to California refineries. Over the past fiscal year, 58 oil-by-rail unit trains came through California.² Although none of those trains contained the highly combustible Bakken crude, which was present in the Canadian disaster, CORT nevertheless monitored the operations of the 19 crude oil facilities in California and followed the progress of proposed new facilities before they came online.

Additionally, CPUC inspectors from the CPUC Railroad Bridge Evaluation Program (RBEP) performed 159 bridge observations and created two RMSRs to improve the safety of the state's railroad bridges.

In 2017, began its Railroad Tunnel Evaluation Project (RTEP) to acquire historical data and perform onsite inspections of California railroad tunnels to assess tunnel conditions, inspection practices, and potential risks. The RTEP team has performed two tunnel observations and the team is working on compiling a tunnel inventory list for all the railroads that operate in California.

Another proactive safety initiative has been the recently started study regarding rail head wear. The rail head, which is the top of the rail where the wheel flange of a rail car contacts the side face of the rail head, incurs very high stresses. Excessive wear on the rail head can lead to broken rails and derailments. The CPUC is working with the railroads to develop contingency

² A unit train is a train that is composed of cars carrying a single type of cargo. A unit crude oil train carries only crude oil.

plans to measure and address excessive rail head wear conditions before they become problematic.

Currently, there are no regulations mandating when rail should be replaced due to rail head wear. As described in last year's Annual Report, the CPUC was participating in the Federal Railroad Administration's (FRA) Rail Safety Advisory Committee (RSAC) Rail Integrity Working Group, which met periodically in Washington DC to explore a new federal regulation for replacing worn rails. The discussion on a new regulation for rail head wear limits has been dropped and the RSAC charter has been allowed to expire by the FRA. The future of RSAC is unclear at this time.

Additional proactive safety activities by CPUC inspectors in 2017-18 included:

- Collection and analysis of 874 near-miss incidents to identify high-risk areas.
- Performance of 12 Positive Train Control (PTC) field tests and demonstrations, performance of 27 PTC surveillance observations, and monitoring of 14 PTC status meetings.
- Presentation of 261 Operation Lifesaver orientations. These railroad safety awareness campaigns reached more than 17,500 people who live or work in proximity to railroad tracks.

The CPUC employs 41 inspectors who are federally-certified in the five FRA railroad disciplines: hazardous materials, motive power and equipment, operations, signal and train control, and track.

CPUC inspectors perform regular inspections, focused inspections (inspections looking at a specific problem), accident investigations, security inspections and complaint investigations. In addition, the inspectors also address public safety risks that, while not violations of regulatory requirements, pose potential risks to public or railroad employee safety.

During 2017-18 CPUC inspectors:

- Performed 4,396 inspections and follow-up inspections to monitor the railroads' compliance with federal and state laws, and CPUC General Orders (GOs).
- Performed 161 safety surveys (bridge and tunnel).
- Cited 9,175 federal regulation defects.
- Recommended civil penalties for 338 violations of federal regulations.
- Completed 293 CPUC GO reports that identified 509 state regulation defects.

Investigations into Runaway Trains or Other Uncontrolled Train Movements

PU Code Section 916.1 requires the CPUC to annually report the results of its investigations of

runaway trains or other uncontrolled train movements that threatens public health and safety. In 2017-18, the CPUC investigated five instances of runaway trains and uncontrolled train movements.

Local Safety Hazard Sites

PU Code Section 7711 requires the CPUC to report to the Legislature on railroad sites 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.³

Section 7711 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.⁴ This report also includes a list of the accidents that have occurred “at or near” an identified local safety hazard site within the previous five years.

Within the previous five calendar years, California experienced 320 derailments. Of that total, 38 derailments, or nearly 12 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.

Fee Impact on Competition

Pursuant to the reporting requirement in PU Code Section 916.3 mentioned above, railroad user fees assessed in 2017-18 on Union Pacific Railroad (UPRR) and BNSF Railway (BNSF), the two largest contributors, represented just slightly less than one third of one percent of revenues and were not believed to have had any effect on competition.

Challenges

The CPUC Office of Rail Safety foresees challenges ahead. The most significant challenge, also described in previous Annual Reports, is inconsistent reporting of accidents and incidents by the railroads, a situation which has been improving only slowly.

An additional challenge continues to be employee retention, mostly due to the pay disparity between the state railroad safety inspectors and their federal counterparts. The much higher pay scales for federal inspectors with fewer responsibilities than state inspectors have made it more

³ 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).

⁴ A list of all derailments is located at <http://www.cpuc.ca.gov/rosb/>

difficult to recruit and retain qualified personnel. The resultant vacancies and time spent on training new staff adversely affects productivity and actual field inspection time. The CPUC has identified this issue as a significant public safety risk in previous Annual Reports over the past 14 years.

I. Introduction

The California Public Utilities Commission is the California regulatory agency with primary authority for railroad safety within California, and the CPUC railroad safety program is one of the most comprehensive such programs in the nation. Several California Public Utilities Code sections set out CPUC responsibilities. In particular, under Section 309.7, CPUC is responsible for inspection, surveillance, and investigation of the rights-of-way, facilities, equipment, and operations of railroads and public mass transit guideways (a limited access rail that is not part of the general rail system).

Within CPUC, the Safety Enforcement Division (SED) advises the Commission on all matters relating to rail safety, and proposes to the Commission rules, regulations, orders, and other measures necessary to reduce the dangers caused by unsafe conditions on the railroads and other rail systems. Within SED, the three Branches of the Office of Rail Safety (ORS) – ROSB, the Rail Transit Safety Branch and the Rail Crossings and Engineering Branch – are responsible for rail safety in general. ROSB is the unit within ORS responsible for enforcing state and federal laws, regulations, Commission General Orders, and directives relating to the transportation of persons and commodities by railroads in particular, and is the organization covered by this Annual Report.⁵

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 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.

To carry out its responsibilities, ROSB conducts safety inspections, performs accident and complaint investigations, identifies potential safety hazards on California railroads, and works to reduce or eliminate the identified hazards. A summary of applicable California PU Code sections and CPUC General Orders is provided in Appendix A.

Federal law, Title 49 of the Code of Federal Regulations (49 CFR) Part 212, established the State Safety Participation Program with the FRA. The purpose of this 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. ROSB may make civil penalty recommendations to the FRA when ROSB inspectors discover non-compliances with federal railroad safety regulations.

⁵ The Rail Transit Safety Branch regulates rail transit systems such as streetcars and subways, while the Rail Crossings and Engineering Branch regulates highway- rail crossings. Their activities are not included in this Annual Report.

California state laws complement the federal State Safety Participation Program and provide even greater protection to railroad employees and the public.

The CPUC employs inspectors who possess expertise in specific disciplines: hazardous materials, motive power and equipment, operating practices, signal and train control, and track, as well as railroad bridges and tunnels.⁶ The inspectors also identify and address additional public safety risks associated with railroad systems.

The CPUC requires entry-level railroad inspectors to have a minimum of five years of direct railroad experience within a specific discipline. Most CPUC 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 requires 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 CPUC 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 inspectors are each assigned a FRA on-the-job training manual. As they complete specific required tasks, the CPUC or FRA railroad safety trainer signs off on the task. When the all of the required tasks are completed, the CPUC inspector must then pass a certification field test. An FRA safety specialist (discipline specific) takes the CPUC inspector out for a day or more in the field to test the person's knowledge and ability to perform as an independent inspector.

The CPUC employs 41 FRA-certified inspectors to perform safety inspections and investigations pursuant to the State Participation Program.⁷ The federally-certified inspectors enforce railroad safety and operating rules, and rail safety regulations, by performing inspections and accident investigations. The CPUC's rail safety responsibilities include:

- Inspecting railroads for compliance with railroad safety and operating rules, and state and federal railroad safety laws.
- Investigating railroad accidents and safety-related complaints.
- Recommending railroad safety improvements to the Commission and federal government.

II. Proactive Safety Efforts

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

⁶ The FRA certifies the inspectors as experts in these disciplines, except for bridges and tunnels. The CPUC proactively identified bridges and tunnels as risks to public safety, and employs one track-certified inspector and one bridge inspector, both with extensive experience, to focus on bridge and tunnel observations.

⁷ Pursuant to 49 CFR Part 212.

ensure the safe operation of railroads in this state. Safety culture improvement and proactive risk management are integral to the CPUC mission. In addition to investigating specific violations of state and federal regulations, CPUC inspectors, as well as support and analytical 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 CPUC GOs. This approach is used as a foundation for continuous improvement of the regulated utilities' safety as well as the CPUC's safety oversight role.

The CPUC 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 (RMSR)
- Crude Oil Reconnaissance Team (CORT)
- Railroad Bridge Evaluation Program (RBEP)
- Railroad Tunnel Evaluation Project (RTEP)
- Rail Head Wear Project
- Operation Lifesaver Presentations
- Near-miss Reporting and Analysis
- Positive Train Control Team (PTC)
- High-Speed Rail Oversight

A. Risk Management Status Reports

During 2017-18, CPUC inspectors created 11 new RMSRs.

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. CPUC inspectors complete RMSRs when they identify risks that may not be addressed by existing regulations and make recommendations to reduce or eliminate such risks.

In the course of field work, CPUC inspectors identify items of concern that is 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.

Once an RMSR is opened, when a risk is considered to present a serious safety hazard, the assigned inspector works with his/her supervisor to mitigate the risk. The inspector and supervisor will meet with a representative or representatives of the railroad, shipper, or other responsible party to discuss the hazard and ways of reducing or eliminating it. The CPUC inspector will keep the RMSR “open” until a satisfactory resolution is achieved. If the issue is resolved, then the RMSR is closed. If the issue is not resolved, the matter will be elevated to the CPUC Program Manager responsible for rail safety, who will contact the responsible party directly. If necessary, the Program Manager may elevate the issue to the Deputy Director for further action, potentially including legal sanctions and the involvement of other regulatory agencies.

Examples of RMSRs are presented in Appendix B.

During 2017-18:

- 9 RMSRs from 2016-17 were closed out (i.e., the recommendations were implemented and or an alternative resolution was reached with the railroad).
- 11 new RMSRs were created:
 - 5 Bridge Safety Issues
 - 2 Movement of railcars/trains within a railyard/Train Securement
 - 2 Railyard Operations
 - 1 Railyard Conditions
 - 1 Lockout Protection

Five of the new reports were closed. ROSB seeks to resolve the remaining six RMSRs during the next fiscal year.

B. Crude Oil Reconnaissance Team

The CPUC established the CORT in 2013 after an unattended 74- car freight train rolled down a slope and derailed on July 6, 2013. The resulting explosion killed 47 people and destroyed large portions of the town of Lac-Megantic in Quebec, Canada. The U.S. railroads were developing an infrastructure capable of moving large amounts of oil to refineries in California. In September 2013, the Golden Eagle Refinery in Martinez, California received the first Bakken oil-unit-train.

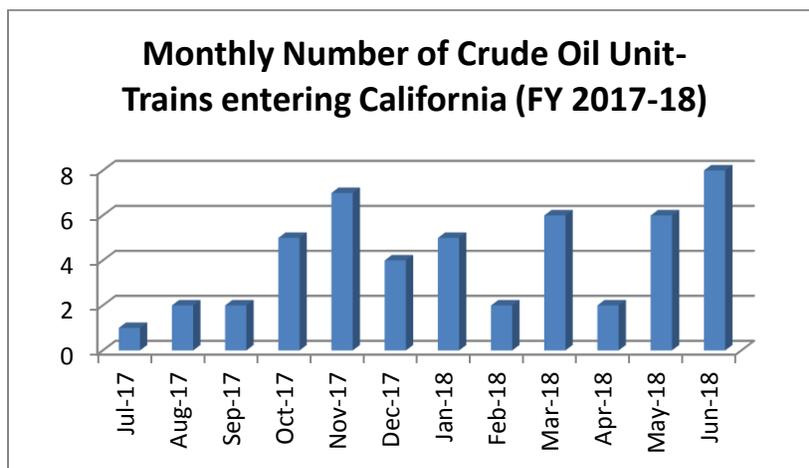
CORT is an interdisciplinary team that includes CPUC rail safety inspectors certified in the specialties of track, signal, hazardous materials, and operating practices. The team identifies risks and provides mitigation recommendations to railroads to improve the safety of crude oil rail transportation in California.

CORT monitors the railroads' infrastructure related to the transportation of crude oil, and assesses and mitigates risk to public safety. CORT performs frequent observations of crude oil transfer facilities and related infrastructure. CORT members inspect such facilities to verify compliance with state and federal railroad regulations, as well as CPUC General Orders. The team also obtains data from each facility pertaining to their actual and expected future monthly train count. These data are used to formulate a monthly CORT report on crude oil shipments coming into the state, and to verify their origin, in particular, whether the shipments contain Bakken crude. CORT also monitors the movements and types of crude oil by rail traversing California. No rail shipments of Bakken crude entered the state during the period covered by this Annual Report.

Currently, there are 12 crude oil refineries operating in California, down from the 19 refineries referenced in the previous Annual Report. Only two are active crude-oil-by-rail, unit train facilities:⁸ the Plains All American facility in Taft, near Bakersfield, and the Kern Oil Refining facility, in Bakersfield.

A total of 58 unit trains entered California during the past fiscal year, with each unit train carrying 100 tank cars. The Plains All American facility received 49 unit-oil trains in 2017-18, containing two types of crude, light crude from Carlsbad, New Mexico, and heavy crude from Edmonton, Canada. Kern Oil Refinery received 9 heavy crude oil unit trains during 2017-18, all originating from Carlsbad, New Mexico.

Another facility, Delta Trading in Bakersfield, is not a refinery and does not receive unit trains, but does receive individual crude oil tank cars, containing heavy crude originating in Canada and piped to Wyoming for further shipment by rail. Delta then transfers the crude oil from the rail car to tanker trucks for distribution. During fiscal year 2017-18, Delta handled 832 crude oil tank cars at their facility.



⁸ A unit train is a train that is composed of cars carrying a single type of cargo. A unit crude oil train carries only crude oil.

CORT traveled to several facilities during FY 2017-18, including Plains All American, where the team inspected various aspects of the facility's spill control and fire prevention systems. CORT also visited Delta Trading and conducted track and hazmat inspections.



CORT members at the Plains All American facility

In 2017-18, CORT activities included the following:

- Reported on monthly operations of the 12 existing California crude oil refineries.
- Monitored all 58 of the oil-by-rail unit trains that traversed through California.
- Conducted investigations at several facilities, including Plains All American and Delta Trading.



CORT track inspector near the Delta Trading facility

C. Railroad Bridge Evaluation Program



CPUC bridge inspector documenting bridge observations

Railroad bridges pose potentially significant safety risks when their ability to carry rail traffic declines due to corrosion of steel components, silt build-up around supports, excessive loads, and other conditions. Some railroad bridges are over a hundred years old. Many railroad bridges span bodies of water, major highways, and/or areas of high population density, and carry a variety of flammable and other hazardous materials.

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. They also conduct joint railroad bridge observations.⁹

Two CPUC inspectors focus on bridge integrity, collaborate with the FRA railroad bridge program, and perform railroad bridge program observations.

CPUC inspectors prioritized bridge observations based on the proximity to the identified Local Safety Hazard Sites across the state.

During 2017-18, the CPUC inspectors who specialize in bridges performed the following:

- 159 total bridge observations.
- 2 RMSRs (notifications to railroads about bridge safety concerns).

⁹ The FRA has only 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 to 11 other states.

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- 44 FRA track inspection reports.
 - 2 State General Order Inspections.



CPUC railroad safety bridge inspector looking over ballast deck bridge substructure for structural integrity and associated potential risks

D. Railroad Tunnel Evaluation Project

Railroad tunnel structural integrity can be weakened by natural events, such as earthquakes, flooding and soil erosion, and by derailments and other railroad accidents. This in turn can lead to significant risks to trains transiting through tunnels.

There are large gaps in the state and federal regulatory coverage of railroad tunnels. CPUC is helping to address this problem by assigning staff to evaluate railroad tunnel conditions. To that end, CPUC has begun the RTEP to develop our own data. Under this Project, CPUC is starting a railroad tunnel inventory, in which railroad tunnels are photographed from end to end, including a video of the tunnel; lengths and heights are measured; and portals and linings are inspected. The RTEP also includes the collection of historic data (e.g., construction dates and materials) that will be useful in assessing tunnel conditions.

As well as tunnel structures, the RTEP covers track conditions. As detailed elsewhere in this Report, inspectors use several methods to inspect track: physically walking the track, riding in a hi-rail vehicle, and riding in a FRA or railroad owned geometry car. Due to the approximate 10,000 miles of track that are to be covered each year, most main line track is inspected using hi-rail vehicles. However, while slower and more labor-intensive, walking the track provides a more comprehensive visual inspection, and the Project utilizes this method to better ascertain track conditions in tunnels. In addition, rail wear measurements will be taken and tunnel drainage assessed.

On June 13, 2018, CPUC inspectors surveyed two UPRR tunnels (Tunnels 33 and 34) east of

Colfax near Cape Horn. The survey identified loose spikes in the wooden ties securing the rails in Tunnel 33. UPRR management was present during the survey, and UP personnel removed the loose spikes, inserted wood plugs, and re-spiked the ties. The inspectors saw a groove in the ceiling of Tunnel 34 that indicated that the ceiling had been struck by a train. However, this was not considered to require remediation.



CPUC inspectors at UPRR tunnel #34



Loose spikes found in tunnel 33



Groove in ceiling, UPRR Tunnel 34

E. Rail Head Wear Project

CPUC continued its efforts in the area of rail head wear. Excessive rail head wear can cause train derailments, especially on sinuously curved track in mountainous areas. Rail head wear can cause problems affecting uniform track gage and train balance while the train is traversing a curve. If the rail head wears too far, two main issues arise: (1) the track gage widens and (2) the rail is subject to rolling over under the weight of lateral dynamic train forces. It is imperative that railroads establish good rail wear monitoring and maintenance plans with remedial contingencies based on the monitored rail head wear life expectancy, especially in multi-curved mountainous areas.

As an example of why rail head wear is an important issue, a CPUC inspector investigated an accident that occurred on February 17, 2018. Five BNSF cars derailed between the railroad stations of Marcel and Cable, in the Tehachapi Pass area, southeast of Bakersfield. The cause of the derailment was a rail which had broken in four places. The inspector measured the head of the rail, and found that it had worn down by 5/8ths of an inch, which is normally the wear limit for most railroads in the US. There is no federal standard minimum requirement. While not the sole cause, it was a contributing factor in the rail breakage.

The CPUC is monitoring rail head wear by utilizing high-grade manual rail head wear gages in critical areas throughout California. CPUC inspectors measure rail head wear during inspections and compare measurements with data collected by the FRA and the railroads themselves. By collecting evidence of the seriousness of head wear, CPUC can influence the responses of railroads and the FRA to this problem.

All CPUC Track inspectors have been issued rail wear gauges to take rail wear measurements during routine inspections, tunnel evaluations and derailment investigations. Measurements also are taken on curves located within local safety hazard sites, and other locations as necessary.

Currently, there are no regulations mandating when rail should be replaced due to rail head wear. As described in last year's Annual Report, the CPUC was participating in the FRA Rail Safety Advisory Committee (RSAC) Rail Integrity Working Group, which met intermittently in Washington DC, to explore promulgation of a new federal regulation for rail head wear limits. The discussion on a new regulation for rail wear limits has been dropped by FRA and the RSAC charter has expired. Currently, we are waiting on FRA to re-charter RSAC. It is unclear if and when that will occur.

CPUC plans to continue its collection of head wear information and, based on this evidence, advocate for effective rail head wear management policies by railroads. This goal is consistent with the Office of Rail Safety's practice of looking beyond the regulations. This ongoing project has already allowed the CPUC to make railroads aware of the risks associated with some of their currently-existing rail replacement plans and thus has had a positive impact on rail replacement management by some railroads.



A CPUC inspector reading rail gage measurements

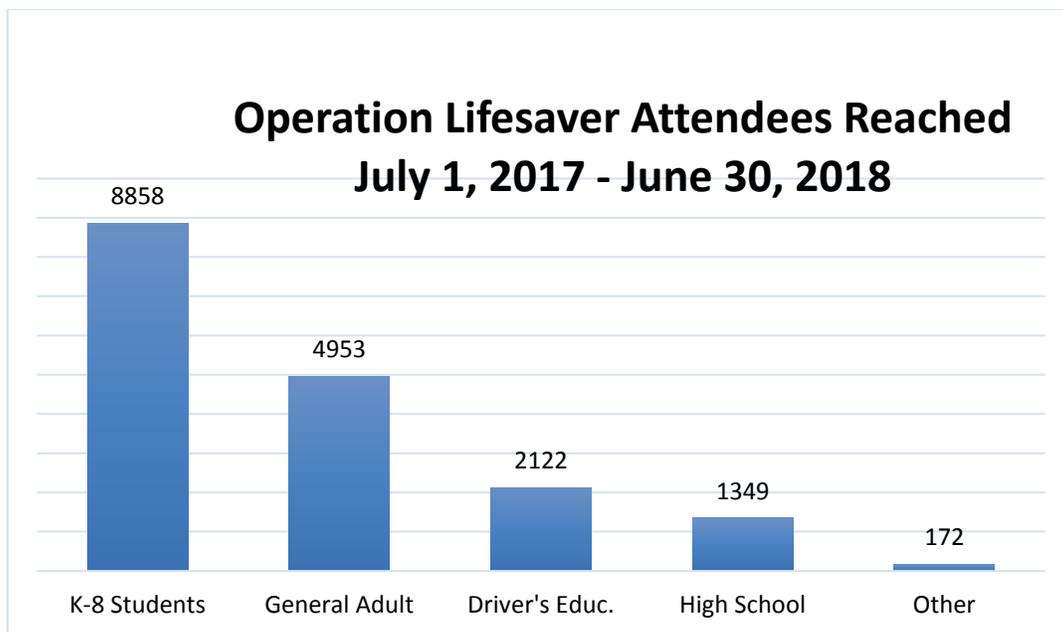
F. Operation Lifesaver Presentations

Operation Lifesaver, Inc., a nonprofit organization, administers a public safety awareness campaign and is funded primarily by grants from the FRA. 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.

Operation Lifesaver volunteers provide specialized training for law enforcement, professional truck drivers, and emergency first-responders. The programs provide valuable information on how to be safe around trains, illustrate how drivers can safely navigate highway-rail grade crossings, and reinforce that it is illegal and unsafe to ever walk on or use railroad tracks for recreation.

CPUC inspectors and engineers have volunteered for Operation Lifesaver over the past decade. CPUC 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.

Appendix C provides examples of Operation Lifesaver presentations.



During 2017-18, CPUC railroad safety staff:

- Performed 261 Operation Lifesaver presentations
- Attended 53 community-wide events
- Reached approximately 17,500 people

Operation Lifesaver events included:

- Alameda County Safe Routes to School
- Behind the Wheel - Tracy
- Bike Mobile Project
- California Day of Preparedness

-
- Cops and Kids Field Day
 - Cosumnes Oaks Drivers Ed
 - DMV Wellness Expo
 - First Transit (Bus Drivers/Dial A Ride)
 - Get Real Behind the Wheel
 - Goleta School Bus Drivers
 - Hemmerling Elementary School
 - LA Union Station Train Fest
 - Let's move on the trail - Fontana
 - New Driver Drive Safe Near Trains
 - Orange Empire Railway - Rod and Rails
 - Paul Ecke Elementary School OLS Pep rally
 - Rail Safety Awareness Campaign
 - Reach Leadership STEAM Academy
 - Red Cross Children's Safety Festival
 - Riverside Homeless Intervention
 - Safe Kids Day
 - San Bernardino 66ers Community Outreach
 - See Tracks Think Train
 - Simi Valley Transit Operators

G. 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 rights-of-way. For the purpose of this code section, “near-miss” is defined as including a runaway train or any other uncontrolled train movement that threatens public health and safety.

The CPUC uses near-miss data to identify locations and certain conditions that may pose a greater likelihood of accidents, and/or have greater public safety consequences in the event of an incident.

The CPUC interprets 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. An accident may be preceded by one or more near-miss events, making near-miss data useful information for identifying potential threats to public health and safety.

The Class 1 freight railroads (BNSF and UPRR) voluntarily provide the CPUC with monthly near-miss reports. The data are not comprehensive, and not always reliable. Reporting of most near-miss data is voluntary, there is no standardized format, and the railroads differ in how they report this information. The railroads do not use a uniform threshold for determining what conditions qualify as a near-miss incident. As such, the near-miss data may not be useful for

comparisons. Nevertheless, when the data indicate hazardous conditions that cause accidents, some of these conditions can be improved voluntarily by the railroads or by CPUC actions.

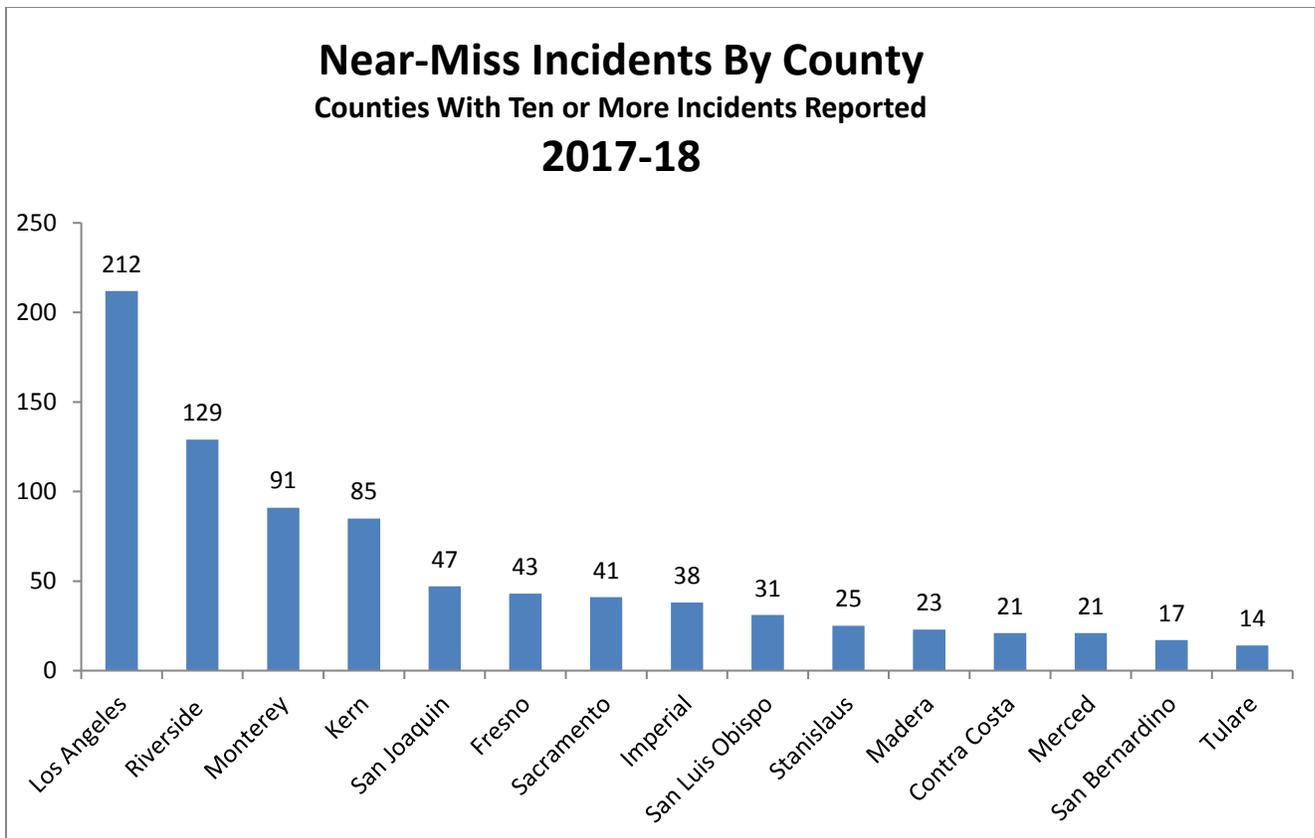
In 2017-18, the railroads reported 874 near-miss incidents in California. In 2016-17, the railroads reported 2,700 incidents. This decrease could be the result of BNSF reporting a significantly fewer number of near miss incidents to the CPUC for the past fiscal year.

Imperial County experienced a significant decrease in the number of near misses, down from 734 in fiscal year 2016-17 to 36 in 2017-18. The decrease probably is the result of safety improvements in progress at a particular grade crossing. As discussed in the 2016-17 Annual Report, out of the 734 near-miss incidents reported in Imperial County in FY 2016-17, 718 occurred at one grade crossing, the Clark Road grade crossing in the city of El Centro. The Clark Road crossing is a major roadway to the downtown area, an elementary school, and the County Airport. The crossing is protected with crossbuck passive warning devices. The County of Imperial, City of El Centro, and UPRR are currently constructing safety improvements at Clark Road, including the installation of automatic gate arms. The scope of improvements was defined through a CPUC GO 88-B (Rules for Altering Public Highway-Rail Crossings) authorization in March 2017.

Los Angeles County continues to experience a great number of near misses. This can be attributed to the population density and the large number of grade crossings and rail traffic. For the fiscal year 2017-18, Los Angeles County experienced 212 near misses or a decrease of nearly 52 percent (411 to 212) from the previous year. The near misses occurred at different locations from last year, and the reasons for the decline are unknown.

A notable increase in near miss incidents occurred in Riverside County, from 55 in 2016-17 to 129 in 2017-18, or approximately a 125 percent increase. As with Los Angeles County, the near misses occurred at different locations from last year, and the reasons for the increase are unknown. There were no particular locations where a significant number of incidents took place.

The following graph shows near-miss incidents in the counties with the greatest number of such incidents.



In 2017-18, the CPUC:

- Collected and analyzed 874 near-miss incidents to detect high-risk areas.
- Identified high-risk crossings and the counties with the greatest number of near-miss incidents.

H. Positive Train Control

The Rail Safety Improvement Act of 2008 (Pub. L. No. 110-432) required each Class I railroad and each entity providing regularly scheduled, intercity or commuter rail passenger service to implement an FRA-certified Positive Train Control (PTC) system by December 31, 2015 on:

- its main line over which 5 million or more gross tons of annual traffic and poison- or toxic-by-inhalation hazardous materials are transported, and
- its main line over which intercity or commuter rail service is regularly provided.

In October 2015, in the Positive Train Control Enforcement and Implementation Act of 2015 (Pub. L. No. 114-73), Congress extended this deadline to December 31, 2018, and included provisions for railroads to request an additional 24-month extension to December 31, 2020, if certain criteria are met.

PTC uses a combination of digital radio communications, global positioning, and fixed wayside

signal systems to send and receive a continuous stream of data about the location, direction, and speed of trains. PTC is designed to prevent train-to-train collisions, overspeed derailments, incursions into established work zones, and movement through a track switch left in the wrong position. If a train does not slow for an upcoming speed restriction, PTC will alert the engineer. If an appropriate action is not taken by the engineer, PTC will apply the train's brakes before the speed restriction is violated.¹⁰

Each railroad that owns track (host railroad) is required to implement PTC along all tracks covered under the above laws. There are several different PTC systems available that meet federal requirements, and different PTC systems are or will be in use by different railroads. This poses challenges when different systems are used by the host railroad and other railroads using that track (tenant railroads). In order to traverse host territory, each tenant must have interoperable PTC onboard equipment, i.e., the different PTC systems must be able to communicate with each other. Achieving interoperability poses technical and administrative challenges that have contributed to delays in PTC implementation.

Most railroads are currently focused on the functionality of PTC on their own trains. In California, one passenger railroad (Metrolink) and one freight railroad (BNSF) are currently interoperable on their shared territory as either host or tenant. Metrolink and UPRR are currently interoperable on portions of their shared territory. One passenger railroad (Amtrak) as a tenant is interoperable with portions of three host railroads (Metrolink, BNSF, UPRR) with most revenue service trains. One passenger railroad, North County Transit District (NCTD), is waiting for FRA approval of their PTC system to begin testing interoperability with two passenger railroads (Metrolink, Amtrak) and three freight railroads (BNSF, UPRR, Pacific Sun [PacSun]). Two passenger railroads (Caltrain and Altamont Corridor Express [ACE]) are progressing with system implementation. One passenger railroad (Caltrain) is waiting to begin Revenue Service Demonstration (RSD) prior to any interoperability with tenants.¹¹ One passenger railroad (ACE) is waiting for final onboard equipment installations and scheduling for interoperability testing with one freight railroad (UPRR) as a tenant, and interoperability with one passenger railroad (Caltrain) as a tenant. One passenger railroad, Sonoma Marin Area Rail Transit (SMART), is currently in RSD and is working towards interoperability with one freight railroad, North Coast Railroad Authority (NCRA). See the PTC status tables below.

CPUC has two PTC-specific inspectors. One has expertise in railroad operations; the other has an extensive computer background, which is essential in understanding the complexities of PTC software design. A senior inspector is the lead for the group. The PTC inspectors have been actively engaged in observations and inspections, such as design review, component and wayside appurtenance testing, and train interface operations during the development and construction of PTC systems in California.

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

¹¹ After reaching the required level of installation and testing, the railroad files an application with the FRA to begin Revenue Service Demonstration with PTC. RSD entails operating revenue (passenger and/or freight) trains with PTC in operation. RSD allows the railroad to collect data on the behavior of the system under normal railroad operational conditions.

California PTC Status: Passenger Railroads

While the implementation of PTC has made significant progress in passenger service, not all passenger lines will meet the 2018 deadline. However, some California passenger railroads will likely meet this deadline if they are able to achieve interoperability with all tenants.

	<u>Passenger Railroad</u>	<u>Stage of PTC Implementation</u>
1	Metrolink	In RSD. Interoperability with tenant BNSF on all host territory. Interoperability with UP and Amtrak are in progress on portions of host territory.
2	North Coast Transit District (NCTD)	In RSD. Interoperability with tenants is next challenge. Waiting for FRA approval of PTC system in order to move forward with interoperability with tenants Metrolink, Amtrak, BNSF, and PacSun.
3	Sonoma-Marín Area Rail Transit (SMART)	In RSD. Working towards interoperability with tenant freight railroad NCRA.
4	Amtrak	Interoperable on BNSF territory for Southwest Chief, Pacific Surfliner, and San Joaquins. Interoperable on Metrolink territory from LA Union Station to Oceanside and to Moorpark. Continuing work on interoperability for other host railroads. Amtrak is a tenant railroad in California.
5	Caltrain	Continuing with installations and overall PTC testing. Working closely with the FRA to ensure they are compliant by the end of 2018.
6	Altamont Corridor Express (ACE)	Waiting for UPRR as host railroad to be ready to test interoperability. On-board equipment for one ACE locomotive and Cab Car has been installed.



A CPUC inspector observing PTC operations during Metrolink passenger service operations



CPUC staff has observed Metrolink's software lab testing, where system changes are tested for both the Metrolink rail system environment (host) and other railroad (e.g. BNSF, UP, Amtrak, NCTD) user environment (tenant) prior to field testing

California PTC Status: Freight Railroads

In the freight railroad industry, PTC made mixed progress during the first half of 2018. As of June 30, 2018, four freight railroads in California were required to implement PTC: UPRR, BNSF, PacSun, and San Joaquin Valley Railroad (SJVR). UPRR and BNSF are required to implement a PTC system. PacSun and SJVR do not fall under the federal requirements to install PTC because they do not carry passengers or materials covered under the applicable regulations. However, both railroads were served notices by other railroads to equip their locomotives with PTC equipment to allow them to operate on tracks owned by the Class 1 carriers.

	<u>Freight Railroad</u>	<u>Stage of PTC Implementation</u>
1	BNSF	All required subdivisions in California have PTC installed and in revenue service. BNSF reported that 96 percent of their PTC runs are uneventful. ¹² All of the required BNSF employees have been trained (1,800 employees). ¹³ BNSF is PTC interoperable with Metrolink, and is working with UPRR and Amtrak towards complete interoperability.
2	UPRR	All required subdivisions in California have PTC in RSD. UPRR is working on interoperability with BNSF, Metrolink, and Amtrak and some subdivisions are operating interoperable with the aforementioned tenants.
3	PacSun	The NCTD served PacSun a notice to equip their locomotives with PTC because PacSun operates on NCTD lines. PacSun has three locomotives, all of which will be equipped. They are currently preparing interoperability testing with NCTD. Initial training for the employees has been contracted.
4	SJVR	SJVR shares track with BNSF and UPRR, which have served notice to SJVR to equip their locomotives with PTC. Installation and testing has occurred outside of California.

¹² Uneventful runs equate to successful initialization of PTC, i.e., no en-route issues and no braking events.

¹³ The remaining employees are in yard service or in a non-active status.



A BNSF Locomotive operating console with PTC screen on the right side



A CPUC inspector observed a UPRR PTC wayside installation and associated PTC radio equipment. PTC antennas are shown on the top of the pole.

CPUC staff will continue to monitor the progress of PTC in California and make recommendations to ensure that carriers operate and maintain safe and effective systems.

During 2017-18, CPUC staff performed the following:

- Conducted observations of 12 field activities, such as wayside and on-board equipment in the laboratory and field environments.
- Performed 27 PTC operational surveillance observations.

-
- Monitored and participated in 14 PTC status meetings.
 - Continued ongoing correspondence with the railroads to determine PTC status and implementation issues.
 - Provided monthly reports of PTC activities to CPUC management.



A CPUC inspector is preparing to board a NCTD Coaster passenger train at Oceanside station to observe locomotive engineer operate with PTC. An Engineer is shown initializing the PTC system prior to departure to San Diego Downtown station

I. California High-Speed Rail



CPUC staff at the Cedar Viaduct construction site

The California High Speed Rail (HSR) system will be the first high-speed rail system in the nation. 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. High-speed trains are designed to be capable of traveling from San Francisco to the Los Angeles basin in under three hours, although actual travel times might exceed that. Speeds will vary, depending on location, but trains can reach speeds in excess of 200 miles per hour on large portions of the system. The system is planned to eventually extend to Sacramento and San Diego, totaling 800 miles with up to 24 stations. Currently, 119 miles of the HSR system are under construction from Madera to north of Bakersfield.

On June 1, 2018, the CHSRA issued a new Business Plan for the HSR system, which forecast delays in the construction schedule compared with previous projections. Previously, the San Francisco-Los Angeles basin Phase 1 System was scheduled to be completed by 2029. This has been pushed back to 2033. The Silicon Valley to Central Valley Line segment, which is under construction, was to run between San Jose and a location north of Bakersfield and to open in 2025. This has been expanded to run between San Francisco and Bakersfield and is now forecast to begin operations in 2029. Portions of this segment, one in the Central Valley and one connecting San Francisco to Gilroy, could be ready for service as early as 2027.

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 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.

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 currently has two dedicated HSR staff. The CPUC railroad safety staff attend meetings to stay apprised of the project and conduct site inspections to monitor progress. In concert with federally certified inspectors, the HSR staff help to ensure compliance with state and federal laws.

Applicable CPUC GOs that are enforced during the planning and initial stages of construction include:¹⁴

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

Most of these General Orders are incorporated in HSR design criteria documents issued by the CHSRA. CPUC railroad safety staff review HSR design documents for compliance with the GOs

¹⁴ A list of railroad-specific General Orders is presented in Appendix A. 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.

listed above. In particular, CPUC rail crossings engineers have reviewed numerous applications for alterations of railroad crossings under GO 88-B. CPUC electric safety staff and a rail crossings engineer have participated in discussions with rail carriers regarding the electrification of the Caltrain system running from San Jose to San Francisco, which will also be used by the HSR system.

At the present time, CPUC railroad safety staff is monitoring HSR developments and making sure that HSR planning is incorporating CPUC General Order requirements. Staff are obtaining and reviewing planning documents, and observing HSR construction activities as they proceed. Once construction advances and operations are ready to begin, the CPUC oversight will include discipline-specific inspections, as well as incident investigations in the event of violations of state and federal laws, pursuant to 49 CFR 213 Subpart G, Train Operations at Track Classes 6 and Higher.

In 2017-18, the CPUC HSR staff performed the following:

- Railroad safety inspectors performed 5 observations of the initial phase of HSR construction to ensure compliance with GO clearance requirements.
- Rail crossings engineers reviewed a number of applications for alterations of railroad crossings and made recommendations to improve pedestrian and automobile safety.
- Rail crossings engineers processed 11 applications for grade-separated crossings in five counties (Kern, Tulare, Madera, Fresno and Kings) to ensure that the applications complied with CPUC General Orders regarding vertical clearance.
- HSR staff attended 6 meetings of the CHSRA Fire and Life Safety & Security Committee (see below) and performed observations at the construction sites on a quarterly basis.

CHSRA Fire and Life Safety & Security Committee meetings are attended by representatives of state and local agencies involved in security aspects of HSR regulation. Topics of discussion in the 2017-18 meetings included:

- HSR trainset fire and life safety design considerations (e.g., emergency lighting and communications, access to/egress from trainsets, crime prevention through environmental design).
- Lessons learned from the December 19, 2017 Amtrak derailment 40 miles south of Seattle. The accident is still under investigation by the National Transportation Safety Board. Possible root causes of the accident were discussed.
- Coordination between HSR, and federal, state, and local first responders in case of derailments, terrorism, and other safety-related events.

III. Rail Safety Activities

PU Code Section 916 requires the CPUC to report to the Legislature on its rail safety activities annually. The CPUC employs 41 inspectors who are federally-certified in the five FRA railroad disciplines: hazardous materials, motive power and equipment, operations, signal and train control, and track.

CPUC inspectors perform regular inspections, focused inspections, accident investigations, security inspections and complaint investigations. In addition, the inspectors also address public safety risks that, while not violations of regulatory requirements, pose potential risks to public or railroad employee safety.

A. Inspection Process

CPUC railroad safety inspectors perform investigative and surveillance activities to detect instances of non-compliance (commonly called “defects” in FRA and CPUC railroad safety-related documents) with both federal and state railroad safety laws and regulations.

Federal: To enforce federal regulations, CPUC inspectors operate under the Commission’s Safety Participation Program agreement with the FRA (49 CFR Part 212). The primary federal rail safety regulations are contained in 49 CFR Chapter II, Federal Railroad Administration, Department of Transportation. These regulations include the following Parts: 213 (Track Safety Standards), 214 (Railroad Workplace Safety), 215 (Railroad Freight Car Safety Standards), 231 (Railroad Safety Appliance Standards), 218 (Railroad Operating Practices), 232 (Brake System Safety Standards for Freight and Other Non-Passenger Trains and Equipment; End-Of-Train Devices) and 236 (Rules, Standards, and Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems, Devices, and Appliances). Hazardous Materials inspectors also enforce regulations contained in 49 CFR Chapter I, Subchapter C, Hazardous Materials Regulations, including Parts 172 (Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans), 173 (Shippers - General Requirements for Shipments and Packaging), 174 (Carriage by Rail), 178 (Specifications for Packaging), and 179 (Specifications for Tank Cars).

State: The primary California railroad safety laws and regulations enforced by CPUC inspectors are several Commission General Orders and Public Utilities Code sections. A list of these laws and regulations is contained in Appendix A. The GOs most frequently cited by the Railroad Operations and Safety Branch of the Commission’s Safety Enforcement Division are 26-D (Regulations Governing Clearances on Railroads and Street Railroads With Reference to Side and Overhead Structures, Parallel Tracks, Crossings of Public Roads, Highways and Streets), 118-A (Regulations Governing the Construction, Reconstruction, and Maintenance of Walkways Adjacent to Railroad Trackage and the Control of Vegetation Adjacent Thereto). Hazardous materials inspectors also apply GO 161 (Rules and Regulations Governing the Transportation of Hazardous Materials by Rail).

In general terms, for both Federal and State laws and regulations, CPUC inspectors perform the following steps:

1. The inspector records all noncomplying conditions at the facility or other railroad location in question, including the location, type, and size of each defect discovered.
2. The inspector presents inspection findings to a responsible party or parties representing the management of the railroad or property concerned, discusses how the defects can be corrected, and establishes a timeframe for correcting the defects.
3. Where a defect is determined by an inspector to be an imminent threat to safety, the responsible party is required to implement remedial action immediately. In addition, in such cases:
 - For non-compliances with federal regulations, the CPUC inspector may recommend that FRA issue a violation to the railroad, with an accompanying civil penalty. The FRA Chief Counsel reviews the recommendation and determines whether FRA will issue a violation and the amount of the civil penalty, if any, to be assessed.¹⁵
 - For non-compliances with GOs 26-D and 118-A, and PU Code Section 7662 (which sets signage requirements; see Appendix A), CPUC Resolution ROSB-002 provides the Director or Deputy Director of the Safety and Enforcement Division with the authority to issue citations to railroad carriers, with accompanying fines.¹⁶
4. If the railroad fails to correct a defect that does not pose an imminent threat within the time frame set by the inspector, the inspector may allow additional time for the correction to be made, or the inspector may proceed with the procedures for imminent threats described above.

Most of the trackage in California is owned by UPRR and BNSF, and the majority of federal and state defects are found on rail equipment and tracks that are owned or operated by these companies. At the previously-described quarterly meetings held with UPRR and BNSF, CPUC representatives often discuss safety issues, such as trending or ongoing defects identified by CPUC inspectors, and approaches to reduce or eliminate the causal factors that result in defects.

¹⁵ There is a wide range of financial penalties for violations of applicable federal railroad safety regulations, depending on which regulation is violated and whether the violation is ruled as “willful.” A penalty may be assessed against an individual only for a willful violation. The final penalty amount depends on the resolution of a claims conference between the railroad and the FRA. Penalties for violations of hazardous materials-related regulations potentially are much higher.

¹⁶ For violations of GO 118-A and PU Code Section 7662, the penalty allowed under ROSB-002 is \$500 per incident plus \$50 per day for each day in violation. For violations of GO 26-D, the penalty allowed under ROSB-002 is \$1,000 per incident. A railroad issued a penalty may accept the fine or contest it through an appeals process set forth in ROSB-002. No ROSB-002 citations were taken in FY 2017-2018.

B. Regular Inspections



CPUC and Caltrain personnel inspecting in San Bruno at one of the new foundations that will support the upcoming electrification

Over the past year, CPUC inspectors have engaged in proactive safety efforts and retroactive accident investigations to reduce public safety risks, as well as regular inspection work. Examples of regular inspections are listed in Appendix D.

During 2017-18 CPUC inspectors:

- Performed 4,396 inspections and follow-up inspections to monitor the railroads' compliance with federal and state laws, and CPUC GOs.
- Performed 161 safety surveys (bridge and tunnel).
- Cited 9,175 federal regulation defects.
- Recommended civil penalties for 338 violations of federal regulations.
- Completed 293 CPUC GO reports that identified 509 state regulation defects¹⁷.

¹⁷ Non-conformances with FRA regulations (“federal regulation defects”) can only be reported by inspectors certified in the applicable railroad discipline in which the defects occur (e.g., track defects are reported by track inspectors). Accordingly, the numbers of federal defects are disaggregated by discipline in the following discussion. However, inspectors from any of the five railroad disciplines can identify GO defects, and these defects are not disaggregated by discipline in the discussion.

CPUC Hazardous Materials inspectors:



CPUC Hazardous Materials inspector inspecting tank car

- Inspected or evaluated 55,637 units in 1,064 FRA inspection reports.
- Identified 1,338 federal regulation defects.
- Recommended 12 violations for civil penalties for federal defects identified during regular inspection activity.

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.

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 24-hour Warning Center. Inspectors also conduct unannounced inspections at the facilities of shippers, consignees, freight forwarders, intermodal transportation companies, and railroads.

CPUC hazardous materials inspectors also inspect facilities to ensure compliance with CPUC GO 161, Rules and Regulations Governing the Transportation of Hazardous Materials by Rail.

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.

CPUC Motive Power and Equipment (MP&E) inspectors:



CPUC MP&E inspector measuring a wheel flange

- Inspected or evaluated 75,238 units in 877 FRA inspection reports.
- Identified 2,750 federal regulation defects.
- Recommended 174 violations for civil penalties for federal regulation defects identified during regular inspection activity.

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

PU Code Section 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 (three times per year).¹⁸

¹⁸ 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).

During 2017-18, CPUC inspectors did not satisfy the mandate. Of the 59 facilities, 52 sites were inspected three times or more during the fiscal year. Of the remaining 7 facilities, 2 were inspected twice and 5 were inspected once. Facilities that have greater numbers of train traffic are inspected more often than those with lesser train traffic.

The primary reason for not meeting the mandate is employee retention. When a certified CPUC 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 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 new hires on California-specific laws and CPUC GOs.

CPUC Operating Practices inspectors:



CPUC Operating Practices inspector measuring safety chain height

- Inspected or evaluated 21,574 units in 902 FRA inspection reports.
- Identified 942 federal regulation defects.
- Recommended 131 violations for civil penalties for federal regulation defects identified during regular inspection activity.

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.

CPUC Signal and Train Control inspectors:



CPUC Signal and Train Control inspector, inspecting inside a signal house

- Inspected or evaluated 12,475 units in 333 FRA inspection reports.
- Identified 931 federal regulation defects.
- Recommended 6 violations for civil penalties for federal regulation defects identified during regular inspection activity.

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:



Track inspectors inspecting a switch on the UPRR

- Inspected or evaluated 22,014 units in 927 FRA submitted inspection reports.
- Identified 3,214 federal regulation defects.
- Recommended 15 violations for civil penalties for federal regulation defects found during regular inspection activity.

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 Section 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. This mandate was not met due to extended vacancies and the difficulties associated with identifying and recruiting well-qualified and experienced candidates.

Inspectors use several methods to inspect track. Each method has its benefits and drawbacks depending on the terrain, steepness, and location.¹⁹ The methods include:

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

¹⁹ 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 or railroad owned geometry car (a passenger coach equipped to identify geometric track deficiencies that create accident risks).

In 2017-18, CPUC inspectors surveyed 4,186 miles of track in California aboard track geometry vehicles. The track geometry vehicles identified 260 defective conditions. CPUC inspectors conducted numerous follow-up inspections to monitor the railroads' compliance and verify that the defects had been corrected.

C. Focused Inspections



CPUC inspectors inspecting a tie crane at night during a focused inspection for operable change-of-direction alarm

PU Code Section 765.5(e) requires the CPUC to conduct focused inspections of railroad yards and track. A focused inspection is an inspection that may concentrate on a specific discipline's regulations and/or a specific location or theme. These inspections target railroad yards and track that posed increased safety risks, 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 inspectors to evaluate all aspects of a railroad or railroad facility's operational and maintenance practices and procedures. This includes evaluation of railroad personnel's technical expertise and experience, and organizational safety culture. If corrective actions are recommended by CPUC inspectors, a follow-up inspection is performed to determine progress by the railroad entity in carrying out the recommended actions.

In 2017-18, CPUC inspectors performed 21 focused inspections, which consisted of:

- 4 track inspections
- 4 hazardous materials inspections
- 3 operating practices inspections
- 3 signal and train control inspections
- 1 Mechanical Inspection
- 6 cross-discipline inspections

Appendix E provides examples of focused inspections.

D. Accident Investigations



A CPUC inspector at a 2017 derailment site near Elk Grove

In 2017-18, CPUC inspectors performed 146 accident investigations.

PU Code Section 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 maintenance or operation, resulting in loss of life or injury to person or property damage. CPUC inspectors evaluate each accident when reported to the CPUC, usually by the 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 2017-18, there were 923 reported railroad-related incidents in California, up from 840 in the previous fiscal year. Each incident falls into one or more categories: 403 were related to crossing or trespasser incidents; 297 were material spills, of which 115 involved hazardous materials; 194 were derailments; and 34 were in other categories. These incidents resulted in a total of 217 fatalities and 141 injuries (up from 174 and 132 in the previous year, respectively), mostly to trespassers. CPUC railroad safety supervisors determined that 146 incidents required further investigation.

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

E. Security Inspections

Among other provisions, the Local Community Rail Security Act of 2006, PU Code Sections 7665 through 7667, requires that each railroad operator implement an infrastructure protection program to protect rail infrastructure in the state from acts of sabotage, terrorism, or other crimes. The infrastructure protection program is to be updated by the rail operator at least once every year, and the updated plan submitted to CPUC. CPUC reviews the programs, and it may conduct inspections to facilitate the reviews and order rail operators to improve, modify, or change their programs to comply with the Act. Also, every operator of rail facilities in the state is to provide CPUC with a risk assessment incorporating a broad range of risk-related information.

In 2017-18, CPUC railroad security inspectors performed security inspections on all 37 railroads that operate in California. All were in compliance with relevant state railroad security-related laws.²⁰ Amtrak, UPRR, and BNSF railroads have national security plans that are reviewed annually by the FRA. CPUC inspectors reviewed each railroad’s security plan at various locations within the state.

All railroads were provided a copy of the CPUC Security Plan Guidance. This guidance was developed to provide all railroads uniform information on regulatory requirements. A majority of the railroads have utilized this guidance.

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

Railroad	Date of Inspection	Compliant	Comments
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²⁰ One railroad listed in several previous Annual Reports, the Lake Railway, located in Alturas, terminated operations in August 2017. A new railroad, the Goose Lake Railway, began operations in February 2018 in Alturas.

Altamont Commuter Express	01/10/2018	Y	
Santa Maria Valley RR	02/01/2018	Y	
Fillmore Western	05/15/2018	Y	
San Joaquin Valley RR	10/09/2017	Y	
Modesto & Empire Traction	10/11/2017	Y	
Central California Traction Company	10/17/2017	Y	
Stockton Terminal & Eastern Railroad	10/17/2017	Y	
Sacramento Valley Railroad	10/12/2017	Y	
Quincy Railroad	05/10/2018	Y	
California Northern Railroad	10/12/2017	Y	
Richmond Pacific Railroad	01/30/2018	Y	
San Francisco Bay Railroad	01/30/2018	Y	
Cal Train	04/12/2018	Y	
Napa Valley Railroad	12/14/2017	Y	
Niles Canyon Railway	01/31/2018	Y	
Santa Cruz Monterey Bay	04/20/2018	Y	
Metrolink	01/16/2018	Y	
Amtrak Los Angeles	01/04/2018	Y	
San Diego & Imperial Valley	11/17/2017	Y	
Ventura County Railroad	11/17/2017	Y	
Trona Railway Company	03/08/2018	Y	
So Cal Ramp Services	03/09/2018	Y	
North County Transit District	10/25/2017	Y	

Pacific Sun Railroad	10/26/2017	Y	
Pacific Southwest Railway Museum	10/26/2017	Y	
Baja California Railroad	10/30/2017	Y	
West Isle Line	10/09/2017	Y	
Santa Cruz & Big Trees	01/31/2018	Y	
Amtrak Oakland	01/30/2018	Y	
Sierra Northern Railroad	04/11/2018	Y	
Pacific Harbor Lines	11/14/2017	Y	
Los Angeles Junction Railroad	05/18/2018	Y	
BNSF	05/18/2018	Y	
UPRR	06/12/2018	Y	Phone Interview. Security manager is located in Omaha NE.
Goose Lake Railway	05/09/2018	Y	
Northwestern Pacific Railroad Company	01/30/2018	Y	
Oakland Global Rail Enterprise	05/09/2018	Y	

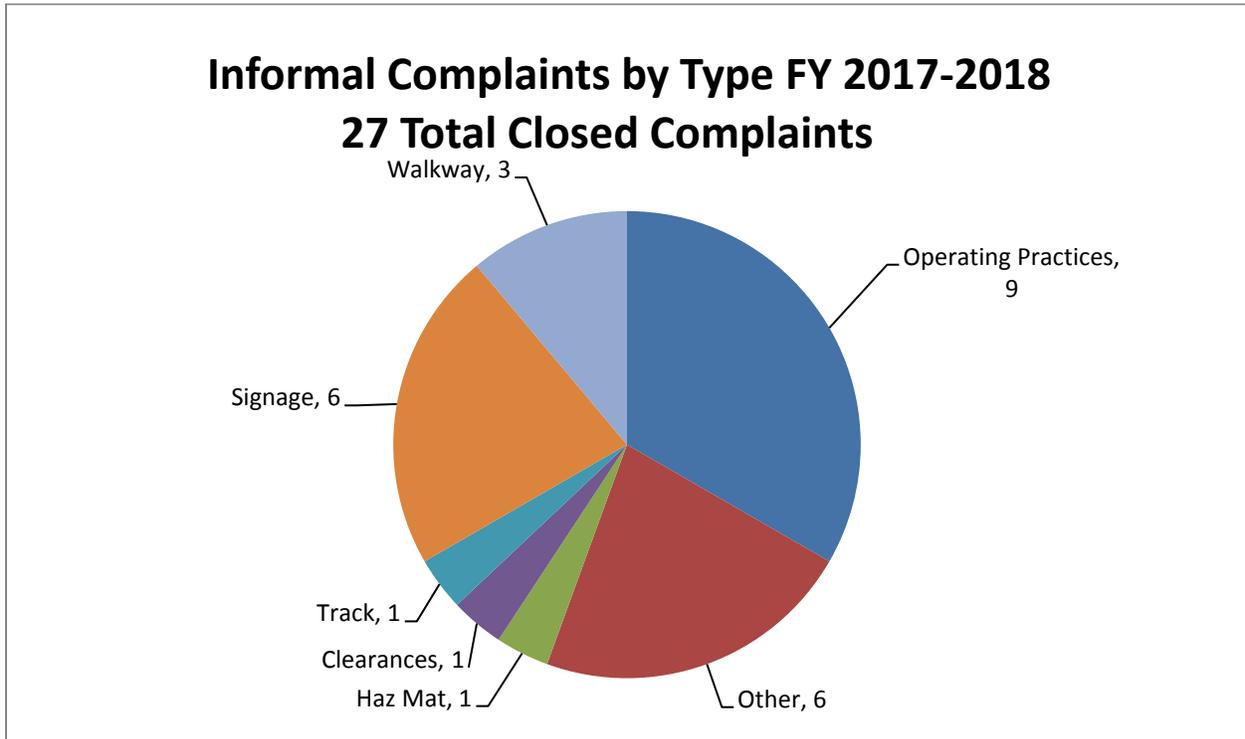
F. Safety Complaint Investigations

As well as inspection activities mandated by law, the CPUC investigates complaints related to railroad safety. These are received from a variety of sources, including railroad employees, railroad unions, and the general public. In 2017-18, CPUC investigated 27 such complaints.

In these investigations, CPUC inspectors sometimes find non-conformances with railroad safety regulations, e.g., for the placement of yellow and red flags near tracks to warn train crews to restrict or stop train movements. Where these involve state regulations, CPUC directs the railroads to follow proper procedures. If the complaint pertains to federal regulations, CPUC inspectors communicate with the FRA to synchronize investigation tasks to conclusion.

In a few cases, upon inspecting the properties in question, CPUC finds that the regulatory non-compliances or other safety issues that were raised in the complaints do not exist or have already been corrected, and informs complainants that no action is necessary. Where CPUC lacks the regulatory authority to resolve an issue raised by a complainant, such as homeless camps

encroaching on railroad property, staff may directly contact the responsible agency or agencies, and suggest that action be taken. In many instances, CPUC will look beyond the regulations in evaluating non-regulated risks and other safety issues raised by complainants, and strive to work with railroads, shippers and other entities associated with the complainants' safety concerns to find resolutions.



IV. Investigations of Runaway Trains and Other Uncontrolled Train Movements

PU Code Section 916.1 requires the CPUC to annually report the results of its investigations of runaway trains or other uncontrolled train movements that threaten public health and safety. In 2017-18, the CPUC investigated five instances of runaway trains and uncontrolled train movements.

- On July 20, 2017, at approximately 11:15 PM, there was uncontrolled movement of ten railcars in the UPRR West Colton Yard, located in Bloomington, San Bernardino County. The ten cars rolled uncontrolled for approximately 166 feet and collided with stationary railcar TILX29214, resulting in its derailment in the upright position. No injuries or hazardous materials releases were reported.

- On September 5, 2017, at approximately 10:20 AM, railcar AOKX 497422 rolled uncontrolled within the West Colton Yard. The cause of the movement was a second railcar being directed at a greater than expected speed onto the track containing the

AOKX497422 railcar. The second car impacted AOKX497422, which initiated the uncontrolled movement. AOKX497422 rolled out of track number 20 and onto an industry track traveling an approximate distance of 80 feet. No injuries or hazardous materials releases were reported.

- On September 13, 2017, at approximately 1:35 PM, the uncontrolled movement of railcar GNTX295074 resulted in the collision and derailment of two other railcars in the West Colton Yard. The two railcars derailed by the GNTX295074 were OFFX25190 and the BOX24683. The GNTX295074 collided with the other two cars and all three rolled out of the east end the track they were assigned to. The impact of GNTX295074 on the other two cars was sufficient for the lead car striking a “skate”²¹ on the tracks to roll over it entirely, causing the derailment of all three railcars. All three derailed in an upright position.
- On October 19, 2017, at approximately 9:29 AM, a single UPRR railcar rolled uncontrolled 20 feet and struck a stationary railcar. Both cars came to a stop shortly after the collision. The cause of the uncontrolled movement was the failure by a crew to properly couple the first car to another car that was properly secured. The incident occurred within the 4th Street Yard in the city of Los Angeles. No injuries or hazardous materials releases were reported.
- On March 16, 2018, at approximately 5:00 PM, a piece of snow equipment moved uncontrolled for an unknown distance within the UPRR Truckee facility in Nevada County. The equipment was a snow spreader used to help clear the tracks of heavy snow deposits.

The CPUC investigation determined that the equipment had been secured in compliance with UPRR’s then-existing securement rules. However, ice built up between the wheels and brake shoes. As the ice melted in the afternoon, a gap developed between the brake shoes and the wheels of the snow spreader, and the brake no longer held the equipment in place.

The grade on the track was approximately .05%, permitting the downhill movement of the equipment once the brakes failed. The snow spreader was derailed by rolling through the on track derailing device, which functioned as designed. As a result of this incident, UPRR management has revised its securement rules.

The July 20, September 5, and September 13, 2017 uncontrolled movements in the UPRR West Colton Yard were the subjects of an informal complaint to CPUC from United Transportation Union labor representatives in the area and were investigated by CPUC inspectors.

²¹ A skate is a device placed on the track to prevent the wheels of the boxcars from rolling further.

CPUC's investigation concluded that the September 5 and September 13 incidents were due to problems with the UPRR West Colton Yard's computer system, which controls the speeds and destinations of railcars being classified into the 64 different tracks at that location.

In the September 5 and September 13 incidents, there were communication difficulties between the computer system and the UPRR West Colton Yard's Automatic Equipment Identification (AEI) scanner.²² In these incidents, cars sometimes were scanned incorrectly by the AEI scanner and miscalculations occurred in determining car weights. This resulted in inadequate slowing of the cars passing through the Yard's retarder system²³, which in turn led to uncontrolled movements and the resulting collisions.

In addition to the above communications problems, UPRR was experiencing other issues with a transition from an older computer system to a new one. In particular, the new system sometimes showed no cars on a track that in fact had cars in it. When the computer determined that cars needed to roll farther before stopping, as happens with an empty track, it allowed a greater speed for cars departing the retarder system. When the track was occupied, the departing car could collide with the first car it encountered.

It is not clear whether the July 20 incident was caused by similar computer problems as occurred on September 5 and 13, and the cause remains unknown.

CPUC inspectors met with UPRR West Colton Yard management to discuss these uncontrolled train movements. UPRR plans to reduce the risk of further rollouts by improving the reliability of the computer system. To that end, UPRR is expediting the replacement of the current system with the new one as swiftly as possible. The computer system currently in use pre-dates the implementation of the AEI technology, and it is believed that the new computer system will correct the communication problems between the two.

²² Automatic Equipment Identification scanners use technology similar to that used by retail stores to scan inventory. As each car passes the AEI scanner, the identification is passed to the Yard's computer system, which calculates speeds and makes necessary adjustments via a system of retarders (see following footnote).

²³ A retarder is a mechanical device that squeezes the wheels of rolling stock in order to slow their velocity as the cars pass through them.

V. Local Safety Hazard Sites

Public Utilities Code section 7711 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).²⁴ 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 7711 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.²⁵

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

²⁴ 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).

²⁵ A list of all derailments is located at <http://www.cpuc.ca.gov/PUC/safety/Rail/Railroad/>

Table 1—List of Local Safety Hazard Sites

*LSHS #	Current LSHS Track Line	Previous LSHS Track line at time of D.97-09-045 ²⁶	RR Milepost	Number of Derailments 2013-17	Overlap with Site #**
16	UPRR Mojave Subdivision	SP Bakersfield Line	335.0 to 359.9	11	
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	1	#9
19	UPRR Mojave Subdivision	SP Bakersfield Line	463.0 to 486	1	
12	UPRR Roseville Subdivision	SP Roseville District	150.0 to 160.0	1	
6	UPRR Yuma Subdivision	SP Yuma Line	542.6 to 589.0	0	#3, #4
22	UPRR Canyon Subdivision	UP Feather River Division	234.0 to 240.0	0	#25
25	UPRR Canyon Subdivision	UP Feather River Division	232.1 to 319.2	0	#22, #23
3	UPRR Yuma Subdivision	SP Yuma Line	535.0 to 545.0	9	#6
23	UPRR Canyon Subdivision	UP Feather River Division	253.0 to 282.0	2	#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	

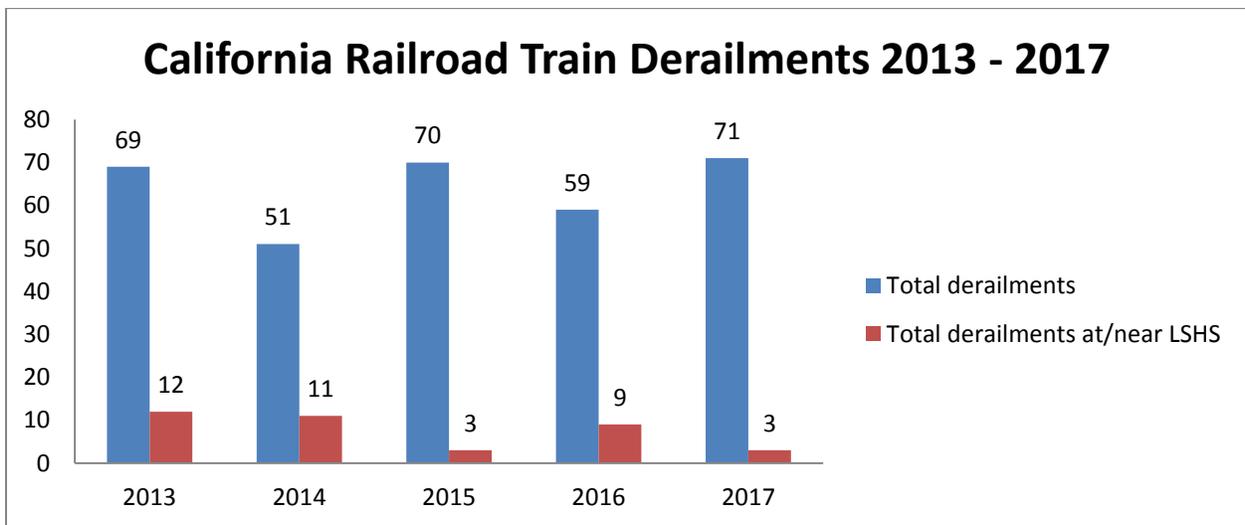
²⁶ In 1996, UPRR purchased Southern Pacific Railroad.

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.

** The two methods of determining LSHSs described earlier sometimes produce different site boundaries. Where a site’s boundaries identified by one method overlap with another site identified by the different method, the other site is listed in this column.

Within the previous five calendar years, California experienced 320 derailments. Of that total, 38 derailments, or nearly 12 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.



Source: Federal Railroad Administration, Office of Safety Analysis:

Total derailments: Table 1.12, Ten Year Accident/Incident Overview

Total derailments at /near LSHS: Table 3.11, Accident Detail Report, as calculated by CPUC staff

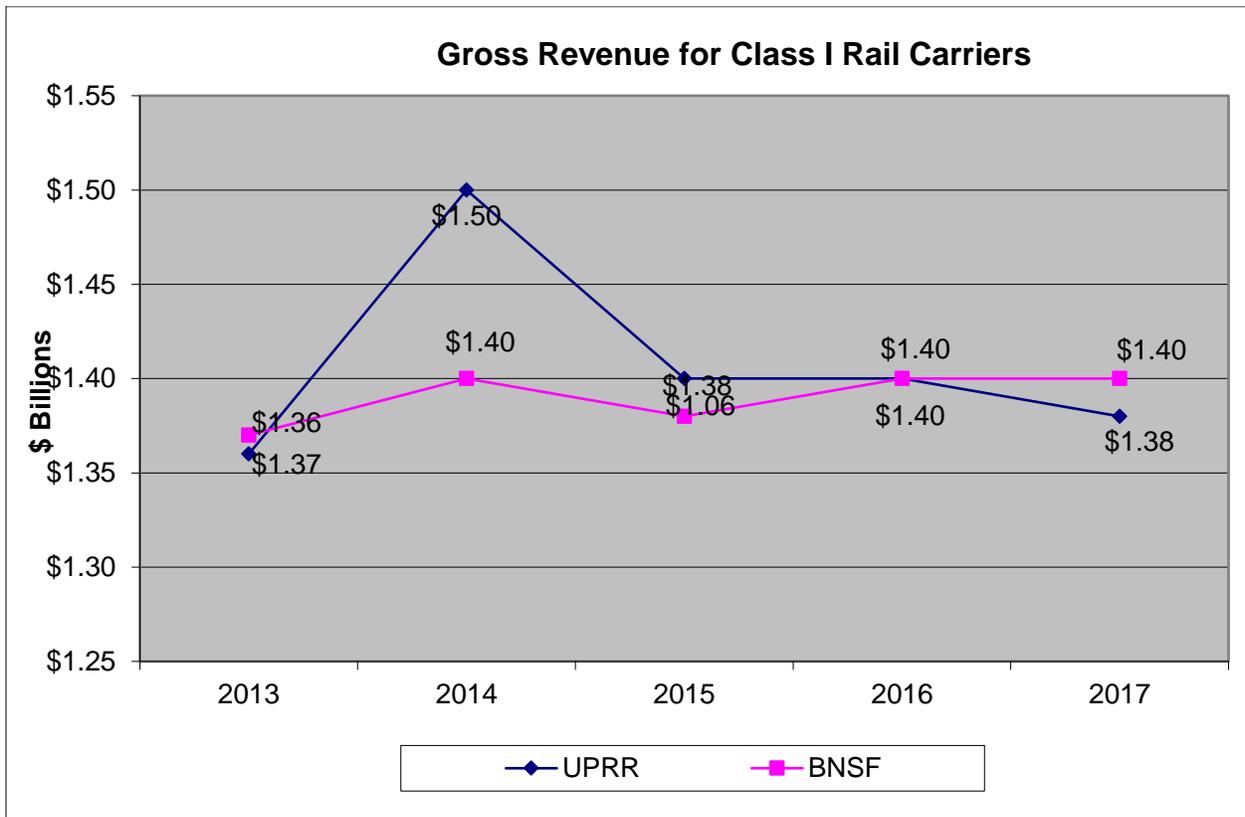
VI. Regulatory Fee Impact on Competition

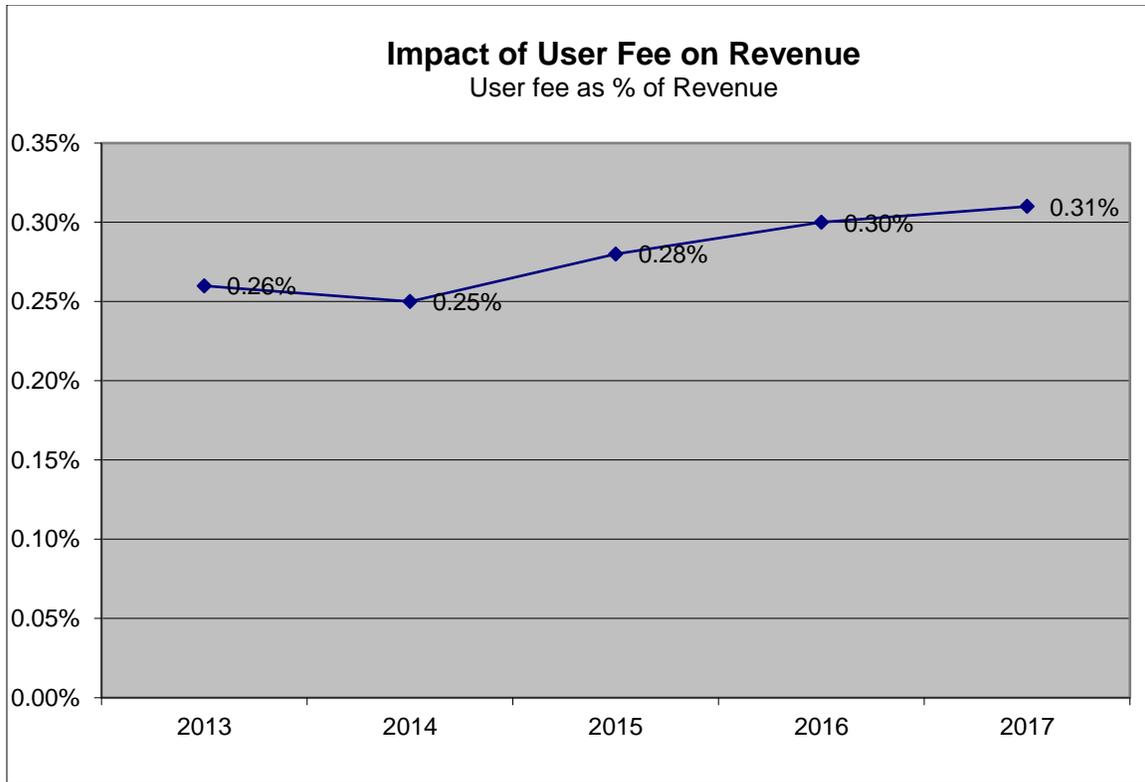
PU Code Section 309.7 requires the activities of the CPUC that relate to safe operation of common carriers by railroad, other than those relating to grade crossing protection, to be supported by the fees paid by railroad corporations. In 2017-18, the Legislature appropriated

\$8.1 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. The railroad user fees assessed in 2017-18 on UPRR and BNSF constituted slightly less the one third of one percent of revenues (0.31 percent) and were unlikely to have had any effect on competition.

The following two graphs show the percentage of user fees versus railroad revenue last year.





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

VII. Challenges for Rail Safety

A. Reporting of Accidents and Incidents

California railroad accident reporting and investigation requirements include the following:

- 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 OES²⁷ of accidents and incidents.²⁸
 - 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.²⁹
 - General Order 161 requires railroads to immediately notify the appropriate emergency-response agency in the event of a hazardous materials incident.
 - 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.

In the CPUC's 2015 and 2016 Annual Railroad Safety Activity Reports,³⁰ 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 Section 309.7, which requires CPUC inspectors to advise the Commission on rail safety issues, and propose regulatory remedies to address unsafe conditions. As a result, CPUC inspectors may potentially be unaware of an unsafe condition, and thus may be unable to address such condition in a timely manner.

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 holds quarterly meetings with UPRR, BNSF, the California Short Line Railroad Association and railroad labor organizations. 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 timely manner.

B. Recruitment and Retention

²⁷ The California Office of Emergency Services was formerly called the California Emergency Management Agency (CEMA).

²⁸ OES immediately notifies the CPUC.

²⁹ OES immediately notifies the CPUC.

³⁰ <http://www.cpuc.ca.gov/rosb/>

Recruitment and retention were identified in 14 previous Annual Railroad Safety Activity Reports as major obstacles to fulfillment of CPUC’s mandated railroad safety requirements. These continued to be challenges in 2017-18.

The 2016 Annual Report discussed the issue in detail.³¹ 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. The CPUC rail safety staff has received some salary increases through bargaining unit activities, which is helpful, but the gap still remains and additional pay increases are necessary to close the gap.

However, there has been an increase in CPUC’s hiring of inspectors for 2017, which in turn will help with increased inspections, once the new staff are sufficiently trained and have received FRA discipline-specific certification. Currently, there are eight new inspectors participating in the FRA on the job training program:

- 2 Motive Power and Equipment inspectors
- 2 Signal and Train Control inspectors
- 2 Track inspectors
- 2 Operating Practices inspectors

³¹ <http://www.cpuc.ca.gov/rosb/>

Appendix A – State Railroad Safety Laws and General Orders

Authority	Statutory Specified Tasks (paraphrased)	CPUC-General Orders
<p>PU Code Sec. 309.7 (a)</p>	<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>	
<p>PU Code Sec. 309.7 (b)</p>	<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>	<p>GO 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.</p>
<p>PU Code Sec. 309.7 (c)</p>	<p>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.</p>	<p>Resolution ROSB-002 established a civil penalty citation program for enforcing compliance with safety requirements for railroad carriers</p>
<p>PU Code Sec. 309.7 (d)</p>	<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</p>	

	<p>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>	
<p>PU Code Sec. 315</p>	<p>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.</p>	
<p>PU Code Sec. 421</p>	<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>	
<p>PU Code Sec. 761</p>	<p>Whenever the commission finds that rules, practices, equipment, appliances, facilities, or service of any public utility are unjust, unreasonable, unsafe, improper, inadequate, or insufficient, the commission shall fix the rules.</p>	<p>GO 27-B: Filing and posting of railroad timetables and changes.</p>
<p>PU Code Sec. 765.5</p>	<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</p>	

	<p>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>	
<p>PU Code Sec. 768</p>	<p>768. <u>The commission may, after a hearing, require</u> 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. <u>The commission may prescribe</u>, 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. <u>The commission may establish</u> uniform or other standards of construction and equipment, and require the performance of any other act which the health or safety of its employees,</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>

	passengers, customers, or the public may demand.	<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> <p>GO 126: Establishes requirements for the contents of First-Aid kits provided by common carrier railroads.</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. 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.	

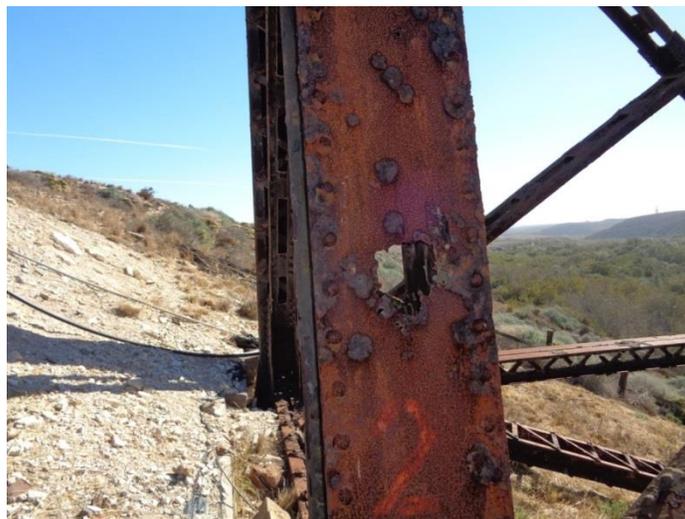
<p>PU Code Sec. 7665.2</p>	<p>By July 1, 2007, requires every operator of rail facilities to provide a risk assessment to the commission and the agency for each rail facility in the state that is under its ownership, operation, or control, and prescribes the elements of the risk assessment.</p>	
<p>PU Code Sec. 7665.4</p>	<p>(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. (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.</p>	
<p>PU Code Sec. 7665.6</p>	<p>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. 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 specified circumstances.</p>	<p>GO 161: Establishes safety standards for the rail transportation of hazardous materials.</p>
<p>PU Code Sec. 7665.8</p>	<p>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.</p>	
<p>PU Code Sec. 7673</p>	<p>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.</p>	

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.	

Appendix B – Example of Risk Management Status Reports

November 14, 2017: During an observation of a UPRR railroad bridge located within Vandenberg Air Force Base in Santa Barbara County, a CPUC bridge inspector noted extensive rusting and other deterioration of portions of the steel bridge. A UPRR employee who was present during the inspection immediately notified the UPRR Structures Department.

CPUC inspectors had discussions with the UPRR Structures Department staff and informed them that this concern was being documented by the RMSR process. Through these discussions, it was determined that the bridge is still structurally sound and can host train movements. However, UPRR staff did inform the CPUC inspectors that the bridge will be replaced in the year 2020.



Deteriorated steel, UPRR bridge, Vandenberg Air Force Base



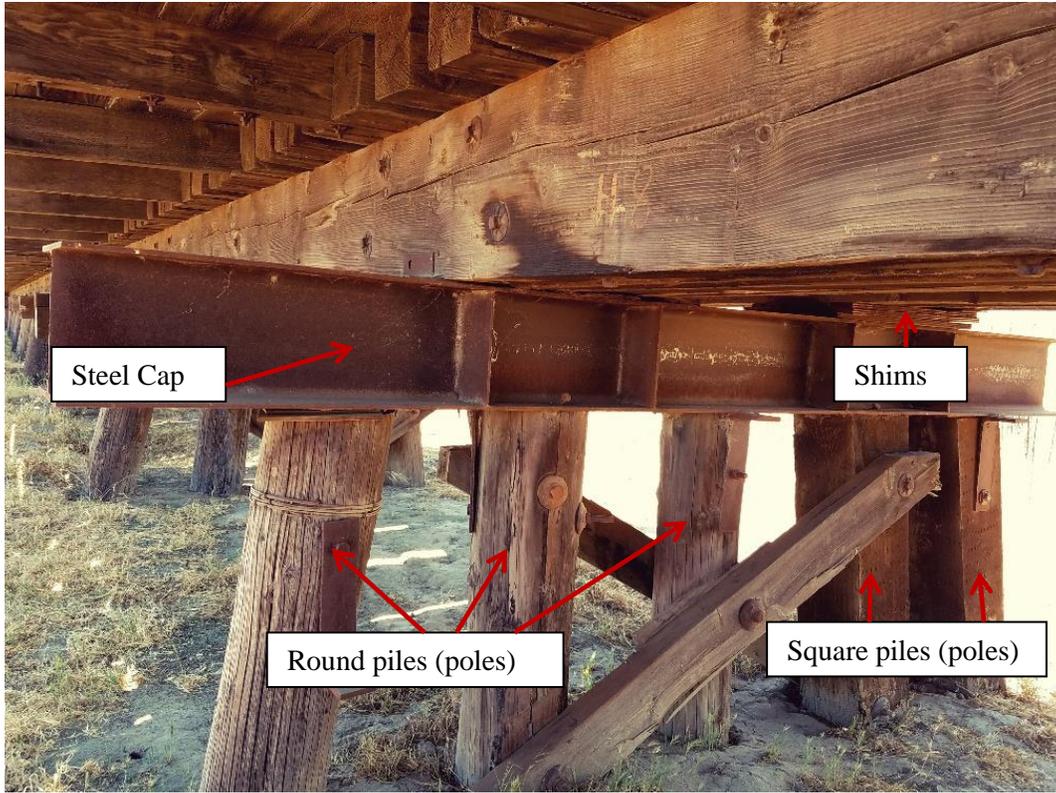
Deteriorated steel on a UPRR bridge, Vandenberg Air Force Base

June 5, 2018: CPUC railroad bridge inspectors conducted a routine bridge observation (inspection) on the San Joaquin Valley Railroad (SJVR). At one location during the inspection, CPUC bridge staff found on the underside of one of the bridges an odd combination of round and square piles (bridge support poles) as shown in the photo below. It is important to note that round bridge piles can be driven deep into the ground to provide adequate bridge support, whereas square piles cannot. Square pile holes must be more broadly excavated in order for the pile to be inserted deep enough to be properly anchored. Without proper anchoring, and subsequent compaction, square piles will sink, causing an un-level bridge support condition.

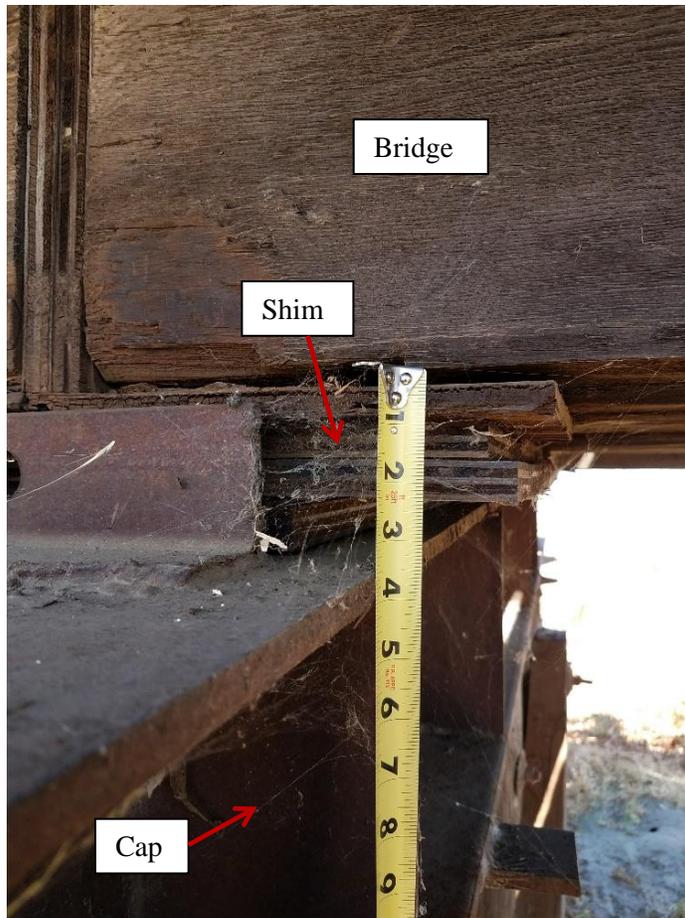
Piles are grouped into sections comprising of four or more piles, called “bents.” Each bent is topped with a “cap” (most often a wooden timber) that spans the top of the piles horizontally, thus creating vertical support to keep the track structure level.

The inspection discovered that one of the bent’s wooden caps had been replaced by a steel cap. The replaced steel cap was found to be 3 and $\frac{3}{4}$ inches out of level. To remedy the un-level condition, wooden shims had been placed between the cap and the bridge support beams (stringers) to bring the bridge structure back to level. However, the shims were found to be deteriorating, causing concern for level bridge integrity under load.

The SJVR was notified of the conditions identified, and informed SJVR that this concern was being documented on the RMSR form. Through these discussions regarding the bridge concerns identified by CPUC inspectors, the railroad replaced the shims and will perform weekly inspections to ensure the bridge’s integrity until such time as the piles and cap can be replaced. The railroad will make permanent repairs to the piles and cap in 2019 under their capital project plan.



A steel cap that replaced an old wooden cap does not sit level under the bridge as support.



Deteriorating shims compounding out of level condition under bridge

Appendix C - Examples of Operation Lifesaver Presentations

August 26, 2017: In conjunction with the Sacramento Police Department and other organizations in the City of Sacramento, CPUC Railroad safety staff gave a presentation on how to be safe around trains and tracks at a Community Safety Blitz during the California Day of Preparedness. This was an event where a wide variety of organizations provided information on what the public can do to be prepared in the event of a natural or man-made catastrophe. Over 200 people attended this event.



CPUC Railroad Safety staff providing information at the Operation Lifesaver booth in Old Town Sacramento

April 20, 2018: A CPUC railroad safety employee gave an Operation Lifesaver presentation to first-grade students at the Kings County Safe Kids Day Event, held at West Hills College in Lemoore. Using visual aids and handouts to explain the dangers associated with being around railroad tracks, the presentation discussed railroad hazards and unsafe acts, such as walking along a railroad track, and how to avoid injury. The event was attended by approximately 150 students.



CPUC Railroad Safety staff gives Operation Lifesaver Presentation at Kings County Safe Kids Day event

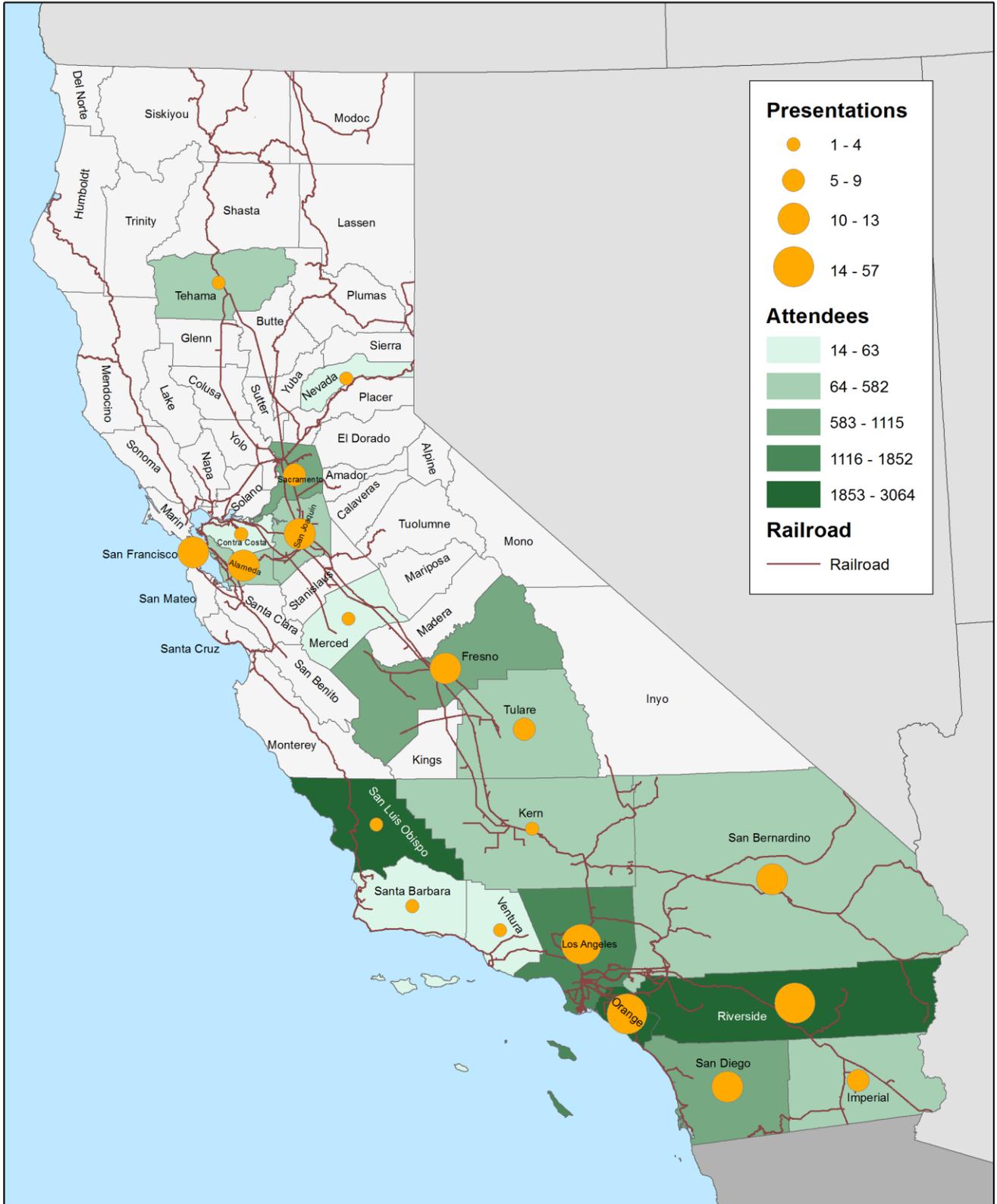
June 28, 2018: A CPUC railroad safety employee gave an Operation Lifesaver presentation to children and teenagers on safety practices around railroad crossings and railroad property. The

event took place at the Beale Memorial Library in Bakersfield during their summer lunch program. The library is located near the railroad tracks. Approximately 200 people attended the event.



CPUC staff conducting an Operation Lifesaver presentation in Bakersfield

Operation Lifesaver Presentations by counties (FY2017-2018)



Appendix D - Examples of Regular Inspections

July 12, 2017: Two CPUC inspectors conducted a routine inspection of a 38-car outbound train in the UPRR Roseville yard. Although the train had been previously inspected by the railroad's own mechanical inspectors and released for revenue service, the inspectors discovered defective conditions in nine of the cars. Two of these conditions warranted violations.

The two violations concerned equipment that prevent derailments. One rail car had a broken side bearing cage. The side bearing cage provides load stability and keeps the freight car from rolling or tipping over on curves. Another rail car was leaking droplets from the cushioning unit, which is supposed to be sealed. The end-of-car cushioning unit cushions the freight car from pulling forces exerted by the engine. Both of these conditions were severe enough to be in violation of FRA regulations in 49 CFR Part 215 (Railroad Freight Car Safety Standards).

The seven other defective conditions included broken suspension system components, defective air brakes, and out-of-compliance coupler heights.

The CPUC inspectors informed a railroad representative of the defective safety conditions. All of the conditions were required to be repaired before the train could depart. The railroad representative immediately had three of the cars with defective conditions removed from the train consist to be repaired in a shop environment. The remaining defective conditions were repaired where the train was standing. The CPUC inspectors verified that all conditions were corrected before the train departed.

October 4, 2017: Two CPUC inspectors performed a routine track inspection of the UPRR Benicia Valero refinery tracks. Defective crossties were identified. Crossties are used to maintain track gage (measurement limits between rails), surface (track level), and alignment. The inspectors identified five locations that did not meet minimum federal requirements in 49 CFR Part 213 (Track Safety Standards), which requires a 39 foot track segment to have sufficient number of crossties to provide effective support to hold gage within the limits allowed for the speed of track. Wide gage track is a leading cause of track-related derailments.

The Benicia Valero Refinery receives rail cars on a daily basis. The rail cars normally carry hazardous commodities used for the operation of the refinery. The track is also located over a large storm drain that feeds into San Francisco Bay. A derailment at this location could easily turn a car over into a neighboring canal and pollute the bay.

After the inspection, UPRR committed to making permanent repairs within 30 days. On November 9, 2017, CPUC inspectors performed a follow-up inspection and found that the defective ties had been replaced.

January 4, 2018: Two CPUC inspectors performed a regular inspection of railroad operations at the UPRR Roseville Yard. The inspectors identified non-compliant walkway conditions, specifically, oversized walkway ballast (gravel; rock) at two locations, extending for a combined total of approximately 260 feet. Some of the ballast at these locations was as much as five inches in diameter.

The oversized ballast did not comply with CPUC General Order 118-A, which mandates that “Walkways shall provide a reasonable regular surface with gradual slope not to exceed approximately one inch to eight inches” and “Where crushed material is used for walkway surfaces adjacent to tracks in railway switching yards, 100% of the material must be capable of passing through a 1 ½ inch square sieve opening.”

Large ballast, as described above, is difficult to walk on and can lead to injuries to railroad workers if they slip, trip, or fall due to the large ballast. In addition, during certain operations, railroad workers perform strenuous actions, consistent with normal trackside duties, alongside railroad cars. If workers were to lose their foothold in the walkway, due to stepping on oversized ballast while working next to moving railroad cars, they could fall into the moving railroad cars and suffer serious personal injuries.

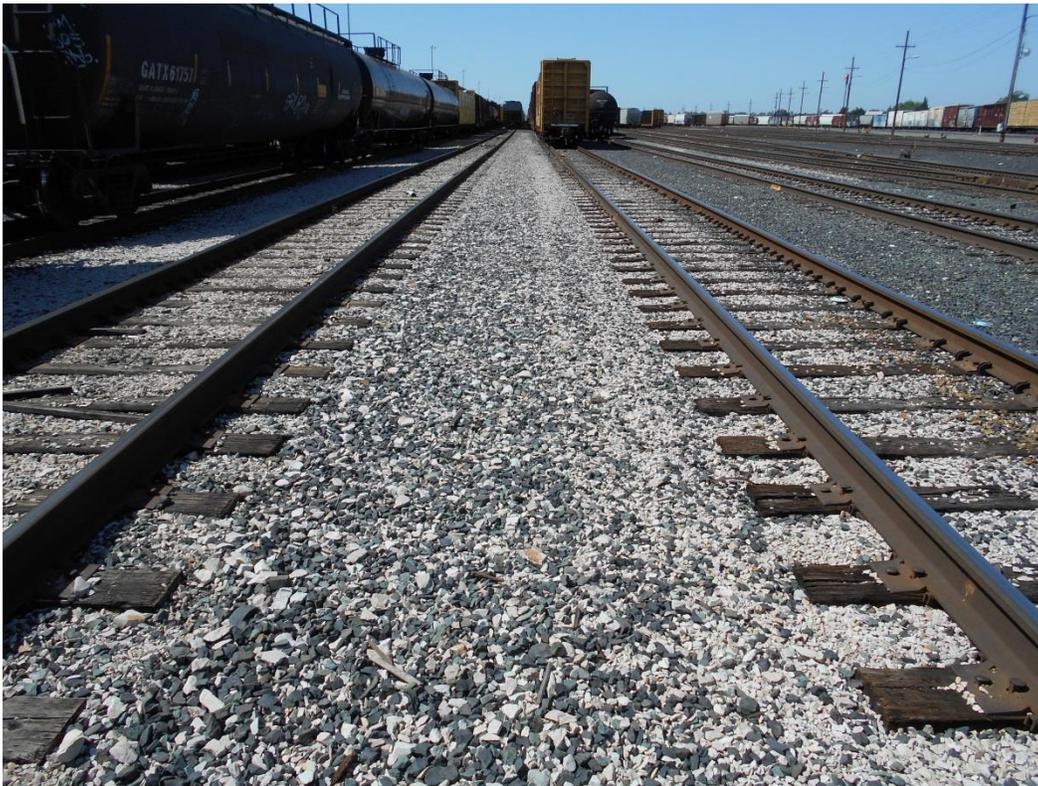
The two CPUC Inspectors found that these conditions had been previously reported to UPRR management by other CPUC staff. A report of the findings of this inspection, including pictures of the non-compliant conditions, was sent to the UPRR Senior Manager of Terminal Operations and the UPRR Senior Manager of Road Operations. A follow-up inspection was made on January 18, 2018 by the CPUC Operating Practices inspector, who discovered that the unsafe condition had not been remediated. CPUC staff contacted the appropriate railroad manager again, insisting on remedial action. An additional follow-up inspection was conducted soon thereafter, which found that all non-compliant conditions had been corrected.



CPUC Inspector measuring walkway distance from track center



Oversized ballast, which creates a tripping hazard.



Oversized ballast location after large ballast removal; replaced with ballast complying with GO 118-A.

January 17, 2018: Two CPUC inspectors performed a hazardous materials compliance inspection at the UPRR interchange with the California Northern Railroad (CNR) in Suisun-

Fairfield. CPUC staff found that some cars had been delivered to the interchange track that morning by a UPRR freight train out of Roseville. Standard railroad procedure is for all departing trains from Roseville to receive an outbound rail car inspection of the entire train by UPRR employees prior to leaving a rail yard. The CPUC inspectors examined 17 tank cars containing liquefied petroleum gas (LPG) and found defects on 10 of the 17 cars.

The CPUC inspectors discovered three instances where the moveable safety railings on top of a rail tank car were open, having been left in a position where an emergency responder or hazmat worker could have tripped on the railing arm and possibly fallen off the tank car. The top of the tank car platform to the ground is approximately 12 feet. A fall would result in a serious injury or fatality. 49 CFR Part 231 (Railroad Safety Appliance Standards) requires the safety railing to enclose the operating rail tank car platform, and be open only at the at the platform access ladder locations.

Placards showing the presence and types of hazardous materials contained therein are federally required on tank cars carrying such materials. Without this rail tank car contents identification, emergency responders would not have the necessary information they need available regarding rail tank car contents. Subsequently, in the event of a rail tank car hazardous materials release, emergency responders could erroneously apply the wrong release mitigating procedure, resulting in a fire or explosion. 49 CFR Part 172 (Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans) requires the railroad to maintain the placards so they are in the correct format, visible, legible, and in the correct color, and that tank cars containing specified hazardous materials be marked on each side with the key words of the proper shipping name.

The CPUC inspectors discovered three instances where some tank car placards were missing or in an incorrect format, and 10 instances where the proper shipping name was either illegible or missing. This was particularly serious regarding four tank cars found by the CPUC inspectors that contained non-odorized LPG. The four rail tank cars were not properly marked indicating the commodity. 49 CFR Part 172 requires a rail tank car carrying non-odorized LPG to be legibly marked on two opposing sides. Non-odorized LPG cannot be detected without specific sensors. A rail tank car release of non-odorized LPG increases the risk of fire and/or explosion. This is an example of the importance of proper marking and placarding of a commodity for the benefit of emergency responders.

The inspectors verbally reported these defects to the CNR train conductor, as soon as the train crew arrived to take possession of the train. Railroads can hold the cars from transportation until the cars are brought into compliance, as they were in this instance. Shippers are responsible for making arrangements to correct the defects.

The UPRR and the two shippers involved were issued defect reports. Both shippers committed to reviewing the outbound inspection procedures at their facilities. Additionally, the CPUC inspectors discussed their findings with the UPRR Car Department Manager in Roseville. He stated that he would discuss the CPUC findings with his car inspection staff and stress the importance of compliance with his employees at their start-of shift safety meetings. As a result

of the inspectors' proactive contacts with the shippers and railroad, incidents of non-compliance in these matters have dropped to near zero.

February 12, 2018: CPUC inspectors conducted a routine inspection of the UPRR Plaster City Yard, approximately 20 miles west of El Centro. The inspectors observed several rail cars stored on a track that were left physically in the foul of an adjacent track.³² This situation was in violation of 49 CFR Part 218 (Railroad Operating Practices) and UPRR's General Code of Operating Rules. This situation could have resulted in a serious injury or fatality to a railroad employee riding the side of a rail car, and derailment or damage to railroad equipment, if a train moving on the adjacent track failed to stop short of the rail cars.

UPRR Management was immediately notified of this condition by the CPUC inspectors. Due to the severity of this situation, a violation with an assessment for civil penalties was recommended to FRA. UPRR management acted immediately to move the cars to a safe location. CPUC inspectors returned to this location on March 12, 2018 for a follow up inspection. No fouling conditions were observed.



Railcar blocking access to an adjacent track

February 20, 2018: Four CPUC inspectors conducted an inspection of the Los Angeles Junction Railway (LAJ) in Los Angeles. During this inspection, the team inspected multiple tank cars containing hazardous materials. The inspectors identified 10 tank cars with valves or closures that were not properly secured. On one tank car, the bottom outlet liquid valve cap was missing. The CFR 49, part 173.31, mandates that rail tank cars are safe for transportation and that rail tank car closures are properly secured.

³² Fouling a track, in this instance, means the placement of a rail car in such a position that the rail car blocks entrance or egress to another track by a train or other equipment.

The CPUC inspectors notified the railroad’s management of the non-compliant conditions. As a result, the cars were moved to a repair track within the yard and placed on hold until repairs could be made by qualified mechanical personnel. BNSF personnel subsequently remediated all of the defects identified (LAJ is a subsidiary of BNSF Railway).

CPUC’s follow-up investigation found that the rail tank car shipper responsible for the missing bottom outlet cap on the rail tank car mentioned above, had previously been cited for numerous violations of U.S. Department of Transportation regulations. The CPUC inspectors recommended to FRA that a civil penalty be assessed against this shipper for violation of federal hazardous materials regulations mentioned above.

CPUC inspectors will conduct additional inspections of hazardous material tank car shipments from the shipper in question to the destination facility in Los Angeles as part of an ongoing FRA investigation regarding the handling of hazardous materials by LAJ.

April 5, 2018: While performing a routine inspection in the city of Wilmington, CPUC inspectors noted a non-compliant condition with CPUC General Order 26-D (side clearances) at a Toyota loading facility on the Pacific Harbor Line (PHL). Vegetation was found growing over the top of a fence and into the railyard. The vegetation was brushing along the sides of railcars, which could cause serious injury to railroad employees riding on the side of rail cars while performing routine work. CPUC GO 26-D requires all structures and obstructions above the top of rail shall have a minimum side clearance of 8 feet inches from the track center.

After being notified by the inspectors, PHL personnel cut back the vegetation to ensure that it would not come into contact with employees riding on rail cars. A follow-up inspection by CPUC personnel verified that the issue had been mitigated.



Vegetation impeding side clearance



Side clearance after vegetation removal

April 5, 2017: A CPUC inspector performed an inspection on rail cars carrying hazardous materials on a UPRR storage track in the city of Crockett. The inspector discovered a post and a sign stating "Warning Petroleum Pipeline" had been erected in the track walkway at a distance of 7 feet 4 inches from track center.

CPUC GO 26-D requires all structures and obstructions above the top of rail shall have a minimum side clearance of 8 feet 6 inches from the track center. GO 26-D also states that "posts, pipes, warning signs and similar obstructions should, where practicable, have a side clearance of 10 feet." This post and sign was erected close enough to the track that a railroad employee riding the side of a rail car could have been knocked off and seriously injured.

The CPUC inspector notified a UPRR manager of track maintenance that the sign must immediately be removed. A follow-up inspection by the CPUC inspector verified that the sign had been removed.

April 23, 2018: A CPUC inspector performed a routine inspection on the Central California Traction (CCT) Railroad in the Port of Stockton. During the inspection, the CPUC inspector identified a walkway hazard on the CCT's San Joaquin River Bridge. The walkway was so deteriorated that it would not support the weight of an average size person. General Order 118-A requires walkways adjacent to railroad tracks to have a reasonable and regular surface for the safety of railroad employees performing normal trackside duties.

The CPUC inspector notified a CCT manager regarding the condition. CCT personnel placed caution tape around the hazard as a temporary safety warning measure and put out a notice to employees regarding the danger. The walkway timbers were replaced the next day. The CPUC inspector performed a follow-up inspection and verified that all repairs had been made.



Unsafe walkway on the San Joaquin River Bridge



San Joaquin River bridge walkway after repair

May 10, 2018: A team of CPUC and FRA inspectors conducted a routine inspection of the UPRR Los Angeles Transportation Center (LATC) Yard. The inspection discovered 45 non-compliant conditions of federal regulations, due to defective appurtenances on various types of rail cars on a UPRR train in the LATC Yard. The train had passed inspection by UPRR

personnel, and was preparing to depart the LATC Yard, when CPUC inspectors discovered the defective conditions.

The inspectors determined that 24 of the defective conditions warranted federal civil penalty recommendations (violations). Twenty-one of the defects were regarded as not serious enough to be recommended as violations. The 45 defects included problems with rail car suspensions, brakes and other safety appliances, such as handholds and running boards.

The railroad initiated immediate remedial actions to correct the defects. One car was removed from the train for repairs. All other defects were repaired before the train's departure.

Appendix E - Examples of Focused Inspections

January 16, 2018: CPUC inspectors, accompanied by BNSF personnel, conducted focused inspections of BNSF Roadway Maintenance Machines (RMMs) for compliance with Title 49 CFR Part 214 (Railroad Workplace Safety) regulations. The BNSF RMMs that were inspected are part of a tie renewal production project (tie gang) that is replacing defective railroad ties with new ties on the BNSF Stockton Subdivision, between Escalon and Stockton. The inspection took place at night due to the tie gangs' work schedule. The RMMs inspected included tie cranes, tie inserters, platers, spikers, and a ballast regulator. A total of fifteen RMMs were inspected.

While the BNSF tie gang was working in full operation, the CPUC inspectors checked for compliance with Railroad Workplace Safety regulations. During these production line operations utilizing RMMs, federal safety requirements must be followed to protect railroad employees working in and around RMMs. Five non-compliances with federal regulations were found: 1) automatic change of direction alarm not audible; 2) illumination device missing, inoperable, or fails to illuminate for 300 feet; 3) failure to equip machine with windshield; 4) failure of operator to tag or report non-compliant condition; and 5) machine without conspicuous display of as-built light weight.

The defects that could be remediated on the spot were corrected. Parts needed for other defects noted were ordered and corrections made once the part arrived, consistent with the requirements of federal RMMs regulations.

March 12-14, 2018: CPUC Hazardous Material Inspectors performed a hazardous materials focused inspections at three locations over a three day period. The inspections were performed at the BNSF A-Yard in San Bernardino; the BNSF Hobart Yard in Commerce; and the International Transportation Services Facility in Long Beach. The United States Coast Guard also participated at the Long Beach location. The inspections concentrated on the marking and labeling of hazardous material packages.

The inspections focused on the following: intermodal facility hazmat operations; proper paperwork including description, classification, quantities, emergency response telephone numbers, and certification for shipment; placarding; marking and stenciling of portable tanks, freight containers and packaging (bulk and non-bulk); blocking and bracing in freight containers; closures (e.g., valves, pressure relief devices, vacuum relief valves, and bottom outlet valves) on portable tanks; presence of dents, gouges, scrapes and visible defects in tank welds and tank frames.

A total of 49 freight containers with 889 non-bulk/ large packages and 11 intermodal tanks were inspected. Multiple non-compliances with federal regulations (49 CFR Chapter I, Subchapter C, Hazardous Materials Regulations [various Parts] and Part 178, Specifications for Packaging), were found, including:

- Freight containers and intermodal tanks were missing placards.
- Freight containers and intermodal tanks were missing marine pollution markings.

-
- Freight containers were missing material identification numbers.
 - An intermodal tank had loose manway cover eyebolts.
 - The blocking and bracing of hazardous materials cargo in a freight container was improperly installed and failed to secure the cargo.

The improper blocking and bracing was considered to be a particularly serious issue, as it could have resulted in hazardous materials containers falling out of their secured positions and spilling their contents.

The shipper was responsible for the defects, and arranged for their remediation. The inspectors recommended to the shipper that it implement better training of its personnel responsible for hazardous materials shipments.



Failed blocking and bracing of hazardous materials containers

Appendix F – Examples of Accident Investigations

CPUC railroad safety supervisors review reported rail incidents and determine whether they need to dispatch an inspector or inspection team to investigate the accident. During 2017-2018, CPUC inspectors investigated 146 accidents and incidents. Examples of accident investigations include:

October 8, 2017: A nine-car Napa Valley Railroad (NVRR) train, a tourist train that originates in Napa County, collided with an excursion van at a private railroad grade crossing while travelling north through the town of St. Helena. The locomotive engineer noticed the van on the grade crossing at a distance of approximately 200 feet prior to reaching the crossing, and made an emergency air brake application while sounding the locomotive's bell and horn. However, while the train had slowed to seven miles per hour prior to impact, the train was unable to stop before hitting the van. The collision resulted in minor injuries to six van passengers. There were no reported injuries to the 277 passengers and five crew members on the train.

All of the injuries to the six van passengers were considered to be minor, although one of the passengers requested medical treatment. The van was moderately damaged in the collision, as the train had reduced speed prior to impact. The train was undamaged, and continued toward its destination after approximately one hour of delay.

A CPUC inspector investigated the incident. The locomotive was not equipped with a train event recorder (black box). Details of the incident were developed through interviews of the train crew, NVRR officers, NVRR police, and other witnesses, as well as on-board video recordings from the locomotive. The video data showed that the van did not stop at the stop sign before the grade crossing and became "high-centered" on the tracks within the crossing (i.e., stuck on a high spot with its wheels unable to gain traction). Witnesses at the scene told NVRR police officers that the locomotive was sounding its horn and bell immediately before entering the grade crossing. Weather was clear, and range of vision was unobstructed for both the train and the excursion van.

In the locomotive video, the van drives into the crossing shortly before the train arrives. The driver is seen leaving the vehicle and waving his arms in an attempt to stop the train seconds before the train reaches the crossing.

Based on the above information, the cause was due to error by the van operator. CPUC staff concluded that there were no violations of railroad operating rules or of state or federal regulations by the train crew.



View of private crossing as seen from east to west, the direction the van was traveling (signs replaced after incident)



View of private grade crossing as seen from south to north, the direction the train was traveling

October 13, 2017: A UPRR freight train derailed 5 rail cars (4 auto racks and 1 boxcar) of its 97 car train in the city of Los Angeles, at approximately 2:55 AM.

The incident was investigated by CPUC railroad safety staff. Data from the train's event recorder did not show improper train handling by its crew.

The derailment blocked two main line tracks. The two main lines were cleared and repaired within 24 hours. During that time, the railroad utilized the adjacent yard tracks to move trains and maintenance equipment around the damaged track area. There were no injuries or hazardous materials releases due to the derailment.

CPUC inspectors determined the root cause of the derailment to be mechanical failure of the stabilizing rod on one of the derailed auto racks.



Derailed auto rack train car



Auto rack being re-railed

April 15, 2018: At approximately 3:55 AM, a hazardous materials release incident took place in the UP West Colton Yard in the city of Colton, San Bernardino County. An unknown amount of anhydrous ammonia liquid and vapor were released from a railroad tank car. The leaking car was discovered by a train crew working in the area who noticed an odor. An evacuation was ordered for a half mile radius from the leaking tank car, which included 63 West Colton Yard railroad employees. No railroad employees sustained injuries as a result of the release and subsequent evacuation. The incident did not affect Interstate 10 operations or the railroad main line tracks, as these locations were outside the evacuation zone, and no non-railroad personnel were within the evacuation zone.

A UP Hazardous Materials (hazmat) manager was notified, as well as local fire departments and the California Office of Emergency Services. The initial cause of the release was identified by the UP hazmat manager as a loose sample line valve on the rail tank car. Once the valve was tightened, the flow of liquid stopped but not the release of vapor. Further examination by UP hazmat manager and the local fire department first responders revealed that the sample line valve was defective. A vapor control system was attached to the sample line valve to catch any escaping vapors, and the car was scheduled for trans-loading to another tank car prior to the

replacement of the defective valve. Once the vapor control system was in place, the evacuation order was lifted, after approximately 2 ½ hours.

CPUC railroad safety staff monitored the railroad’s progress in remedying this incident. The vapor control system was left in place, and the car was monitored 24 hours a day by contractors from American Integrated Services. The air quality was also monitored once per hour in the immediate vicinity. On April 22, the car was trans-loaded by American Integrated Services without further incident and sent to GATX, a tank car repair facility located in Colton, for further inspection and cleaning.

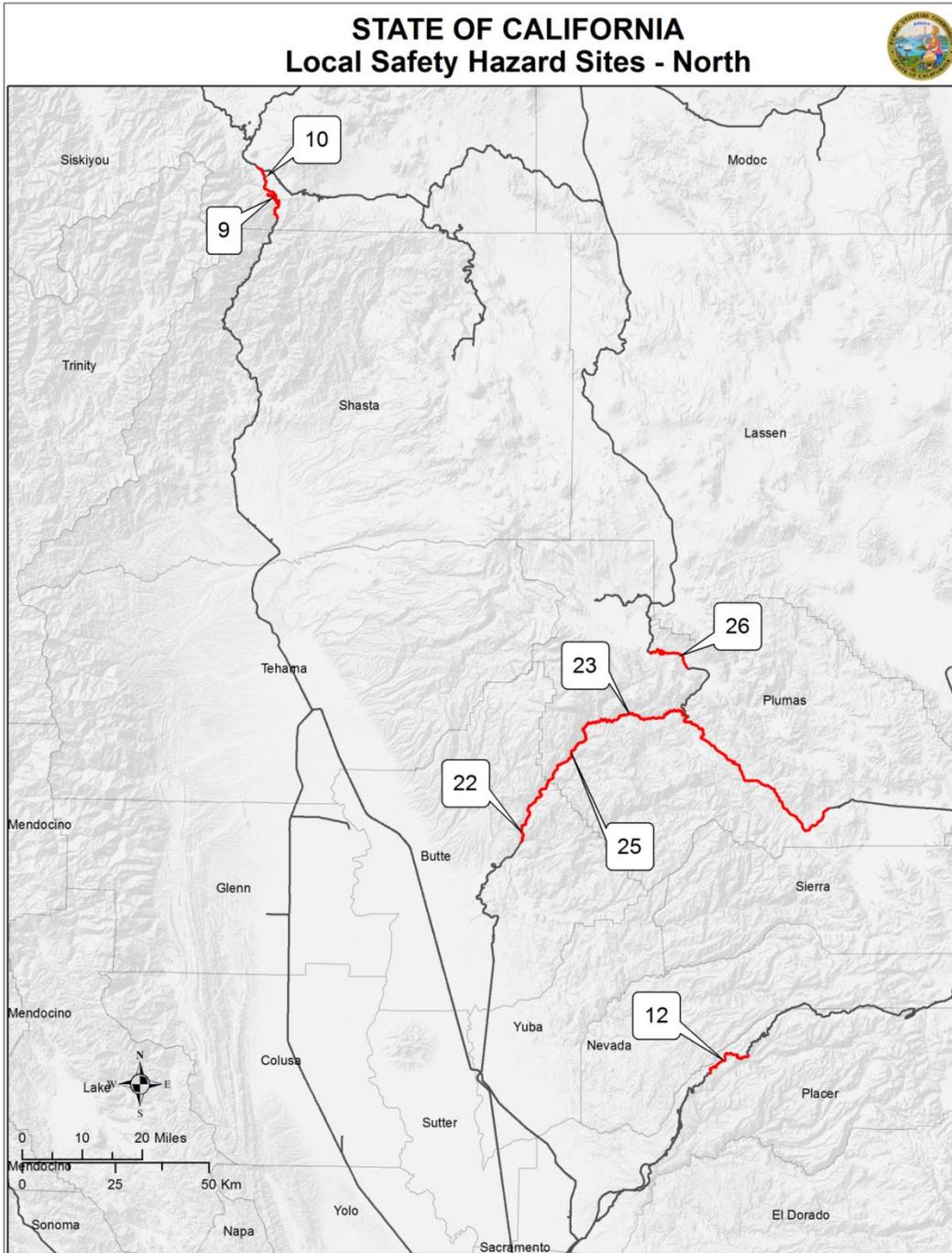
The CPUC and FRA inspectors identified two non-compliances of FRA regulations. Both the sample line valve (liquid) and vapor valve (air), as used on the vapor recovery system, were not “tool tight” (i.e., tightened with an appropriate tool, and unable to be moved by bare hands). The failure to properly tighten the valves was the responsibility of the shipper, rather than the railroad. As described above, the defective valves had to be replaced. The sample line valve issue was cited as an FRA defective condition, but the vapor line valve defect was an FRA recommendation for civil penalties, due to the more serious nature of the commodity venting into the atmosphere and creating a serious inhalation risk.



Vapor control system attached to sample line of the anhydrous ammonia car

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 74 -76 in that order.



STATE OF CALIFORNIA Local Safety Hazard Sites - Central



STATE OF CALIFORNIA Local Safety Hazard Sites - South

