ANNUAL RAILROAD SAFETY REPORT
TO THE
CALIFORNIA STATE LEGISLATURE

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

November 30, 2019
for
Fiscal Year 2018-2019

CALIFORNIA PUBLIC UTILITIES COMMISSION
RAIL SAFETY DIVISION
RAILROAD OPERATIONS AND SAFETY BRANCH

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Roger Clugston, Director

RAILROAD OPERATIONS AND SAFETY BRANCH

Robert Grimes, Program Manager

Table of Contents

List of Abbreviations

ACEX	Altamont Corridor Express
ATK	Amtrak
BNSF	BNSF Railway
CFR	Code of Federal Regulations
CHSRA	California High Speed Rail Authority
CORT	Crude Oil Reconnaissance Team
CPUC	California Public Utilities Commission
FRA	Federal Railroad Administration
GO	General Order
GOTP	General Order Training Program
HSR	High Speed Rail
LPG	Liquefied Petroleum Gas
LSHS	Local Safety Hazard Site
MP&E	Motive Power and Equipment
NEPA	National Environmental Policy Act
NWP	Northwestern Pacific Railroad
OES	Office of Emergency Services
OP	Operating Practices
PCMZ	Caltrain
PSRR	Pacific Sun Railroad
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
RSD	Rail Safety Division
RTEP	Railroad Tunnel Evaluation Project
RvSD	Revenue Service Demonstration
SCAX	Metrolink
SDNX	North Coast Transit District
SJVR	San Joaquin Valley Railroad
SMART	Sonoma-Marin Area Rail Transit
UPRR	Union Pacific Railroad

Annual Railroad Safety Activity Report
Fiscal Year 2018-2019

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

Executive Summary

The California Public Utilities Commission's (CPUC or Commission) [1] statewide railroad safety responsibilities are performed through its Rail Safety Division (RSD). The Railroad Operations and Safety Branch (ROSB), a unit of RSD, enforces state and federal railroad safety laws and regulations governing freight and passenger rail in California.

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

- PU Code Section 916 requires CPUC 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 CPUC to report on the actions it has taken to comply with Section 765.5, which requires 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 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 CPUC to annually report the results of its investigations of runaway trains or other uncontrolled train movements that threaten public health and safety. This is included in this report, beginning on page 49.

- PU Code Section 916.2 requires CPUC to report to the Legislature on sites on railroad lines in California it finds to be hazardous. The report is to include a list of all derailment accident sites in the state where accidents have occurred within at least the previous five years, and a list of all railroad sites in the state that the Commission has determined to pose a local safety hazard (called Local Safety Hazard Sites [LSHS]). Section 916.2 permits this report to be combined with the report required by Section 916. The list of derailments is located on the Commission's website at

[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 PU Code Section 308.

http://www.cpuc.ca.gov/rosb/, and the list of LSHS, documented by calendar year, is presented beginning on page 54.

- PU Code Section 916.3 requires CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of CPUC's activities. This report includes the assessment, beginning on page 56.

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

Public safety and risk management are paramount to CPUC's 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

CPUC performs proactive safety efforts to reduce safety risks associated with railroads. These include the following:

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 address safety risks that, while not violations of regulatory requirements, pose potential risks to public or railroad employee safety. Examples of the work performed by CPUC inspectors are shown in Appendix D (Examples of Regular Inspections), Appendix E (Example of a Multi-Site Focused Inspection), and Appendix F (Example of an Accident Investigation).

During FY 2018-2019 CPUC inspectors:

- Performed 4,463 inspections and follow-up inspections to monitor the railroads' compliance with federal and state laws, and CPUC General Orders (GOs).
- Performed 186 safety surveys (bridge and tunnel).
- Cited 9,975 federal regulation defects.
- Recommended civil penalties for 233 violations of federal regulations.

- Completed 413 CPUC GO reports that identified 979 state regulation defects.

CPUC inspectors complete **Risk Management Status Reports** (RMSRs) when they identify risks that may not be addressed by existing railroad rules or regulations. Once an RMSR is documented, the assigned inspector and his/her supervisor meet with the responsible railroad, shipper or associated entity's responsible representative, convey the safety risk linked with the issue, and define a time period in which the risk should be addressed. The CPUC railroad safety inspector performs a follow-up inspection to determine whether the risk was mitigated. If the railroad fails to eliminate or sufficiently mitigate the risk, the CPUC Program Manager will pursue resolution with the responsible railroad officials, and if necessary, bring the issue up to the Director or to the full Commission for further enforcement action. During FY 2018-2019, CPUC inspectors created nine new RMSRs. Appendix B provides an example of a Risk Management Status Report.

CPUC's **Crude Oil Reconnaissance Team** (CORT) is comprised of CPUC inspectors from all five railroad disciplines. Team members obtain information from California refineries, such as planned crude oil unit train shipment arrival dates and routes. (A unit train is a train that is composed of cars carrying a single type of cargo, and a crude oil unit train carries only crude oil). CORT submits a monthly report to ROSB management on crude oil shipments coming into the state.

Currently, there are two active crude-oil-by-rail unit train facilities in California: the Plains All American facility in Taft, near Bakersfield, and the Kern Oil Refining facility, in Bakersfield. A total of 75 crude oil unit trains entered California during the past fiscal year, with each unit train carrying 100 tank cars. This was an increase of 34 percent over the previous fiscal year.

During FY 2018-2019, CORT expanded its scope to cover additional hazardous materials-related activities besides crude oil shipments. Starting in February 2019, the team began tracking the number of unit trains carrying ethanol entering the state. In April 2019, the team began tracking the number of individual tank cars containing ethanol or Liquefied Petroleum Gas (LPG) in storage at various locations throughout California. Data produced by these new activities will assist other agencies if cars carrying such commodities release their contents due to derailments or other types of incidents.

During the last fiscal year, CPUC inspectors from the **Railroad Bridge Evaluation Program** (RBEP) performed 155 bridge observations and created two RMSRs to improve the safety of the state's railroad bridges. Railroad bridges and their approaches 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. Such conditions can create high adverse consequences to the public and environment should a railroad bridge suffer structural damage or other failure while railcars are crossing over it.

The **Railroad Tunnel Evaluation Project** (RTEP) evaluates railroad tunnel conditions. 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 moving through tunnels.

CPUC staff have completed railroad tunnel inventories for all railroads operating in California. There are approximately 120 such tunnels that are in use and approximately 30 that are not in service. RTEP inspectors are proceeding to inspect these tunnels and did inspect 32 tunnels this past fiscal year. The inspectors document tunnel and track conditions by taking photographs and videos and completing tunnel survey forms. Future tunnel surveys can use this information to assess whether tunnel conditions have worsened and if so, to what extent. A representative of the railroad responsible for the tunnel is present during the inspections, and they are made aware of concerns brought up by the CPUC inspection team.

Through its **Rail Head Wear Project**, CPUC is working to address the problem of 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 Federal Railroad Administration (FRA) and the railroads collect rail head wear measurements under some circumstances. However, as described in previous Annual Reports, there are no regulations mandating when rail should be replaced due to rail head wear. There are no current efforts by FRA to promulgate such regulations.

CPUC is working with the railroads to develop contingency plans to measure and address excessive rail head wear conditions before they become problematic. During FY 2018-2019, CPUC continued its efforts in the area of rail head wear by monitoring rail head wear by utilizing high-grade manual rail head wear gages in critical areas throughout California. By collecting evidence of the seriousness of head wear, CPUC potentially can influence the responses of railroads and the FRA to this problem.

The **General Order Training Program** (GOTP) was initiated to improve the understanding by CPUC inspectors of CPUC's railroad's safety General Orders

and a related PU Code section. Prior to this program, the training of newly hired inspectors about the requirements of these Orders and the Code happened on an ad hoc basis. Experienced inspectors would point out nonconformances with these provisions to new inspectors, with little standardization and with mixed results, in part because of the different backgrounds and levels of knowledge of even experienced inspectors.

Thirty-eight inspectors have gone through the GOTP by the close of fiscal year 2018-2019. Two presentations on GOs 118-A and 26-D also were given to BNSF Railway (BNSF) and Union Pacific Railroad (UPRR) personnel. The effectiveness of the GOTP is shown by the difference in the number of General Order defects detected during inspections in FY 2018-2019 (979) as compared with the previous fiscal year (509), a 92 percent increase.

CPUC railroad safety staff are working on the implementation of **High Speed Rail** (HSR) in California. The California HSR system would 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. CPUC railroad safety staff attend CHSRA 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.

Additional proactive safety activities by CPUC inspectors in FY 2018-2019 included:

- Performance of 21 **Positive Train Control** (PTC) field tests and demonstrations, performance of 94 PTC surveillance observations, and monitoring of 23 PTC status meetings. PTC is designed to prevent a variety of accidents, including train-to-train collisions, overspeed derailments, and incursions into work zones.

- **Operation Lifesaver** (OLI) activities. OLI is a nonprofit organization that administers a railroad safety public awareness campaign. CPUC inspectors and other staff have volunteered to make OLI presentations over the past decade. During FY 2018-2019, CPUC staff performed 173 such presentations and attended 37 community-wide events. See Appendix C.

Investigations of Runaway Trains

PU Code Section 916.1 requires CPUC to annually report the results of its investigations of runaway trains or other uncontrolled train movements that threaten public health and safety. In FY 2018-2019, CPUC investigated seven

instances of uncontrolled train movements. However, only one had a high potential of threatening public health and safety.

Local Safety Hazard Sites

PU Code Section 7711 requires CPUC to report to the Legislature on railroad sites in the state it finds to be hazardous. The sites on railroad lines CPUC identified as hazardous were identified in 1997 in a formal Commission Decision, D.97-09-045, and were termed Local Safety Hazard Sites.

Section 7711 also requires 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.[2] 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 2018-2019 on UPRR and 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

Major challenges faced by the Rail Safety Division's ROSB include:

- Several PU Code sections require railroads to report certain types of accidents either directly to CPUC or to the California Office of Emergency

[2] A list of derailments is located at http://www.cpuc.ca.gov/rosb/

Services (OES), which then notifies CPUC. Other PU Code sections require CPUC to investigate these accidents. In CPUC's 2015 and 2016 Annual Railroad Safety Activity Reports,[3] 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 accidents to the OES and/or CPUC.

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 information is disseminated to CPUC in a timely manner.

- Many locations in California near railroad tracks have been occupied by homeless individuals and encampments, and trespassing on railroad rights-of-way by homeless people has become a frequent occurrence. This poses an increased risk to the homeless of being struck by trains. Also, homeless encampments often create unsafe work environments for railroad and agency personnel.

  While CPUC cannot compel homeless people to vacate railroad rights-of-way or create shelter for homeless individuals, it has the regulatory authority to enforce measures that can reduce some safety issues created by homeless encampments. The disposal of waste materials or other disturbances of walkways by homeless people can create tripping hazards in the vicinity of railroad rights-of-way. This would cause violations of GO 118-A, which sets standards for walkway surfaces alongside railroad tracks. Similarly, tents, wooden structures, and miscellaneous debris in homeless encampments can create violations of Commission GO 26-D, which sets clearance standards between railroad tracks, and structures and obstructions adjacent to tracks. CPUC staff have met with local governmental officials and railroad company personnel to discuss ways of addressing homeless issues related to railroad safety.

[3] http://www.cpuc.ca.gov/rosb/

I. Introduction

The California Public Utilities Commission (CPUC or 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 (PU) Code sections set out CPUC responsibilities. In particular, under PU Code 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 Rail Safety Division (RSD) 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 RSD, three Branches – the Rail Operations and Safety Branch (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 RSD 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.[4]

ROSB protects California communities and railroad employees from unsafe practices on freight and passenger railroads by enforcing state and federal rail safety rules and regulations, performing 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.

Title 49 of the Code of Federal Regulations (49 CFR) Part 212 established the State Safety Participation Program with the Federal Railroad Administration (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

[4] 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.

regulations.

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

CPUC employs inspectors who possess expertise in specific railroad disciplines: hazardous materials, motive power and equipment, operating practices, signal and train control, and track, as well as railroad bridges and tunnels.[5] The inspectors also identify and address additional public safety risks associated with railroad systems.

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. CPUC also requires each applicant to pass a written and oral exam.

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 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 an 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 all of the required tasks are completed, the CPUC inspector must then pass a certification field test. An FRA safety specialist who is 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.

CPUC employs 41 FRA-certified inspectors to perform safety inspections and investigations pursuant to the State Participation Program.[6] The federally-certified inspectors enforce railroad safety and operating rules, and rail safety regulations, by performing inspections and accident investigations. CPUC's rail safety responsibilities include:

- Inspecting railroads for compliance with railroad safety and operating rules, and state and federal railroad safety laws.

[5] FRA certifies the inspectors as experts in these disciplines, except for bridges and tunnels. 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.

[6] Pursuant to 49 CFR Part 212.

- 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 CPUC to report on the actions CPUC has taken to comply with section 765.5, which requires CPUC to take all appropriate action necessary to ensure the safe operation of railroads in this state. Safety culture improvement and proactive risk management are integral to CPUC's 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.

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, CPUC embraces a comprehensive safety management approach that integrates public policy, risk management, and compliance with federal and state laws and CPUC General Orders (GOs). This approach is used as a foundation for continuous improvement of the regulated utilities' safety as well as CPUC's safety oversight role.

CPUC inspectors identify public safety risks, "beyond the regulations." 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, CPUC uses proactive tools, cooperative engagement, and presentation methods, such as:

- Risk Management Status Reports

- Crude Oil Reconnaissance Team

- Railroad Bridge Evaluation Program

- Railroad Tunnel Evaluation Project

- Rail Head Wear Project

- Operation Lifesaver Presentations

- Near-miss Reporting and Analysis

- Positive Train Control Team

- High-Speed Rail Oversight

A. Risk Management Status Reports

In the course of field work, CPUC railroad safety inspectors sometimes identify items of concern that are either: (1) out of their area(s) of expertise; (2) outside of formal/official reporting and action protocols; or (3) despite prior formal or informal regulatory action, are still safety risks. When this happens, the inspectors complete a Risk Management Status Report (RMSR).

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

An example of an RMSR is presented in Appendix B.

During FY 2018-2019:

- 6 previous fiscal year RMSRs were closed out (i.e., the recommendations were implemented and/or an alternative conclusion was reached with the railroad).

- 9 new RMSRs were created. The issues were as follows:

    - 6—Bridge safety
    - 1—Grade crossing
    - 1—Movement of railcars/trains within a railyard/train securement
    - 1—Railyard condition

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

B. Crude Oil Reconnaissance Team

On July 6, 2013, an unattended 74-car freight train rolled down a slope and derailed in the town of Lac-Megantic in Quebec, Canada. The resulting explosion killed 47 people and destroyed large portions of the town. Recognizing the significance of this incident and of the increasing development of railroad infrastructure to handle crude oil shipments, CPUC created the Crude Oil Reconnaissance Team (CORT).

CORT is comprised of CPUC inspectors from all five railroad disciplines (track, signal and train control, hazardous materials, motive power and equipment, and operating practices). Team members obtain information from California refineries, such as planned crude oil unit train shipment arrival dates and routes. A unit train is a train that is composed of cars carrying a single type of cargo, and a crude oil unit train carries only crude oil. The trains tracked by CORT typically have around 100 individual tank cars. CORT also verifies the origin of crude oil shipments, in particular, whether the shipments contain Bakken crude, which is more volatile than most other types of crude oil. The team monitors crude oil unit trains to ensure that if Bakken crude enters the state, the Rail Safety Division is informed.

Most of the crude oil entering the state arrives in unit trains. However, some crude also enters in individual tank cars that are part of trains carrying mixed cargos, known as "manifest trains." Crude oil cars travelling in manifest trains are difficult for CORT to track until they reach a rail yard. This is due to several factors. While to date there have been only a few dozen crude oil unit trains entering California over the period of an entire year (75 in FY 2018-2019; see below), 25 to 30 manifest trains that have the potential to carry crude oil cars enter the state each day. Such trains might have 50 to 100 cars. Only a small number of these trains, and only a small number of cars on these trains, might actually be carrying crude. Refineries do not have information about which manifest trains are carrying crude oil cars, and therefore cannot inform CPUC about their arrival dates, routes, or contents.

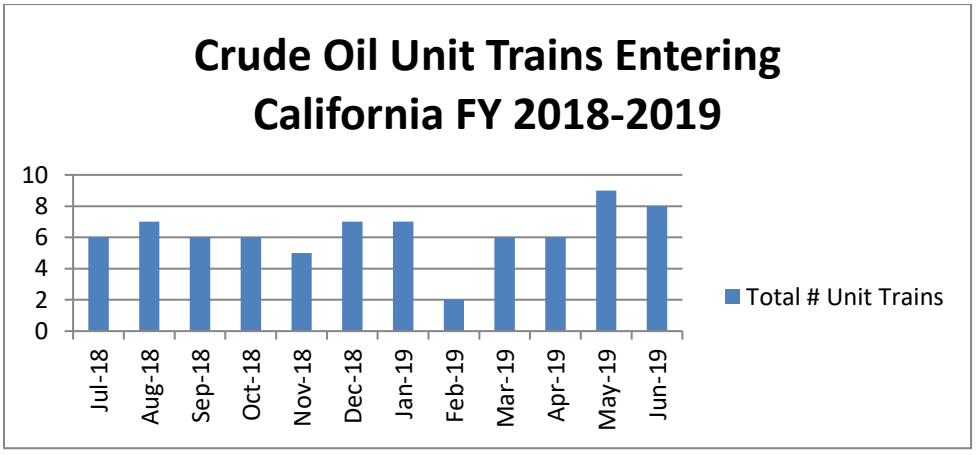
CPUC does not have the personnel to check the large number of manifest trains, and cars on such trains, that might be carrying crude oil. Information about tank car contents is submitted to emergency management agencies if a derailment or other emergency occurs, but not on a routine basis otherwise. However, once crude oil tank cars reach rail yards, CPUC is able to obtain information about them from the yard masters, who know the contents of the various tank cars within their facilities as well as their final destinations once they leave the yards.

CORT personnel also inspect crude oil transfer facilities and related infrastructure

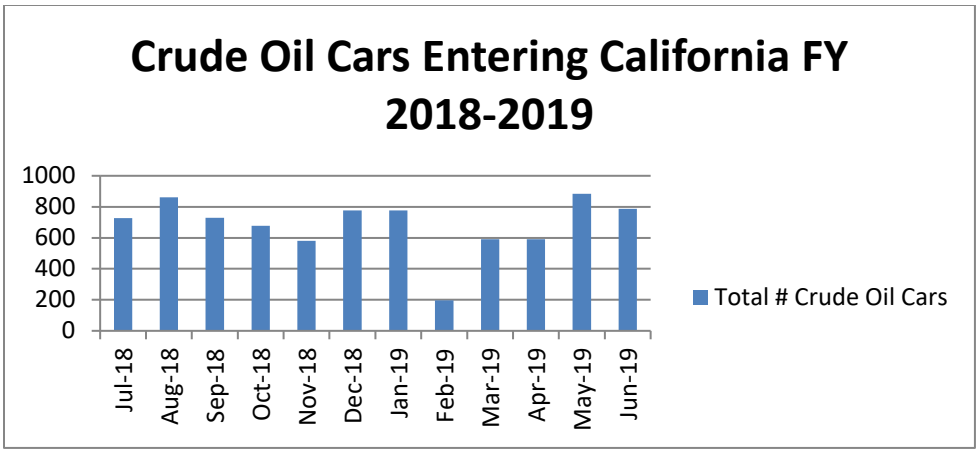
to verify compliance with state and federal railroad regulations, as well as CPUC railroad-related GOs. As part of these efforts, the team obtains data from each facility pertaining to its actual and expected future monthly train count, which are used to formulate a monthly CORT report on crude oil shipments coming into the state.

Currently, there are two active crude-oil-by-rail unit train facilities in California: the Plains All American facility in Taft, near Bakersfield, and the Kern Oil Refining facility, in Bakersfield.[7] A total of 75 crude oil unit trains entered California during the past fiscal year, with each unit train carrying 100 tank cars. This was an increase of 34 percent over the previous fiscal year. The Plains All American facility received 68 unit oil trains, all originating in Edmonton, Canada, and containing heavy crude. Kern Oil Refinery received seven light crude oil unit trains, all originating from Carlsbad, New Mexico. Last year, comparable figures were 58 unit trains entering California, each carrying 98 loaded tank cars, with the Plains facility receiving 49 unit trains and the Kern facility receiving 9.

Delta Trading in Bakersfield, another facility covered in last year's Annual Report, received individual crude oil tank cars during FY 2018-2019, but no unit trains, as the facility is not large enough to receive unit trains. It no longer receives crude oil by rail. Prior to shutting down their rail operations, they received a total of 650 loaded tank cars of crude oil from July 2018 to January 2019.



[7] In January 2019, the San Ardo oil well facility ceased shipping crude oil by rail. No refining was ever done there.

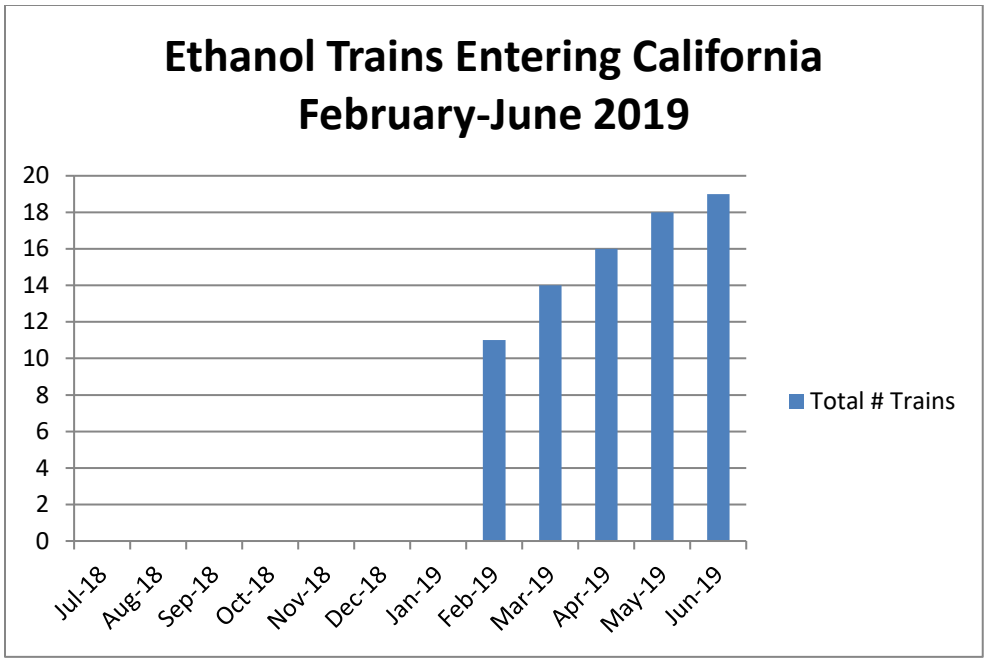


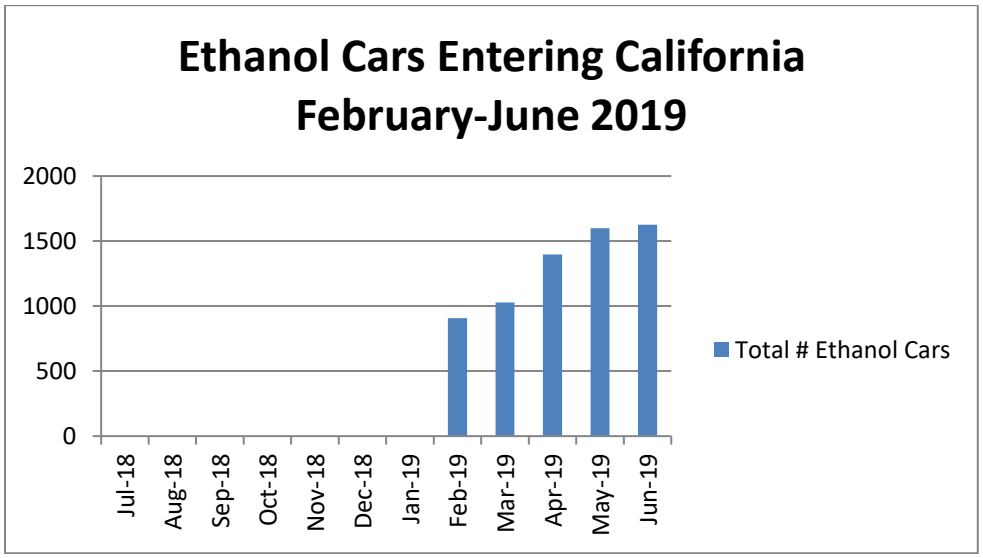
During FY 2018-2019, CORT expanded its scope to cover additional hazardous materials-related activities besides crude oil shipments. Starting in February 2019, the team began tracking the number of unit trains carrying ethanol entering the state. In April 2019, the team began tracking the number of individual tank cars containing ethanol or Liquefied Petroleum Gas (LPG) in storage at various locations throughout California. Data produced by these new activities will assist other agencies if cars carrying such commodities release their contents due to derailments or other types of incidents.

Ethanol unit trains entering the state. Ethanol is an extremely volatile commodity that moves in large volumes throughout the state. Currently, there are two facilities that handle unit trains of ethanol in California: Kinder Morgan and NuStar. CORT began collecting monthly train shipment data for Kinder Morgan in February 2019, and NuStar in April 2019. As with crude oil, individual ethanol cars entering the state cannot be tracked until they reach rail yards and are assembled into trains with known final destinations.

Kinder Morgan, located in Wilmington, receives ethanol by rail, then moves it via pipeline to various refineries in Los Angeles County. Lomita Rail Terminal handles the delivery and removal of tank cars going to the Kinder Morgan facility. This rail terminal received 67 unit trains of ethanol from February through June 2019. BNSF transports the cars from Arizona to Wilmington, California, where Lomita Rail Terminal then delivers them to Kinder Morgan. When there is no room for these cars at the Kinder Morgan facility, they are stored in a siding outside of the Kinder Morgan facility or a rail yard in Barstow.

Nustar Energy is located near Oakland. During the period March through June 2019, the facility received 11 ethanol unit trains, each with 96 cars. The trains arrived from Canada via Union Pacific-controlled track. Upon arrival, the product is placed in storage tanks until being shipped by truck or pipeline to various refineries.





Storage of tank cars containing ethanol and LPG. Several short-line railroads have begun leasing empty track space to vendors for storage of both empty and loaded cars containing ethanol or LPG as a means of generating additional revenue. Most of their customers store LPG tank cars. When there is a demand for one or more of these cars, they are removed from storage on a first-in first-out basis.

To discover the number of stored cars carrying these commodities, CORT contacts FRA personnel, railroad managers, vendors, and train crews to locate yards storing both loaded and empty cars throughout California. To date, four storage areas have been located, with storage at each of these locations fluctuating between 50 and 150 cars per month. The Rail Safety Division

conducts compliance inspections of these locations on a regular basis. When a defect is found, such as missing placards, the railroad and the vendor are both notified. Depending on the lease agreement, either the railroad or the vendor is responsible for correcting the defect.

CPUC inspector at a rail car storage facility

C. Railroad Bridge Evaluation Program


CPUC inspector inspecting a railroad bridge

Railroad bridges and their approaches 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 more than 100 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. Such conditions can create extremely dangerous consequences to the public and environment should a railroad bridge suffer structural damage or other failure while railcars are crossing over it.

Title 49 CFR Part 237 requires railroad track owners to create a bridge management program, perform annual bridge inspections, and calculate load capacities. 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.[8]

Two CPUC inspectors focus on bridge integrity, collaborate with the FRA railroad bridge program, and perform railroad bridge program observations. CPUC inspectors prioritize bridge observations based on several factors, such as the proximity of railroad bridges to the identified Local Safety Hazard Sites across the state, or to saltwater bodies, where salinity can cause increased rates of corrosion.

During FY 2018-2019, CPUC inspectors who specialize in bridges performed the following:

- 155 total bridge observations.
- 31 FRA track inspection reports (including track condition violations).
- 14 State General Order Inspections (including walkway and obstruction violations).
- 8 RMSRs (notifications to railroads about bridge safety concerns not covered by regulations).

Examples of potentially hazardous conditions are shown below. The second photograph shows a homeless encampment beneath a railroad bridge. As described in Chapter VII of this Report, "Challenges for Rail Safety," such encampments – at any point along the railroad right-of-way, not just bridges – pose dangers to the occupants and to CPUC inspectors.

[8] The FRA has only six 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.

Missing handrail and deteriorated wooden walkway; violations of GO 118-A issued to railroad

Homeless encampment under railroad bridge

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 traveling through tunnels. CPUC is helping to address this problem by assigning staff to evaluate railroad tunnel conditions in the Railroad Tunnel Evaluation Project (RTEP).

CPUC staff have completed railroad tunnel inventories for all railroads operating in California. There are approximately 120 such tunnels that are in use and approximately 30 that are not in service. RTEP inspectors are proceeding to

inspect these tunnels. The RTEP inspection team is made up of CPUC track inspectors. Team members inspect the tunnels and track structures within tunnels by walking the track. The inspectors document tunnel and track conditions by taking photographs, and videos, and completing tunnel survey forms. Information collected on the survey forms include tunnel history; height and width measurements; rail wear measurements; conditions of tunnel walls, ceilings, and floors; adequacy of drainage; and ballast conditions. Future tunnel surveys can use this information to assess whether tunnel conditions have worsened and if so, to what extent. A representative of the railroad responsible for the tunnel is present during the inspections, and they are made aware of concerns brought up by the CPUC inspection team.

The RTEP inspected 32 tunnels this past fiscal year. For example, on February 11, 2019, team members conducted an inspection of a tunnel near Santa Cruz used by the Santa Cruz Big Trees Railroad. This tunnel was built in 1875. The inspection identified poor drainage inside the tunnel caused by drainage ditches being obstructed by debris. Proper drainage is necessary to maintain track stability. Railroad management resolved the drainage problem by removing debris and cleaning the ditches.

View of east entry to tunnel showing drainage ditches obstructed by debris

Mud inside tunnel caused by poor drainage

E. Rail Head Wear Project

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.

FRA and the railroads collect rail head wear measurements under some circumstances. However, as described in previous Annual Reports, there are no regulations mandating when rail should be replaced due to rail head wear. There are no current efforts by FRA to promulgate such regulations.

During FY 2018-2019, CPUC continued its efforts in the area of rail head wear. CPUC is monitoring rail head wear by utilizing high-grade manual rail head wear gages in critical areas throughout California. All CPUC Track inspectors have been issued rail wear gauges to take rail wear measurements. Inspectors measure rail head wear during tunnel surveys and derailment investigations, and at Local Safety Hazard Sites. Depending on site-specific conditions, they may also take measurements during regular and focused inspections. The inspectors also compare measurements with data collected by the FRA and the railroads. By collecting evidence of the seriousness of head wear, CPUC potentially can influence the responses of railroads and the FRA to this problem.

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 Rail Safety Division's practice of looking beyond the regulations. This ongoing project has already allowed 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.

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 other staff have volunteered for Operation Lifesaver over the past decade. These personnel 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.

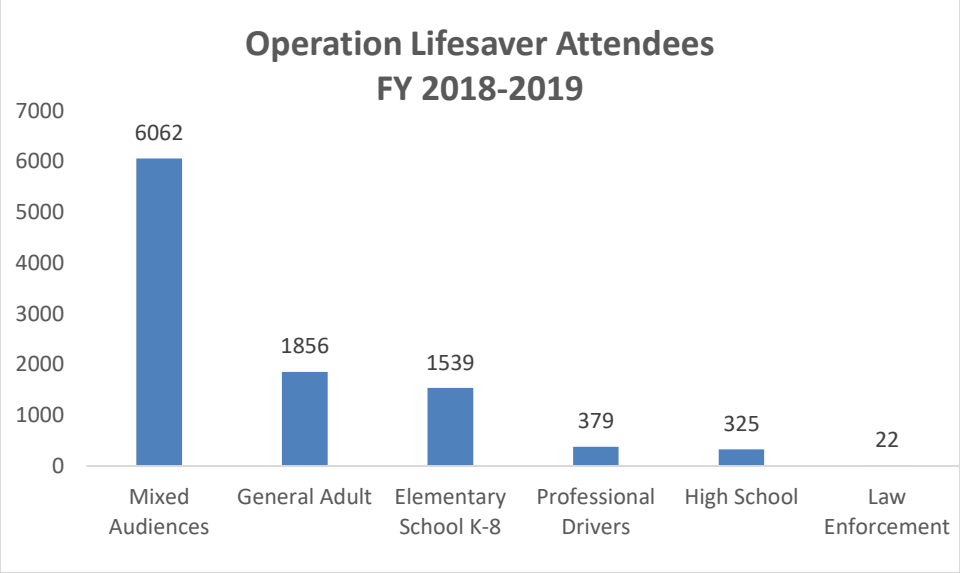
During FY 2018-2019, among other activities, a CPUC employee made 12 Operation Lifesaver presentations to 227 professional bus drivers in five different counties. Depending on their routes, bus drivers may frequently cross railroad grade crossings and are one of the target audiences of Operation Lifesaver. The presentations concentrated on three safety issues:

- Bus drivers may be the first to notice various safety issues, such as obstructed views of railroad crossings due to vegetation growth, or safety signage or equipment (e.g., crossing gates) needing repair. In such cases, the drivers should contact their management to make other bus drivers aware of safety issues, and to contact the railroads involved.

- Bus drivers should be aware of the dimensions of their vehicles so that when they approach a grade crossing, they can avoid becoming stuck on the tracks.

- The bus drivers were reminded of the meanings of railroad signs. For example, a grade crossing with multiple tracks will have a sign designating the number of tracks. Also, when a railroad crossing gate is lowered and/or the signal lights are blinking then the warning devices should be treated as a stop sign. Vehicles must come to a complete stop and only continue driving when the gates are raised, and it is safe to do so.

Appendix C provides examples of Operation Lifesaver presentations.



During FY 2018-2019, CPUC railroad safety staff:

- Performed 173 Operation Lifesaver presentations
- Attended 37 community-wide events

- Reached approximately 10,200 people

Operation Lifesaver events included:

- ACE/AMTRAK Rail Safety Event
- Annual Riverside Emergency Preparedness Fair
- Burbank Fire Safety Day
- Cabazon Elementary School
- California Truckers Association
- CAL OES Open House
- Coach USA Professional Drivers
- Cosumnes Oaks Drivers Ed
- CPUC Halloween Fair
- Del Mar Junior Lifeguards
- Fairmont Elementary School
- Firebaugh CVIIC Immigration Workshop
- Get Behind the Wheel Event
- Great Valley School Ag Day
- Lankershim Elementary School
- Los Angeles Angels Rail Safety Presentation
- Olive Street School
- OmniTrans - Professional Drivers
- Pacific Harbor Line Health Fair
- Pacific Surfliner - Petco Park
- Roosevelt Elementary School
- San Clemente Junior Lifeguards
- San Clemente Ocean Festival
- San Joaquin AgVenture
- San Juan Capistrano Station
- San Luis Obispo Railroad Days
- Simi Valley Transit Operators
- Sonoma Safe Routes Bike Rodeo
- Southland Transit Drivers
- Union Station Train Fest
- Zenith's Ag Safety & Compliance Summit

G. 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 may use a combination of wired or wireless digital 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 involving different track blocks, 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, stop indication, a switch improperly aligned, or a work zone boundary which has not been given the approval to pass by the Employee-In-Charge, 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, stop indication, switch in wrong position location, or work zone is violated.[9]

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). Two different types of PTC systems are in use within California. 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.

Metrolink (SCAX) is currently interoperable with its host system territory. Tenant railroads North Coast Transit District (SDNX), Amtrak (ATK), BNSF Railway (BNSF), and Union Pacific Railroad (UPRR) are interoperable on SCAX territory, SDNX is currently interoperable with its host system territory. Tenant railroads SCAX, ATK, BNSF, and Pacific Sun Railroad (PSRR) are interoperable on SDNX territory. BNSF is currently interoperable with its host system territory. Tenant railroads SCAX, ATK, SDNX, and UPRR are interoperable on BNSF territory. UPRR is currently

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

interoperable with its host system territory. Tenant railroads SCAX, ATK, BNSF, and Altamont Corridor Express (ACEX) are interoperable on UPRR territory. ATK as a tenant railroad is interoperable with SCAX, SDNX, BNSF, and UPRR host territory. ACEX as a tenant railroad is interoperable on UPRR host territory. Caltrain (PCMZ) is still in progress of implementation and must perform Revenue Service Demonstration (RvSD) prior to interoperability operations with tenant railroads UP, ATK, and ACEX.[10] Sonoma-Marin Area Rail Transit (SMART) is working towards interoperability with tenant railroad Northwestern Pacific Railroad (NWP). NWP is not interoperable due to pending prerequisite testing on SMART host territory. See the PTC status tables below.

CPUC has two PTC inspectors. One has expertise in railroad operations; the other has an extensive technology background, which is essential in understanding the complexities of PTC software design. A Superintendent is the lead for the group. The PTC inspectors have been actively engaged in observations of design review, component and wayside appurtenance testing, PTC system, train interface operations, inspections, and direct observations during the development, construction, implementation, maintenance, and continuation of PTC systems in California.

California PTC Status: Passenger Railroads

While the implementation of PTC has made significant progress in passenger service, not all passenger lines met the 2018 deadline. However, these California passenger railroads may meet the 2020 deadline:

[10] After reaching the required level of installation and testing, the railroad files an application with the FRA to begin RvSD with PTC. RvSD entails operating revenue (passenger and/or freight) trains with PTC in operation. RvSD allows the railroad to collect data on the behavior of the system under normal railroad operational conditions and allows the railroad to collect required data to support assertions made in the PTC Safety Plan.

	Passenger Railroad	Stage of PTC Implementation
1	SCAX	Conditional Certification.[11] Interoperability with tenants BNSF, UP, SDNX, and ATK on all host territory.
2	SDNX	Conditional Certification. Interoperability with tenants SCAX, ATK, BNSF, and PSRR.
3	SMART	In Extended RvSD as of April 10, 2019. Conducting interoperability testing with tenant freight railroad NWP with anticipated freight RvSD by November 2019.
4	ATK	ATK is a tenant railroad in California. Interoperability with host railroads SCAX, SDNX, BNSF, and UP.
5	PCMZ	Continuing with PTC testing. Working towards RvSD by Q4 2019 with interoperability testing by Q4 2019 with tenant railroads ATK, ACEX, and UP.
6	ACEX	ACEX is a tenant railroad in California. Q4 2018 RvSD interoperability with host railroad UP. Waiting for interoperability testing with host railroad PCMZ anticipated in Q4 2019.

California PTC Status: Freight Railroads

In the freight railroad industry, PTC made significant progress during the 2018/2019 Fiscal Year. Four freight railroads in California were required to implement PTC: UP, BNSF, PSRR, and San Joaquin Valley Railroad (SJVR). UPRR and BNSF are required to implement a PTC system as per federal regulations as set forth in 49 CFR 236.1005 (Requirements for Positive Train Control Systems). PSRR 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.

[11] FRA Conditional Certification of the railroad's Safety Plan and PTC system granted. The Safety Plan demonstrates to the FRA that the respective railroad's PTC system meets all of the federal requirements and works as stated.

	Freight Railroad	Stage of PTC Implementation
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 SCAX, SDNX, ATK, and BNSF.
2	UP	All required subdivisions in California have PTC in revenue service. UPRR is interoperable with BNSF, SCAX, ATK, and ACEX. UPRR will work with PCMZ when ready for interoperability.
3	PSRR	The SDNX served PSRR a notice to equip their locomotives with PTC because PSRR operates on SDNX lines. PSRR's parent company is Watco Companies, LLC. PSRR is interoperable with SDNX.
4	SJVR	SJVR shares track with BNSF and UP, which have served notice to SJVR to equip their locomotives with PTC. SJVR's parent company is Genesee & Wyoming Inc. (GWRR). Installation and testing have occurred outside of California.

BNSF PTC wayside location observed by CPUC inspectors in conjunction with an FRA inspector

[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.

CPUC inspector observing a SCAX PTC wayside testing laboratory installation. Switch, signal, and grade crossing warning devices are simulated during testing processes to ensure proper operation with the PTC system.

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 FY 2018-2019, CPUC staff performed the following:

- Conducted observations of 21 field activities by conducting observations of wayside and on-board equipment in the laboratory and field environments.
- Performed 94 PTC operational surveillance observations.
- Monitored and participated in 23 PTC status meetings.
- Provided ongoing correspondence with the railroads to determine status, challenges, and issues of implementation and continuation.
- Provided monthly reports of PTC activities to CPUC management.

[LEFT] A CPUC inspector observes the engineer operating a SDNX train with PTC system active en-route to San Diego Downtown station (SAN) from Oceanside Transit Center Station (OSD). [RIGHT] A CPUC inspector at OSD after observing PTC interoperability operations inbound from SAN.

H. California High-Speed Rail

The California High Speed Rail (HSR) system would 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.

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.

The HSR system has been planned to connect San Francisco to the Los Angeles basin, with high speed trains designed to be capable of traveling between these destinations under three hours, although actual travel times might exceed that. Train speeds would vary, depending on location, but would be capable of reaching speeds in excess of 200 miles per hour on large portions of the system. Eventually, the system has been planned to extend to Sacramento and San Diego, totaling 800 miles with up to 24 stations.

However, these plans were revised in 2019:

- During his first State of the State address on February 12, 2019, Governor Newsom announced that the HSR system initially will be limited to construction and operation between Merced and downtown Bakersfield.[14] This would cover a distance of approximately 171 miles. Construction of the rail line, installation of tracks and testing of trains and systems are projected to be completed by the end of 2028. The HSR system would connect with diesel-powered passenger trains in Merced, from which passengers could transfer to the Altamont Corridor Express to San Jose, or to the San Joaquin service to Sacramento or Oakland; or transfer to bus service to Los Angeles from Bakersfield. Environmental studies for the San Francisco – Los Angeles/Anaheim segment and some other regional work will continue, but additional funding sources are needed to complete the rest of the system.

Some of the events, through June 2019, associated with this major change in the HSR project are summarized below:

- Following the Governor's statement, the Trump Administration threatened to withhold further funding and to seek reimbursement of federal funds already expended on the project. In a letter to CHSRA Chief Executive Officer (CEO) Brian Kelly from FRA Administrator Ronald Batory, dated February 19, 2019, the FRA gave notice that it intended to terminate the existing Cooperative Agreement between it and California.[15] The termination would prevent the disbursement of $928.62 million in upcoming grant funds. The Department of Transportation also announced that it is "actively exploring every legal option to seek the return from California of $2.5 billion in Federal funds FRA previously granted for this now-defunct project."[16]

- The State responded with a defense of the project and of its use of federal funds. In March 4, 2019 letters to FRA, CHSRA CEO Kelly stated that the CHSRA has met its commitments under its federal grant agreements, and that in addition to the Bakersfield-Madera segment itself, the work that will continue to be performed will enable the Authority to connect that segment to Silicon Valley and Southern California.[17] Several members of the State

[14] For the text of the Governor's statement, see https://www.gov.ca.gov/2019/02/12/state-of-the-state-address/.

[15] Letter, Ronald Batory to Brian Kelley, February 19, 2019, www.fra.dot.gov/Elib/Document/18319.

[16] "U.S. Department of Transportation Announces Cancellation of Grant Funds to CA High Speed Rail Project," https://www.transportation.gov/briefingroom/dot0719

[17] Letter, Brian Kelly to Ronald Batory, https://www.hsr.ca.gov/docs/newsroom/2019_Batory_030419.pdf; letter, Brian Kelly to Jamie Rennert, Director of the FRA Office of Project Delivery,

Legislature and of California's Congressional delegation communicated their support of the project to U.S. Department of Transportation Secretary Elaine Chao.

- On May 1, 2019, the CHSRA issued a Project Update Report to the State Legislature. Among other topics, the Report discussed problems related to project funding, cost increases, schedule delays, and other risks. A major issue identified in the Report was the FRA's disengagement with the CHSRA:

  > The most significant schedule risk facing the Authority today is the Federal Railroad Administration's (FRA) withdrawal in completing its responsibilities under the National Environmental Policy Act (NEPA). Since July 2018, the FRA has not acted as required to complete the combined state and federal reviews on environmental deliverables identified in the ARRA [American Recovery and Reinvestment Act] agreement. This includes failure to complete necessary document reviews under NEPA and related federal environmental laws and agreements, not participating in coordination meetings with other federal agencies, and refusing to sign draft Environmental Impact Statements (EIS) for public circulation, despite having participated in the development and early reviews of the documents.[18]

- On May 16, 2019, in a 25-page letter to CEO Kelly, FRA's Batory criticized the CHSRA's performance and stated that the FRA had terminated its agreement with the CHSRA effective that day and was "deobligating" the $928.62 million.[19]

- On May 21, the Newsom Administration responded with legal action, filing a lawsuit in federal court in San Francisco to recover the canceled funding.[20]

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http://www.cahighspeedrail.ca.gov/docs/newsroom/2019_Rennert_030419.pdf.

[18] "Delivering High-Speed Rail to Californians: Project Update Report to the California State Legislature," May 1, 2019, p. 74, http://hsr.ca.gov/About/Legislative_Affairs/legislative_reports.html

[19] https://www.fra.dot.gov/eLib/Details/L20107

[20] "California says Trump's high-speed rail cut was payback for state's stand on border wall," Sacramento Bee, May 21, 2019, https://www.sacbee.com/news/politics-government/capitol-alert/article230652854.html. The state also had planned to file a request for a temporary restraining order to block the federal government from giving the funds to a different rail project. However, on May 22, in a joint court filing from the state and U.S. Justice Department, an agreement was recorded under which FRA cannot re-obligate California's funding to another state without first initiating a formal process of issuing a notice. The filing said the FRA has no present intention to issue a new funding notice and said that after a notice was issued it

It is unclear what the outcomes will be of the disputes between the CHSRA and the Administration regarding project funding, environmental reviews, and other major issues.

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 Rail Safety Division, with its regulatory authority over high speed rail as a passenger rail system, has important responsibilities in helping to ensure the safety of HSR.

CPUC currently has two dedicated HSR staff. 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:[21]

- 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 listed above. In particular, CPUC rail crossings engineers have reviewed numerous applications for alterations of railroad crossings under GO 88-B.

At the present time, CPUC railroad safety staff are 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, CPUC oversight will include

typically takes at least four months to award the funds. Associated Press, "US won't immediately give away $1B for California rail," May 22, 2019, https://www.kron4.com/news/california/us-wont-immediately-give-away-1b-for-california-rail/; Reuters, "Trump administration holds off redirecting California's high-speed rail money," May 22, 2019, https://www.reuters.com/article/us-california-rail/trump-administration-holds-off-redirecting-californias-high-speed-rail-money-idUSKCN1SS2OG.

[21] 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.

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 FY 2018-2019, CPUC 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 20 applications for alterations of railroad crossings and made recommendations to improve pedestrian and automobile safety.

- Rail crossings engineers processed 13 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 a meeting of the CHSRA Fire and Life Safety & Security Committee (see below).

CHSRA Fire and Life Safety & Security Committee meetings are attended by representatives of state and local agencies involved in security aspects of HSR regulation. This Committee has greatly reduced the number of meetings it holds. The meeting on February 19, 2019 was attended remotely by CPUC staff. Among other topics, the conveners of the meeting stated that the Governor's decision did not mean that the HSR system would be limited to the Bakersfield-Madera route. While the system has been streamlined, it will expand when funding is available. Participants at the meeting also discussed upcoming construction contracts, including fencing, signage, and walkways.

Staff also attended the August 9, 2018 "Continued Oversight of the California High-Speed Rail Project" hearing in Sacramento of the U.S. House of Representatives Committee on Transportation and Infrastructure, Subcommittee on Railroads, Pipelines, and Hazardous Materials. The main issues raised concerned the lack of stable funding for the HSR system, and project scheduling.

III. Rail Safety Activities

PU Code Section 916 requires CPUC to report to the Legislature on its rail safety activities annually. 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 PU Code sections. A list of these laws and regulations is contained in Appendix A. The GOs most frequently cited by ROSB 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. [22]

- 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 Rail Safety Division with the authority to issue citations to railroad carriers, with accompanying fines. [23]

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

[22] 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.

[23] 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 issued in FY 2018-2019. Note: Violations concerning overgrown vegetation are cited under 49 CFR 213.37 rather than GO 118-A.

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.

B. Regular Inspections

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

During FY 2018-2019 CPUC inspectors:

- Performed 4,463 inspections and follow-up inspections to monitor the railroads' compliance with federal and state laws, and CPUC GOs.
- Performed 186 safety surveys (bridge and tunnel).
- Cited 9,975 federal regulation defects.
- Recommended civil penalties for 233 violations of federal regulations.
- Completed 413 CPUC GO reports that identified 979 state regulation defects.[24]

<u>CPUC Hazardous Materials inspectors:</u>

CPUC Hazardous Materials inspector documenting observations during an inspection

[24] 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 inspectors taking a measurement

- Inspected or evaluated 45,459 units[25] in 822 FRA inspection reports.
- Identified 1570 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

[25] A unit is a metric used to measure the activities of CPUC inspectors. Units can be physical objects like locomotives, signal systems, and paper and electronic records generated by railroad companies; or actions performed by railroad personnel, such as switching operations. These are inspected or otherwise evaluated by inspectors for compliance with applicable regulations and railroad operating rules.

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:

MP&E inspector conducts an inspection of railroad equipment

- Inspected or evaluated 73,877 units in 838 FRA inspection reports.
- Identified 2,899 federal regulation defects.
- Recommended 142 violations for civil penalties for federal regulation defects identified during regular inspection activity.

MP&E units include each locomotive, each rail car, inspection records or specific components thereof.

PU Code Section 765.5(d) requires 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).[26]

[26] 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 FY 2018-2019, CPUC inspectors did not satisfy the mandate. Of the 59 facilities, 57 sites were inspected three times or more during the fiscal year. Of the remaining 2 facilities, 2 were inspected twice. 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, 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.

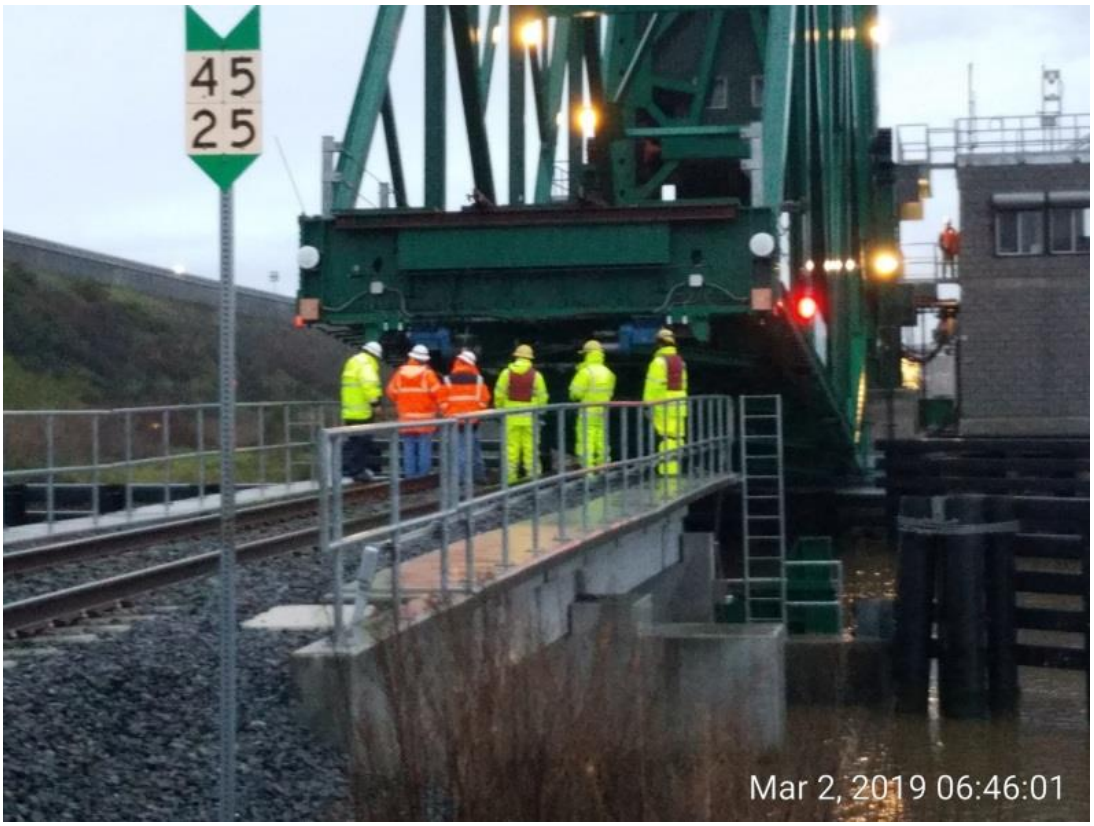
CPUC Operating Practices (OP) inspectors:

CPUC inspector checking the remote-control operator's certification

- Inspected or evaluated 22,933 units in 971 FRA inspection reports.
- Identified 1,093 federal regulation defects.
- Recommended 61 violations for civil penalties for federal regulation defects identified during regular inspection activity.

Operating Practices activities 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:

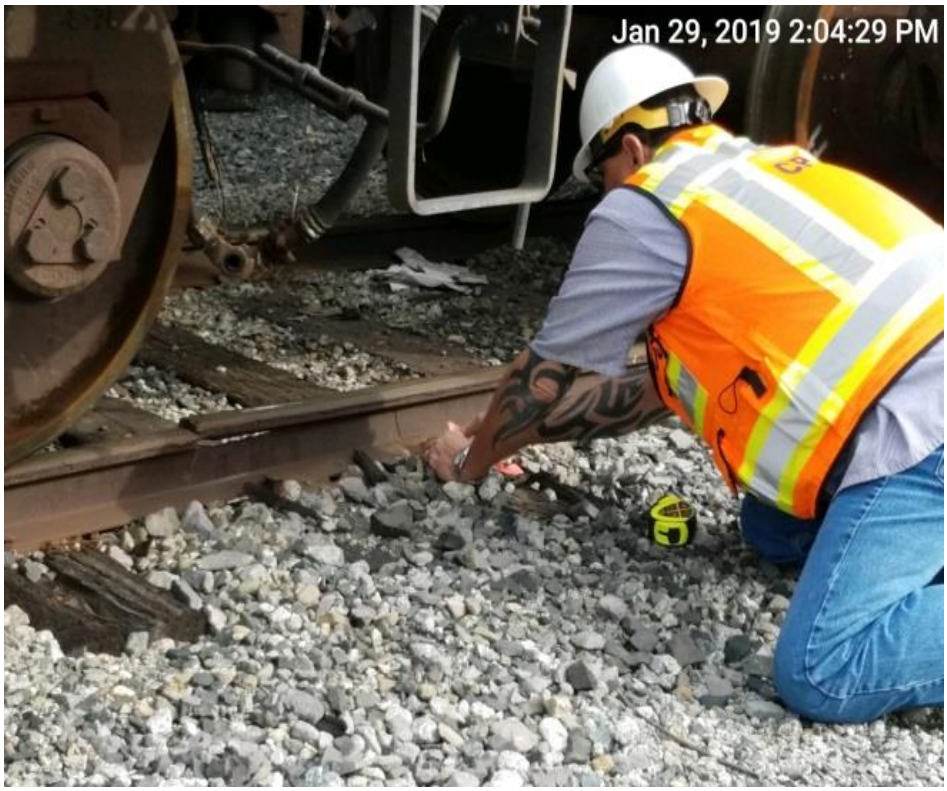


CPUC Signal inspectors and railroad personnel inspecting signals and electronic components that govern train movements over the Haystack bridge

- Inspected or evaluated 15,790 units in 367 FRA inspection reports.
- Identified 1025 federal regulation defects.
- Recommended 10 violations for civil penalties for federal regulation defects identified during regular inspection activity.

Signal and Train Control units include each signal system structure, maintenance and testing records, warning devices at crossings, and other electronic or mechanical signaling systems.

CPUC Track inspectors:



CPUC Track inspector identifies a broken rail under a tank car

- Inspected or evaluated 19,971 units in 992 FRA submitted inspection reports.

- Identified 3,301 federal regulation defects.

- Recommended 8 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 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. [27]

The methods include:

- Physically walking the track.
- Riding in a hi-rail vehicle (motor vehicle outfitted with steel rail guide wheels).
- Riding in an FRA or railroad owned geometry car (a passenger coach equipped to identify geometric track deficiencies that create accident risks).

In FY 2018-2019, CPUC inspectors surveyed 4,752 miles of track in California aboard track geometry vehicles. The track geometry vehicles identified 627 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

PU Code Section 765.5(e) requires 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 pose 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, although PU Code Section 767.5 permits 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. An example of a focused inspection is shown in Appendix E.

[27] The 2013-14 Annual Report to the Legislature provides a detailed explanation about the methods of track inspections: http://www.cpuc.ca.gov/rosb/

CPUC inspectors identify a large magnet in the walkway during a focused inspection

In FY 2018-2019, CPUC inspectors performed 20 focused inspections, which consisted of:

- 1 track inspection.
- 2 hazardous materials inspections.
- 3 operating practices inspections.
- 5 signal and train control inspections.
- 4 mechanical inspections.
- 5 cross-discipline inspections.

D. Accident Investigations

In FY 2018-2019, CPUC inspectors performed 180 accident investigations.

PU Code Section 315 requires 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 CPUC, usually by OES, and determine the appropriate investigative response based on accident severity criteria, including:

- Impact to the public (evacuations, injuries, fatalities).
- Injuries or fatalities to railroad employees or passengers.

- Environmental impact.

- Impact on commercial transportation (highway closures, commuter interruptions).

- Violations of state or federal railroad safety regulations or operating rules.

In FY 2018-2019, there were 885 reported railroad-related incidents in California, down from 923 in the previous fiscal year. Each incident falls into one or more categories: 417 were related to crossing or trespasser incidents, 249 were hazardous materials spills, 202 were derailments, and 17 were in other categories. These incidents resulted in a total of 67 fatalities and 112 injuries (significantly down from 217 and 141 in the previous year, respectively), mostly to trespassers. CPUC railroad safety supervisors determined that 180 incidents required further investigation. Appendix F describes an example of a major accident investigation 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 every operator of rail facilities in the state 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, the operators are to provide CPUC with a risk assessment incorporating a broad range of risk-related information.

In FY 2018-2019, CPUC inspectors performed security inspections on all 37 railroads that operate in California. All followed relevant state railroad security-related laws. 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 utilized this guidance. Genesee & Wyoming Company, which operates four railroads within California, has adopted the security plan guidance as a blueprint to develop a standard format for each railroad, and will incorporate it throughout its entire system.

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

Railroad	Date of Inspection	Compliant	Comments
Altamont Commuter Express	5/23/2019	Y	
Amtrak Los Angeles	5/23/2019	Y	
Amtrak Oakland	5/23/2019	Y	
Baja California Railroad	4/30/2019	Y	
BNSF	6/15/2019	Y	
Cal Train	4/23/2019	Y	
California Northern Railroad	5/15/2019	Y	
Central California Traction Company	12/12/2018	Y	
Fillmore Western	4/12/2019	Y	
Goose Lake Railway	5/16/2019	Y	
Los Angeles Junction Railroad	6/19/2019	Y	
Metrolink	4/15/2019	Y	
Modesto & Empire Traction	12/12/2018	Y	
Napa Valley Railroad	3/6/2019	Y	
Niles Canyon Railway	4/23/2019	Y	
North County Transit District	4/29/2019	Y	
Northwestern Pacific Railroad Company	3/6/2019	Y	
Oakland Global Rail Enterprise	3/6/2019	Y	
Pacific Harbor Lines	3/28/2019	Y	
Pacific Southwest Railway Museum	3/14/2019	Y	
Pacific Sun Railroad	10/12/2018	Y	
Quincy Railroad	5/15/2019	Y	
Richmond Pacific Railroad	3/6/2019	Y	
Sacramento Valley Railroad	1/9/2019	Y	
San Diego & Imperial Valley	10/18/2018	Y	

San Francisco Bay Railroad	**3/5/2019**	**Y**	
San Joaquin Valley RR	**1/7/2019**	**Y**	
Santa Cruz &Big Trees	**4/23/2019**	**Y**	
Santa Cruz Monterey Bay	**4/24/2019**	**Y**	
Santa Maria Valley RR	**4/25/2019**	**Y**	
Sierra Northern Railroad	**1/9/2019**	**Y**	
So Cal Ramp Services	**5/13/2019**	**Y**	
Stockton Terminal & Eastern Railroad	**5/14/2019**	**Y**	
Trona Railway Company	**3/27/2019**	**Y**	
UPRR	**6/17/2019**	**Y**	**Phone Interview. Security manager is located in Omaha NE.**
Ventura County Railroad	**4/29/2019**	**Y**	
West Isle Line	**12/10/2018**	**Y**	

F. Safety Complaint Investigations

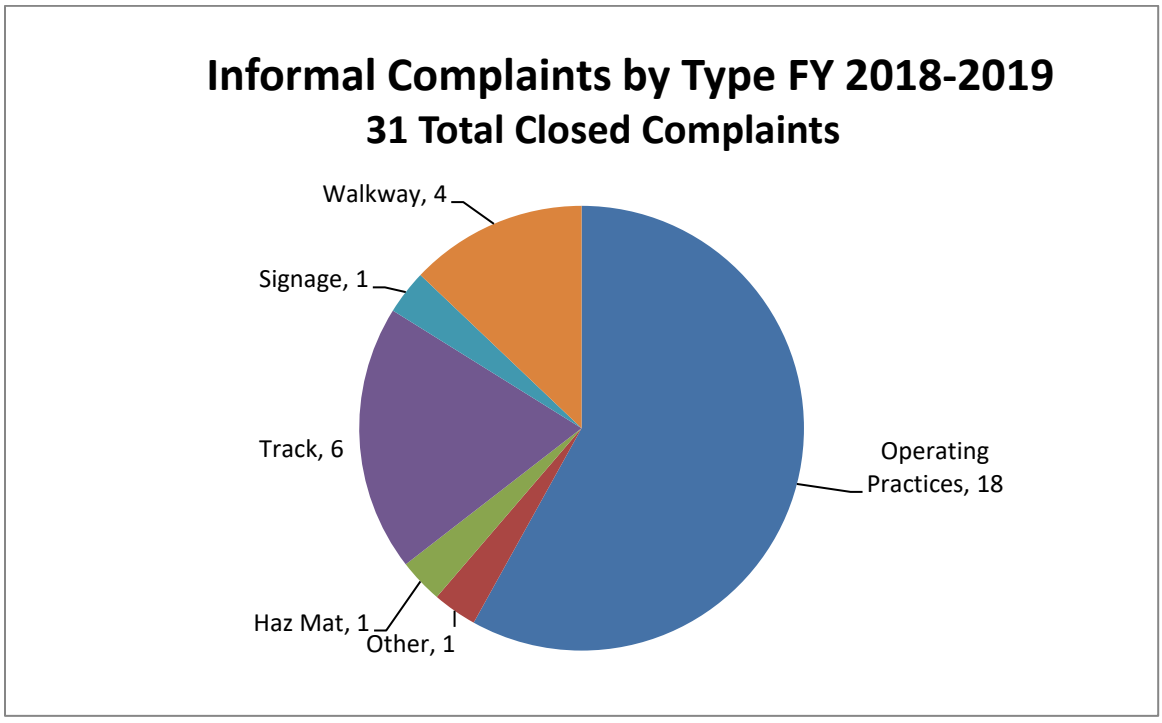
As well as inspection activities mandated by law, CPUC investigates complaints related to railroad safety. These are received from a variety of sources, including railroad employees, railroad unions, and the general public. In FY 2018-2019, CPUC investigated 31 such complaints.

In these investigations, CPUC inspectors sometimes find non-conformances with railroad safety regulations, e.g., where yellow or red flags are not placed near tracks to warn train crews to restrict or stop train movements, as required in certain situations under PU Code Section 7662.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 has found 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.

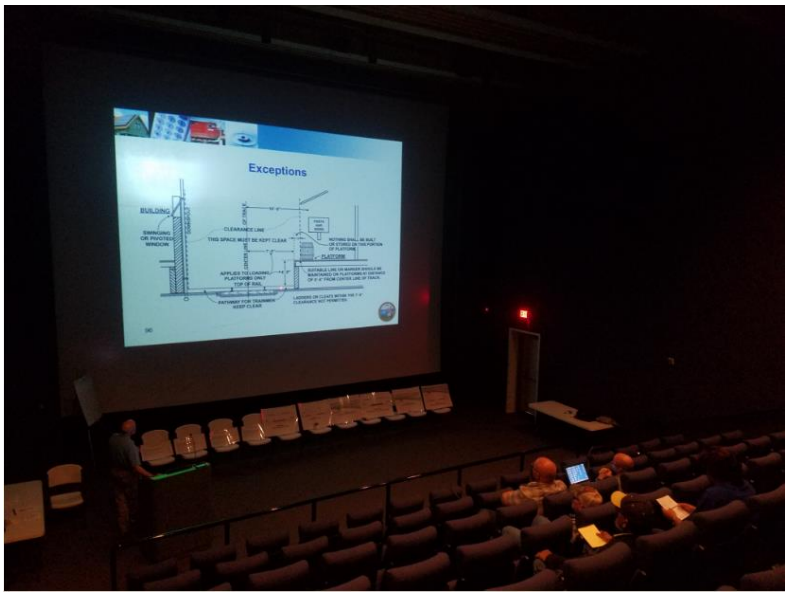
Sometimes, CPUC may lack the regulatory authority to resolve an issue raised by a complainant. For example, the Commission has received complaints regarding homeless encampments encroaching on railroad property. As

described in Chapter VII, CPUC has limited authority to resolve such complaints, despite the safety hazards they describe.

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.



G. General Order Training Program



General Order 26-D Class held in the Sacramento Rail Museum Auditorium

The General Order Training Program (GOTP) was initiated to improve the understanding by CPUC inspectors of CPUC's railroad's safety GOs and a related PU Code section. Prior to this program, the training of newly hired inspectors regarding the requirements of these Orders and the Code happened on an ad hoc basis. Experienced inspectors would point out nonconformances with these provisions to new inspectors, with little standardization and with mixed results, in part because of the different backgrounds and levels of knowledge of even experienced inspectors.

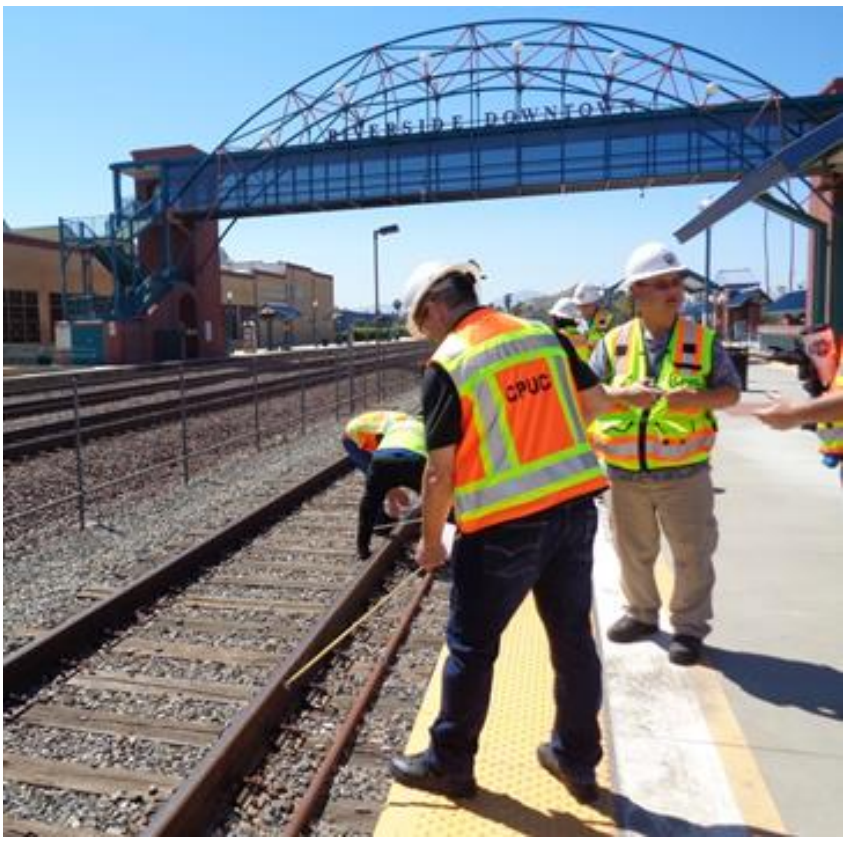
Planning for GOTP began in 2016. An in-house working group was formed to develop instructional materials. Priority was given to GOs 26-D (Clearances), 118-A (Walkways) and PU Code 7662 (Signage). Seventeen training classes covering these subjects were given between May 2017 and December 2018.

Class materials consist of PowerPoint presentations, with examples of non-complying conditions. Students are given reference materials and two pocket-sized manuals to take with them for use after the classes. Following training classes, students complete field exercises under the tutelage of an instructor. Thirty-eight inspectors had been trained by the close of fiscal year 2018-2019. Two presentations on GOs 118-A and 26-D also were given to BNSF and UPRR personnel.

Training course materials for three more GOs, 72-B (Grade Crossings), 75-D (Warning Devices) and 161 (Hazardous Materials) have been developed, with classes scheduled to begin in September 2019. There are currently six trained

presenters for these courses. Thirty-four inspectors are scheduled to receive the additional training. There are also five vacant inspector positions. Once filled, those inspectors will be enrolled in all six courses during their first year with CPUC, along with other training leading to their certification in their particular railroad disciplines (Hazardous Materials, Motive Power and Equipment, Operating Practices, Signal and Train Control, and Track).

The effectiveness of GOTP is shown by the difference in the number of GO defects detected during inspections in FY 2018-2019 (979) as compared with the previous fiscal year (509), a 92 percent increase. This, plus the training that was given to BNSF and UPRR personnel, has reduced the risks of railroad accidents and injuries. As the program grows, so will rail safety in California.



Field exercise session showing student and instructor measuring clearance for compliance with GO 26-D

IV. Investigations of Runaway Trains and Other Uncontrolled Train Movements

PU Code Section 916.1 requires CPUC to annually report the results of its investigations of runaway trains or other uncontrolled train movements that threaten public health and safety. Similarly, PU Code Section 7711.1 requires 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.[28]

In FY 2018-2019, CPUC investigated seven instances of uncontrolled train movements. In one of these incidents, an uncontrolled movement resulted in the derailment of twelve rail cars, one of which contained the hazardous material sulfuric acid. Although no contents were released from this tank car or the other derailed cars, this event is reported below as an uncontrolled movement that threatened public health and safety.

July 8, 2018: At approximately 4:00 AM, there was an uncontrolled movement of three tank cars carrying sulfuric acid in the Union Pacific West Colton Yard, located in Bloomington, San Bernardino County. The uncontrolled movement resulted in the derailment of twelve rail cars: one of the three uncontrolled tank cars, nine empty hopper cars, [29] and two empty tank cars.

The West Colton Yard has multiple tracks. Starting at the west end of the Yard and proceeding to the east, individual rail cars are directed onto designated tracks depending on their final destinations, where they are consolidated into larger units which then leave the Yard. Movements of these cars to the various tracks are not powered; rather, they move by gravity from higher to lower places in the Yard after the cars are disconnected from other cars. The movements are controlled by a computer system which uses software that receives information on the location and speed of each car from radar transmitters situated on the tracks, and then feeds this information into a program. Based on data on how far a car is traveling, its weight, and its contents, the computer program activates retarders on each of the Yard's tracks. The retarders are mechanical braking devices that slow the speeds of cars by applying pressure to their wheels. There are retarders at both the east and west ends of each track: at the west end, the retarders adjust the speeds of the cars as they roll onto the tracks, while at the east end the retarders stop and hold the first car that enters the track, thereby providing a barrier to prevent uncontrolled movements out of the track by other cars. The speeds of other cars rolling onto the track behind the first car are adjusted by the computer system to allow them to roll the exact distance to the next car as the track fills up. Periodically, all the cars that have accumulated on that track are removed from that location and attached to an outbound train.

In this incident, the retarder at the west end failed to engage the three tank

[28] Such uncontrolled movements are required to be reported to the California Governor's Office of Emergency Services under PU Code Section 7661.

[29] A hopper car is a railroad freight car used to transport bulk commodities such as coal, ore, grain, and track ballast.

cars, which moved in two groups. Rather than stopping at the east end of Track 12, the tank cars crossed via a connecting track onto Track 306, moving uncontrolled for about 550 feet. The first tank car collided with a large group of empty hopper cars being moved on Track 306, about 300 feet west of the Riverside Avenue overpass. That tank car then derailed and caused seven of the hopper cars to derail on Track 306. The two other tank cars arrived together about 45 seconds later and collided with two other empty hopper cars on Track 306, causing the derailment of those hopper cars as well. The two tank cars remained upright. As the derailed cars piled up, they collided with two empty tank cars on neighboring Track 305, causing the derailment of those two cars.

In total, ten cars derailed on Track 306 as a result of the uncontrolled movement: the first tank car transporting sulfuric acid plus seven empty hopper cars in the first collision, and two more empty hopper cars in the second collision. Two empty tank cars derailed on Track 305 from the ensuing pile-up on Track 306.

Initially, it was unknown whether any hazardous materials were released as a result of the derailment. As a precaution, an evacuation order was issued and all persons working in the immediate area were relocated to the administration building at the other end of the yard. Two engines from the San Bernardino County Fire Department arrived at the scene of the incident around 4:30 AM. The Fire Department and a Union Pacific Hazardous Materials Specialist determined that the tank cars involved were not leaking and that it was safe for personnel to return to normal operations. The evacuation order was lifted at 9:30 AM.

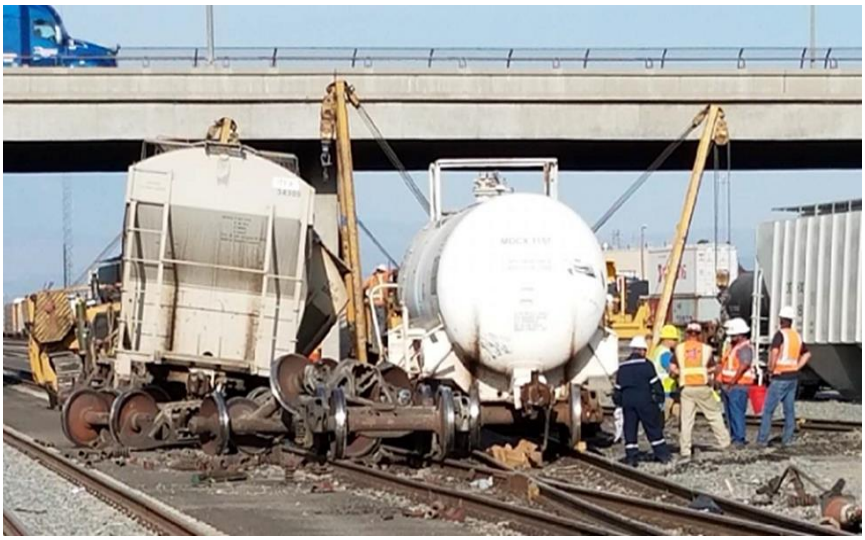
CPUC inspectors investigated the incident. UPRR cameras had recorded the derailments, and the inspectors reviewed video and examined the incident site. CPUC's investigation determined that the incident did not result from any non-compliance with federal or state regulations or with railroad operating rules. Instead, the CPUC investigation discovered that the computer program controlling the Yard's retarders had failed to properly activate the retarder on the west end of Track 12 that was supposed to control the speed of the three tank cars. Consequently, their speed was higher than it should have been, and when the cars reached the east end of the track, they had too much momentum for the retarder on the east end to stop them. This resulted in the collisions and subsequent derailments.

UPRR officials stated to the CPUC investigators that they had been having trouble with their computer system for the last six months, although none of the problems had resulted in a derailment prior to the incident. Work was in progress to install new software, but it was not in service at that time.

The CPUC investigators recommended that UPRR add an additional layer of

protection against uncontrolled movements by leaving two rail cars at the east end of each track with handbrakes manually applied to both cars, creating a barrier that would physically block any uncontrolled cars from going further. UPRR management agreed to implement this recommendation on tracks that had recently experienced an uncontrolled movement or similar safety concern. That policy remained in effect until the new software was installed approximately one month after the incident, at which time CPUC inspectors performed follow-up inspections for several weeks to ensure that the uncontrolled movement problem was resolved. After a period of adjustment, CPUC agreed with UPRR management that the system was working properly. UPRR management then made the decision to discontinue the use of the two-car barriers on the tracks, due to the costs entailed: while each two-car set was soon replaced by other sets, each set still was delayed in reaching its final destination for the period the cars were used as barriers.

Derailed cars



Cleanup activities near Riverside Avenue overpass

V. Local Safety Hazard Sites

PU Code Section 7711 requires CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. The sites on railroad lines 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).[30] 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 grades 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 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.[31]

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

[30] ROSB uses 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).

[31] A list of derailments is located at https://www.cpuc.ca.gov/rosb/

Table 1—List of Local Safety Hazard Sites

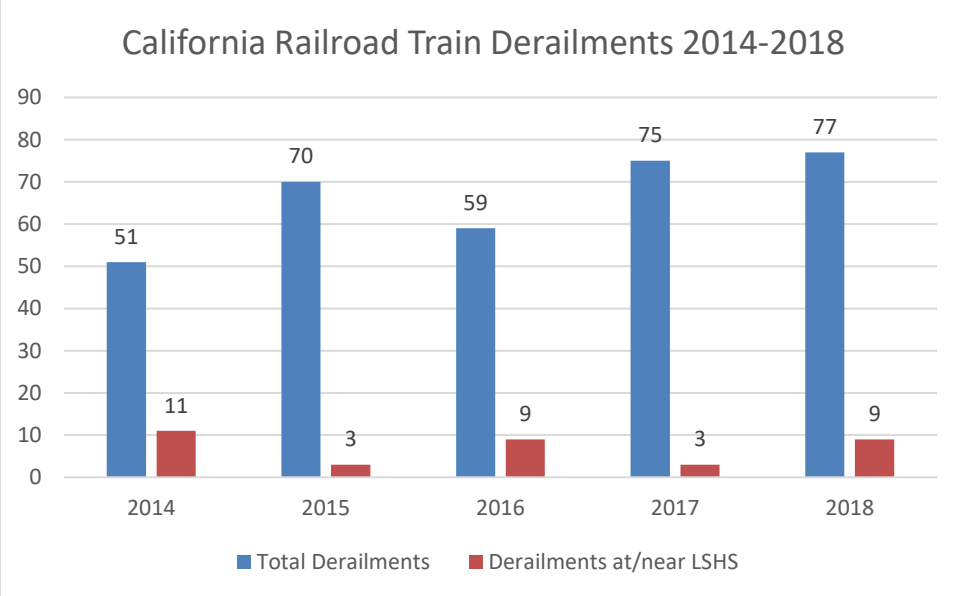
LSHS #	Current LSHS Track Line	Previous LSHS Track line at time of D.97-09-045[32]	RR Milepost	Number of Derailments 2014-18	Overlap with Site #
16	UPRR Mojave Subdivision	SP Bakersfield Line	335.0 to 359.9	12	
9	UPRR Black Butte Subdivision	SP Shasta Line	322.1 to 332.6	3	#10
10	UPRR Black Butte Subdivision	SP Shasta Line	322.1 to 338.5	1	#9
19	UPRR Mojave Subdivision	SP Bakersfield Line	463.0 to 486	0	
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	UPRR Feather River Division	234.0 to 240.0	0	#25
25	UPRR Canyon Subdivision	UPRR Feather River Division	232.1 to 319.2	0	#22, #23
3	UPRR Yuma Subdivision	SP Yuma Line	535.0 to 545.0	4	#6
23	UPRR Canyon Subdivision	UPRR 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	UPRR 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	

[32] In 1996, UPRR purchased Southern Pacific Railroad.

28	BNSF Cajon Subdivision	ATSF Cajon	53.0 to 68.0	0	
29	BNSF Cajon Subdivision	ATSF Cajon	81.0 to 81.5	0	
30	BNSF Cajon Subdivision	ATSF Cajon	55.9 to 81.5	1	

* 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 328 derailments. Of that total, 35 derailments, or nearly 11 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.



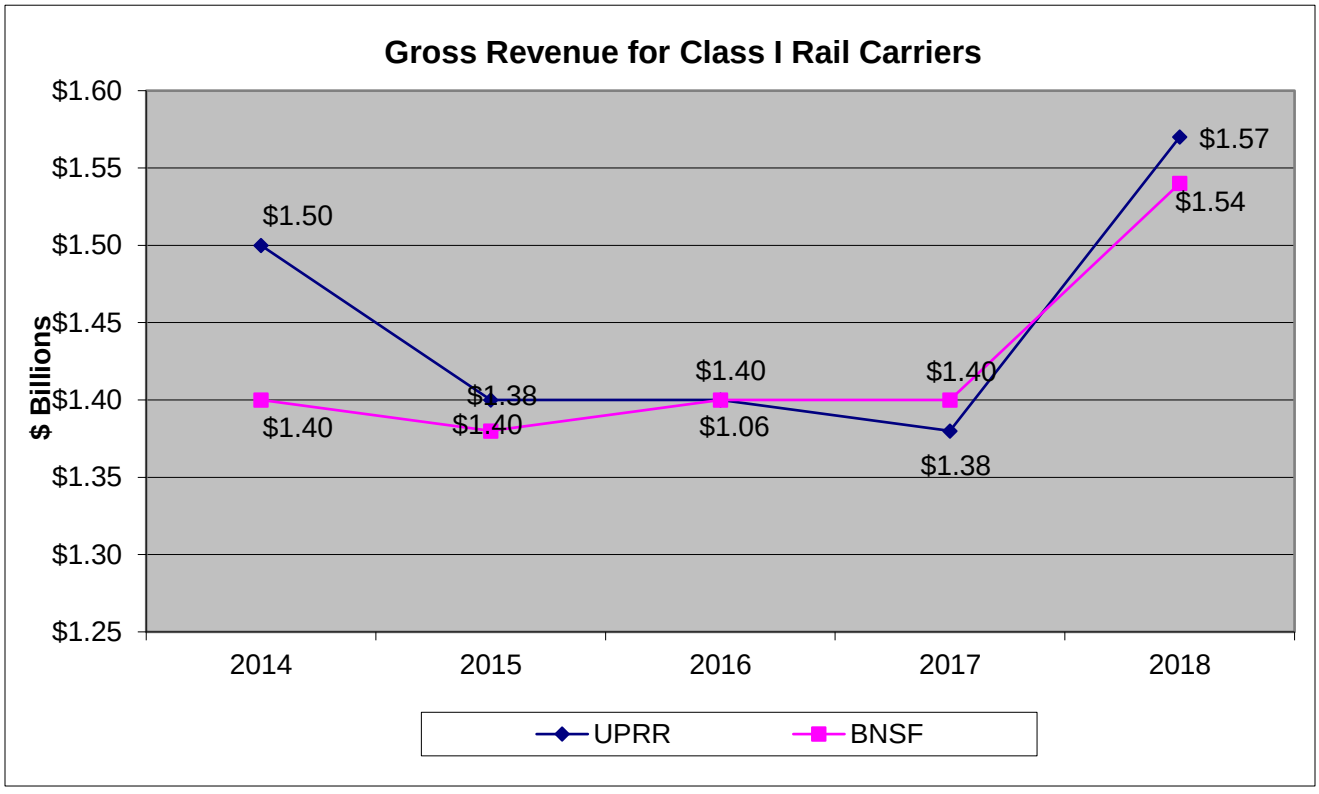
Source: Federal Railroad Administration, Office of Safety Analysis:
Total derailments: Table 1.12, Ten Year Accident/Incident Overview
Total derailments at /near LSHS: Table 3.11, Accident Detail Report, as calculated by CPUC staff

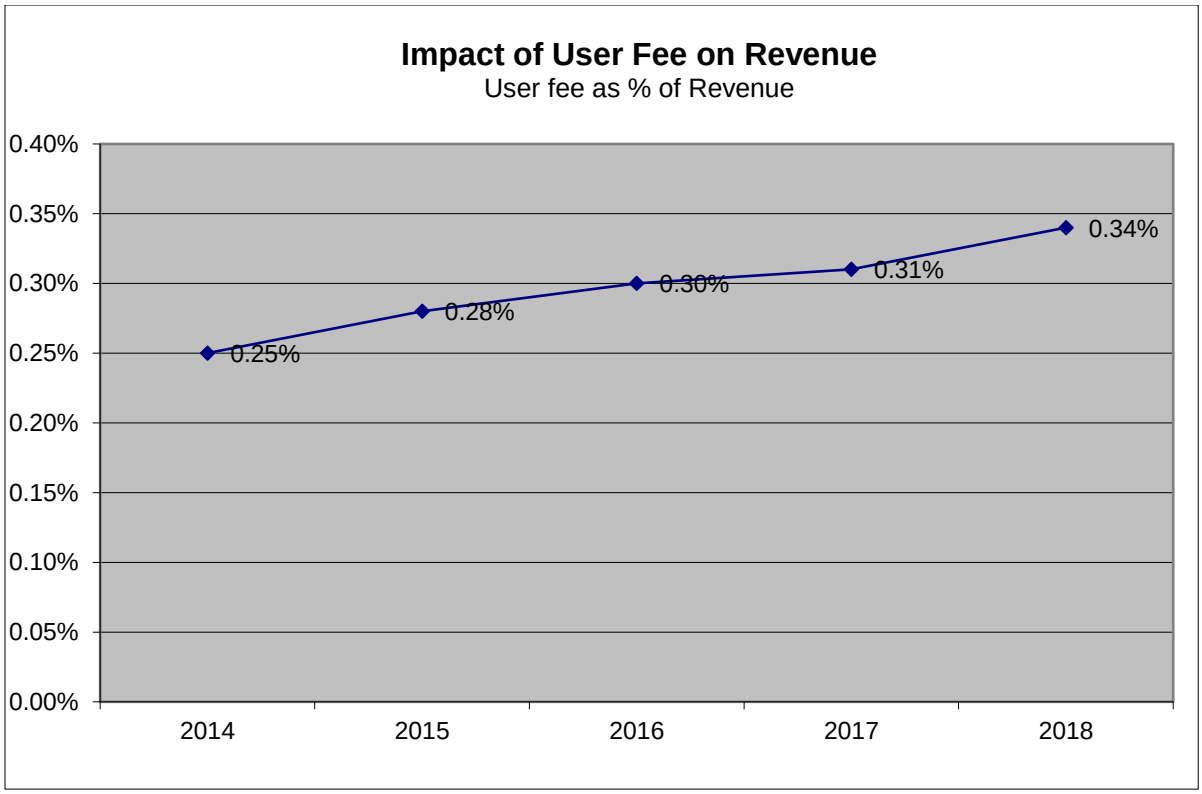
VI. Regulatory Fee Impact on Competition

PU Code Section 309.7 requires the activities of 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 2018-2019, the Legislature appropriated $8.8 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 ROSB program. The fees do not fund any other CPUC programs.

PU Code Section 916.3 requires CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of CPUC's activities. The railroad user fees assessed in 2018-2019 on UPRR and BNSF constituted slightly less than one third of one percent of revenues (0.34 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: the railroads report their revenues to CPUC annually to determine the user fee that funds 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 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 CPUC to make an order or recommendation.

- PU Code Section 7661 requires the Rail Safety Division to investigate any incident that results in notification of a runaway train or other uncontrolled train movement that threatens public health and safety, and report its findings concerning the cause or causes to the Commission.

- PU Code Section 7662 requires railroads to provide immediate notification to OES[33] of accidents and incidents.[34]

- 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.[35]

- GO 161 requires railroads to immediately notify the appropriate emergency-response agency in the event of a hazardous materials incident.

- 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.

In CPUC's 2015 and 2016 Annual Railroad Safety Activity Reports,[36] CPUC reported that one of the most significant challenges facing railroad safety in California is the inconsistency of many railroads in reporting incidents and accidents to the OES and/or CPUC. Such inconsistency limits 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 it 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 CPUC to deploy inspectors to determine whether the railroad violated regulations or otherwise had unsafe operating or maintenance practices that were culpable to the accident.

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 CPUC in a timely manner.

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

[34] OES immediately notifies CPUC.

[35] OES immediately notifies CPUC.

[36] http://www.cpuc.ca.gov/rosb/

B. Trespassing on Railroad Property by Homeless Individuals

Many locations in California near railroad tracks have been occupied by homeless individuals and encampments. Compared with other areas, these sites often offer the homeless greater concealment and less likelihood of intervention from local authorities. As a result, trespassing on railroad rights-of-way by homeless people has become a frequent occurrence.

While data are lacking on what percentage of trespassers killed or injured by railroad operations are homeless, some trespassing casualties have been identified in police reports and news media as transients or persons without fixed addresses, and railroad personnel have stated to CPUC staff that many of the trespassers struck or nearly struck by trains appeared to be homeless. Some casualties were the result of suicide attempts.

Apart from the risks to homeless people from trespassing, homeless encampments often create unsafe work environments for railroad and agency personnel due to biological hazards (e.g., feces and syringes), vicious dogs, rats and other vermin attracted to discarded food and other materials, and miscellaneous criminal activities, including assaults on railroad and agency personnel. Among other problems, this impedes the inspections of train equipment and tracks necessary for safe operations.

Fires from homeless encampments have spread to surrounding vegetation and other flammable materials. Underpasses beneath railroad bridges often are occupied by homeless individuals seeking shelter from the elements, and some wooden bridges have caught fire as a result of homeless people setting up campfires to warm themselves, cook food, etc. Even concrete structures can be degraded by fires. Also, structures can lose stability, especially during rainstorms, when homeless people dig holes in the supporting dirt underneath.

Train schedules can be severely impacted by issues related to homelessness. If they can do so, train operators slow down or stop when they see trespassers on or near tracks. If the trains cannot slow or stop in time and if trespassers are struck, trains must stop and wait for emergency responders to arrive and assist at the scene. Similarly, debris placed by homeless people on or near tracks and fires on or near tracks caused by homeless activities may cause disruptions to service.

Both railroad law enforcement personnel and local law enforcement often do not have the resources to effectively police railroad properties. It is particularly difficult to prevent trespassing and detain offenders in remote areas, but in all regions, police and prosecutorial resources frequently are diverted to more

pressing law enforcement needs. Some jurisdictions have almost entirely stopped prosecuting trespassing cases involving homeless people on railroad rights-of-way.

Lastly, even when homeless people are evicted from locations near tracks, unless effective barriers are erected, there is little to prevent the same or other homeless people from reoccupying these sites or from occupying similar sites along the same track.

While CPUC cannot compel homeless people to vacate railroad rights-of-way or create shelter for displaced individuals, it has the regulatory authority to enforce measures that can reduce some safety issues created by homeless encampments. The disposal of waste materials or other disturbances of walkways by homeless people can create tripping hazards in the vicinity of railroad rights-of-way. This would cause violations of GO 118-A, which sets standards for walkway surfaces alongside railroad tracks. As stated by that GO, "The Commission, after hearing, may order the railroad corporation to eliminate any unsafe walkway condition and may specify such reasonable time within which the improvement shall be completed as may be appropriate under the circumstances."

Similarly, tents, wooden structures, and miscellaneous debris in homeless encampments can create violations of Commission GO 26-D, which sets clearance standards between railroad tracks, and structures and obstructions adjacent to tracks. The GO states that "no railroad or street railroad corporation shall operate any cars, trains, motors, engines, or other rolling equipment over its own or other tracks, except as hereinafter provided, on which overhead or side clearances, or clearances between tracks, are less than the minimum herein prescribed…"

These GOs cover only a small portion of the railroad safety issues presented by homelessness near railroad properties. CPUC staff have met with local governmental officials and railroad company personnel to discuss ways of addressing these issues.

UPRR, Santa Ana - Costa Mesa industrial lead, Warner Avenue. Note debris on left track and proximity of structures to track.

Appendix A – State Railroad Safety Laws and General Orders

Authority	Statutory Specified Tasks (paraphrased)	CPUC-General Orders
PU Code Sec. 309.7 (a)	RSD 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. RSD 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.	
PU Code Sec. 309.7 (b)	RSD 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. 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 120 days, and all main and branch line tracks are inspected not less frequently than every 12 months.	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.

PU Code Sec. 309.7 (c)	RSD shall, with delegated CPUC attorneys, enforce safety laws, rules, regulations, and orders, and to collect fines and penalties resulting from the violation of any safety rule or regulation.	Resolution ROSB-002 established a civil penalty citation program for enforcing compliance with safety requirements for railroad carriers
PU Code Sec. 309.7 (d)	(d) The activities of the consumer protection and safety division that relate to safe operation of common carriers by rail, other than those relating to grade crossing protection, shall also be supported by the fees paid by railroad corporations. 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.	
PU Code Sec. 315	The Commission shall investigate the cause of all accidents occurring within this state upon the property of any public utility or directly or indirectly arising from or connected with its maintenance or operation, resulting in loss of life or injury to person or property and requiring, in the judgment of the Commission, investigation by it, and may make such order or recommendation with respect thereto as in its judgment seems just and reasonable.	
PU Code Sec. 421	(a)-(g) The Commission shall annually determine a fee and is permitted to expend funds for specified purposes.	
PU Code Sec. 761	Whenever the Commission finds that rules, practices, equipment, appliances, facilities, or service of any public utility are unjust, unreasonable, unsafe, improper,	GO 27-B: Filing and posting of railroad timetables and changes.

	inadequate, or insufficient, the Commission shall fix the rules.	
PU Code Sec. 765.5	(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. (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). (c) On or before July 1, 1992, the Commission shall hire a minimum of six additional rail inspectors who are or shall become federally certified, consisting of three additional motive power and equipment inspectors, two signal inspectors, and one operating practices inspector, for the purpose of enforcing compliance by railroads operating in this state with state and federal safety regulations. (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. (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.	
PU Code Sec. 768	768. The Commission may, after a hearing, require every public utility to construct, maintain, and operate its line, plant, system, equipment, apparatus, tracks, and premises in a manner so as to promote and safeguard the health and safety of its employees, passengers, customers, and the public. The Commission may prescribe, among other things, the installation, use, maintenance, and operation of appropriate safety or other devices or appliances, including interlocking and other protective devices at grade crossings or junctions and block or other systems of signaling. The Commission may establish uniform or other standards of construction and equipment and require the performance of any other act which the health or safety of its employees, passengers, customers, or the public may demand.	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 standard for overhead and side clearance on the railroad tracks. GO 72-B: Formulates uniform standards for grade crossing construction to increase public safety. GO 75-D: Establishes uniform standards for warning devices for at-grade crossings to reduce hazards associated with persons traversing at-grade crossings. 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. GO 126: Establishes requirements for the contents of First-Aid kits provided by common carrier railroads.
PU Code Sec. 916	Requires CPUC to report to the Legislature on its rail safety activities annually, on or before November 30.	
PU Code Sec. 916.2	Requires 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 CPUC to report on the actions CPUC has taken to comply with section 765.5, which requires CPUC to take all appropriate action necessary to ensure the safe operation of railroads in this state. Requires CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of CPUC's activities.	
PU Code Sec. 7661	Requires Rail Safety Division to investigate any incident that results in a notification to CEMA.	
PU Code Sec. 7662	Requires a railroad to place appropriate signage to notify an engineer of an approaching grade crossing and establishes standards for the posting of signage and flags, milepost markers, and permanent speed signs.	

PU Code Sec. 7665.2	By July 1, 2007, requires every operator of rail facilities to provide a risk assessment to the Commission and the agency for each rail facility in the state that is under its ownership, operation, or control, and prescribes the elements of the risk assessment.	
PU Code Sec 7665.4	(f) Requires the rail operators to develop an infrastructure protection program and requires CPUC to review the infrastructure protection program submitted by a rail operator. Permits CPUC to conduct inspections to facilitate the review and permits CPUC to order a rail operator to improve, modify, or change its program to comply with the requirements of this article. (g) Permits CPUC to fine a rail operator for failure to comply with the requirements of this section or an order of the Commission pursuant to this section.	
PU Code Sec. 7665.6	Requires every rail operator to secure all facilities that handle or store hazardous materials; store hazardous materials only in secure facilities; ensure that the cabs of occupied locomotives are secured from hijacking, sabotage, or terrorism; and, secure remote-control devices. 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.	GO 161: Establishes safety standards for the rail transportation of hazardous materials.

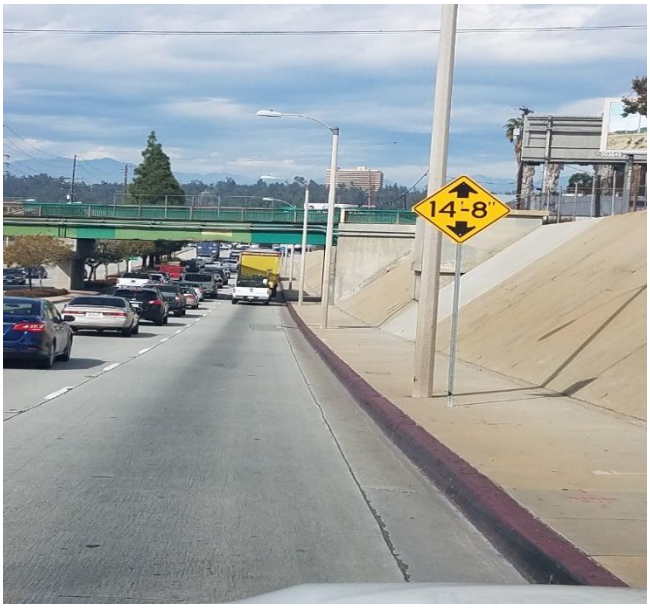
PU Code Sec. 7665.8	Requires every rail operator to provide communications capability to timely alert law enforcement officers, bridge tenders, and rail workers of the local or national threat level for the rail industry, i.e. sabotage, terrorism, or other crimes.	
PU Code Sec. 7673	Requires every railroad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

Appendix B – Example of a Risk Management Status Report

September 25, 2018: During an inspection of a UPRR bridge located on Azusa Avenue in the City of Industry, a CPUC inspector saw that the bridge had suffered damage from vehicles exceeding height limits hitting the bottom of the bridge as they passed underneath it, on both sides of the road. There were no bridge height warning signs on Azusa Avenue leading to the underpass.

A Risk Management Status Report was prepared and a UPRR bridge inspector was informed of the issue. UPRR worked with local governmental authorities, resulting in the installation of warning signs on both sides of Azusa Avenue stating the vertical clearance between the road and the bridge.

Damaged UPRR bridge, east side of Azusa Avenue, looking north



New clearance sign, east side of Azusa Avenue, looking north

Appendix C - Examples of Operation Lifesaver Presentations

February 12, 19, 28, 2019: The City of Riverside has partnered with California Operation Lifesaver and requires that anyone who drives or has access to drive a city vehicle must participate in an Operation Lifesaver presentation every two years. CPUC inspectors gave presentations to city employees on three dates in February 2019. The total number of attendees was 92. The presentations covered the dangers associated with being around railroad tracks, such as walking alongside a railroad track, where to cross tracks safely, how long it takes trains to stop. Also discussed were different strategies to avoid injury, which included not stopping a vehicle on train tracks, staying off the tracks, stopping a vehicle at least 15 feet away from the tracks, and never trespassing on train tracks, especially on bridges or through tunnels.

CPUC inspector (standing) presenting Operation Lifesaver materials to Riverside Public Works employees

March 20, 2019: CPUC staff participated in a safety event at Cal State University Stanislaus in Turlock that was directed at the local farming community. OLI presenters were invited to provide safety awareness training regarding trains and railroad property. Over 250 people attended the event.

CPUC staff offering safety information at safety event at Cal State University Stanislaus

April 23, 2019: CPUC staff participated in the Sonoma Safe Bike Routes Safety Rodeo, where first responders, utility service providers and other agencies provided safety presentations to over 100 elementary school-aged children. The presentations included the dangers of playing and trespassing on railroad property, how to approach railroad crossings, and how technology can be a distraction to pedestrians and bicyclists. After the presentations, children participated in various scenarios where they put to use the safety lessons they received.

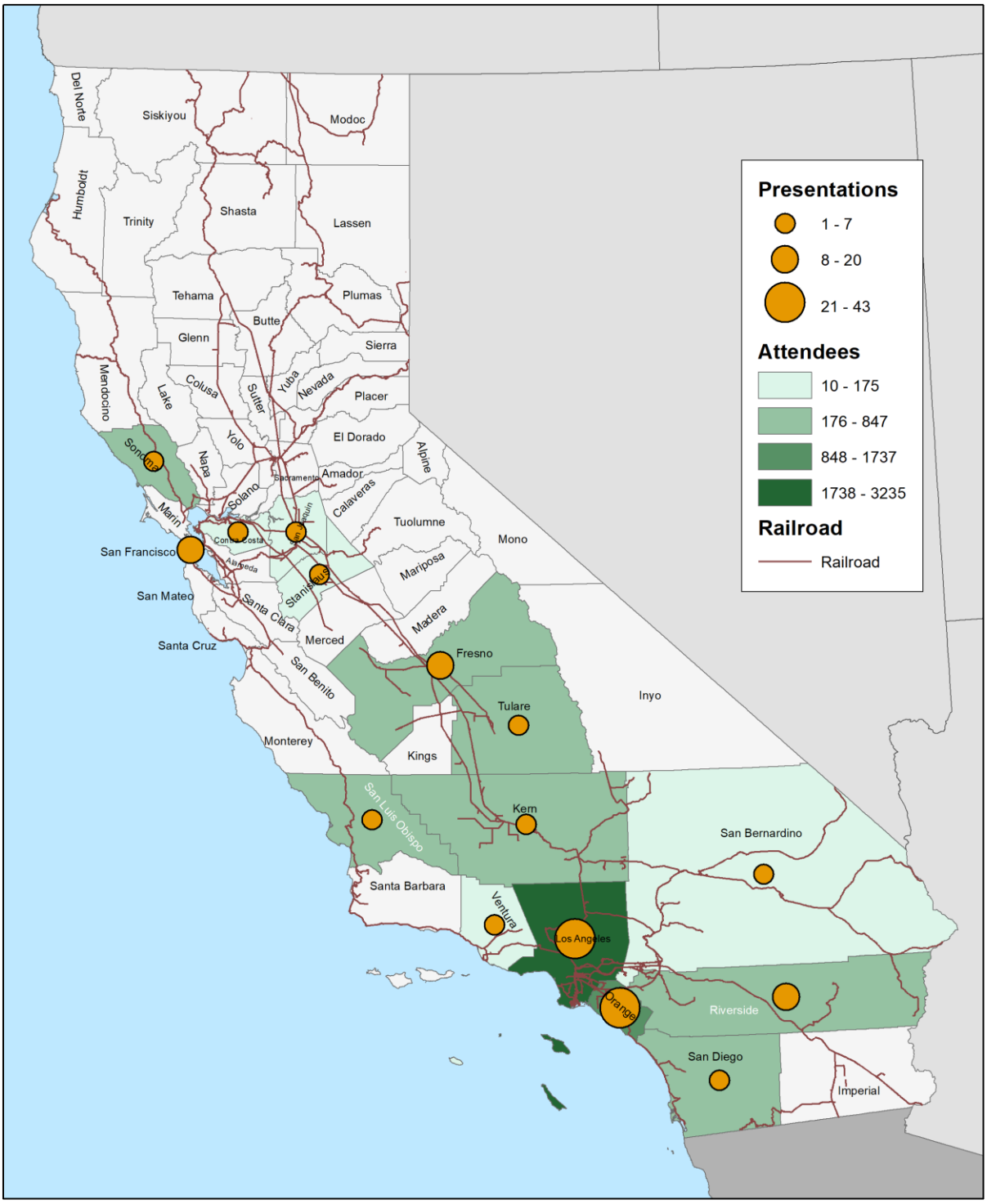

CPUC staff at the Sonoma Safe Bike Routes Safety Rodeo

May 11, 2019: Two CPUC inspectors operated an Operation Lifesaver booth during an open house day at the Burbank Fire Department in Burbank. The event was designed as a safety fair with many different booths and activities, all with a focus on safety for the general public. The inspectors provided information regarding safe practices on and around railroad tracks. Brochures of safety information were given out, and a "wheel of fortune"-type game was offered that challenged players with 18 different safety tips and talking points, such as "is it safe to stop on the railroad tracks?" and "is it okay to take a

shortcut over a bridge?" Approximately 425 people passed through the Operation Lifesaver booth.

CPUC rail safety supervisor sharing rail safety message with public

Operation Lifesaver Presentations
by counties (FY2018-2019)



Appendix D - Examples of Regular Inspections

October 29, 2018: While conducting a routine inspection of the UPRR Oroville yard, a CPUC inspector observed several walkway areas that had improperly sized ballast, including large river rocks and uneven surfaces. The areas therefore did not comply with the GO 118-A requirement for a reasonable and regular walkway surface.

These conditions created significant tripping hazards for railroad employees. Railroad workers must use the walkways several times a week to perform routine trackside duties alongside rail cars. If a worker were to trip, slip or fall as a result of the non-compliant walkway surfaces, he or she could be injured by the fall itself, and potentially, by falling into the path of moving rail cars or locomotives.

The inspector immediately contacted the UPRR Manager of Track Maintenance regarding these conditions. The manager stated that he would have the conditions remediated by November 2, 2018. On November 9, CPUC inspectors conducted a follow-up inspection of the non-complying areas. All the defective conditions had been remediated.

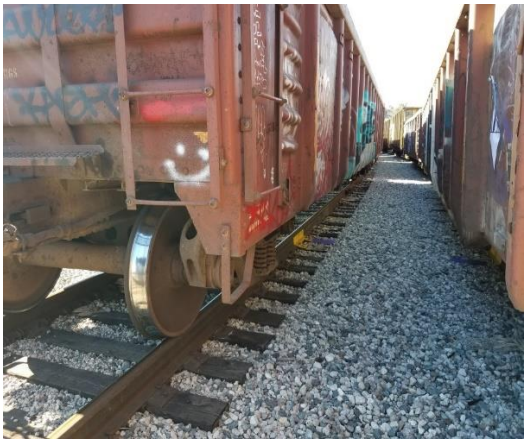
Walkway near derail switch with irregular surface

Same area after resurfacing with properly sized ballast

December 4, 2018: While conducting a routine inspection of the UPRR Aurant Yard in Los Angeles, a CPUC inspector discovered rail cars that were left beyond the safe clearance limits of a track, as demarcated by painted track clearance points. Railroads paint clearance points on the rails of converging tracks so that railroad employees can easily identify where rail cars can be safely left. Trains or rail cars projecting outside these clearance points can potentially contact other passing rail cars or trains on the joining track. Such contact can result in a side swipe or more severe collision, further resulting in derailments causing equipment damage, employee injuries or deaths. Also, injury or death can occur when

railroad employees riding the sides of rail cars during routine railroad switching operations are knocked off due to inadequate clearances. UPRR management was notified immediately of this issue and arranged for a train crew to move the rail cars to a safe location behind the clearance markers.

Yellow paint is the designated clearance point; this rail car extends beyond its limit



Another view of the same rail car after being moved and properly secured behind the clearance point

March 26, 2019: A CPUC inspector conducting a routine inspection of the California Northern Railroad American Canyon Yard observed a sink hole approximately 12 inches in diameter and 12 inches deep in the walkway adjacent to the main track. This walkway is frequently used by railroad employees to switch rail cars that are to be distributed to industries in the vicinity. Additionally, the hole was located near a building where maintenance workers routinely crossed the tracks. A railroad worker could easily step into this hole, potentially resulting in a serious leg injury, or the hole could cause the worker to stumble into the path of a moving rail car.

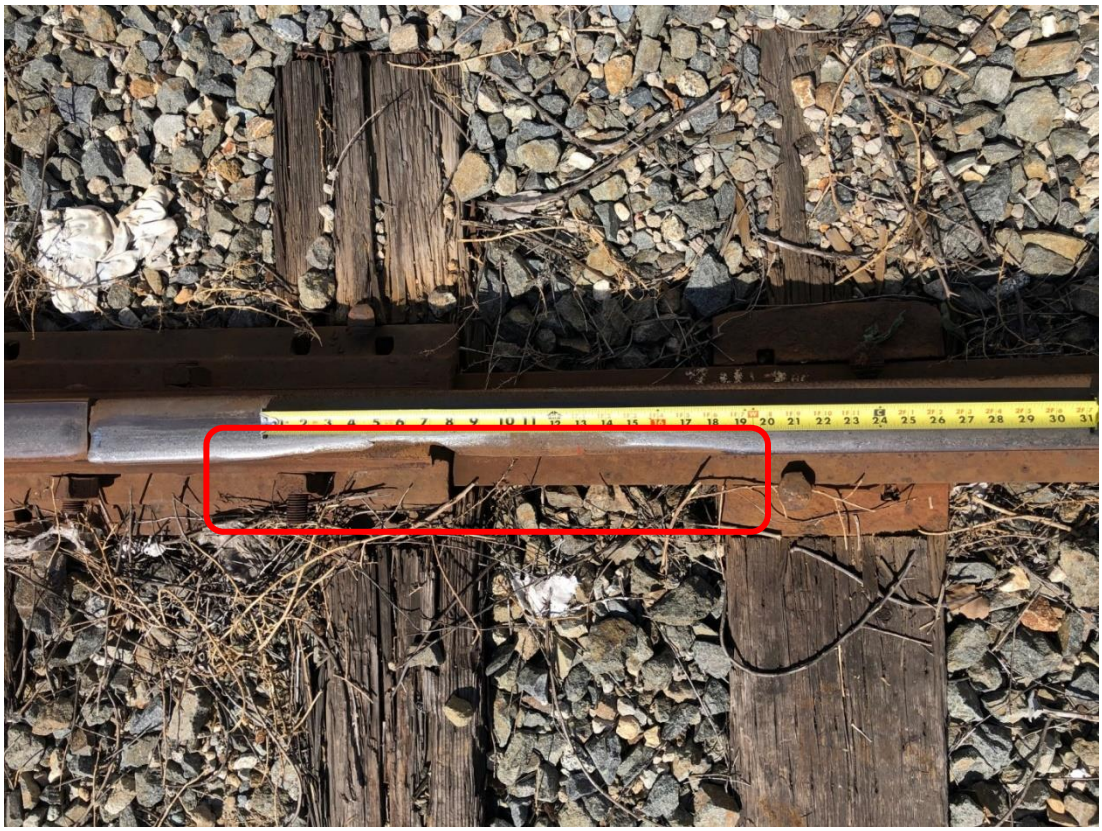
The hole made the walkway noncompliant with GO 118-A, which requires a reasonable and regular walkway surface to be maintained along railroad tracks to provide a safe walking area for railroad employees performing their work. The inspector immediately reported the issue to a railroad supervisor and maintenance employees filled in the hole.

On April 1, 2019, a follow-up inspection by CPUC verified that the sink hole had been filled and that the walkway complied with GO 118-A.

12 inch diameter by 12 inch deep hole in walkway

Walkway after hole filled in and surface compacted

April 18, 2019: While inspecting the industrial lead at a UPRR Santa Ana facility, a CPUC inspector observed an 18-inch horizontal split head (a horizontal break in a rail). This type of broken rail defect severely weakens the rail and can cause the rail to fail under a train, resulting in a derailment. The inspector promptly notified the responsible UPRR manager for this area and the track was taken out of service. A track maintenance crew replaced the defective rail and the track was put back in service.

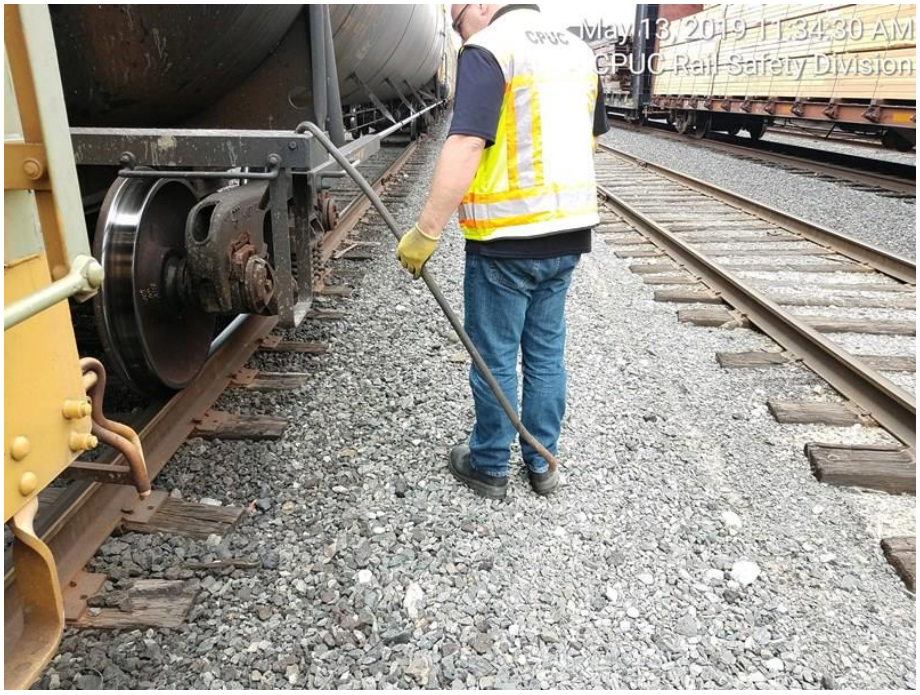

18-inch horizontal split rail head

May 13, 2019: CPUC inspectors were performing a routine inspection at the UPRR yard in Mira Loma when a UPRR freight train approached their location. As the train passed by them, the inspectors observed a long metal rod protruding from the side of a tank car. This object could have potentially injured or killed a bystander or railroad worker standing near the railroad tracks as the train passed by their location.

The tank car contained anhydrous ammonia, a toxic gas. This metal rod could potentially strike against some other object and possibly puncture the tank car. The inspectors followed the train to its stop in the railroad yard and notified the train crew of the metal rod they had observed. The train crew contacted a UPRR mechanical department supervisor for removal of the protruding rod.

The inspectors then performed a thorough inspection of the train, including the tank car at issue. The inspection identified the metal rod as a defective rail car uncoupling lever which likely had been removed from another freight car by railroad mechanical employees, placed on the end of the tank car, and left there in error.

A report was sent to local UPRR management identifying the hazard and reiterating the importance of proper inspections by qualified railroad personnel prior to the departure of trains from their initial terminals, as well as of inspections of these trains performed by other train crews as the trains pass them between railroad terminals.



Inspector observing protruding metal rod on tank car

June 25, 2019: CPUC railroad safety inspectors performing a routine inspection at the Pacific Harbor Line (PHL) facility in Compton observed a defective condition on a grade crossing warning gate arm at the Myrrh Street highway-rail crossing. A wire clamp holding the gate arm wire to the gate arm was broken, allowing the wire to move around freely. The loose wire could have become entangled in the flashing lights on the gate mast, preventing the gate arm from descending when trains approached and allowing cars to proceed through the crossing and into the path of an oncoming train. PHL signal maintenance staff repaired the clamp and secured the wire.

Unattached gate arm light wire; red arrow shows proper attachment point

Appendix E - Example of a Multi-Site Focused Inspection

June 17-21, 2019: CPUC and FRA inspectors performed a focused inspection of petroleum refineries in the Bay Area. The refiners inspected were Marathon and Shell in Martinez, Valero in Benicia, and Chevron in Richmond. The purpose of the inspection was to review records and refinery employee practices that could potentially lead to hazardous materials releases from tank cars shipped from these facilities.

The records reviewed at each of the refineries were:

• Certificate of Registration (49 CFR §172.620): Any person or entity who offers for transport, or transports, hazardous materials must register with the Pipeline and Hazardous Materials Safety Administration.

• Shipping Papers (49 CFR §172.202): In addition to emergency response information, shipping papers require information about the contents of tank cars, including:

- UN Number: Identifies the product,
- Shipping Name (from the Hazardous Materials Table in 49 CFR §172.101),
- Hazard Class for quick identification of product properties (e.g., explosives, gases, corrosive materials).
- Packing Group (i.e., high, medium, or low danger)
- Quantity

• Training Records (49 CFR §172.704): For those employees involved in the loading, unloading, and releasing for transport cars containing hazardous materials or hazardous waste. The training categories reviewed were:

- General Awareness
- Function Specific
- Safety
- Security Awareness
- In-Depth Security Training

• Site Safety Plan (49 CFR §172.802):

- Personnel Security,
- Unauthorized Access
- En Route Security.

• Track Inspection Records (CPUC General Order 161):

- Required on a monthly basis by General Order if used for loading or unloading hazardous materials.

- Includes checking for static protection on tracks used to load or unload flammable liquids or gases.

Printed copies of company- and task-specific Standard Operating Procedures and Policies (SOPs) were reviewed before going out to the loading and unloading facilities to investigate compliance. Several suggestions were made to the facilities to improve the readability and consistency of SOPs.

- At one location, SOPs did not address protection against inbound rail car switching operations as required by 49 CFR §173.31(g)(1). The facility operations manager stated that the SOPs would be rewritten to include the required protections. Follow-up inspections confirmed that SOPs had been corrected.

- One supervisor had not received job-specific training within the required time frame (90 days). This was documented in the CPUC Inspection Report, and a subsequent inspection confirmed that the supervisor had finally received the training.

- Several locations did not have a current copy of their Certificate of Registration posted as required by regulation. All but one facility was able to provide a current copy. A follow-up inspection confirmed that the facility had a current copy available.

After the paperwork reviews, the teams went out to the loading and unloading racks. Observations included the following:

- A tank car that had just been loaded with LPG did not have its hand brake fully applied. It was not connected to another car. 49 CFR §173.31(g)(3) states that cars being loaded or unloaded must be secured with both wheel chocks and an applied handbrake. This exception was brought to the attention of the facility operations manager, who addressed the requirement with the operator.

- At one location, two tank cars were placed to be loaded. The switch leading up to that track was not lined and locked away from that track to provide protection against rail movements entering that track as required by 49 CFR §173.31(g)(1). The operations manager made note of the requirement and stated that she would have the switch lined away from the loading track and provide a lock for the switch. She also stated that she would put the instructions in the SOPs. This was confirmed in a subsequent inspection.

- Another location did not provide protection against inbound rail movements. Personnel were unaware that they could use an existing switch to provide that protection if it was lined and locked away from the loading track. The supervisor stated that they would use that procedure in the future to provide protection.

- Two locations loading flammable materials were not properly grounding (static protection) the tank cars while loading them. The operators and supervisors were shown what was required to properly provide that static protection.

- At one location, the blue sign warning against entering a track where connections are made for tank car loading and/or unloading, as required by 49 CFR §173.31(g)(2), was faded and needed replacing. A subsequent inspection found that the sign had been replaced with a legible sign.

- Several cars had hazardous materials identification placards that did not comply with applicable regulations, including the following examples:

    - All four placards on one car were too faded to distinguish the color or class of the contents. 49 CFR §172.516(c)(6) requires easy recognition on placards. They were replaced.

    - Two cars were placarded "Combustible" rather than "Flammable," which indicates a higher (less dangerous) flash point for the product. 49 CFR §172.508(a) and (b) require accurate categorization of the contents. The correct placards were placed on the cars.

    - At one location, a pneumatic impact gun was used to tighten the bolts securing a tank car manway cover. 49 CFR §173.31(d)(1)(iv) states that the manway cover bolts must be "tool tight," but it does not relieve the operator from using proper torqueing as required by the gasket type. Overtightening the bolts cut the manway cover gasket, making it useless, as it would allow the hazmat product to leak during transportation. This was explained to the facility supervisor and operator. The supervisor included a torque value in the SOP for securement to ensure this would not reoccur.

Non-compliant placement of wheel chocks

Non-compliant static protection location

Appendix F – Example of an Accident Investigation

CPUC railroad safety supervisors quickly evaluate reported railroad accidents and determine whether they need to dispatch an inspector or inspection team to investigate them. During FY 2018-2019, CPUC inspectors investigated 180 accidents. An example of an accident investigation is presented below.

August 21, 2018: At approximately 9:18 AM, 13 tank cars, 3 box cars, and 1 locomotive derailed on a BNSF train traveling from Barstow to Los Angeles on main track #3 in the city of San Bernardino, one of three main tracks at that location. The derailed locomotive was one of two new passenger locomotives being delivered from the manufacturer in Illinois for use by Metrolink in Los Angeles. They were not being used to power the train.

Twelve of the thirteen derailed tank cars were transporting hazardous materials. The three other derailed cars were empty boxcars. Upon derailment, two of the tank cars began releasing their contents. One of these commodities was a highly volatile petroleum distillate, and the other was diesel fuel.

The San Bernardino County Fire Department ordered an evacuation of all businesses and residences within a one thousand foot radius of the incident. All roads were closed within the evacuation area. Affected businesses included a Federal Express facility, which evacuated over 200 employees and shut down for the remainder of the day.

Responding agencies, including a BNSF Hazardous Materials response team and the San Bernardino County Fire Department, stopped the hazardous materials releases and determined by 3:30 PM that it was safe for the roads to be reopened. Evacuees were allowed to return to their homes and workplaces. The spills were cleaned up by BNSF with the contaminated soils and absorbent materials sent offsite for proper disposal. The derailed cars were sent to a repair facility by rail, with the exception of the two passenger locomotives, which were placed on flat cars and taken to Metrolink's Central Maintenance Facility in Los Angeles for further analysis.

There were no injuries or fatalities as a result of this derailment. However, the derailment caused extensive track damage on Track 3, and lesser amounts of damage on Tracks 1 and 2. Due to the damage, train movements did not resume on Track 1 until 5:40 PM the next day (August 22). Track 2 was returned to service at 11:45 PM on August 22, while Track 3 remained closed until 5:30 PM on August 23.

CPUC inspectors investigated the incident. Also participating in the investigation were FRA inspectors and BNSF officials. After determining that the

derailment was not caused by operator error or other human factors, CPUC's investigation of the potential causes of the accident focused on track and mechanical equipment (i.e., locomotives and rail cars). The CPUC inspectors discovered that one of the new Metrolink locomotives had derailed because two of its wheels had moved inward on the axle shaft on which they were mounted, causing them to come off of the track. The locomotive then derailed, causing the other 16 cars to derail. The second Metrolink locomotive also had inward movements of its wheels, but not enough to cause it to derail.

CPUC inspectors observed testing for wheel and axle integrity conducted at the Central Maintenance Facility. In interviews with Metrolink managers, the inspectors found that Metrolink had twelve other locomotives identical to the one that had derailed that were currently in service in the southern California region. The inspectors recommended that these locomotives be taken out of service immediately until inspections could be made of all twelve to check for similar inward movements of the wheels on their respective axles. Metrolink accepted this recommendation. While no wheel movements were found on any of the locomotives, as a precaution, orange-colored markings were applied to portions of the wheels and axles so that any such movement would immediately be apparent to Metrolink's own mechanical inspectors.

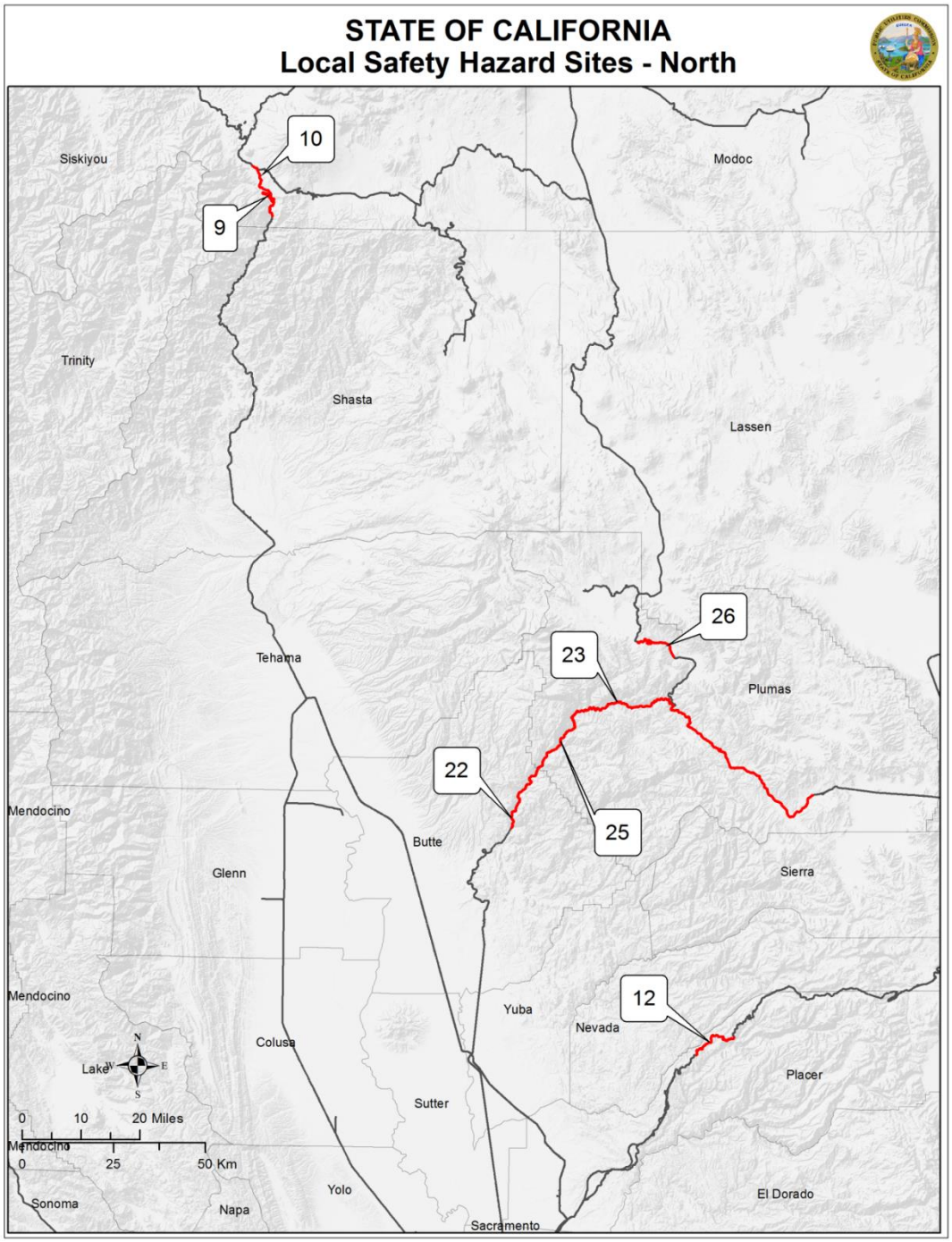
CPUC staff concluded that the incident did not involve any violation of railroad operating rules or of state or federal regulations by the train crew. The Transportation Testing Center, Inc (TTCI) in Pueblo, Colorado, a wholly owned subsidiary of the Association of American Railroads, conducted tests on similar equipment to identify what caused the failure of the wheels to remain in place on the axle. Testing ended in August 2019.

TTCI concluded that that the failure was caused by excessive heat build-up in the wheels of the two Metrolink passenger locomotives, due to those locomotives having a different braking system than that used on freight locomotives. In contrast to freight locomotives, which have a braking system that utilizes brake shoes like the brake pads on an automobile (but on a larger scale), passenger locomotives are equipped with two braking systems: the brake shoes used on freight locomotives, and an additional system of disc brakes. TTCI concluded that the continual application of this dual braking system on the two passenger locomotives during the long descent down the Cajon Pass from Hesperia to San Bernardino caused overheating of their wheels and axles, which led to the inward wheel movements sufficient to cause the derailment of one of the locomotives. Restrictions for usage of these locomotives are in place until this issue is resolved.

Derailed tank cars

Appendix G – Local Safety Hazard Site Maps

Local Safety Hazard Sites are shown below in three areas: 1) Northern California, 2) California Central Coast/Desert Valley, and 3) Southern California. The map numbers correlate to the list of Local Safety Hazard Sites beginning on page 54.




STATE OF CALIFORNIA
Local Safety Hazard Sites - Central
Inyo
San Benito
Fresno
Tulare
Kings
Monterey
San Luis Obispo
1
Kern
16
Santa Barbara
Ventura
Los Angeles
N
W
E
S
0
10
20 Miles
0
25
50 Km


STATE OF CALIFORNIA
Local Safety Hazard Sites - South
Kern
San Bernardino
Los Angeles
28
30
19
29
6
4
3
Riverside
Orange
San Diego
Imperial
31
N
W
E
S
0 10 20 Miles
0 25 50 Km