JOINT HEARING OF THE SENATE ENVIRONMENTAL QUALITY AND NATURAL RESOURCES AND WATER COMMITTEES

Emergency Response to Rail Accidents
Regulatory Framework

Wednesday, March 19, 2014
California State Capitol, Room 3191
9:30 am

Introduction and Overview

The rapid expansion of crude oil transportation by rail, coupled with a series of derailments and explosions over the past year, has raised concerns about the safety of rail transport of hazardous materials.

Railroads carry numerous hazardous materials on a regular basis, and a spill associated with any of those materials could be disastrous. In 1991, California experienced two such incidents that caused dire public health and environmental impacts: the spills at Dunsmuir and Seacliff. As a result, the Legislature passed several measures aimed at preventing and preparing for such accidents.

In recent years, the landscape of rail transport of hazardous materials has changed. It is important to evaluate if California is prepared to respond quickly and efficiently following a rail accident.

This background paper will cover (1) background on railroads and emergency response, (2) railroad risk assessment, (3) transport of hazardous materials by rail, and (4) crude oil background, spills and response.

I. Background on Railroads and Emergency Response

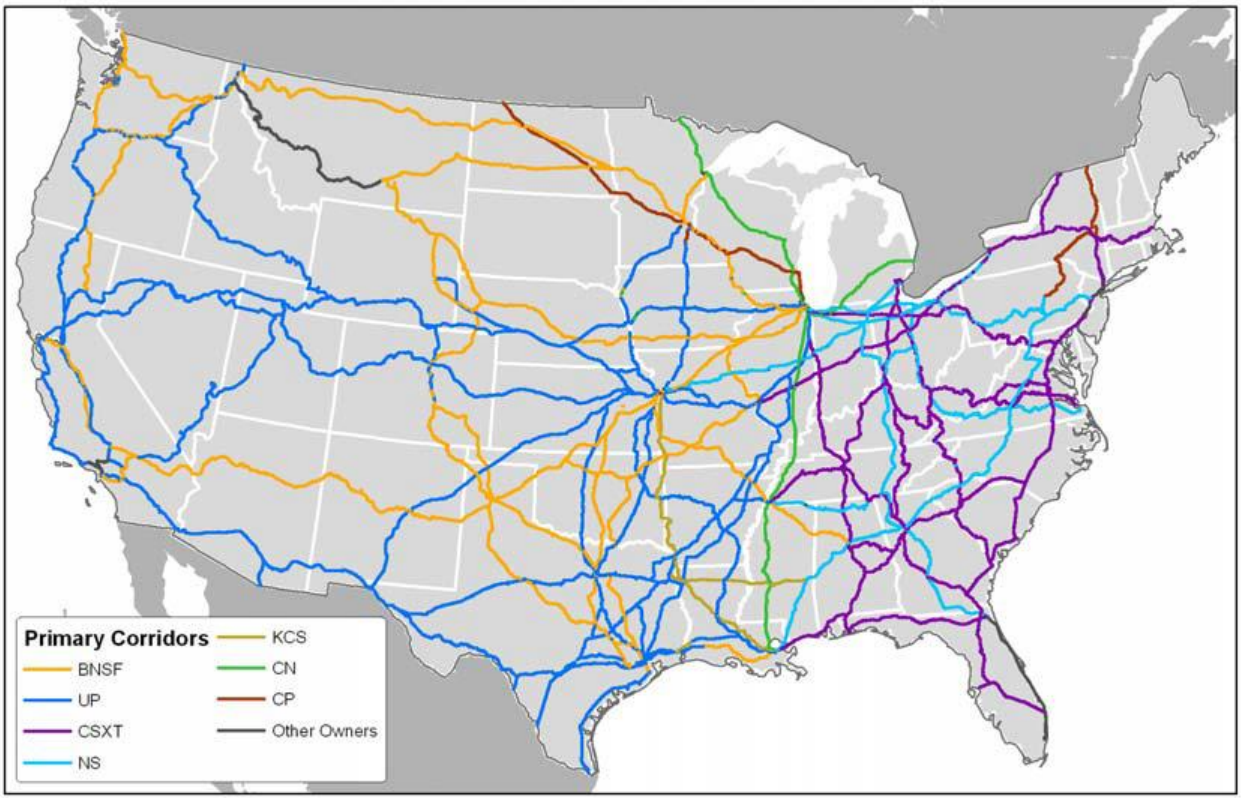
How much rail is in California?

California's freight rail system has become increasingly important for international, interstate, and intrastate trade. According to the Association of American Railroads (AAR) in 2011, freight trains operated on 6,863 miles of rail in California.

These freight lines can roughly be divided into four regions throughout the state: Central Coast, Central Valley, Southern California, and Northern California. Rail traffic is heaviest in southern California but is also high in other parts of the state, such as the Central Valley and between Sacramento and Stockton.

There are only a handful of major entries to California by rail: two routes from Klamath Falls, Oregon; three routes from Nevada through Quincy, Truckee, and Barstow (to Las Vegas); and two routes from Arizona through Needles and Yuma. Of these seven routes, many are located in mountainous regions of the state and

contain some of California's steepest rail grades. The California Public Utilities Commission (CPUC) has identified local safety hazard sites along five of them.



Primary Rail Freight Corridors. Image from National Rail Freight Infrastructure Capacity and Investment Study, 2007

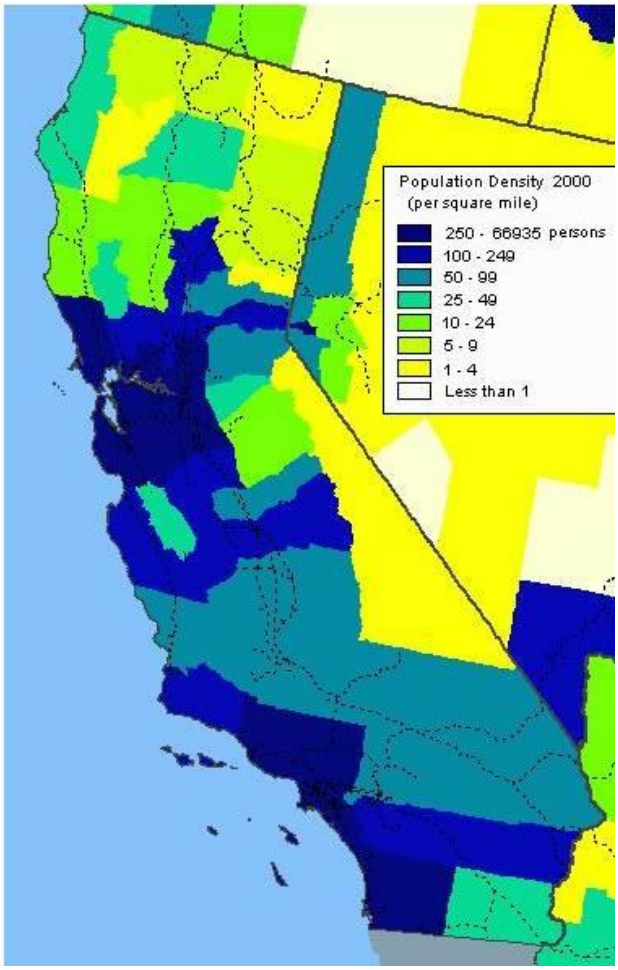
Many of California's rail lines pass over or near bodies of water. In particular, railroad tracks often follow rivers and major creeks because the ground is typically more level in those areas. Two of the best known routes are the Feather River route from Portola to Oroville and the Sacramento River route through Mount Shasta, Dunsmuir, and Lake Shasta. Rail lines also run adjacent to the Pacific Ocean, such as the Coast Route between Vandenberg and San Diego.

Rail lines frequently pass through residential areas and regions of high population density. This is particularly true in southern California, where high population

density overlaps with heavy rail traffic. In addition, most towns in California have a freight railroad that runs through or near it.

Map of California Rail Lines and Water Ways

Map of California Rail Lines and Population Density



In 2011, 155.6 million tons of freight originated in, terminated in, or traveled through California by rail. Freight trains brought in 97.4 million tons of material into California on more than 3 million carloads. The five most common commodities were intermodal (e.g., containerized products, 27.8 million tons), farm products (14.0 million tons), food products (12.4 million tons), chemicals (11.1 million tons), and primary metal products (4.5 million tons).

Historic Rail Accidents in California

Two rail accidents in California in 1991 changed the landscape of hazardous response following a train derailment.

On July 14, 1991, a 97-car Southern Pacific train derailed on the Cantara Loop Bridge in the upper Sacramento River gorge. In the process, more than 19,000 gallons of metam sodium, a pesticide used in farming, were released into the river. Within three days, the pesticide cloud had reached Lake Shasta, where it formed a plume 18 feet thick, one hundred yards wide, and three quarters of a mile long. The spill killed over one million fish and sickened hundreds of residents and cleanup workers.

The response effort involved more than 60 agencies; however, there was limited expertise on how to deal with such an expansive spill.

Two weeks later, on July 28, 1991, a Southern Pacific train derailed in Seacliff, California, releasing 440 gallons of aqueous hydrazine, a corrosive liquid commonly used in jet fuel. The adjacent freeway was closed, and nearby residents were evacuated. Emergency response crews worked for five days before the area could be reopened to the public.

Legislative Response to 1991 Hazardous Materials Spills

Following the hazardous spills in Dunsmuir and Seacliff, six bills were introduced that year in the California Legislature to improve rail safety and emergency response. The bills that were signed by Governor Wilson:

1) Enacted a comprehensive system for identifying railroad sites that were local safety hazards through the Safe Rail Transportation Act of 1991 (AB 151, Chapter 763, Statutes of 1991);
2) Eliminated a fine exemption from railroads (AB 684, Chapter 764, Statutes of 1991; and SB 152, Chapter 767, Statutes of 1991); and
3) Established a procedure for railroad safety and emergency planning and response, and increased fines for oil and chemical spills (SB 48, Chapter 766, Statutes of 1991).

Rail Safety: CPUC

Under these provisions, the CPUC was required to annually report to the Legislature on the type, quantities, and locations of hazardous materials transported by railroads; however, this requirement was later removed from the law following a challenge from the railroads. The CPUC continues to monitor hazardous materials that enter California by rail, and CPUC rail safety inspectors investigate accidents involving the actual or threatened release of hazardous materials as reported by California Emergency Management Agency (CEMA). Inspectors also conduct unannounced inspections at the facilities of shippers, consignees, freight forwarders, intermodal transportation companies, and railroads.

Emergency Response: CPUC

The CPUC also established General Order 161 in 1991, which requires railroads to notify the appropriate emergency response agency following any release or threatened release of a hazardous material within 60 days. Railroads that transport hazardous materials are also required to have an emergency preparedness plan covering notification procedures, mitigation of a release, and training procedures for railroad personnel.

Emergency Response: Railroad Accident Prevention and Immediate Deployment (RAPID)

The Railroad Accident Prevention and Immediate Deployment (RAPID) Force was established (SB 48, Chapter 766, Statutes of 1991) in order to provide immediate onsite response capability in the event of a hazardous spill by rail. RAPID is headed by CalEPA and consists of representatives from the Department of Fish and Wildlife, CalEPA, California Air Resources Board, Cal Recycle, Regional Water Quality Control Boards, Department of Toxic Substances Control (DTSC), Department of Pesticide Control, Office of Environmental Health Hazard Assessment, Department of Public Health, California Highway Patrol, Department of Food and Agriculture, Department of Forestry and Fire Protection, Department of Parks and Recreation, CPUC, Office of Emergency Services, and any other potentially affected state, local, or federal agency.

Additionally, CalEPA was required to develop a state RAPID plan in cooperation with the State Fire Marshal, affected businesses, and the RAPID force. A draft of this report was prepared in April 1994. It states:

> "The mission of the RAPID Force is to provide immediate, onsite technical assistance in an organized and predictable manner to state and local agencies at surface transportation incidents involving a large-scale release of hazardous materials, where the resources of multiple state agencies are needed and/or where multiple state agencies have statutory responsibilities in order to minimize the potential damage to the public health and safety, environment, and property."

A Rail Accident Prevention and Response Fund (RAPRF) and the Hazardous Spill Prevention Account (HSPA) were established in order to pay for hazardous spill response, training, and education. This fund relied on fees imposed on surface transporters of hazardous materials.

The express statutory fee schedule for funding RAPID through the RAPRF and HSPA ended on December 31, 1995, following a sunset provision in the law. However, the mandate for the RAPID body, the RAPRF and the HSPA has not been repealed. Currently, the RAPRF has $13,000 in the fund, and the HSPA has $4,000 in the account.

Deployment of the RAPID Force

The RAPID Force was deployed several times between 1991 and 1995 in response to chemical spills from trains. In addition, the RAPID program worked with DTSC in the training of local emergency response personnel throughout the state. Three illustrative examples of the use of the RAPID Force are discussed below.

General Chemical Release in Richmond

On July 26, 1993, a rail tanker containing concentrated sulfuric acid overheated and exploded during an off-loading procedure. This released between four and eight tons of the poisonous gas over a four-hour period, leading to the medical

treatment of over 20,000 people. The RAPID Force provided technical advice to the incident commander at the release site, developed a health advisory for affected residents, provided health assessment and toxicological assistance, and assisted in community meetings.

Alameda Creek Spill, Alameda County

On January 30, 1994, RAPID team members responded to a request for assistance from the City of Fremont where a rail car plunged off the track and fell into Alameda Creek. The car contained a variety of hazardous materials, and upon impact, burst into flames. The RAPID Force provided direct, onsite support to the local response agency. This included assistance on sampling, analysis, cleanup options and follow-up. Toxicological assistance was also provided to the incident commander.

Smith River Spill, Del Norte County

On August 4, 1994, a truck dumped approximately 1,800 gallons of latex paint onto a steep riverbank in the extreme northwest corner of California. The paint quickly flowed into the Smith River, where it ultimately affected the ecological health of the river. Although this was not a rail incident, RAPID Force members were immediately sent to the scene to provide technical assistance for sampling the soil and water, and remediating the spill.

Legal Challenges to Hazardous Spill Regulations

In order to implement the laws enacted in 1991, the CPUC issued D.97-09-045 in September 1997. This declaration adopted safety regulations to eliminate or reduce local safety hazards. The CPUC regulations were intended to complement the Federal Railroad Administration's (FRA) efforts.

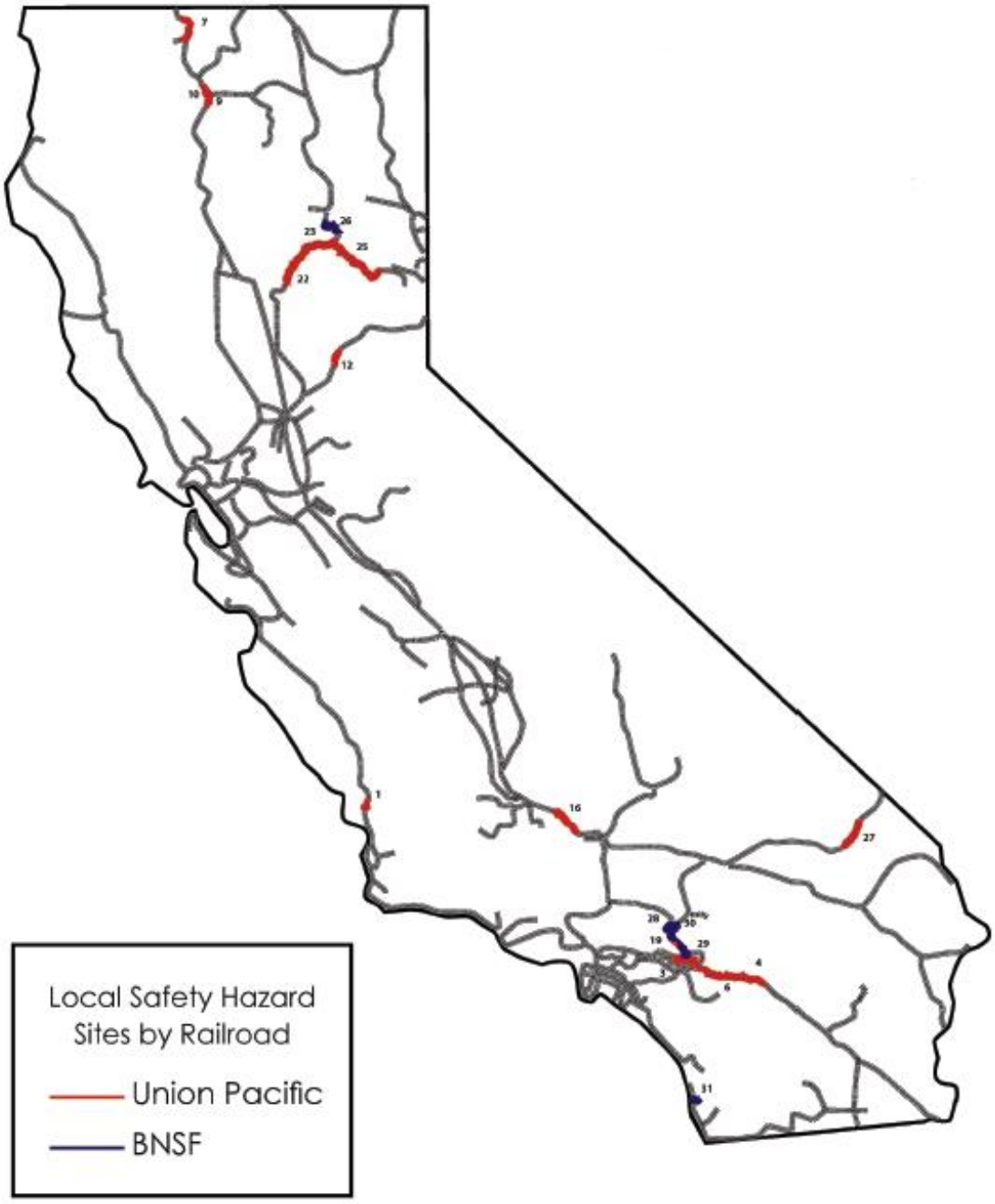
Following the issuance, the railroads challenged the CPUC decision and claimed that the CPUC lacked the authority to require the railroads to comply with train composition rules. In 2003, the Ninth Circuit Court of Appeals concluded that the CPUC rules were preempted by federal law in several areas. In response, the CPUC and the railroads reached a settlement (formalized in D.06-02-013) that allowed the CPUC to enforce the railroads' rules for train composition at the local

safety hazard sites and to require a scientifically based process for generating those rules.

II. Railroad Risk Assessment

CPUC Risk Identification

In an attempt to mitigate potential accidents, the CPUC has identified areas of increased risk of derailment. After the accidents at Dunsmuir and Seacliff, the Legislature required the CPUC to identify sections of railroad track that posed local safety hazards. The CPUC identified 19 track sections, listed in and depicted below.



Local safety hazard sites identified by the CPUC, from its Annual Railroad Local Safety Hazard Report for 2012. Published on July 1, 2013.

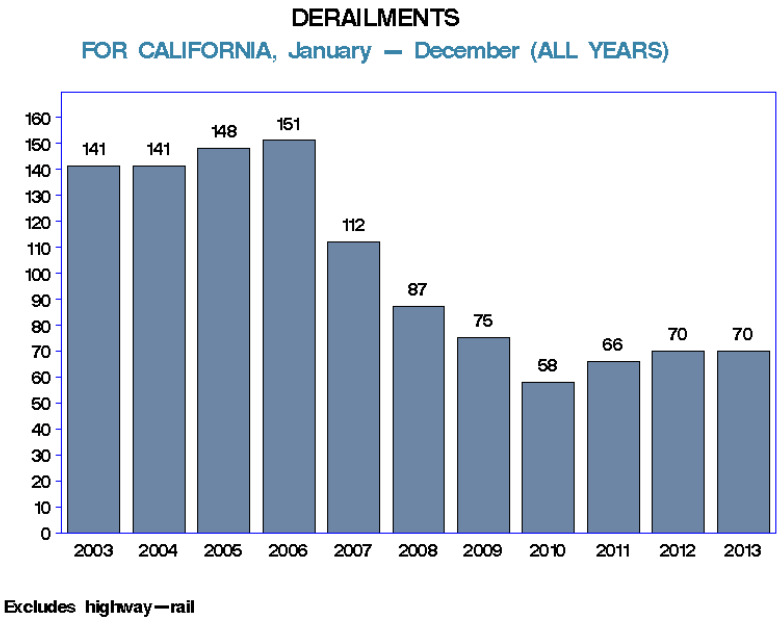
Local Safety Hazards as identified by the CPUC September, 1997

1) Site No. 1 - SP Coast Line, Milepost 235.0 to 249.0 (Now UPRR Coast Subdivision)
2) Site No. 3 – SP Yuma Line, Milepost 535.0 to 545.0 (Now UPRR Yuma Subdivision)
3) Site No. 4 – SP Yuma Line, Milepost 586.0 to 592.0 (Now UPRR Yuma Subdivision)
4) Site No. 6 - SP Yuma Line, Milepost 542.6 to 589.0

5) Site No. 7 – SP Siskiyou Line, Milepost 393.1 to 403.2 (Now Central Oregon and Pacific Railroad Siskiyou Subdivision)
6) Site No. 9 – Shasta Line (Black Butte District), Milepost 322.1 to 332.6 (Now UPRR Black Butte Subdivision)
7) Site No. 10 – SP Shasta Line, Milepost 322.1 to 338.5 (Incorporated into Site No. 9 – see above)
8) Site No. 12 – SP Roseville District, Milepost 150.0 to 160.0 (Now UPRR Roseville Subdivision)
9) Site No 16 – SP Bakersfield Line, Milepost 335.0 to 359.9 (Now UPRR Mojave Subdivision)
10) Site No. 19 – SP Bakersfield Line, Milepost 463.0 to 486
11) Site No. 22 – UP Feather River Division, Milepost 234.0 to 240.0 (Now UPRR Canyon Subdivision)
12) Site No. 23 – UP Feather River Division, Milepost 253.0 to 282.0 (Now UPRR Canyon Subdivision)
13) Site No. 25 - UP Feather River Division, Milepost 232.1 to 319.2
14) Site No. 26 – UP Bieber Line, Milepost 15.0 to 25.0 (Now BNSF Gateway Subdivision)
15) Site No. 27 – UP L.A. Subdivision Cima Grade, Milepost 236.5 to 254.6
16) Site No. 28 – ATSF Cajon, Milepost 53.0 to 68.0 (Now BNSF Cajon Subdivision)
17) Site No. 29 – ATSF Cajon, Milepost 81.0 to 81.5 (Now BNSF Cajon Subdivision)
18) Site No. 30 – ATSF Cajon, 55.9 to 81.5
19) Site No. 31 – ATSF San Diego, Milepost 249.0 to 253.0 (Now BNSF San Diego Subdivision)

Many of the local safety hazard sites are located along the Sacramento and Feather Rivers and Cajon and Tehachapi Passes. These local safety hazards are often found in rural areas with challenging terrain that includes higher grades and tighter track curves.

The CPUC reports that, from 2003-2013, the 2% of track identified as local safety hazard sites were responsible for 18% of derailment accidents. The graph below shows the number of California derailments reported to the Federal Railroad Administration during that time period.



Federal Railroad Administration reportable derailments in California from 2003-2013.

In order to mitigate the risks associated with train derailments, the CPUC adopted regulations that regulated the length and speed of trains, hours of allowable travel, and special training protocols.

Additional Rail Risk Assessment Procedures

The Local Community Rail Security Act of 2006 (AB 3023, Chapter 867, Statutes of 2006) requires that all rail operators provide a risk assessment to the CPUC, the Director of Homeland Security, and CEMA that describes all of the following:

a) The location and functions of the rail facility.
b) All types of cargo, including hazardous cargo, that move through, or are stored at, the rail facility.
c) The frequency that any hazardous cargo moves through, or is stored at, the rail facility.
d) A description of the practices of the rail operators to prevent acts of sabotage, terrorism, or other crimes at the rail facility.
e) All training programs that the rail operator requires for its employees at the rail facility.
f) The emergency response procedures of the rail operator to deal with acts of sabotage, terrorism, or other crimes at the rail facility.

g) The procedures of the rail operator to communicate with local and state law enforcement personnel, emergency personnel, transportation officials, and other first responders, in the event of acts of sabotage, terrorism, or other crimes at the rail facility.

The Act also requires that by January 1, 2008, every rail operator shall develop and implement an infrastructure protection program. Commission staff, in consultation with the Governor's Office of Homeland Security (OHS) and Office of Emergency Services (OES) must review all infrastructure protection plans, and may conduct inspections in order to evaluate railroads compliance with their own plans.

Representatives from the CPUC, OHS, and OES conduct the risk assessment and infrastructure protection plan reviews in person at the railroad location where these documents are normally stored. The review team also provides feedback to the railroad representative on the risk assessment/protection plan sufficiency, and/or areas for improvement.

III. Transport of Hazardous Materials by Rail

Federal Law for Hazardous Material Transport

The Pipeline and Hazardous Materials Safety Administration (PHMSA) issued regulations under 49 U.S.C. Chapter 51 covering hazardous materials transportation and inspection of shipments by rail. The rules call for inspection of hazardous shipments when they are accepted for transportation or placed in a train in conjunction with other routine inspections. Additionally, states are free to develop and enforce their own hazardous regulatory scheme as long as the regulation is consistent with federal law.

Hazardous Materials Transport – Nationwide and in California

Hazardous Waste Manifests and Labeling

While the United States Department of Transportation requires that shippers and carriers of hazardous materials identify transported goods as such, there is no requirement to make the information accessible to the public. Hazardous materials

shipped by vessel and rail are manifested, but the information is not collected in any comprehensive way.

Labeling and placarding requirements of hazardous materials only cover packaged/containerized shipments, like trucks and rail. Bulk shipments of hazardous materials in ships and pipelines are not placarded and are more specifically defined.

Though railroads reportedly keep records of hazardous materials they have shipped, this information is considered proprietary. As a result, it is difficult to track precisely how much hazardous material is being transported at a given time or for a specific year.

Modes of Hazardous Waste Transport

According to PHMSA, in the United States, 40,315 groups registered as offerors and transporters of hazardous materials (including wastes) between October 1, 2012 and September 30, 2013, for a total of $26,544,569 in registration fees. (Small businesses and non-profits registered for $275 and larger companies registered for $2,600).

The United States Department of Transportation estimated 2.2 billion tons of hazardous materials were shipped nationwide in 2007 by all modes of transport, including truck, rail, pipeline, water, and air.

Truck shipment accounted for 53.9% of these shipments by weight, while rail (5.8%), water (6.7%), air (estimate not available), and pipeline (28.2%) accounted for the remainder of single-mode shipments across the United States in 2007. (Multiple modes accounted for about 5% of total tons shipped the same year.)

Based on 2007 data, each year about 130 million tons of hazardous materials are shipped by rail, while about 150 million tons are shipped by vessel. In 2013, this number included more than 15 million barrels of crude imported from Canada via marine vessel, according to the California Energy Commission (CEC).

In 2011, according to the Surface Transportation Board's (STB) Waybill Sample (a stratified sample of carload waybills for all rail traffic submitted by those rail carriers terminating 4,500 or more revenue carloads annually) railroads transported 1.8 million carloads of hazardous materials, roughly half of which are in the chemicals category.

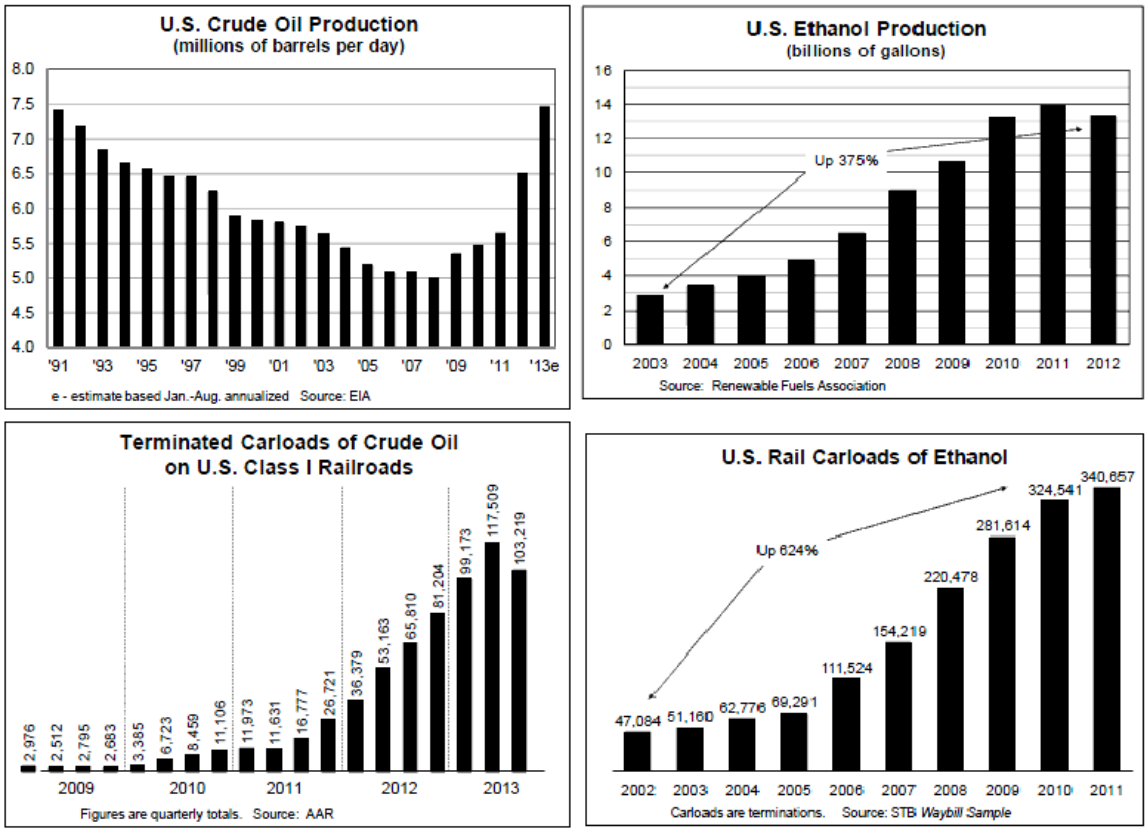
Hazardous Chemicals by Rail

The federal government classifies a subset of hazardous materials as "toxic inhalation hazard" (TIH) materials. These are gases or liquids, such as chlorine and anhydrous ammonia, which are especially hazardous if released into the atmosphere and require additional handling and monitoring procedures. In 2011, railroads carried 77,500 TIH carloads. Hazardous materials accounted for 6% of rail carloads in 2011. TIH materials accounted for 0.3%.

According to the Association of American Railroads (AAR), the highest-volume chemical carried by United States railroads is ethanol. Over half of all rail chemical tonnage (more than 81 million tons in 2012) consists of various industrial chemicals, including potassium chloride, sodium carbonate (soda ash), sodium hydroxide (caustic soda), sulfuric acid, urea, and anhydrous ammonia. Plastic materials and synthetic resins—including polyethylene, polypropylene, polyvinyl chloride, and similar products—account for around 25% of rail chemical tonnage. Most of the rest consists of fertilizers and other agricultural chemicals. (Note that not all chemicals shipped by rail are classified as hazardous.)

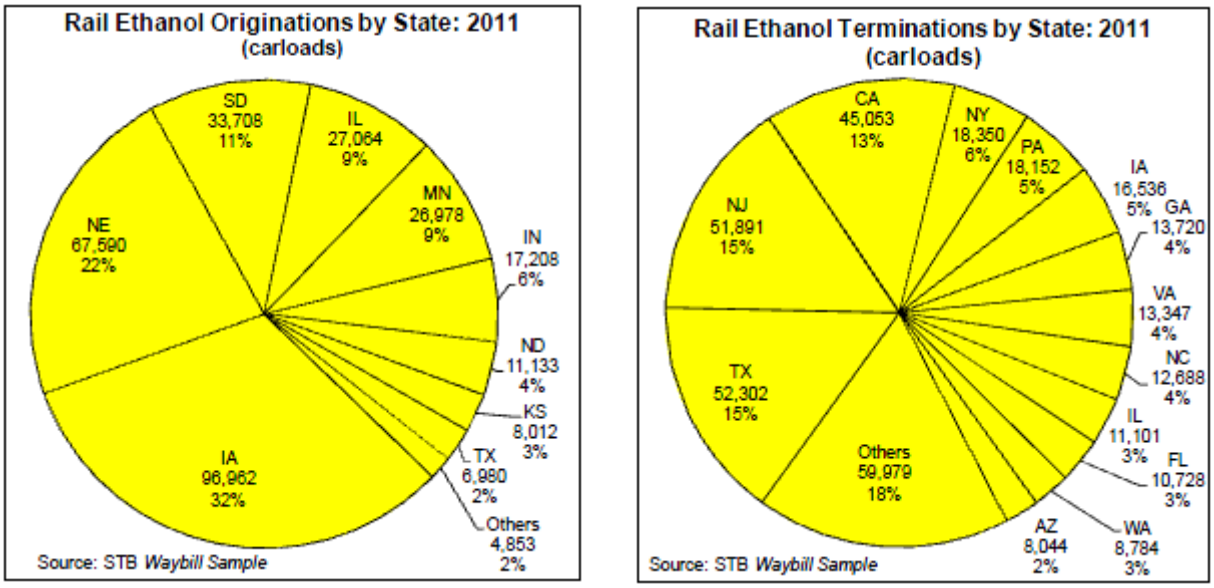
Hazardous Chemicals by Rail: Crude Oil and Ethanol

The production of two types of hazardous materials, crude oil and ethanol, has seen rapid growth in the past few years. This increasing production has required a flexible mode of transport to match output, and has begun to increasingly rely on rail transport. In fact, railroads account for about 70% of all ethanol transport, according to the AAR, and crude oil by rail is growing quickly as pipelines become saturated and do not connect new oil boom regions (such as the Bakken in North Dakota and the Tar Sands in Canada) to major refining locations (such as California). Rail is especially important when primary markets for products are far from their sources, as is the case for both commodities.



Increasing production and transport by rail of both crude oil and ethanol.

In 2011, California had the third highest amount of imported rail tons of ethanol in the country, with more than 45,000 carloads arriving in state. The same year, about 9,000 tank cars of crude oil were imported into California by rail, and this number is projected to increase to over 200,000 cars by rail by 2016, according to the CEC.



Rail ethanol transport origins and terminations by state. **Most ethanol originates in the Midwest, and California receives the third highest number of ethanol carloads in the country.**

Incidents with Hazardous Materials Releases

Short of having a comprehensive, publically available database of all hazardous materials shipped in the United States, the PHMSA Incident Database gives a perspective on the impact of shipped hazardous goods within California boundaries. In 1993, the United States Department of Transportation's Office of Hazardous Materials Safety (OHMS), within the Research and Special Programs Administration (RSPA) created the definition of a serious incident to better convey consequences of hazardous materials transportation. The definition resulted from a need to distinguish between those incidents that have the potential to result in significant consequences from the growing number of relatively minor incidents (such as a half-gallon spill from a paint can on a rail yard).

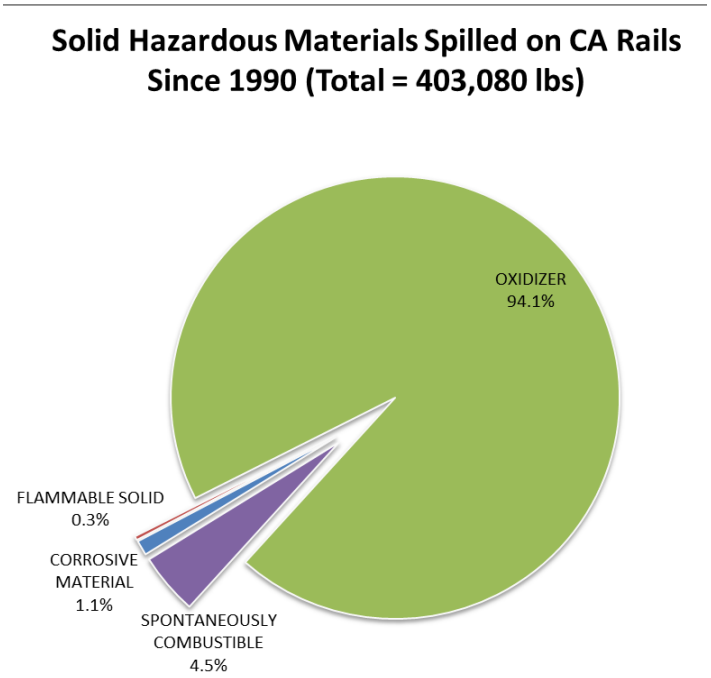
Serious incidents are currently defined as incidents that involve:

- A fatality or major injury caused by the release of hazardous material.
- The evacuation of 25 or more employees or responders or *any number* of the general public as a result of hazardous materials release or exposure to a fire.
- A release or exposure to fire which results in the closure of a major transportation artery.
- The alteration of an aircraft flight plan or operation.

- The release of radioactive materials from Type B packaging.
- The suspected release of a Risk Group 3 or 4 infectious substance.
- The release of over 11.9 gallons or 88.2 pounds of a severe marine pollutant.
- The release of a bulk quantity (over 119 gallons or 882 pounds) of a hazardous material.

Hazardous Waste Spills Since 1990: Solids

A total of over 403,000 pounds of solid hazardous materials were spilled from rails since 1990. These included the following hazardous classes: oxidizer (mostly ammonium nitrate fertilizers); corrosive materials (two incidences of copper chloride); and flammable solids (magnesium or magnesium alloys).

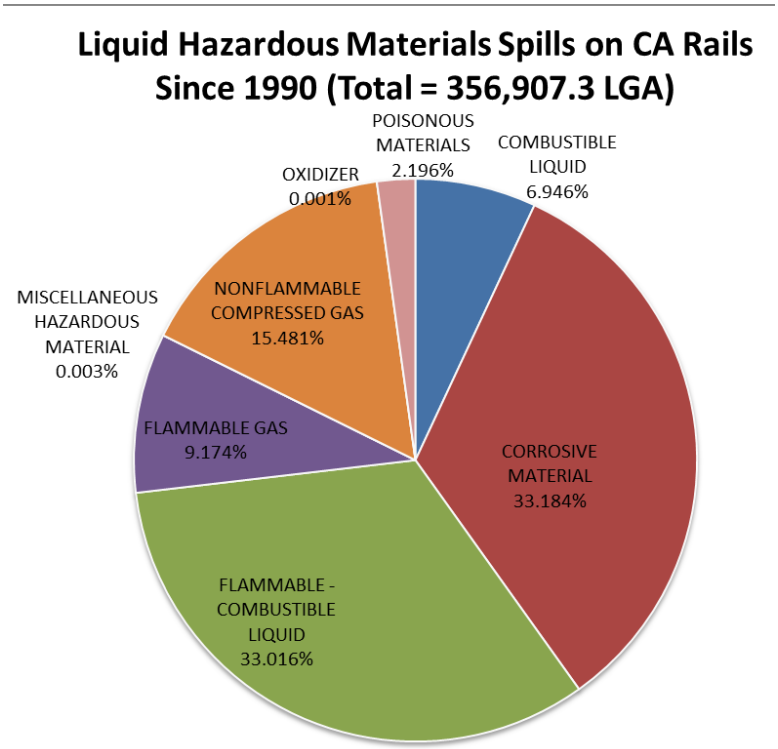


Relative amounts of solid hazardous materials released in serious incidents on California Rails from 1990 through 2013. **The most commonly released solid hazardous material was fertilizer. The flammable solids class was involved in only 1 recorded serious incident.**

Hazardous Waste Spills Since 1990: Liquids

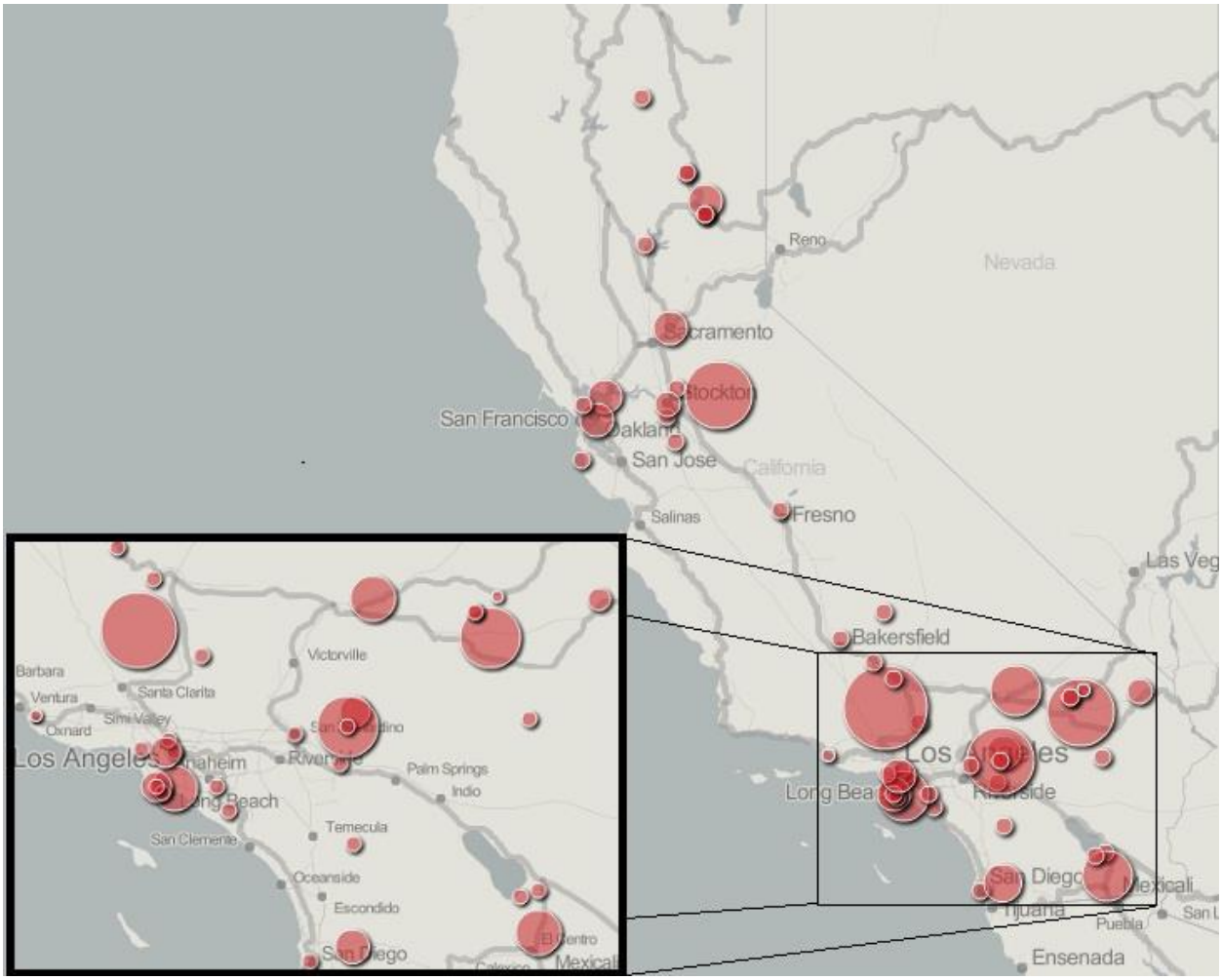
Far more serious incidents involving liquid hazardous materials were recorded for the same time period in California. Six of the nine hazardous classifications were represented in these incidents: corrosive liquids, flammable and combustible

liquids, nonflammable and flammable compressed gases, oxidizers, poisonous materials, and miscellaneous materials. The largest grouping, flammable and combustible liquids, included non-specified combustible liquids, non-specified alcohols and petroleum products, as well as a few single incidents of other liquids. The next category, corrosive materials, was often hydrochloric, phosphoric, or sulfuric acid, though other corrosives were spilled over the time period as well. Flammable gases were liquid petroleum gases, while nonflammable gases tended to be argon or carbon dioxide refrigerated liquids.



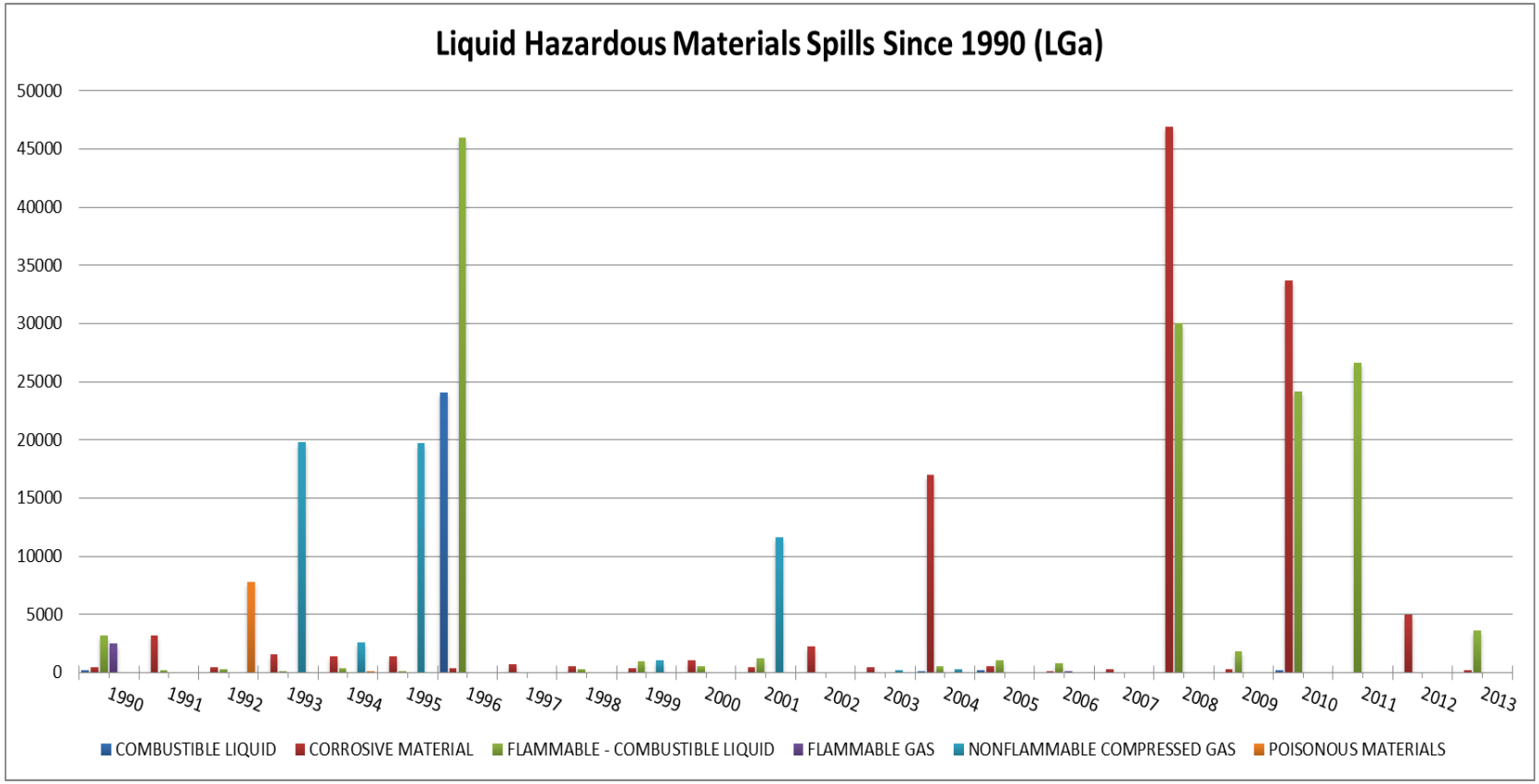
Relative amounts of liquid hazardous materials released in serious incidents on California Rails from 1990 through 2013. **The most commonly released liquids tended to be non-specified flammable/combustible liquids and corrosive acids.**

Liquid spills since 1990 occurred most often in the central and southern portions of the state, particularly in the Los Angeles area. Nine incidents occurred in Los Angeles itself, involving corrosive and flammable liquids.



Geographic distribution of rail incidents involving hazardous liquids since 1990. Bold grey lines mark primary railroad tracks. Size of red circles indicates relative number of incidents, with the smallest circle representing one incident and the largest representing 11. Southern California is inset to show detail. Please note: most serious incidents reported are unique incidents; however, in some cases each car in a derailment is listed as a separate incidence. This was the case in a Fremont, CA derailment of nine cars in a single accident; therefore Fremont is overrepresented in this map.

Over the span from 1990 through 2013, the predominant class of spills has shifted from combustible liquids (non-specified) and nonflammable compressed gases in the 1990's to corrosive materials and flammable liquids.



Liquid Hazardous Materials Spills on California Rails since 1990 (liquid gallons). Note that the well-known Cantara Loop derailment, which spilled 19,000 gallons of metam sodium into the Sacramento River, is not shown on this chart; metam sodium was not classified as a hazardous material at the time and was therefore not reported as an incident involving hazardous materials. The largest spill of flammable gas was 5 gallons and is not easily visible in the chart.

IV. Crude Oil Background, Spills and Response

Oil Tanker Spills and Legislative Response: 1989-1991

Two major crude oil spills from tankers influenced state law for emergency response following marine oil spills: the Exxon Valdez spill in Alaska on March 24, 1989, and the American Trader spill near Huntington Beach on February 7, 1990. As a result, the Legislature passed the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act in 1990. This Act covers all aspects of marine oil spill prevention and response in California. The Act established an Administrator to direct prevention, removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spill in marine waters of the state. In 1991 the Office of Spill Prevention and Response (OSPR) opened, headed by the Administrator.

Oil Spill Prevention and Response Program

The Brown Administration has proposed significant changes to the existing oil spill prevention and response program through the FY 2014-15 Budget to address the expected increase of crude oil transport by rail. The proposed Department of Fish and Wildlife Budget Change Proposal (BCP) expands the current oil spill prevention and response program focused on marine waters inland to include all waters of the state. According to the Department, about half of all inland spills are oil spills. Given the proximity of rail lines to California's waterways, the risk of contamination following a rail accident is high. The Administration's proposal would require the implementation of a statewide inland oil spill program encompassing oil-related facilities and oil transporters.

The proposal would extend to inland waters features of the current marine oil spill program including:

- Development and testing of inland oil spill contingency plans,
- Certifications of financial assurance to fund cleanup in the event of an oil spill,
- Use of the Oil Spill Response Trust Fund to pay for response,
- Penalties for spills, and
- Oiled Wildlife Care Network (OWCN) response in the event of a spill.

The BCP also adds members to the Oil Spill Technical Advisory Committee to reflect inland interests. To implement and fund the new inland program, OSPR would add 38 positions with an ongoing appropriation of $6.2 million annually. Revenue for the program is provided by removing the January 1, 2015, sunset date on the 6.5¢ cap on the per barrel fee for oil delivered at marine terminals and extending the fee to include all crude oil delivered to refineries in California by any transportation method. The fees are deposited in the Oil Spill Prevention and Administration Fund. The per barrel fee change is expected to address an ongoing structural deficit in this fund, despite the BCP also shifting support for the OWCN to this fund and increasing it to $2.5 million. The planned changes require legislative action and extensive budgetary trailer bill language accompanies the BCP. The Legislative Analyst's Office has recommended support for the proposal, although it recommends that a risk-based fee, if feasible, be implemented that covers the cost of the entire oil spill program and that the requested positions be funded for one-half year only.

Crude Oil Rail Accidents

Train accidents involving large crude oil spills resulting in large fires and explosions have made headlines in the past year. According to data from PHMSA, the amount of crude oil spilled from rail cars in 2013 exceeded that spilled in the preceding four decades. In 2013, 1.15 million gallons of crude oil were spilled, compared with about 800,000 gallons spilled from rail cars between 1975 and 2012.

One of the most serious of these recent accidents was the Lac-Mégantic derailment that occurred in the town of Lac-Mégantic in Canada on July 6, 2013. In this accident, a 74-car freight train carrying crude oil from the Bakken formation derailed in the downtown area, killing 47 people and destroying more than 30 buildings when multiple tank cars exploded and burned. In addition, the Chaudière River was contaminated by 26,000 gallons of crude oil.

A number of other accidents occurred in the last six months:

- On October 19, 2013, nine tank cars of propane and four tank cars of crude oil from Canada derailed as the train was traveling at 22 miles an hour.

While three of the propane tank cars ignited, the crude tank cars were not punctured. There were no injuries, but about 100 residents were evacuated.

- On November 8, 2013, a train carrying 90 cars of crude oil from North Dakota to a refinery at the Gulf Coast derailed in Aliceville, Alabama. Thirty tank cars left the tracks and about a dozen of these burned. There were no injuries or fatalities.

- On December 30, 2013, a train hauling 106 cars of crude oil collided with a grain train in Casselton, North Dakota. Between the trains, 34 cars derailed, including 20 carrying crude oil, which exploded and burned for over 24 hours. No injuries were reported, but over 1,400 residents were evacuated.

- On January 7, 2014, a mixed train carrying crude oil, propane, and other materials derailed in Plaster Rock, New Brunswick, with 17 cars from the track. Five of these cars carrying crude oil caught fire and exploded. About 45 homes were evacuated.

- On January 20, 2014, a 101-car train including five cars carrying crude oil derailed on a bridge over the Schuylkill River in Philadelphia, Pennsylvania. No leakage was reported in this accident.

- On February 13, 2014, another train carrying crude oil from Canada derailed in Vandergrift, Pennsylvania, at a bend by the Kiskiminetas River. Of the 120 cars hauled by the train, 21 left the tracks and 19 of these carried oil. Four tank cars spilled between 3,000 and 4,000 gallons of oil.

Properties of Crude Oil

All crude oil is not the same. Depending upon the source of the oil, it may have widely varying chemical and physical properties prior to refining. For example, crude may exhibit a range of viscosities (flow freely (high) or not (low)), densities, volatile hydrocarbon fractions, impurities, and flammabilities. A very light crude may float on water, evaporate quickly and ignite in the presence of a lighted match. A very heavy crude – such as the bitumen produced from tar sands – may have the

consistency of thick mud, smell like rotten eggs, not burn readily, and sink through water. The "sour" smell is from an impurity, hydrogen sulfide, in the crude oil; high concentrations of hydrogen sulfide can be corrosive. While hydrogen sulfide is naturally occurring, other impurities may be introduced into the crude oil by the production process. Regardless of the source, impurities affect the composition of the crude oil and may correspondingly affect the volatility, toxicity, corrosivity, and chemical reactivity of the crude oil.

The risks to health, safety and the environment for a crude oil spill are driven by the specific properties of the crude oil. Therefore, federal law and regulation requires that all hazardous materials be properly labeled to ensure appropriate and safe handling, transport and emergency response, if needed.

Bakken Crude Oil Properties

Recent rail accidents where derailments led to explosions and extensive fires suggest that Bakken crude oil may have different properties than what is typically assumed for crude oil. Tests of the Bakken crude that exploded in the Lac-Mégantic derailment showed that it has a lower flashpoint and is thus much more flammable than most crudes. Its viscosity is also very close to that of unleaded gasoline so it would flow readily when spilled. There is speculation that Bakken crude is also more corrosive, which could result in thinning and failure of tank car walls.

Bakken Crude Oil Federal Response

PHMSA and the Federal Railroad Association (FRA) joined to initiate "Operation Classification," also known as the "Bakken Blitz," to test samples and verify correct labeling of crude oil coming from the Bakken formation. Spot checks to obtain crude oil samples and subsequent testing of the sampled oil began in the summer of 2013. Recently announced preliminary results show 11 of 18 crude oil samples were incorrectly classified as being less flammable than they actually were, and the program is being expanded. Due to the inquiry, three companies have been issued Notices of Proposed Violations totaling $93,000.

On February 25, 2014, the United States Department of Transportation issued "an Emergency Order requiring all shippers to test product from the Bakken region to ensure the proper classification of crude oil before it is transported by rail." This information should assist in emergency response procedures should a spill occur in California and assuming the proper documentation of such testing is provided.