



# Crude Oil, Ethanol Railroad Shipment Review, Safety Activity, Highlights



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*\* Disclaimer: Much of the information in this presentation is preliminary, represents some of the information examined to-date in an ongoing analysis and assessment, and should be independently verified before further use. This presentation is only intended to be a briefing, a primer, and material for further research and investigation.*





## Presentation Overview

- Review/update on oil-train and ethanol-train accidents.
- Oil, ethanol rail shipment trends.
- Regulatory responses:
  - National Transportation Safety Board.
  - U.S. Department of Transportation:
    - Federal Railroad Administration.
    - Secretary Foxx.
    - Pipeline and Hazardous Materials Safety Administration.
  - Governor's Task Force.
  - Department of Fish and Wildlife, Office of Spill Prevention and Response.
- CPUC rail safety oversight activities.





# Crude-oil tank car accidents

November 2013, Aliceville, Alabama

July 2013, Lac-Mégantic, Quebec



October 2013, Gainford, Alberta



December 2013, Casselton, North Dakota

January 2014, Plaster Rock, New Brunswick





## Ethanol tank-car accidents



June 2009, Cherry Valley, IL



February 2010, Tehachapi, CA



February 2011, Arcadia, OH



October 2011, Tiskilwa, IL



July 2012, Columbus, OH



August 2012, near Plevna, MT





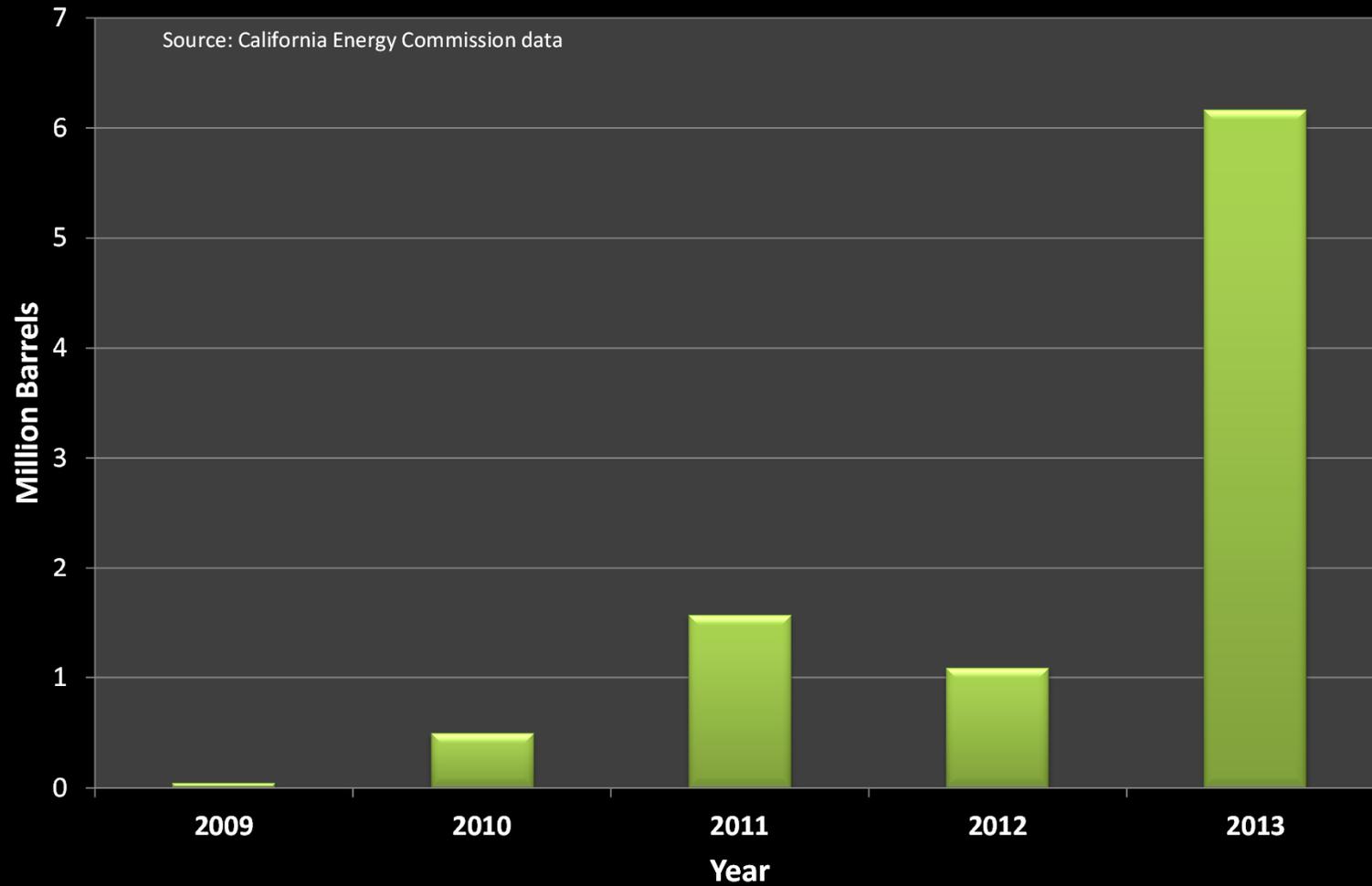
## Crude-oil, Ethanol Tank-Car Accident Causes

- Some causes have been determined, some are preliminary.
- Of the eleven accidents presented:
  - Six had track related causes.
  - Two had equipment (rail car) related causes.
  - Two had either track or equipment related causes (yet to be determined).
  - One had a human-factors cause (unattended train securement).





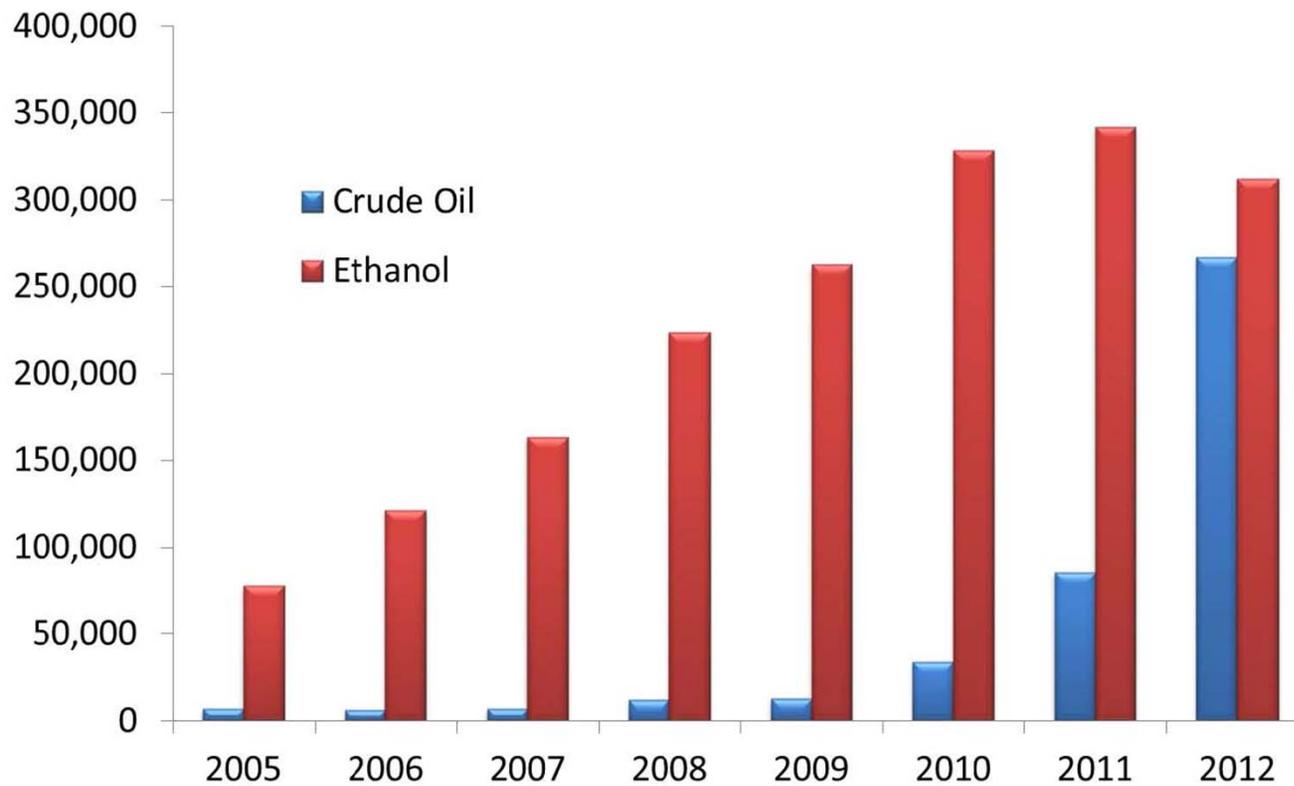
## Increase in Oil Shipments by Rail in California 2009 - 2013





# Crude Oil and Ethanol Rail Shipment Trends – U.S.

## Crude Oil and Ethanol Rail Originations





## Planned Oil Refinery Facilities for Oil-by-Rail<sup>1</sup>

- **Plains All American – Bakersfield – Under construction<sup>2</sup>**
  - 90 cars per day.
- **Pittsburg – WesPac Energy Project – Planned**
  - 70 cars per day.
  - Construction could begin early 2014, 18 months for completion.
- **Benicia – Valero – Planned**
  - 100 rail cars per day.
  - Could be operational by early 2015, first quarter
- **Bakersfield – Alon – Planned**
  - 200 cars per day.
- **Wilmington – Valero – Planned**
  - 85 cars per day.
  - Seeking permit approval.

<sup>1</sup> Source: California Energy Commission, with conversion from barrels to carloads.

<sup>2</sup> CPUC update.





## Oil-by-Rail Projection for California\*

- Currently: Less than one percent of crude (produced and imported) originates by rail shipment.
- Projected to grow to as much as 25 percent by 2016, depending on:
  - Discounted crude oil prices compared to foreign sources.
  - How long these discounted prices will last.
  - Cost of rail transportation from Canada, the Dakotas, and Texas.
  - The extent that new crude-by-rail projects become operational.
  - Any reversal of California's trend of declining crude oil production.





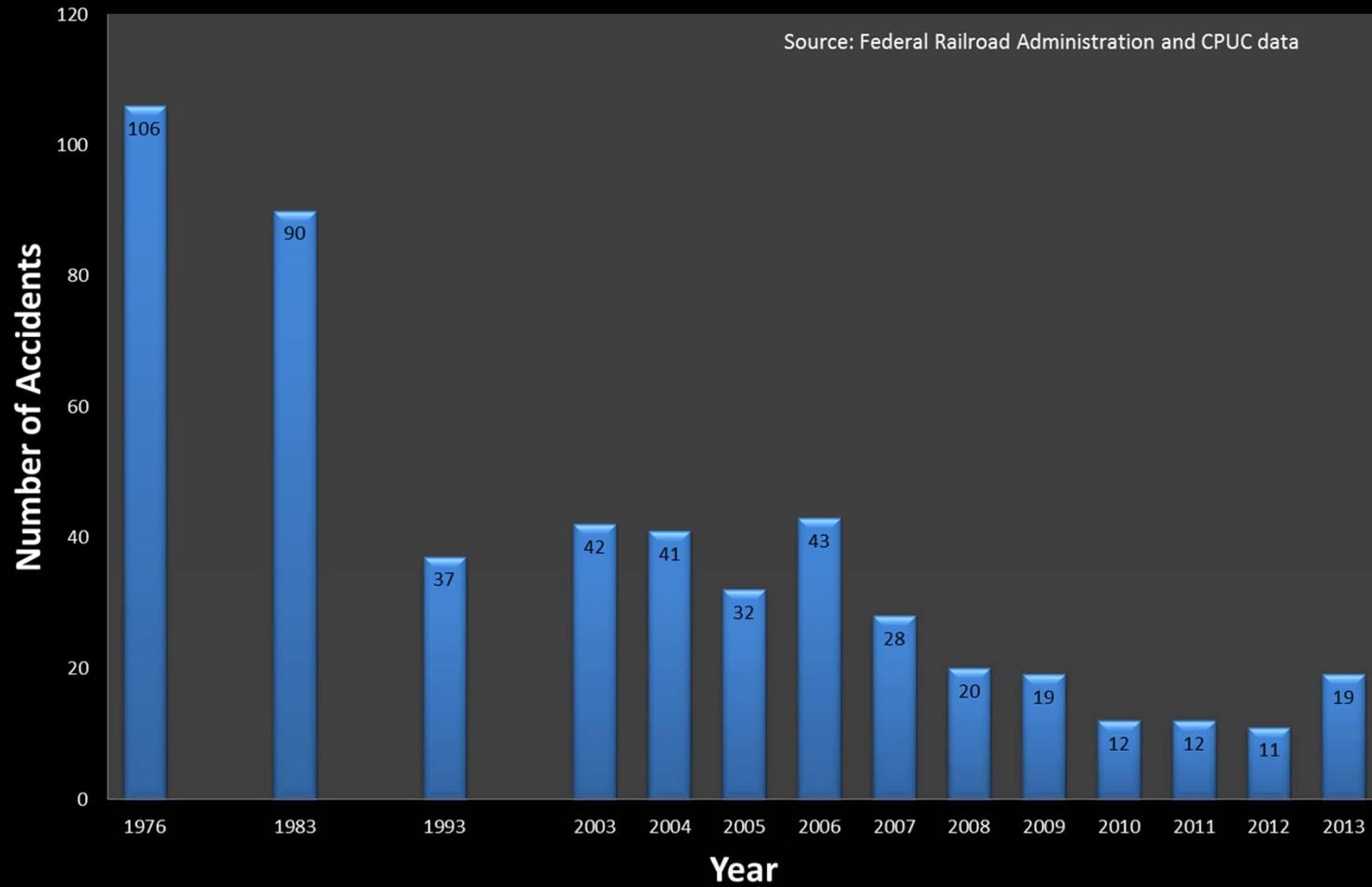
## Railroad Freight Routes into California

- Klamath Falls, Shasta, Dunsmuir, Sacramento River, Roseville.
- Klamath Falls, Feather River, Stockton.
- Reno Junction, Feather River, Stockton.
- Reno, Donner Pass, Roseville.
- Mojave, Tehachapi Pass, Bakersfield.
- Las Vegas, Barstow, Cajon Pass, Colton.
- Needles, Barstow, Cajon Pass, San Bernardino.
- Yuma, Palm Springs, Colton.



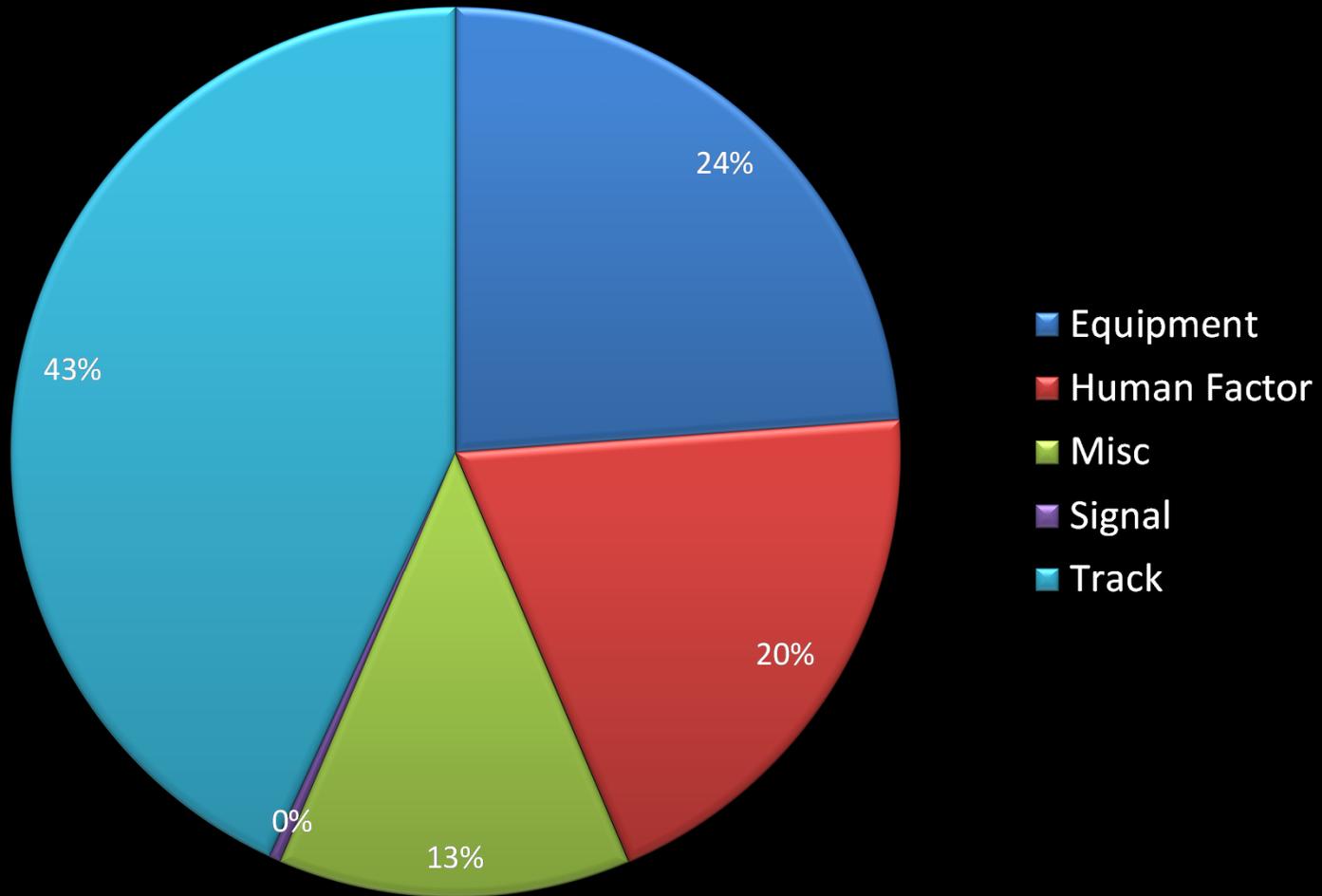


## California Main Line and Siding Train Accidents 1976, 1983, 1993, 2003-2013



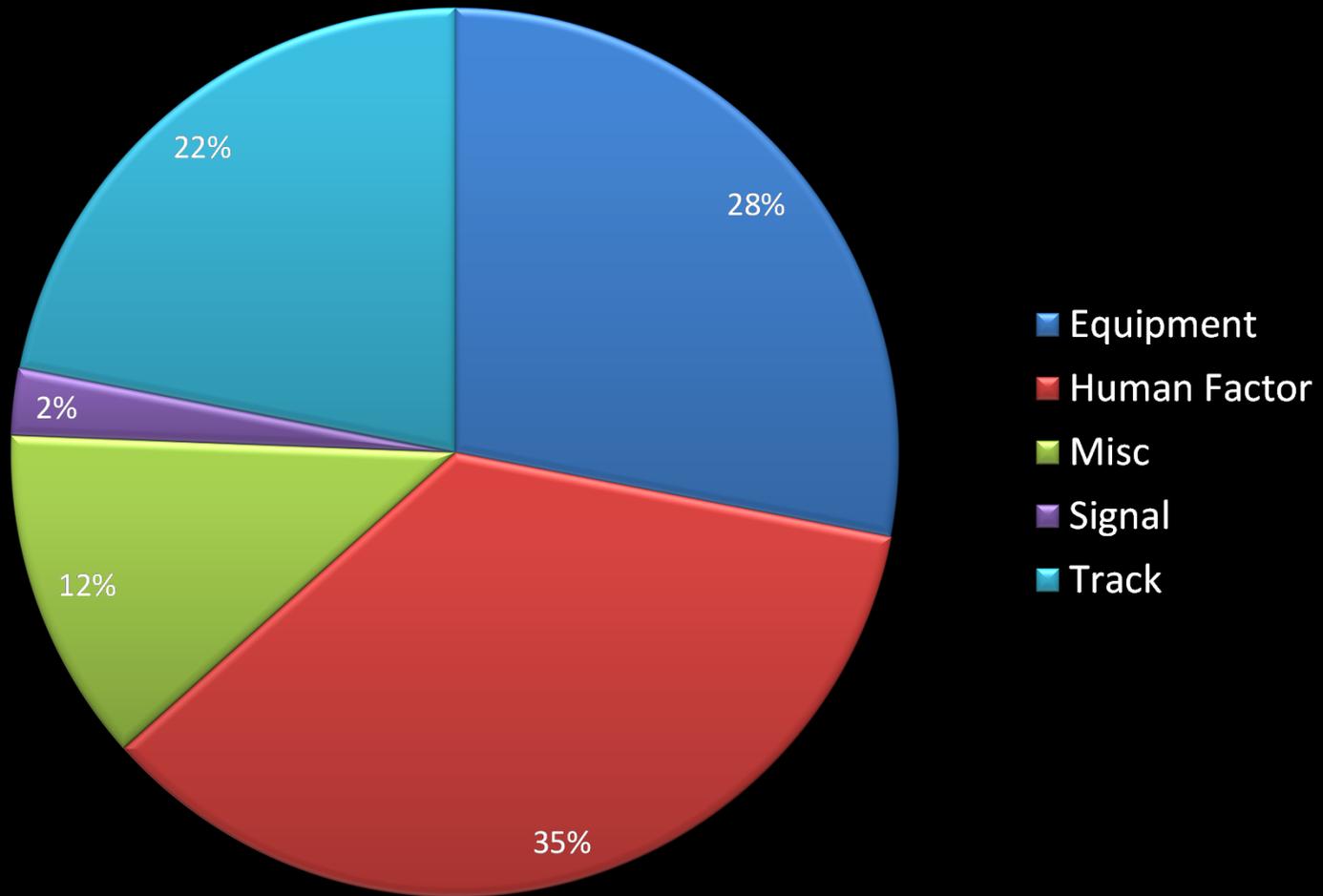


### Cause Categories for Main Line Derailments and Collisions - U.S. 2009 - 2013





### Cause Categories for Mainline Derailments and Collisions - California 2009 - 2013





## National Transportation Safety Board

- Involvement in Canadian Transportation Safety Board investigation of Lac-Mégantic tragedy.
- Recommendations to the Federal Railroad Administration (FRA) and the Pipeline and Hazardous Materials Safety Administration (PHMSA):
  - Route planning, rerouting. (FRA and PHMSA)
  - Audit, ensure adequate rail carrier response plans. (FRA)
  - Audit, ensure appropriate hazardous materials classifications, safety and security plans. (FRA)
  - Revise spill response thresholds. (PHMSA)
  - Require shippers to test for and ensure proper classification, packaging, documentation. (PHMSA)





## Federal Railroad Administration Action, Rulemakings

- Issued Emergency Order 28 (EO-28) for U.S. railroads in response to Lac-Mégantic tragedy.
- Rail Safety Advisory Committee workgroups to advise on making EO-28 permanent:
  - Hazardous materials issues.
  - Train securement.
  - Crew size.
- Consists of about 50 members from railroads, unions, shippers, car owners, equipment suppliers.
- States have one “seat” or vote – Association of State Rail Safety Managers (ASRSM).
  - ASRSM managers from the 30 states with FRA/State Participation Program.
  - CPUC currently represents ASRSM in RSAC.





## U.S. Department of Transportation, Secretary Foxx

- Secretary Foxx’s January 16 “Call to Action” meeting with:
  - Association of American Railroads (AAR).
  - American Petroleum Institute (API).
  - Association of Short Line and Regional Railroad Association (ASLRRA).
- January 22 follow-up letter documenting meeting accomplishments, agreements:





## Secretary Foxx meeting (cont.)

- AAR agreed to consider and provide details on:
  - The use of existing Federal protocols for routing hazardous materials, such as Toxic-by-Inhalation hazardous materials, for crude oil unit train shipments.
  - The use of speed restrictions where appropriate on crude oil unit trains travelling through high consequence areas.
  - The use of distributed power on unit crude oil trains.
  - Increasing and improving track, mechanical, and other rail safety inspections.





## Secretary Foxx meeting (cont.)

- API recommended and agreed to:
  - Share expertise and testing information with DOT, notably PHMSA, about characteristics of crude oil in the Bakken region.
  - Work on identifying best practices to ensure that appropriate and comprehensive testing and classification of crude oil being transported by rail is performed.
  - Collaborate with PHMSA on improving its analysis of crude oil characteristics.





## Secretary Foxx meeting (cont.)

- AAR and API agreed to:
  - Improve emergency responder capabilities and training to address crude oil incidents.
  - Recommission the AAR's Rail Tank Car Standards Committee – to agree on a new AAR rail tank car standard.





## Pipeline and Hazardous Materials Safety Administration

- *Operation Classification, aka “Bakken Blitz”*
  - Joint FRA/PHMSA operation.
  - To investigate how shippers and carriers are classifying crude oil and what actions they are taking to determine the characteristics of the material.
    - Launched in August 2013.
    - Primarily targets shipments from the Bakken.
    - Consisted of unannounced spot inspections, data collection and sampling, and verifying compliance.
    - Initial fines for misclassification reported today: \$93,000.
    - Ongoing.





## Governor's Task Force on Oil-by-Rail

- To examine safety issues relating to the increased transport of crude oil by rail into California.
- To explore what actions the state can and should take.
- Consists of California State agencies that might take action.





## Office of Spill Prevention and Response (OSPR)

- Office is within the Department of Fish and Wildlife.
- Updating program to address projected shift in oil by ships to oil by rail:
  - Less than one percent by rail in 2013.
  - Projected to rise to 25 percent.
- With CPUC, other state agencies on Governor's Task Force.
- Looking for opportunities to work together with other agencies.





## CPUC Activities

### General:

- 38 FRA-certified railroad inspector/investigator positions.
  - Track and Structures.
  - Motive Power and Equipment.
  - Signal and Train Control.
  - Operating rules and practices.
  - Hazardous materials shipment.
  - State regulations.
- Accident analysis, risk management staff.





## CPUC Activities (cont.)

- Specific examples of CPUC staff risk reduction activities relating to crude-oil, ethanol trains:
  - Joint CPUC/FRA focused inspections of hazardous materials shipments.
  - Plan review, construction monitoring, inspections, of Bakersfield to Plains refinery trackage, bridges, crossings, operating practices...
  - FRA Rail Safety Advisory Committee rulemakings on oil-train emergency order, permanent regulations.
  - Discussion, updates with UPRR and BNSF in quarterly meetings.
  - Tehachapi Pass track inspection.
  - Tehachapi Pass accident investigation.





## Tehachapi Pass Track Inspection



25

**First defect: What is the defect?**





## Track Inspection (cont.)

- Continuous welded rail (CWR) shrinks in winter cold.
- The greater the temperature drop, the more likely CWR will break.
- Recent cold temperature swings.
- Rail breaks, need to repair and keep traffic moving.





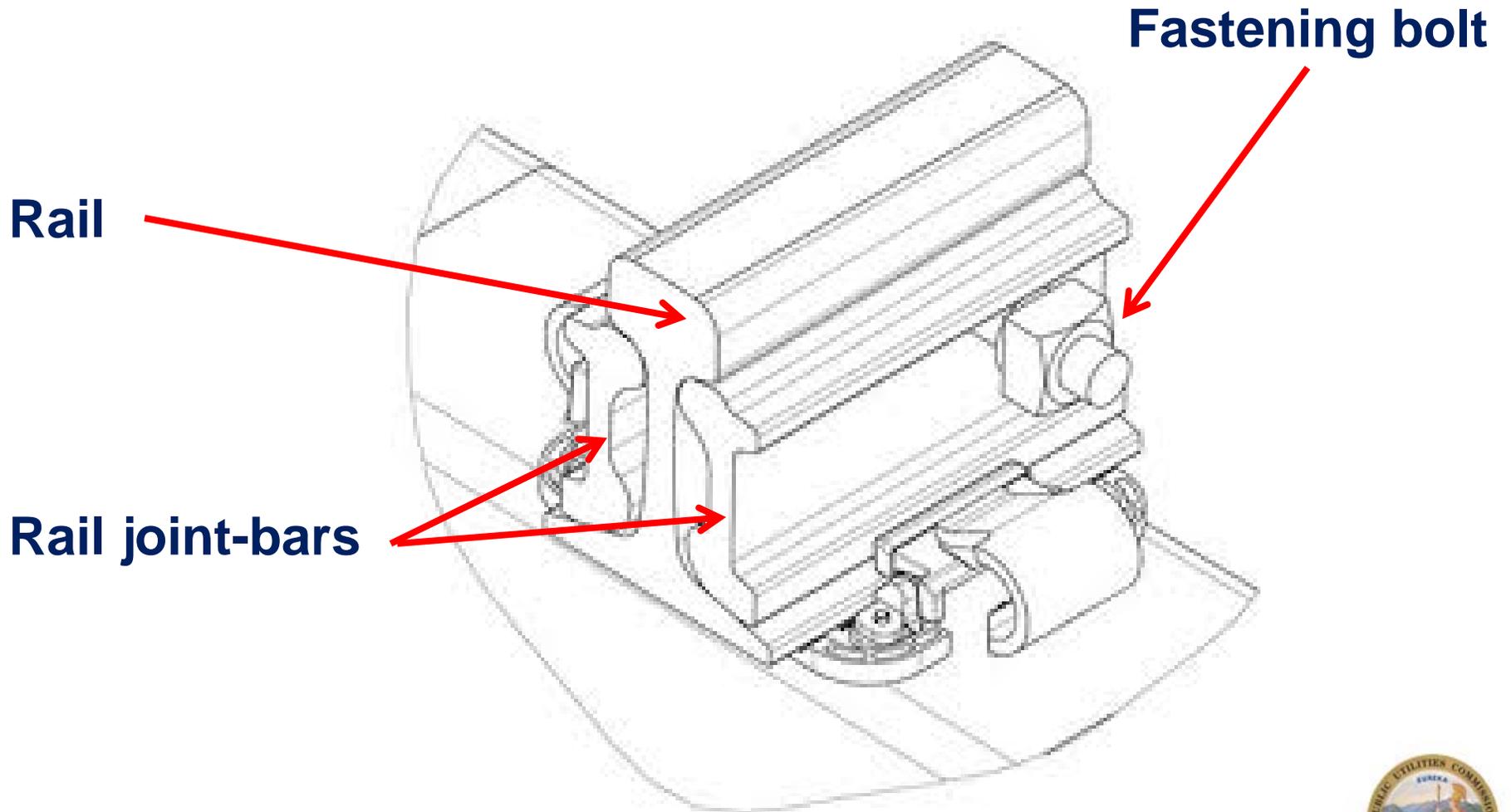
## Track Inspection (cont.)

- Inclusion nucleus





## Rail Joint-bars Used for Repair





## Rail ends and joint bars in a normal rail joint





**Best practices:**

**Thermite weld**



**Rail drill for holes**





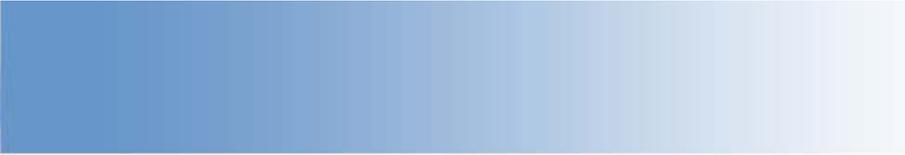
## Using a torch to cut rails: Not a good practice for cutting joint-bar holes





## Second Rail Break, Subsequent Derailment, Staff Investigation Tehachapi, December 10, 2013





33

Broken rail repair – due to torch-cutting holes for bolts, no slow order





## Staff Actions

- CPUC staff discovered the first rail break:
  - Wrote an FRA defect report.
  - Slow order, repair.
- Railroad discovered the second rail break:
  - Less than optimal repair: torch-cut bolt holes.
  - Torch-cutting can change metallurgical properties.
  - No slow-order.
  - Derailment.
  - CPUC staff files FRA-violation for no slow-order.

