



**CPUC Public Agenda 3278**  
**Thursday, July 28, 2011, 9:00 a.m.**  
**505 Van Ness Ave, San Francisco**



**Commissioners:**  
**Michael R. Peevey**  
**Timothy Alan Simon**  
**Michel Peter Florio**  
**Catherine J.K. Sandoval**  
**Mark J. Ferron**

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# CPSD Safety Report



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**California Public Utilities Commission**

July 28, 2011





## Presentation Overview

- July 14, 1991, derailment and toxic spill in the Sacramento River at the Cantara Loop above Dunsmuir.
- Subsequent responsive legislation.
- CPUC statewide risk assessment.
- CPUC proceedings, rules, litigation, settlement.
- Recent derailment history.
- Current activity.





Southern Pacific  
Railroad  
Cantara Loop  
derailment and toxic  
spill  
July 14, 1991





# Toxic plume in Sacramento River

July 14 – 16, 1991

- Over 19,000 gallons of metam sodium spilled.

Metam sodium is a pesticide and herbicide used to sterilize soil.

Forms many toxins when mixed with water.





## • Environmental and economic consequences

Sudden and catastrophic reduction in canopy cover and foliage along the river, with a corresponding dramatic loss of many wildlife species dependent on the river's riparian vegetation.

Wildlife such as birds, bats, otters, and mink either starved or were forced to move because their food sources were no longer available.

Over a million fish, and tens of thousands of amphibians and crayfish were killed.

Millions of aquatic invertebrates, including insects and mollusks, which form the basis of the river's ecosystem, were destroyed, with some becoming extinct.

Hundreds of thousands of willows, alders, and cottonwoods eventually died. Many more were severely injured.

The chemical plume left a 41-mile wake of destruction, from the spill site to the entry point of the river into Shasta Lake.

Tourist, fishing economic basis for Dunsmuir area devastated until river recovered years later.

3,000 plaintiffs reach \$15 million settlement for injury claims.

State and federal agencies reach \$38 million settlement for damages and recovery efforts.





# Accident Causes

- “Stringlining.”
- Excessive lateral versus vertical forces – ratio of lateral to vertical forces (L/V ratio).
- Unsafe train make-up: Empty car on head-end of heavy train, long car coupled to short car.
- Steep grade, sharp curve, track-train dynamics (TTD).
- Rule change made previously that weakened train make-up rules.
- Lack of adequate review of train make-up rules changes – no validation of effect on safety, i.e., safe L/V forces.
- Daily certainties - operational expediency and efficiency - attended to at cost of attending to low probability occurrence.





## CPUC actions

- Accident investigation, informal and formal actions.
- Required Southern Pacific:
  - To scientifically validate its train make-up rules.
  - To comply with those rules.
  - To obtain approval from Commission staff for any train make-up rules changes.
  - Proposals for changes must be accompanied by scientific validation of their safety.
  - To comply with track strength standards exceeding Federal Railroad Administration standards.





# Cantara Loop guard railing





## Legislation following Cantara Loop derailment: New PU Code sections

- **7711.** The commission shall annually report to the Legislature, on or before July 1, on sites on railroad lines in the state it finds to be hazardous....  
...a list of all railroad sites in the state that the commission determines, pursuant to Section 20106 of Title 49 of the United States Code, pose a local safety hazard.... (underlining added)
- **7712.** On or before January 1, 1993, the commission shall adopt regulations, based on its findings and not inconsistent with federal law. The commission may amend or revise the regulations as necessary thereafter, to reduce the potential railroad hazards identified in Section 7711. In adopting the regulations, the commission shall consider at least all of the following: ...Sizes, numbers, and configurations of locomotives....Brakes....Length, weight, and weight distribution of trains....Speeds and accelerations of trains....





# Federal/state railroad safety jurisdiction

49 USC Sec. 20106. National uniformity of regulation

Laws, regulations, and orders related to railroad safety... shall be nationally uniform to the extent practicable. A State may adopt... a law, regulation, or order related to railroad safety [if the FRA does not have] an order covering the subject matter of the State requirement.

A State may adopt or continue in force an additional or more stringent law, regulation, or order related to railroad safety or security when the law, regulation, or order—

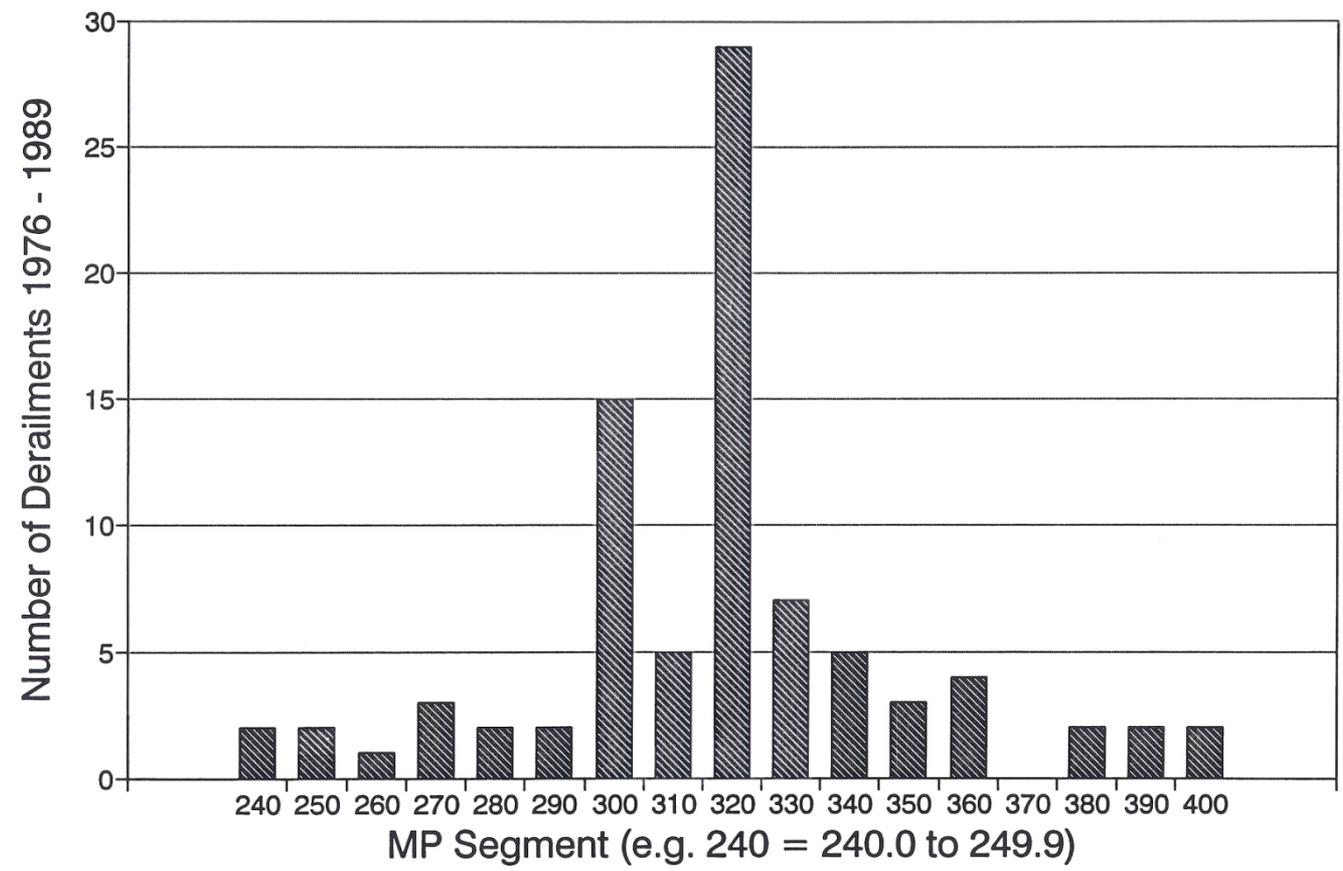
- (1) is necessary to eliminate or reduce an essentially local safety hazard;
- (2) is not incompatible with a law, regulation, or order of the United States Government; and
- (3) does not unreasonably burden interstate commerce.





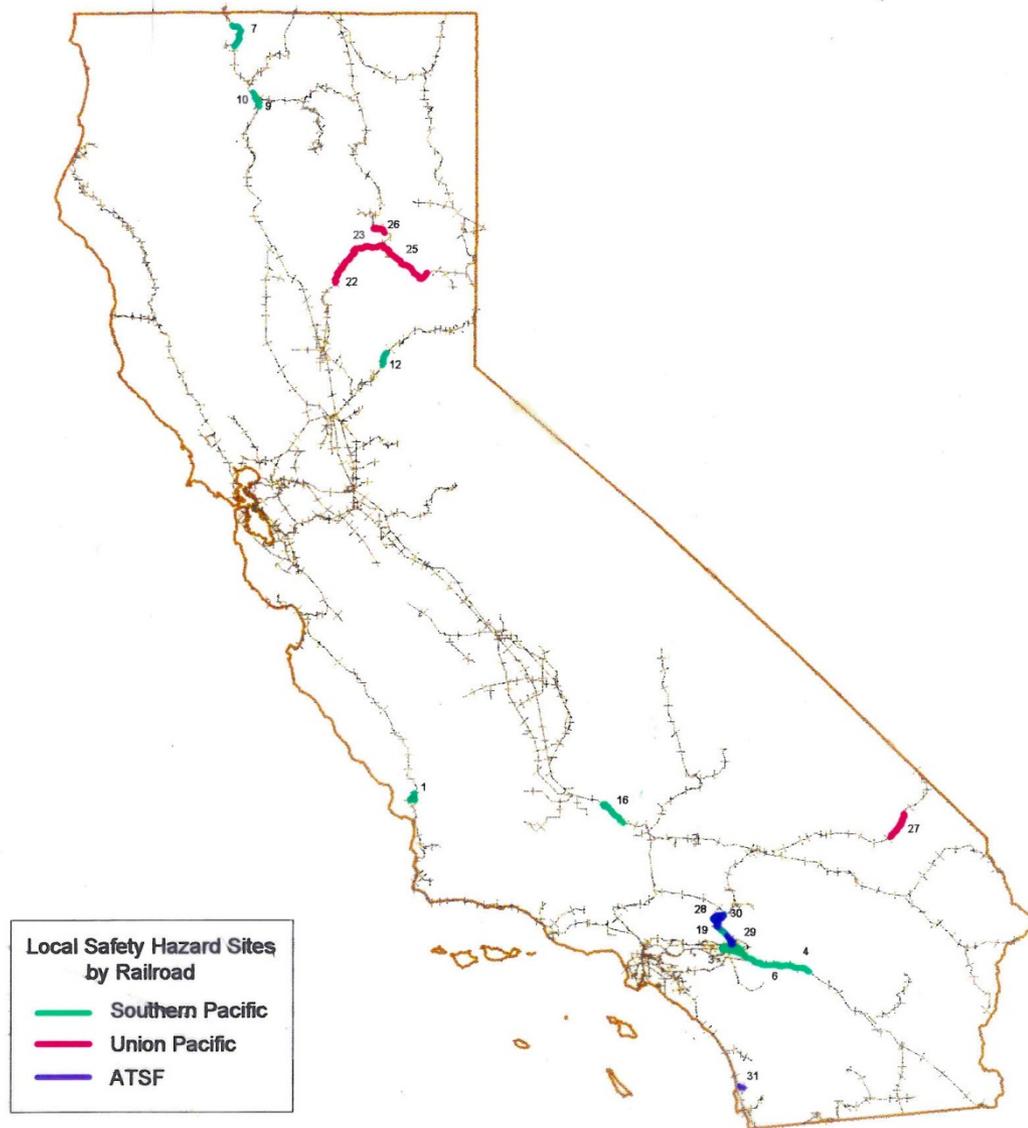
# Derailment history at the Cantara Loop 1976 - 1991

Figure 1  
Accident Frequency: 10-Mile Segments  
Milepost 240 to 410





**Local safety hazard sites identified and verified by CPUC staff**





## Local Safety Hazard Regulation

- 1997: CPUC adopted regulations for 12 different locations.
- 1997 – 2003: Regulations mostly successfully challenged by Southern Pacific and Santa Fe railroads in Federal District Court and 9<sup>th</sup> Circuit Court of Appeals on the basis of federal preemption.
- 2003: Train make-up regulations remanded from 9<sup>th</sup> Circuit to District Court.
- 2004: Railroads and CPUC settle on train make-up regulation for 10 locations.





## 2004 Train make-up regulation settlement

- CPUC may enforce railroads' train make-up rules, with some exceptions such as locomotive power restrictions.
- Railroads may change train make-up rules upon notice to CPUC staff.
- Notice must include expert explanation and justification of the rule changes.
- Justification must include critical calculations of L/V ratios.
- Railroads must identify person responsible for determining TTD rule safety and make available to CPUC staff for questioning and addressing concerns.





## Recent track-train dynamics accident history

July 31, 2003  
derailment just  
south of the  
Cantara Loop





# UPRR Cantara Loop derailment January 21, 2009





# BNSF Miramar derailment March 15, 2010





# UPRR Gold Run derailment February 28, 2011





# UPRR Caliente derailment July 1, 2011





## Current issues, actions

- Issues:
  - Automated train consist verification.
  - Computerized screening for train make-up rule compliance.
  - Train make-up rule oversight. Gaps?
  - Distributed power failures.
  - Longer, heavier trains.
- Accident investigations.
- Quarterly meetings with UPRR and BNSF:
  - Addressing each accident.
  - Review settlement compliance.
- Planned dedicated meetings:
  - Review, update of settlement effectiveness.
  - What new contributions might 20 years of technological advances bring to TTD safety?

