



**CPUC Public Agenda 3282**  
**Thursday, October 6, 2011, 10:00 a.m.**  
**300 South Spring St, Los Angeles**



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

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# CPSD Safety Activities Report



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**California Public Utilities Commission**

October 6, 2011





# Presentation Overview

- September 2008 Metrolink collision in Chatsworth.
- Formal Commission actions immediately following the accident.
- Update on Congressional, Federal Railroad Administration, Commission, CPSD staff, Metrolink, UPRR, and BNSF activities prompted by the accident.





## Formal Commission actions immediately following the 2008 Chatsworth collision

- Emergency order SX-88. Temporary prohibition of cell phone, smart phone, pager use by rail transit vehicle operators.
- OIR 08-10-007. Initiated rulemaking to consider adoption of a permanent personal electronic device use regulation.
- OIR 08-11-017. Initiated “collision-avoidance” rulemaking to consider positive train control (PTC) requirements and regulation.





## Update: Congressional actions

- Rail Safety Improvement Act of 2008.
- Requires railroads to implement a positive train control (PTC) system by December 31, 2015.
- Must be implemented on main lines with over 5 million gross tons, that have:
  - Passenger train operations, and/or
  - Trains that carry toxic inhalation hazard (TIH) or poison inhalation hazard (PIH) commodities.





## Update: FRA actions

- Emergency Order 26, effective October 27, 2008, for railroads banning cell phone use on railroads.
- Permanent cell phone regulation for railroads adopted March 28, 2011: 49 CFR Part 220, Subpart C.
- PTC regulation published in Federal Register January 15, 2010: 49 CFR Parts 229, 234, 235, and 236.
- Settlement agreement to address identification of routes requiring PTC – change from current to future TIH and PIH traffic as the criterion.
- NPRM currently open to change regulation adopting settlement provisions.





## Update: Metrolink's actions

- Automatic train stop devices – limited protective devices installed in additional locations.
- Began reporting red signal violations.
- Inward-facing video cameras – installed in train operating cabs.
- New crashworthy cars: Crash Energy Management (CEM).
- Positive train control (PTC) – pledged completion three years in advance of federal mandate.
- Safety culture – efforts to enhance awareness, motivation, communication, system-based problem-solving.
- Academic rail safety professional program initiated with USC's Viterbi School of Engineering.



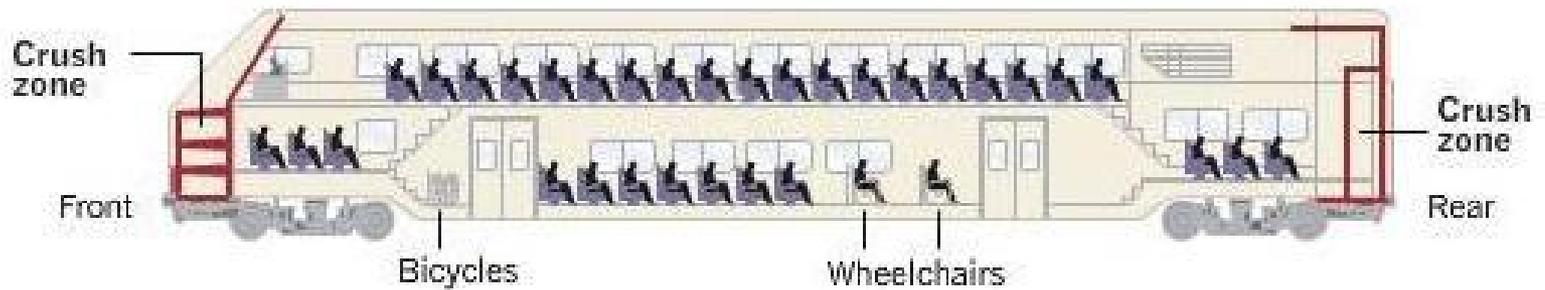


# Metrolink CEM Cab Car Cutaway View

## Cab car

▶ Engineer

▶ Seating





# Metrolink CEM cars





## Metrolink CEM crush structures





# Metrolink cab car seating





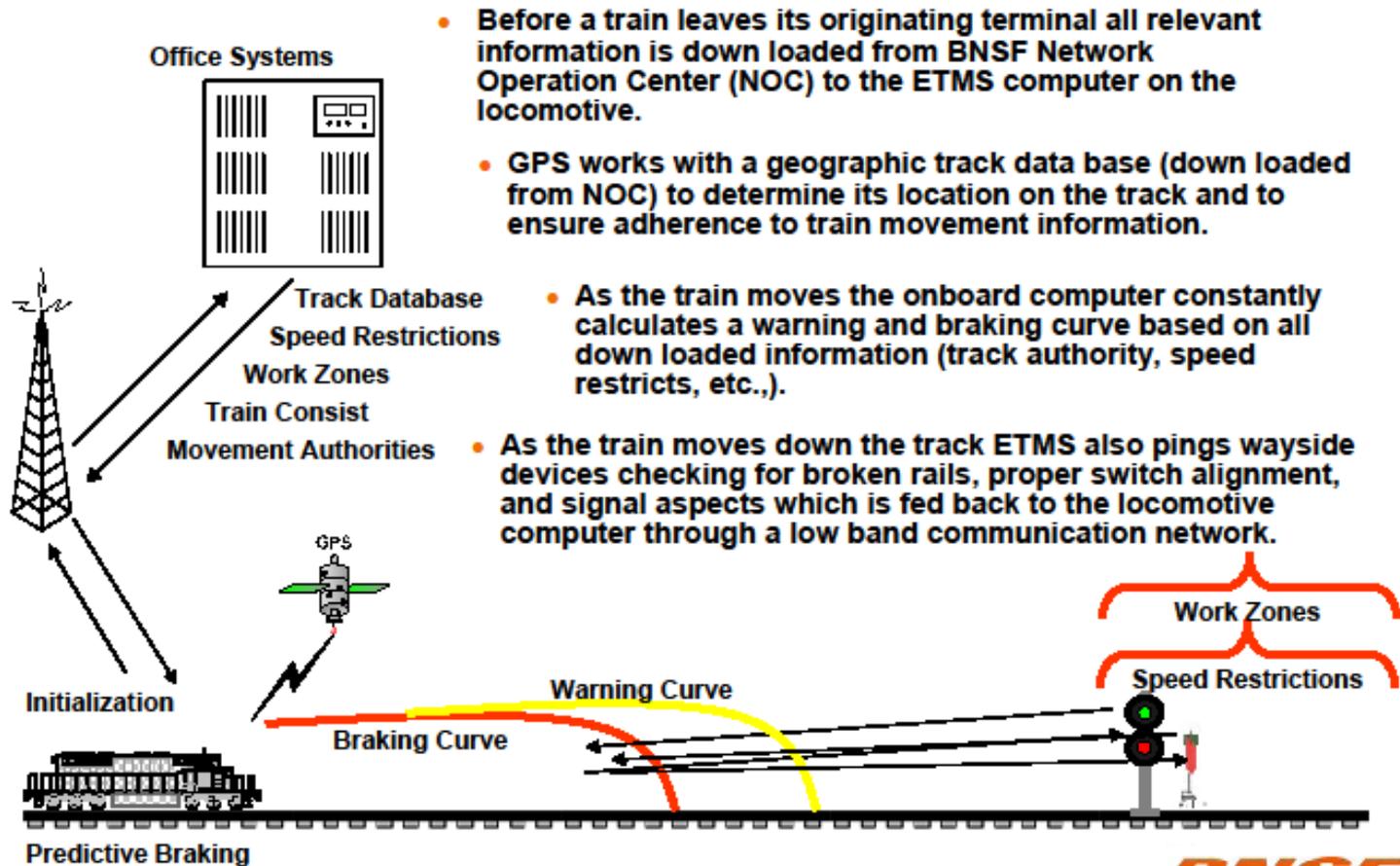
# Positive Train Control

**Positive Train Control (PTC) system illustrated (next slide):  
BNSF's Electronic Train Management System (ETMS)**





# ETMS – How Does It Work?



- Before a train leaves its originating terminal all relevant information is down loaded from BNSF Network Operation Center (NOC) to the ETMS computer on the locomotive.
- GPS works with a geographic track data base (down loaded from NOC) to determine its location on the track and to ensure adherence to train movement information.
- As the train moves the onboard computer constantly calculates a warning and braking curve based on all down loaded information (track authority, speed restricts, etc.,).
- As the train moves down the track ETMS also pings wayside devices checking for broken rails, proper switch alignment, and signal aspects which is fed back to the locomotive computer through a low band communication network.

**BNSF**





# Update: UPRR, BNSF, Metrolink PTC progress

## PTC implementation activities

### 1. On Board Segment

- Computer system on locomotive and cab cars.
- Computer contains track map, braking algorithm.
- Global positioning system plus wheel tachometer
- Display screen for locomotive engineer
- On-board communication servers & antennas

### 2. Communication Segment

- Radio spectrum, plus network of wireless towers
- Line-haul (back-haul) communication network: fiber, digital microwave, leased telecommunications.





### **3. Wayside Segment**

- Overlay on the existing wayside signal system.
- Train “pings” approaching signals up to 8 miles.
- Signal indications communicated back to train.
- On-board system to enforce wayside stop signals.

### **4. Office Segment**

- Co-located with centralized dispatch system.
- Back office server (BOS) routes PTC information.
- Dispatch system feeds information to BOS.
- On-board PTC systems continuously linked to BOS





## Update: CPSD actions

- Directive to Metrolink to report all red signal violations.
- Personal electronic device use prohibitions rulemaking for rail transit systems:
  - Held workshops.
  - Drafted Staff Report, including initial proposed General Order:
    - Accident histories
    - Summarize distraction research
    - Policy analysis
    - Draft proposed General Order
  - Reviewed comments.
  - Assembled settlement team.
  - Held settlement conferences – guidance and facilitation.
  - Drafted Addendum to Staff Report, including discussion of changes and policy analysis of proposed settlement General Order.





## Update: CPSD actions, continued

- Monitor PTC installation:
  - Monthly meetings – conference call with Metrolink, FRA, for any updates to progress.
  - Quarterly meetings – Metrolink facility in-person meetings to review all PTC components, problems, progress.
  - Ongoing progress monitoring. Examples:
    - Monitoring wayside installations for regulatory and specification compliance.
    - Currently reviewing in-cab display equipment prototypes.
    - Checking for software compliance:
      - Field inspections to pull circuitry cards from wayside installations.
      - Check cards for revision currency.
      - Check cards for correct executive software versions.

