



NTSB National Transportation Safety Board

*Office of Railroad, Pipeline and
Hazardous Materials Safety*

**Collision of Metrolink Passenger
Train 111 and Union Pacific
Freight Train LOF65-12**

Signal Presentation
Chatsworth, California
September 12, 2008

Train Movements and Signal Evidence

- Recorded Data
 - Metrolink Dispatch Center
 - Wayside signal equipment
 - Locomotive forward video on the UP train
- Track switch damage at Topanga caused by the Metrolink Train
- All recorded data and physical evidence consistent with the Metrolink train failing to stop at the red signal at Topanga
- Metrolink train continued along main track that was reserved for the UP train.

Signal Presentation

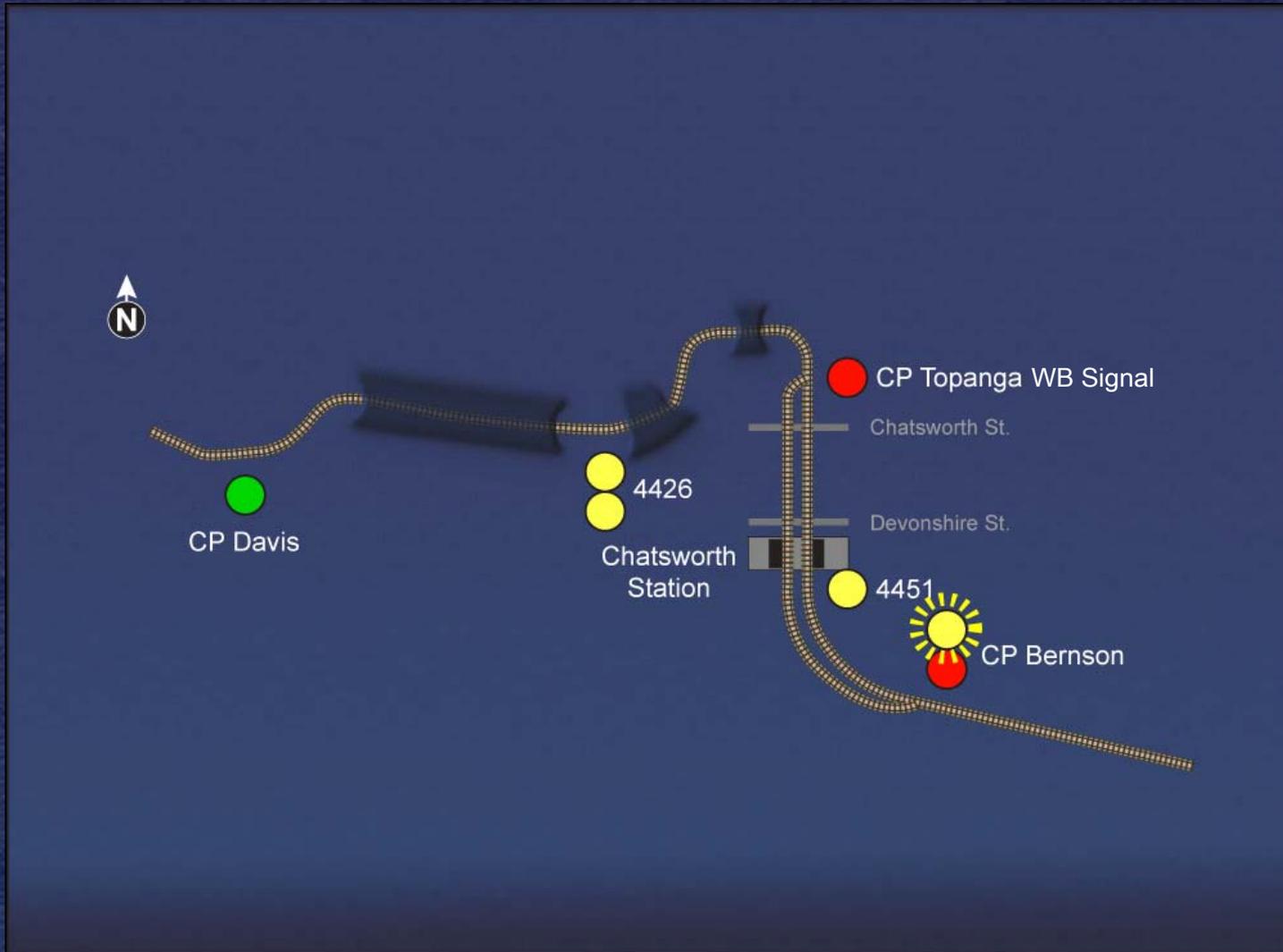
- The dispatcher lined the eastbound route for the UP train from CP Davis onto the single main track and through the siding at CP Topanga.
- The request for the switch at CP Topanga to line for the siding and then for the eastbound signal to clear were transmitted from the dispatch center to the field signal equipment. The switch was lined and locked reverse and then CP Topanga eastbound signal cleared.



Signal Presentation

- The dispatcher then “stacked” the route for the westbound movement of the Metrolink train to proceed west through CP Topanga once the UP train was clear of the siding.
- The dispatcher can make multiple signal routes by “stacking” signal requests. The dispatcher selects the first route, in this case for the UP train movement into the siding, followed by the second route for the Metrolink train movement into the main track.
- All stacked signal requests from the dispatcher are in a queue in the Digicon system at the Metrolink Operations Center and are acted upon, one at a time, in the order that they are requested.
- Recorded data showed that the stacked request for the CP Topanga westbound signal to clear after the UP train was in the siding, was never transmitted from the dispatch center to the field signal equipment.

Signal Aspects from CP Bernson to CP Davis



Signal Presentation

- The CP Topanga switch was lined and locked for the siding for the eastbound movement of the UP train.
- Once the switch was lined for an eastbound train to move into the siding, the system does not allow the westbound signal at CP Topanga to show any aspect other than red.
- As part of the post-accident tests, investigators sent commands to clear the westbound CP Topanga signal with the switch lined for the siding and the signal still would not clear.

Signal Presentation

The investigation determined that had these stacked commands been sent prematurely, the signal equipment would have responded as it did during postaccident testing; that is, the signal system would have discovered a potential routing conflict and changed all the control point signals, both eastbound and westbound, to red until the conflict could be resolved.

Siding



Main Track



Signal Presentation

- Further testing and data evidence revealed that the CP Topanga westbound signal red repeater relay was in the true or up position. In order to energize this relay, current needs to pass through the red light bulb. If the bulb was missing or burnt out, the relay could not have been energized.
- The CP Topanga westbound signal green and yellow repeater relays were in the false or down position, meaning that neither the green or yellow bulb were illuminated.

Conclusion

- The signal and traffic control systems worked as designed on the day of the collision, and the dispatcher's "stacking" of train routes played no role in the accident.

Conclusion

- Physical evidence, documentary and recorded data, and postaccident signal examination and testing confirm that the westbound signal at CP Topanga was displaying a red aspect at the time the Metrolink train departed Chatsworth station, and had the engineer complied with this signal indication, the accident would not have occurred.

Conclusion

- Had a fully implemented positive train control system been in place on the Ventura Subdivision at the time of this accident, it would have intervened to stop the Metrolink train before the engineer could pass the red signal at CP Topanga, and the collision would not have occurred.



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