



National Transportation Safety Board

Office of Railroad, Pipeline and Hazardous Materials Investigations
Human Performance and Survival Factors Division
Washington, DC. 20594

Crashworthiness Factual Report¹ – Addendum # 3

Descriptions of Photographs of the Crashworthiness Investigation²

January 6, 2010

*Collision of SCRRA (“Metrolink”) Train 111 with Union Pacific Train LOF65-12,
in the Chatsworth District of the City of Los Angeles, California, on September 12, 2008*

NTSB Accident Number: DCA 08 MR 009

Compiled by: // s // Date January 6, 2009 .

Richard M. Downs, Jr.
Mechanical Engineer (Crashworthiness)
Investigator / Crashworthiness – Working Group Chairperson

Supervisory review: // s // Date January 7, 2009 .

Joseph P. Scott
Acting Chief, Human Performance and Survival Factors Division
Office of Railroad, Pipeline, and Hazardous Materials Investigations

¹ this report exclusively addresses selective vehicle crashworthiness elements of the accident, where, as a basic definition (as applied to this Investigation), *crashworthiness* is the ability of the vehicle to provide for the survival of its occupant(s) as a result of a collision / impact event.

² this document, assembled in ref. to Crashworthiness Factual Report - § 6.4, serves essentially as a transmittal (cover sheet) of photo-documentation compiled by the Crashworthiness Investigation, the photographs of which are individually submitted to, and catalogued in (by individual Photo Number), the NTSB Docket Management System.

Report Content Synopsis

As support to the Crashworthiness Factual Report of the Investigation, this transmittal provides a narrative description of photographs as compiled by the Crashworthiness Investigation^{3,4}.

Image Sources

Photographic documentation of the Crashworthiness Investigation included images as supplied by staff of the following:

<u>Organizations / Agencies:</u>	<u>Designated in this report as⁵:</u>	<u>Note(s):</u>
NTSB	NTSB	1
California Public Utility Commission	CPUC	2
Federal Railroad Administration	FRA	2
Southern California Regional Rail Authority	SCRRA	2, 3
FRA/Volpe National Transportation Systems Center ⁶	VNTSC	4
Federal Bureau of Investigation / Evidence Response Team ⁷	FBI/ERT	5
Los Angeles Police Department, Air Support Division	LAPD/AS	6

Notes:

1. i.e. the Crashworthiness Working Group Chairperson.
2. participating in the Crashworthiness Investigation as a Party to the Investigation
3. SCRRA provided select images to the Crashworthiness Investigation as supplied to them by a technical contractor (J. L. Patterson & Associates, Inc.), the specific images of which are designated as SCRRA* in the following Image Source identification.
4. supported the Investigation under the direct auspices of the FRA.
5. supported the Investigation under a Memorandum of Understanding (MOU) arrangement, where in this Investigation, technical staff of the FBI Los Angeles, CA, Field Office provided technical (photographic) support to the Crashworthiness and Survival Factors Working Groups.

³ the content of this document was identified / compiled during a 'photo image review' (conducted on March 26, 2009, by the Crashworthiness Working Group, with Survival Factors Group support) of the approximately 5,573 photograph images, total, received by the Crashworthiness Investigation.

⁴ note – although the content of this document was identified during a 'photo image review' (which was a 'Working Group' collective effort), which identified about 167 candidate photo images for prospective inclusion in this report, because of space limitations, not all of the 167 images could be included in this report, in which the final selection of images included in this report was made by the author of this report.

⁵ i.e. Image Source (in the Image Narrative Descriptions)

⁶ Volpe National Transportation Systems Center is a part of the U.S. D.O.T's Research and Innovative Technology Administration (RITA), which provided on-scene technical support to the FRA

⁷ Federal Bureau of Investigation / Evidence Response Team, under a Memorandum of Understanding (MOU), can provide technical assistance to the NTSB for Accident investigation services, consisting principally of evidence documentation and recovery support.

6. this Agency (the jurisdictional law enforcement agency) did not participate in the Crashworthiness Group as a Party to the Investigation, but provided technical (photographic services) support to the Investigation in the interest of promoting public safety.

Appreciation is extended to the above noted Party and tech-support organizations for their support afforded to the Crashworthiness Investigation.

Image Narrative Descriptions

<u>Image Number</u>	<u>Image Source</u>	<u>Description</u>
1.	NTSB	Exemplar [SCRRA] F59PH [model] locomotive (unit # 858), exterior, ¾ - side / end view.
2.	NTSB	Exemplar [SCRRA] F59PH locomotive (unit # 871), interior of Operator's Cab, showing Operator's seat and control console, as viewed from across the Cab.
3.	VNTSC	Exemplar [SCRRA] F59PH locomotive (unit # 871), fuel tank (as fitted to this unit).
4.	FRA	Exemplar [SCRRA] Bombardier BiLevel Coach (car # 197), exterior side view. Note - the overall carbody exterior configuration of the [SCRRA] BiLevel Cab Car is essentially identical to this railcar.
5.	NTSB	Exemplar [SCRRA] Bombardier BiLevel Coach (car # 205), interior, upper level, facing the A-end of the car. Note - the overall carbody interior configuration of the [SCRRA] BiLevel Cab Car is essentially identical to this railcar.
6.	NTSB	Exemplar [SCRRA] Bombardier BiLevel Coach (car # 205), interior, mezzanine (intermediate) level, facing the end-door on the A-end of the car. Note - the overall carbody interior configuration of the [SCRRA] BiLevel Cab Car is essentially identical to this railcar (the difference being the Cab Car incorporates an 'Operator's Compartment' on this level of the car, which would be located to the right of the end-door shown in this image).
7.	NTSB	Exemplar [SCRRA] Bombardier BiLevel Coach (car # 205), interior, lower level, facing the restroom. Note - the overall carbody interior configuration of the [SCRRA] BiLevel Cab Car is essentially identical to this railcar.

8. CPUC Exemplar [UP] SD70ACe [model] locomotive (unit # 8322), exterior, ¾ - side / end view.
9. CPUC Exemplar [UP] SD70ACe [model] locomotive (unit # 8322), interior of Operator's Cab, showing back-side of the Operator's seat and control console, as viewed from the rear Cab door.
10. CPUC Exemplar [UP] SD70ACe [model] locomotive (unit # 8322), interior of Operator's Cab, showing Conductor's seat and work-area, as viewed from the rear Cab door.
11. SCRRA* Aerial pre-recovery view of the overall accident site, with 'callout boxes' (identifying the railroad equipment) added by the author of this report.
12. LAPD/AS Pre-recovery view of the accident site, depicting the overturned leading-end (Cab-area) of SCRRA locomotive # 855 [left and center of image] which came to rest firmly wedged against the overturned leading-end (short-hood / cowl) of UP locomotive # 8485 [far right of center], showing two firefighters performing victim recovery efforts.
13. LAPD/AS Pre-recovery view of the accident site, depicting the top surface of overturned UP locomotive # 8485 [far left of center] and the side of upright UP locomotive # 8491 [left of center], and a derailed freight car, the end of which came to rest on top of the Cab of locomotive # 8491 [center of image].
14. LAPD/AS Pre-recovery view of the accident site, depicting the aft-end and top surface of the fuel tank of SCRRA locomotive # 855 that had separated from the locomotive, showing the degree of batter damage sustained by the fuel tank, which also lost its fuel content in the event, which subsequently ignited at that location.
15. LAPD/AS Pre-recovery view of the accident site, depicting the lead-end panel of the fuel tank of SCRRA locomotive # 855 that had been breached and lost its fuel content in the event [right side of image], which subsequently ignited at that location, and the underside of the lead truck assembly of overturned UP locomotive # 8485 that was situated adjacent to the separated locomotive # 855 fuel tank [center and left side of image].
16. LAPD/AS Pre-recovery view of the accident site, depicting the aft-end of SCRRA locomotive # 855 [right of center] which came to rest within the carbody of SCRRA car # 185 [left of center], taken during victim recovery efforts of the local emergency responders.

17. LAPD/AS Pre-recovery view of the accident site, depicting the aft-end of SCRRA car # 185, which is leaning heavily toward its right side.
18. FBI/ERT Pre-recovery view of the accident site, depicting a view through the aft end-door of SCRRA car # 185 (which was leaning heavily toward its right side) of the rear mezzanine (intermediate) level of the car.
19. FBI/ERT Pre-recovery view of the accident site, depicting the aft-end and underside panel of SCRRA car # 185 which was leaning heavily toward its right side [left of center], and the leading end of SCRRA car # 207, which had separated from SCRRA car # 185 and was not derailed [right of center], which also shows SCRRA car # 617 that had remained coupled to SCRRA car # 207 and was not derailed [far right side of image].
20. FBI/ERT Pre-recovery view of the accident site, depicting the lead-end / right front corner of SCRRA car # 617 [far left side of image] which was not derailed, the right side of SCRRA car # 207 [center of image] which was not derailed, and the aft-end of SCRRA car # 185 which is leaning heavily toward its right side [far right side of image].
21. VNTSC Post-recovery view of the lead-end of SCRRA locomotive # 855, which was placed in an upright orientation, depicting the extensive impact damage sustained to the Operator's Cab (which sustained a complete loss of occupant survival space), and carbody structure of the locomotive.
22. VNTSC Post-recovery view of the aft-end of SCRRA locomotive # 855, which was placed in an upright orientation, depicting the extensive impact damage sustained to the carbody structure of the locomotive (which came to rest within the carbody of SCRRA car # 185).
23. NTSB Post-recovery view through the side window of the Operator's Cab of SCRRA locomotive # 855, depicting the complete loss of occupant survival space within the Cab.
24. NTSB Post-recovery view of the mid-, and the aft section, of the carbody shell of SCRRA car # 185, which was placed in an upright orientation and after removal of the interior [passenger compartment] contents (i.e. the seats, floor structure, etc.).
25. NTSB Post-recovery view of the frame-structure elements of SCRRA car # 185 (after removal of interior [passenger compartment] contents of the carbody shell at that location), depicting the fracture surfaces of the elements [right of center], and a segment of the extensively

- compressed carbody shell of the lead-end of the carbody [far-right of center].
26. NTSB Post-recovery view of the segment of the extensively compressed carbody shell of the lead-end of SCRRA car # 185, depicting the degree of compression damage sustained by this segment of carbody, which also includes the lead truck assembly of the railcar (which remained attached to the railcar).
 27. FBI/ERT Pre-recovery view of the interior, upper level, of SCRRA car # 207, facing the B-end of the car, depicting the overall degree of damage sustained to this area of the car.
 28. VNTSC Pre-recovery view of (fracture) damage sustained to a seatback in SCRRA car # 207.
 29. NTSB Post-recovery view of damage sustained to a work-station table in SCRRA car # 207 (table was separated from wall attachment, and the pedestal separated from its attachment to the floor).
 30. FBI/ERT Pre-recovery view of the interior, lower level, of SCRRA car # 617, depicting the overall degree of damage sustained to this area of the car.
 31. NTSB Post-recovery view of the interior, upper level, of SCRRA car # 617, depicting the overall degree of damage sustained to this area of the car.
 32. NTSB Pre-recovery view of (fracture) damage sustained to a seatback in SCRRA car # 617.
 33. NTSB Post-recovery view of damage sustained to a work-station table in SCRRA car # 617 (table was separated from wall attachment, and the pedestal separated from its attachment to the floor).
 34. VNTSC Post-recovery exterior view of the lead-end of UP locomotive # 8485, which had been re-railed (as preparation for recovery from the site), depicting the extensive impact damage sustained to the lead-end of the unit (of which the Operator's Cab did not sustain any loss of occupant survival space).
 35. FBI/ERT Post-recovery interior view of the Operator's Cab of UP locomotive # 8485, depicting the damage sustained to the Operator's Cab of the unit (of which, also, did not sustain any loss of occupant survival space).

-- End of Report --