

Passenger Equipment Crashworthiness Task Force



Railroad Safety Advisory Committee

October 11, 2005

Overview



- Development of Cab Car End Frame Optimization standards
- Cab Car End Frame Tests
- Adoption of Standard
- Issues identified regarding test protocol
- Recommendations from RSAC

Development of Cab Car End Frame Optimization standards



- Consensus on Fundamental Technical Requirements
- Consensus on Recommended “Home” for Standards
 - Dynamic Standard
 - FRA Regulation
 - Quasi-Static Standard
 - APTA Standard
 - Approach Parallels FRA’s NPRM/AAR S-580
- Consensus Achieved on Values for Energy Absorption
- Consensus not yet achieved for Dynamic Standard

Cab Car End Frame Tests



- Quasi-Static Tests to Help Define APTA Standard
 - M-7 Collision Post (Completed, Bombardier)
 - M-7 Corner Post (Planned, Bombardier)
 - SOA Corner Post (Tentatively Planned, FRA)
 - TBD Collision Post (Tentatively Planned, FRA)
- Dynamic Tests to Help Define Recommendations for FRA Regulation
 - 1990's Corner Posts (Completed, FRA)
 - SOA Corner Posts (Completed, FRA)
 - TBD Collision Post (Tentatively Planned, FRA)

Overview of Draft Cab Car End Frame Standards



- **Dynamic Standard**
 - Cab Car Impact with Rigid Object with Prescribed Initial Locations, Weights and Impact Speed
 - Criterion: No More Than 10 Inches Deformation of Collision/Corner Post
- **Quasi-Static Standard**
 - Corner/Collision Post Severely Deformed for Load Applied 30 Inches Above Deck
 - Criteria
 - Minimum Prescribed Energy Absorbed
 - No More Than 10 Inches Deflection of Collision/Corner Post into Operator's Cab
 - No Complete Separation of Attachments

Adoption of Standard



- Adoption of this standard supersedes some of requirements currently in the CFR
 - FRA will resolve these differences when drafting the NPRM
- TF will review draft text for the NPRM at future meeting
- FRA and APTA have concerns related to the dynamic test
 - TF and WG could not agree on inclusion of the dynamic performance load case
 - FRA desires the dynamic performance load case, APTA does not

Action Items



- FRA agreed that the values used in the August 10th APTA Standard are numbers that could also be used in the Dynamic Test
- FRA will do a dynamic test, paying the cost, using state of the art model
 - Up until now all values have been derived from analysis modeling

Issues identified regarding test protocol



- FRA wants the Dynamic Test included as an option to the Static Test
 - FRA stated that the Dynamic is a performance standard, contending that the static test is more prescriptive and could possibly restrict development of new equipment
 - Also, the static test is not appropriate for nose type designs and other configurations that exist or are in development
- APTA opposed the inclusion of the Dynamic Test as an option
 - They stated it will add cost and, without a test performed using a “production model design”, they believe the numbers are good as presented by FRA for the Dynamic Test but are not completely comfortable

Issues identified regarding test protocol



- Additionally, APTA believes that if dynamic testing is an option, customers when ordering cars will request both tests with the advice of a consultant
 - It will require an actual car be used increasing cost, if the test would happen to fail, then a second car would also have to be used to repeat the test, doubling cost
- For the additional Dynamic Test that FRA has offered to conduct and pay for, APTA members objected to the use of SOA design instead of a production model



Recommendations from RSAC