

Federal Railroad Administration

RSAC Engineering Task Force: Update on Activities

43rd Meeting of the Railroad Safety Advisory Committee
December 14, 2010, Washington, DC
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- Past
 - Tier I Crashworthiness Criteria and Procedures
- Present
 - Safety Requirements for Interoperable High-speed Rail Equipment
- Future
 - Safety Requirements for DMUs
 - Glazing Safety Requirements
 - Occupant Protection Requirements
 - Requirements for E-prep Features
 - Update of Tier I and II Safety Requirements
 - ...

- Description
 - Framework for presenting technical information in support of a waiver request
 - Provide a means of establishing whether the crashworthiness of an alternative design is at least equal to the crashworthiness of designs compliant with Tier I standards
 - Design-neutral and facilitates the application of the latest in rail equipment crashworthiness technology to the U.S.
- Development
 - Developed by ETF starting September 23, 2009
 - Accepted by RSAC on September 23, 2010
- Application
 - DCTA
 - AVGL
 - Et al

- Safety Requirements Divided into Four Parts
 - Crashworthiness, Occupant Protection, and Glazing (ongoing)
 - Suspension and Brake Performance (planned)
 - Safety Appliances, Fire Safety, and Emergency Preparedness Features (planned)
 - Inspection, Test, Monitoring, and Maintenance (planned)
- Safety Concerns Parallel Concerns Addressed by Current Passenger Equipment Regulations

PRESENT

- Objective
 - Develop Recommended Engineering Requirements for Assuring the Structural Crashworthiness, Occupant Protection, and Glazing Performance of Interoperable High Speed Equipment
- Purpose
 - Identify to the Rail Industry the Crashworthiness Requirements for Passenger Equipment Intended for Tier I Operation and Operation Above 125 mph on Dedicated Track with Sophisticated Accident-Avoidance Measures

- Scenarios Difficult for PTC to Prevent
 - Fouled ROW (Highway Equipment, MOW Equipment, et al)
 - Derailment Due to Track or Equipment Defect
- Structural Crashworthiness
 - Non-Passenger Occupied End Cars
 - High Strength Cab/End Cars
 - Energy Absorption (CEM)
- Occupant Protection
 - Enclosed Luggage Racks
- Glazing
 - Repeatable Test Procedure
 - Impact Energy Requirements for Forward-facing Glazing

- Meeting #1—October 20 and 21, 2010 in Cambridge, MA
 - Railroad Reviews Equipment Considerations, CHSTP and FHSR
 - Supplier Reviews of Crashworthiness Features of HSR Equipment, Alstom, Bombardier, Kawasaki, Rotem, Siemens, etc.
 - Discussions of scenarios, structural crashworthiness, occupant protection, and glazing
- Meeting #2—January 11 and 12, 2011 in Orlando, FL
 - Supplier Homework Results for Compliance with Tier I C&P Scenarios
 - SNCF Review of Crashworthiness Requirements for TGV
 - Consensus on scope of scenarios, structural crashworthiness, occupant protection, and glazing
- Meeting #3—April, 2011 in TBD (date and location to be finalized)
 - Consensus on approach for engineering requirements
- Meeting #4— June, 2011 in TBD (date and location to be finalized)
 - Consensus on numerical values for engineering requirements
- Conference calls
 - Consensus on text

- Structural Crashworthiness
 - **Activities:** Model crippling using the methodology laid out in the C&P, and perform a quasi-static crippling test (not required by C&P)
 - **Purpose:** Validate C&P methodology to provide technical basis for potential regulations
- Occupant Protection
 - **Activities:** Development of alternative table testing techniques; Development of operator protection strategies
 - **Purpose:** Lower cost and increase confidence of table qualification tests; Develop technical basis for potential operator protection requirements
- Glazing
 - **Activities:** Development of techniques for analyzing glazing impacts
 - **Purpose:** Facilitate development of robust qualification test techniques; Make possible rapid evaluation of the influence of glazing characteristics on impact performance