2nd IHRA Webinar

Texas Central Railroad
High-Speed Rail Safety Standards (RPA)

Development and Applicability

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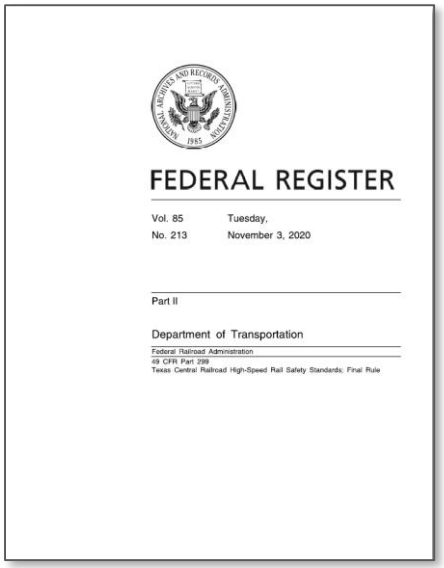
RPA Development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Part II

Department of Transportation

Federal Railroad Administration
49 CFR Part 299
Texas Central Railroad High-Speed Rail Safety Standards; Final Rule

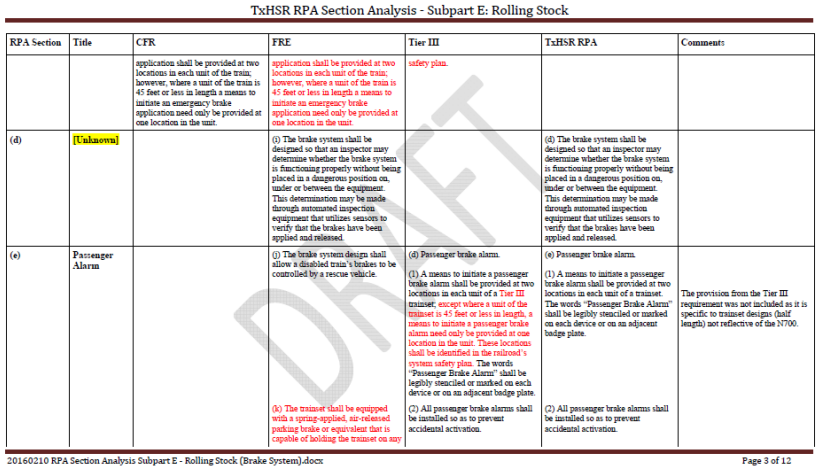
- FRA published Texas Central's final rule (RPA) on November 3, 2020
- The RPA was the culmination of several years of work by:
  - Texas Central RPA Core Team:
    - ✓ Thorough knowledge of all aspects of US regulatory requirements (conventional and high speed, legal) and the Shinkansen system
    - ✓ Supported by subject matter experts from JRC and North America
  - RPA Working Group (WG):
    - ✓ Consisted of Core Team from both FRA Office of Safety and Texas Central, with subject matter experts involved as needed
    - ✓ Through the RPA WG meetings and site visits, FRA gained an in-depth knowledge of the Shinkansen system and operations

RPA Development

- The RPA is based on the Shinkansen accident/collision avoidance approach and requires all safety-critical aspects of the Tokaido Shinkansen system to be deployed in Texas
  - Significantly reduces project risk by minimizing technology changes and eliminating compromises required for interoperability
    - ✓ Minor changes can have unintended consequences
- Aside from significantly increasing safety, the dedicated, standalone operation defined by the RPA:
  - Allows all service-proven and optimized aspects of the system to be retained
  - Permits Texas Central to benefit (comfort and capacity) from the wider (3,360 mm), light weight Shinkansen carbody design

RPA Development

- The RPA WG conducted detailed comparisons of all existing and pending FRA requirements with comparable Shinkansen standards to define specific regulatory provisions for a U.S. Shinkansen operation



TxHSR RPA Section Analysis - Subpart E: Rolling Stock

RPA Section	Title	CFR	FRE	Tier III	TxHSR RPA	Comments
		application shall be provided at two locations in each unit of the train; however, where a unit of the train is 45 feet or less in length a means to initiate an emergency brake application need only be provided at one location in the unit.	application shall be provided at two locations in each unit of the train; however, where a unit of the train is 45 feet or less in length a means to initiate an emergency brake application need only be provided at one location in the unit.	safety plan.		
(d)	[Unknown]		(i) The brake system shall be designed so that an inspector may determine whether the brake system is functioning properly without being placed in a dangerous position on, under or between the equipment. This determination may be made through automated inspection equipment that utilizes sensors to verify that the brakes have been applied and released.		(d) The brake system shall be designed so that an inspector may determine whether the brake system is functioning properly without being placed in a dangerous position on, under or between the equipment. This determination may be made through automated inspection equipment that utilizes sensors to verify that the brakes have been applied and released.	
(e)	Passenger Alarm		(i) The brake system design shall allow a disabled train's brakes to be controlled by a rescue vehicle. (k) The trainset shall be equipped with a spring-applied, air-released parking brake or equivalent that is capable of holding the trainset on any	(d) Passenger brake alarm. (1) A means to initiate a passenger brake alarm shall be provided at two locations in each unit of a Tier III trainset, except where a unit of the trainset is 45 feet or less in length, a means to initiate a passenger brake alarm need only be provided at one location in the unit. These locations shall be identified in the railroad's system safety plan. The words "Passenger Brake Alarm" shall be legibly stenciled or marked on each device or on an adjacent badge plate. (2) All passenger brake alarms shall be installed so as to prevent accidental activation.	(e) Passenger brake alarm. (1) A means to initiate a passenger brake alarm shall be provided at two locations in each unit of a trainset. The words "Passenger Brake Alarm" shall be legibly stenciled or marked on each device or on an adjacent badge plate. (2) All passenger brake alarms shall be installed so as to prevent accidental activation.	The provision from the Tier III requirement was not included as it is specific to trainset designs (half length) not reflective of the N700.

DRAFT

Section Analyses

- The RPA incorporates both Shinkansen technology-specific requirements and also requires compliance with various other U.S. general railroad regulations (or parts of regulations) that are independent of speed or technology

Texas Central RPA

Technology-Specific Provisions

- General Requirements
  - ✓ Definitions
  - ✓ System Description
  - ✓ Incorporation by reference
  - ✓ ….
- Signal & Trainset Control
- Track Safety Standards
- Rolling Stock
- Operating Rules
- System Qualification Tests
- Inspection, Testing, and Maintenance Program

Rules of General Applicability

- Railroad Police Officers
- Railroad Safety Enforcement
- Railroad Noise Emission Compliance
- Rules of Practice
- Railroad Workplace Safety, except § 214.339
- Railroad Operating Practices
- Control of Alcohol and Drug Use
- Radio Standards and Procedures
- Hours of Service
- Railroad Bridge Safety Standards
- Passenger Train Emergency Preparedness
- Training, Qualification, and Oversight
- System Safety Program
- ….

Applicability of the RPA to Other Projects

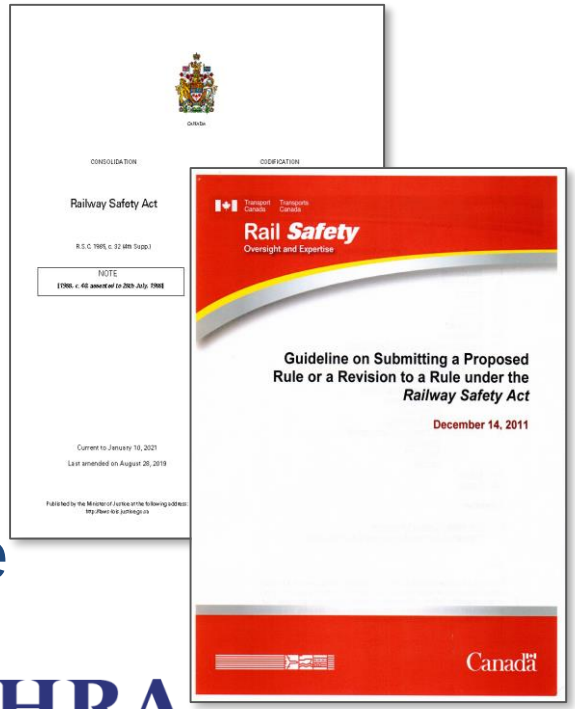
United States

- The RPA for Texas Central:
  - Will facilitate future extensions to the Texas Central system
  - Will significantly reduce the regulatory process to implement any dedicated Shinkansen-based HSR system elsewhere in the U.S.
  - Is being used as a guideline and template to develop an RPA for the Japanese Superconducting Magnetic Levitation (SCMAGLEV) operation planned between Baltimore, MD and Washington, DC.

Applicability of the RPA to Other Projects

Canada

- Similar to most countries that do not currently have HSR, existing regulatory requirements are insufficient to adequately address a Shinkansen HSR operation
- However, the Railway Safety Act provides means for Transport Canada (TC) to implement either new rules (based on an industry proposal) or through a regulation prescribed by Transport Canada
- FRA's RPA for Texas, and supporting documentation used to develop the rule, would significantly reduce the time and effort to define TC requirements



Applicability of the RPA to Other Projects

Other International Projects

- The Texas Central RPA could also provide a regulatory template for other countries planning to introduce a Shinkansen operation
  - The RPA addresses all areas of railroad safety
  - The Texas Central petition for rulemaking submitted to FRA provides technical justification for all provisions
- Detailed discussions would be required with the regulatory entity responsible for railroad safety to:
  - Familiarize them with the RPA content
  - Determine the type of refinements required to tailor the rule to the corresponding regulatory approach

Applicability of the RPA to Other Projects

Other International Projects

- Refinements to the RPA may be needed in some countries to reflect:
  - Local regulations and standards such as:
    - ✓National (speed neutral) railroad regulations/standards
    - ✓Fire safety standards
    - ✓Handicapped facilitation
    - ✓….
  - Approach to approvals/certification
- Engagement with the regulatory agency should be undertaken very early in the project to discuss and agree on the regulatory approach and requirements

Conclusions

- The RPA for Texas Central (and supporting documents submitted with petition for rulemaking) took several years to develop with significant effort from all members of the Working Group
  - The results could not have been achieved without the exceptional commitment and effort of JRC and FRA
- The RPA allows Texas Central to transplant a service-proven Shinkansen system (based on accident/collision avoidance principles), which will maximize safety and minimize project risk
- The RPA for Texas Central will provide the regulatory basis for additional North American Shinkansen operations and could also serve as a template for other international HSR projects