

Introduction of safe and efficient N700-I bullet system, and countermeasures against derailment during earthquake

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The “N700-I Bullet”



“N700-I (I :International) Bullet”

What is the “N700-I Bullet”

The “N700-I Bullet” is a total “High-Speed Rail System”. The system comprises not only the N700-I rolling stock, a derived model of the N700 optimized for overseas operations, but the entirety of the Tokaido Shinkansen system—a system that has provided safe and stable operations in Japan for over 46 years.

Fast

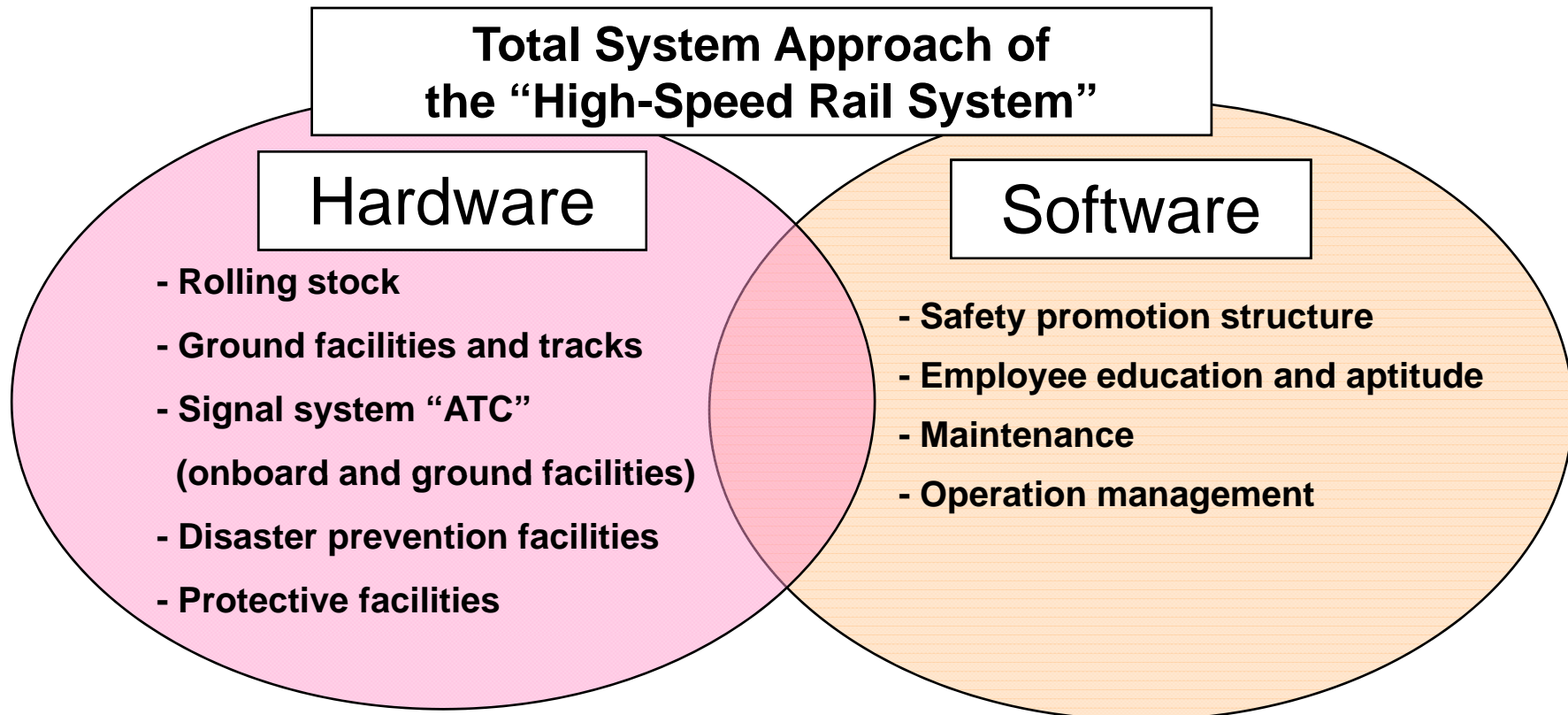
Energy Efficient

Environmentally Friendly

Safe

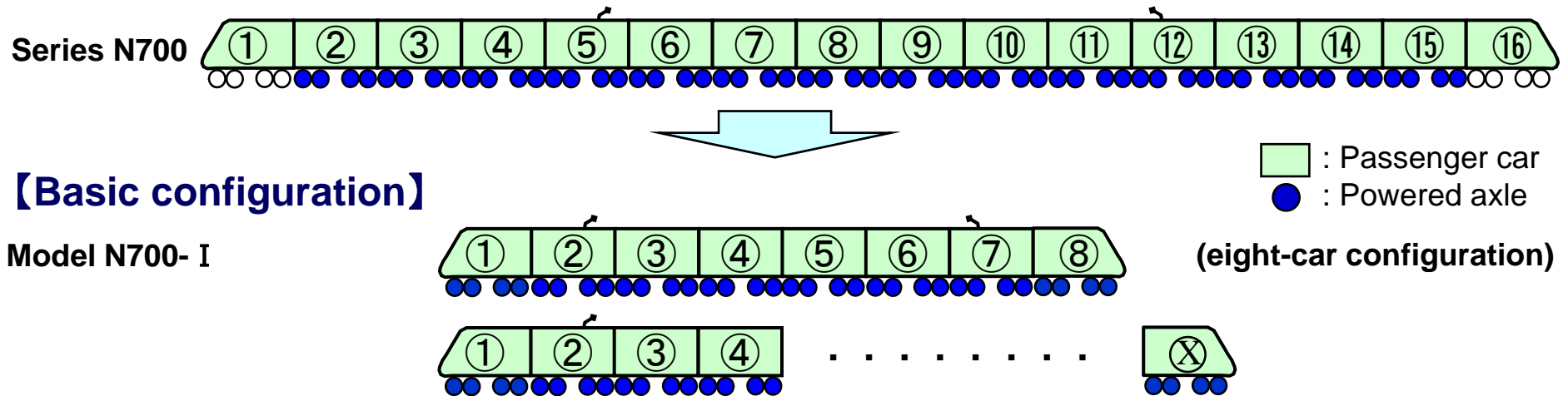
The N700-I Bullet: A Total System Approach

The safety and the high quality of the Tokaido Shinkansen is enabled by the integrated management of the system's hardware and software.



Specifications of N700-I

The N700-I basic configuration is scalable for a 6 to 15 car configuration, capable of being for corridor-specific transportation construction plans.



The configuration length can be freely changed. By applying a distributed traction system, the train performance does not vary regardless of the configuration.
 Moreover, the configuration can be extended in response to increasing transport demands.

【Specification】 N700-I (eight-car configuration)

Electrical system		AC25kV, 60Hz
Basic formation	Configuration	8M (100%AC regenerative brake)
Capacity	Seating capacity	636
Speed	Maximum cruising speed	330 km/h (205mph)
	Starting acceleration	3.2 km/h/s (2.0mph/s)
Output	Total power output	9,760 kW (305 kW x 32)
Train set Length		204.7m (671.6ft)
Train set Weight (Full passenger capacity)		365t (805kips)

A Dedicated HSR System – Crucial to Success

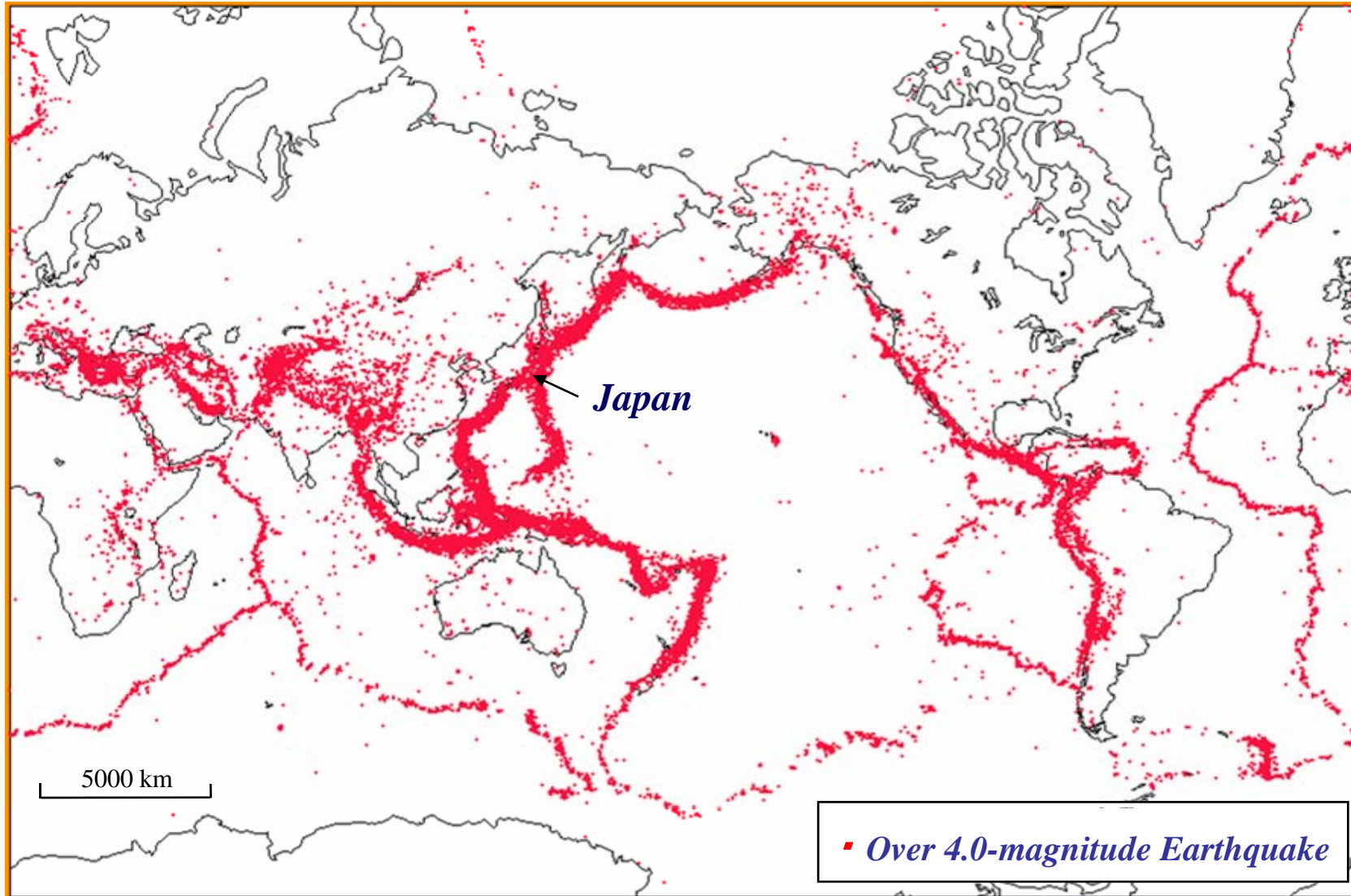
Design Concept of Tokaido Shinkansen

A dedicated, closed passenger rail system with full grade separations as well as segregation of passenger and freight traffic can avoid collision with trains perfectly.

Result: A super efficient and reliable system with 100% safety— ZERO passenger injuries or deaths in 46 years of operation

Distribution map* of earthquakes

- Earthquakes occur in the limited areas of the world
- Japan has wide experience in approach against earthquakes



* Source : (figure) Originated by United States Geological Survey

1900.1.1~2009.1.31

Anti-seismic measures for HSR

I Reinforcement of ground structures and tracks

Prevent derailment by minimizing damage to ground structures and tracks during large earthquake

II Tokaido Shinkansen Earthquake Rapid Alarm System (TERRA-S)

Detection of a large-scale earthquake leads to immediate termination of power transmission to safely bring all train operations to a halt

III Measures to prevent derailment / deviation (Dual - system)

HSR vehicle could be derailed by large earthquakes even with no fatal damage to ground structures or tracks.

1. Measure to prevent derailment

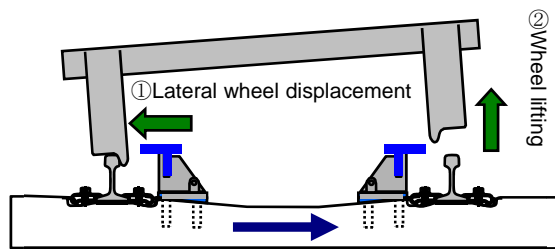
2. Measure to prevent deviation once a vehicle derailed

Measure to Prevent Derailment

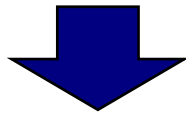
Mechanism of Derailment and Anti-derailing Guard Rails

Anti-derailing Guard Rails prevent rocking derailment by holding the horizontal motion of the vehicle due to large earthquakes.

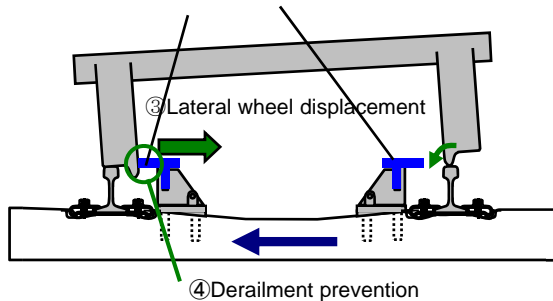
Mechanism of Derailment



Mechanism of rocking derailment



Anti-Derailing Guard Rails



Mechanism that prevents derailment

Anti-Derailing Guard Rails



Service time



Turned over rails
for track maintenance work

Anti-derailing Guard Rail on Tokaido Shinkansen



The anti-derailing guard rails have already been partly installed on Tokaido Shinkansen since 2009.

Conclusions

The “N700-I Bullet” is a fifth-generation technology based on the “***Total System Approach***” that builds on 46 years of experience and refinement.

- 100% safety
- Proven reliability
- Superior performance
- Energy efficiency
- Environmental friendliness

JRC is committed to deploying the N700-I as the HSR solution to USA.