Amsterdam 2008

6th World Congress on High Speed Rail

Fast track to Sustainable Mobility

Shinkansen Technology Exportation

Taiwan High Speed Rail 700T

Ministry of Railway of China CRH2

Kwasaki Heavy Industries, Ltd.

Rolling Stock Company

18 March 2008

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Taiwan High Speed Rail (THSR) Project

Route: B/W Taipei and Kaohsiung (345km),
Max. Operating Speed: 300km/h,
Fully dedicated newly constructed track,

System-wide Contract
Contractor: Taiwan Shinkansen Corporation
Suppliers:
> Kawasaki Heavy Industries, Ltd. (Rolling stock)
> Mitsubishi Heavy Industries, Ltd. (Signaling, Comm., OCS)
> Toshiba Corporation (Power supply, On-board elec. equip., Radio, Traffic control)

Reference System: Tokaido, Sanyo Shinkansen

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General Features of THSR Train (700T)

Basic Model: Series 700 Shinkansen (JR Central & JR West)

=>

Train formation: 12 car consist, (9 motor cars and 3 trailer cars)
=> Tc-M-M-M+T-M-M-Ms+M-M-M-Tc (Ms: Business Class)

Seating Capacity: 989
Train Weight: 502 tons
Max. Speed: 300km/h
(test speed 315km/h)

Design Concept:
1) Environmental Friendly
2) Passenger Friendly
3) Maintenance Friendly

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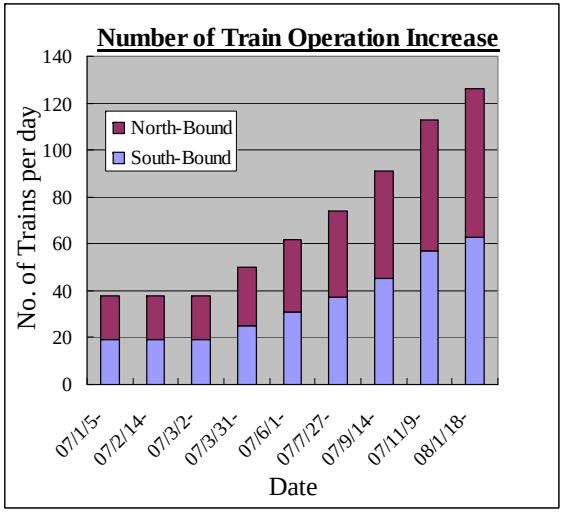
Difficulties in THSR Project

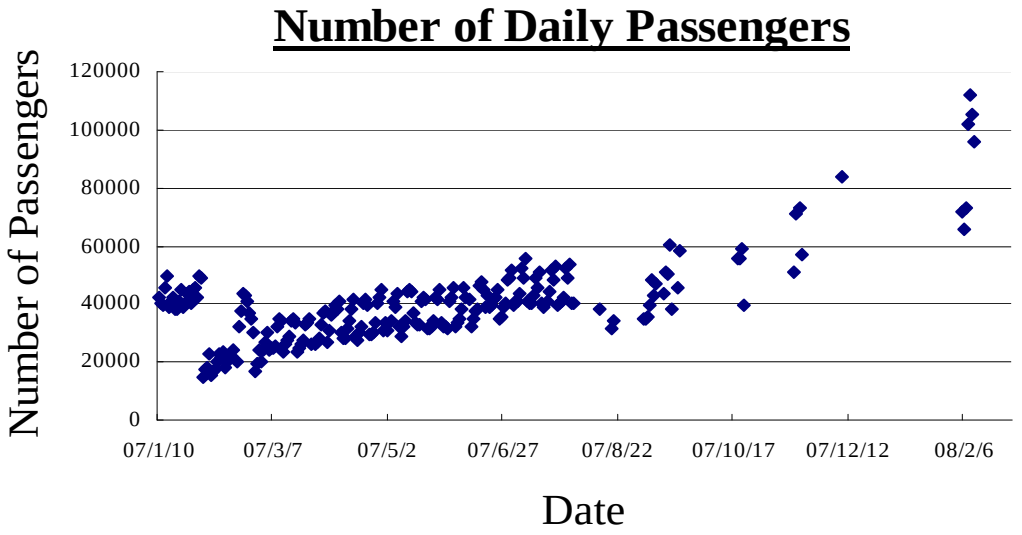
Come-from-behind Award to Japanese Consortium in 2000.
=> Specification: European standard and approach

Shinkansen: High reliability and Safety => Everybody agrees.

However, everybody asks why?
=> Japanese Shinkansen technology was verified by European approach one by one.

Despite the difficulties, Kawasaki could deliver all 360 cars on time by 2006.





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Ministry of Railway of China CRH2

Part of Ministry's of Railway of China 6th Speed up Project

=> Introduction of High Speed Trains from various suppliers.
CRH1, CRH2, CRH5

Kawasaki provided CRH2 with the local partner Sifang.
(8 cars x 60 trains = 480 cars)

Step by step technology transfer

1) Importation of completed trains from Japan (3 trains)

2) Knock-down production (6 trains)

3) Fully domestic production in China (51 trains)

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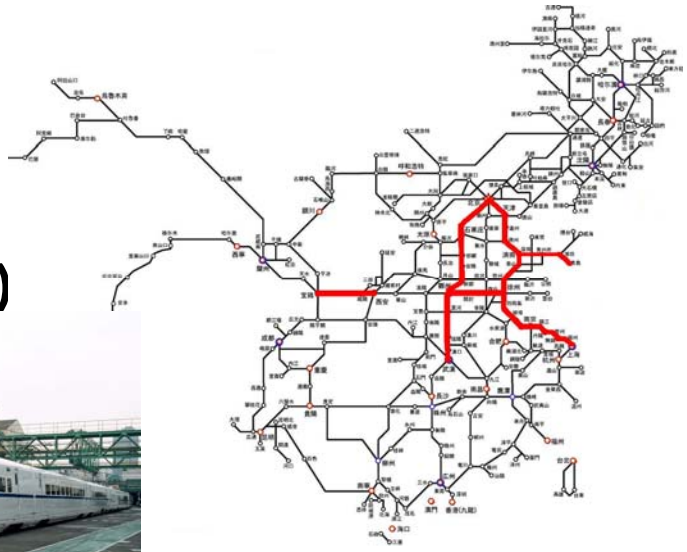
General Feature of CRH2 Train

Operation route of CRH2
Operated mainly on upgraded conventional lines.



Basic Model: Series E2-1000 Shinkansen (JR East)

=>

Train Formation: 8 cars consist (two units can be coupled to make 16 cars consist.)

=> Tc-M-M-T-T-M-M-Tc (4 motor cars & 4 trailer cars)

Max. Operating Speed: Original design speed: 200km/h (test speed: 250km/h)

=> Now operated at 250km/h on limited sections

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Current Status of CRH2

CHR2 is operated with highest availability.

As a result: CRH2 based train increasing

1) Follow-on contract of additional CRH2:
320 cars consisted 16 cars/train

2) 300km/h class EMU: 480 cars (60 trains)

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Prominent Features of Shinkansen-based High Speed Train

1) Light Weight Carbody (0.508 ton/seat, 1.65 ton/m)

=> Low energy consumption, low noise & vibration

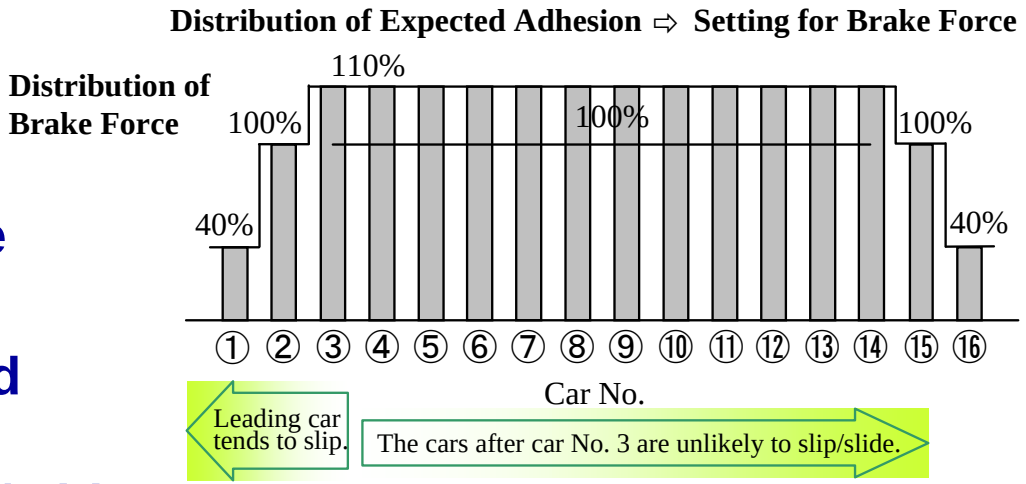
=> Less track maintenance

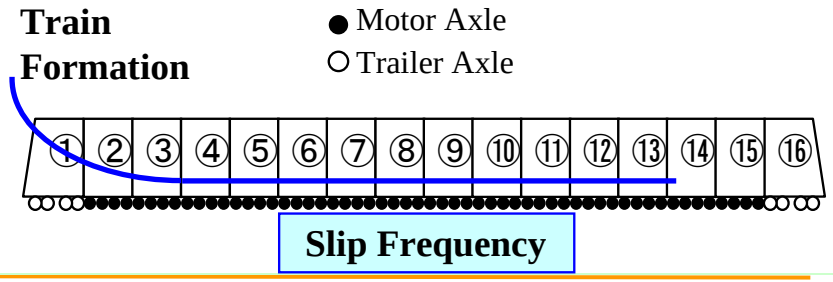
2) Both ends are Trailer Cars

=> Brake effort is reduced and compensated by intermediate motor cars.

=> Optimum use of adhesion and re-generative brake
Less probability of wheel slip/slide, tread flat

=> Stable operation on rainy days





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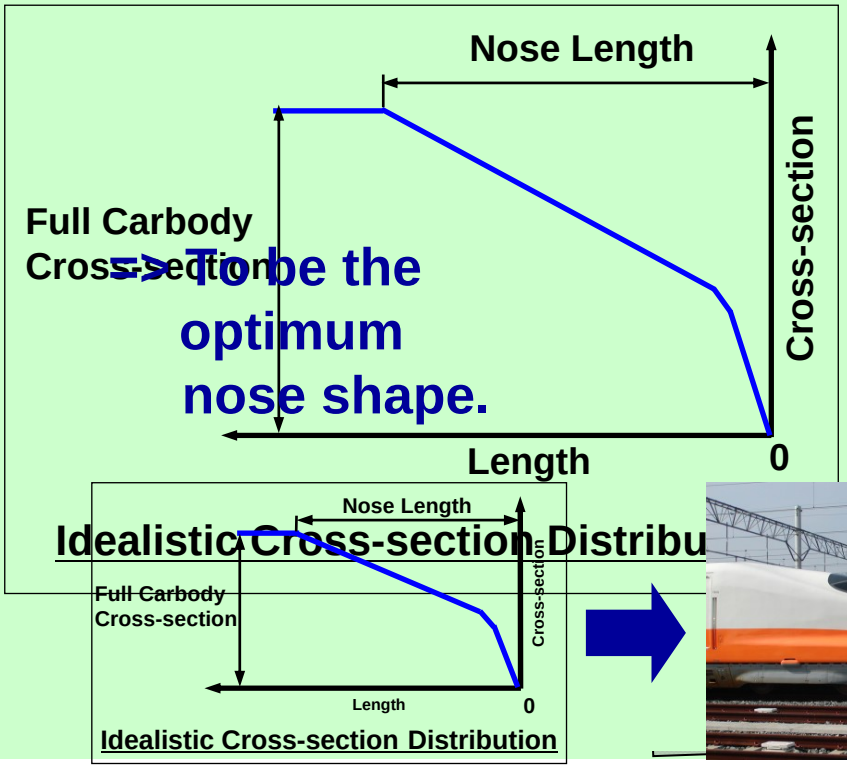
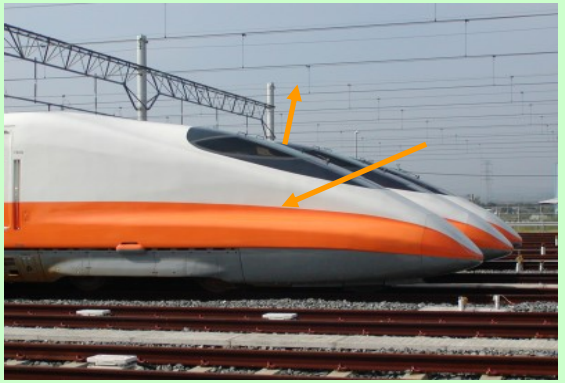
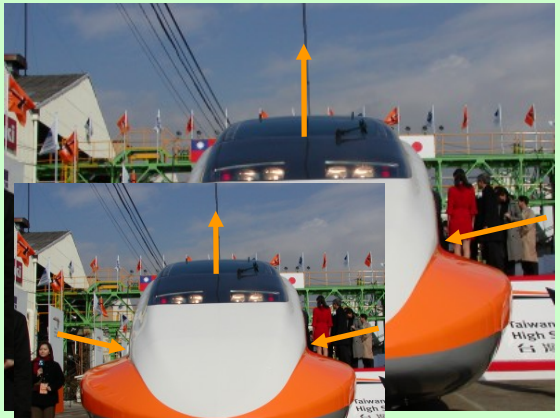
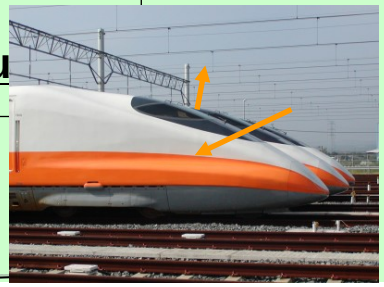
Latest Technology by Kawasaki

=> To be the optimum nose shape.









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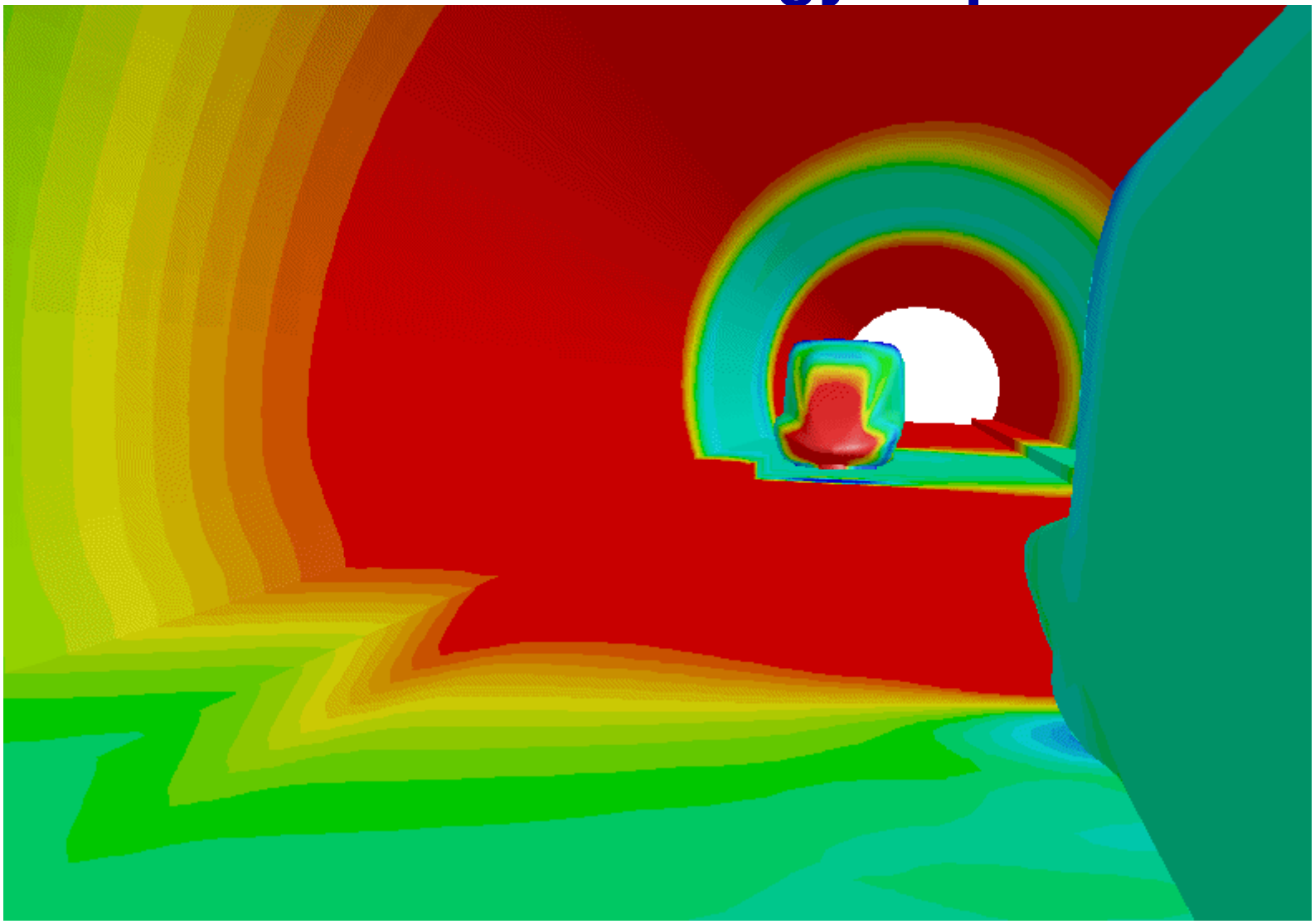

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Conclusion

1) "Shinkansen-based High Speed Train" is *now service proven outside of Japan, too*.

2) "Shinkansen-based High Speed Train" can be *operated not only on dedicated newly constructed lines but also on the upgraded conventional lines*.

3) "Shinkansen technology" is *confirmed by European V&V approach*.

4) "Shinkansen-based High Speed Train" is *most environmental friendly high speed train in the world*.

Kawasaki is taking the leading role in developing and enhancing High Speed Train technology.

Thank you for Your Attention

Kawasaki