



Japanese Technical Standards

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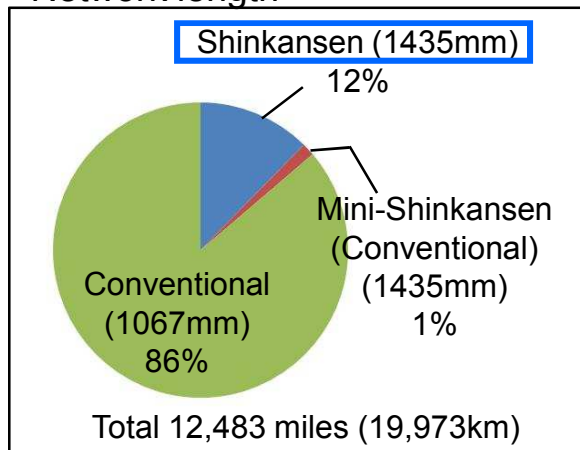


Shinkansen operation: JR companies

- JR companies are private companies and successors of Japanese National Railways
- Passenger companies are also infrastructure owners.
- All companies are independently administered.

6 passenger railway companies
+
1 freight railway company
+
Other companies

Network length



Railway Technical Research Institute
JR Information System
Japan Telecom (now, Soft Bank Telecom)



Definition of Shinkansen

- “a main line on which a train is able to run at over 200km/h* along almost all the route” (Nationwide Shinkansen Railway Development Act)
*200km/h: 125mph
- Mini-shinkansen routes with converted conventional lines are legally conventional lines.



Shinkansen



Mini-Shinkansen

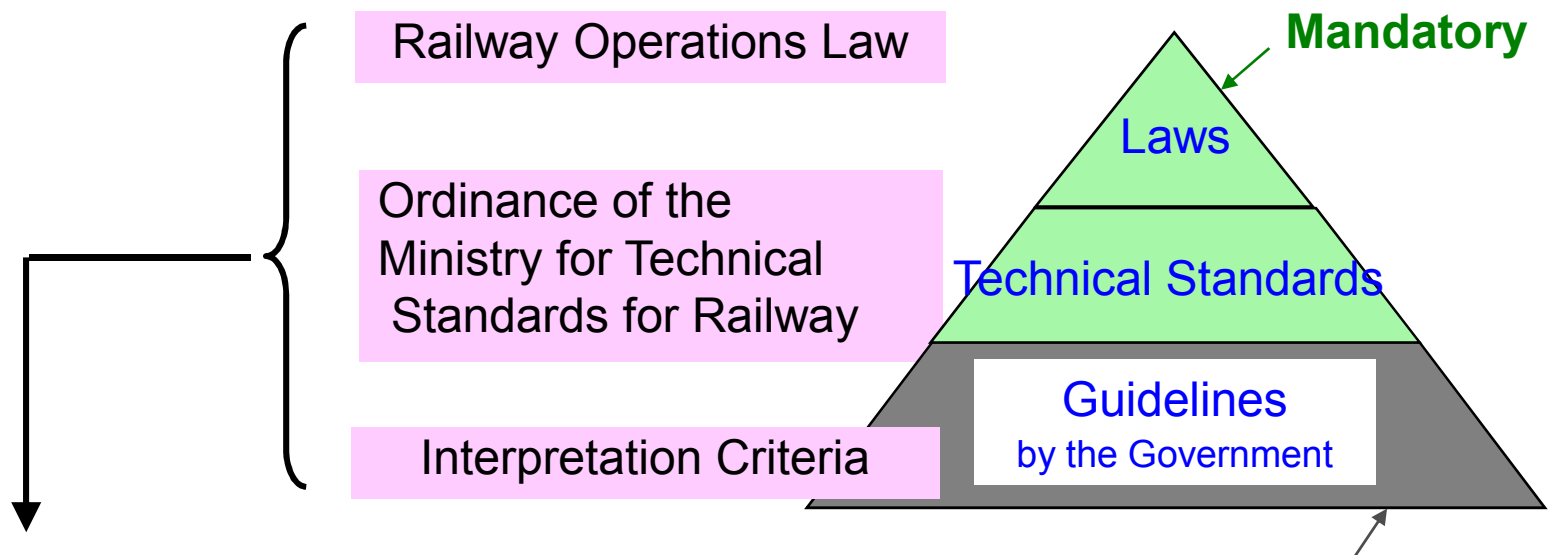
(Photo: running on Shinkansen track)

Shinkansen : High speed rail in Japan

Conventional line: Other than Shinkansen, including Mini-Shinkansen



Technical standards for Japanese Railways



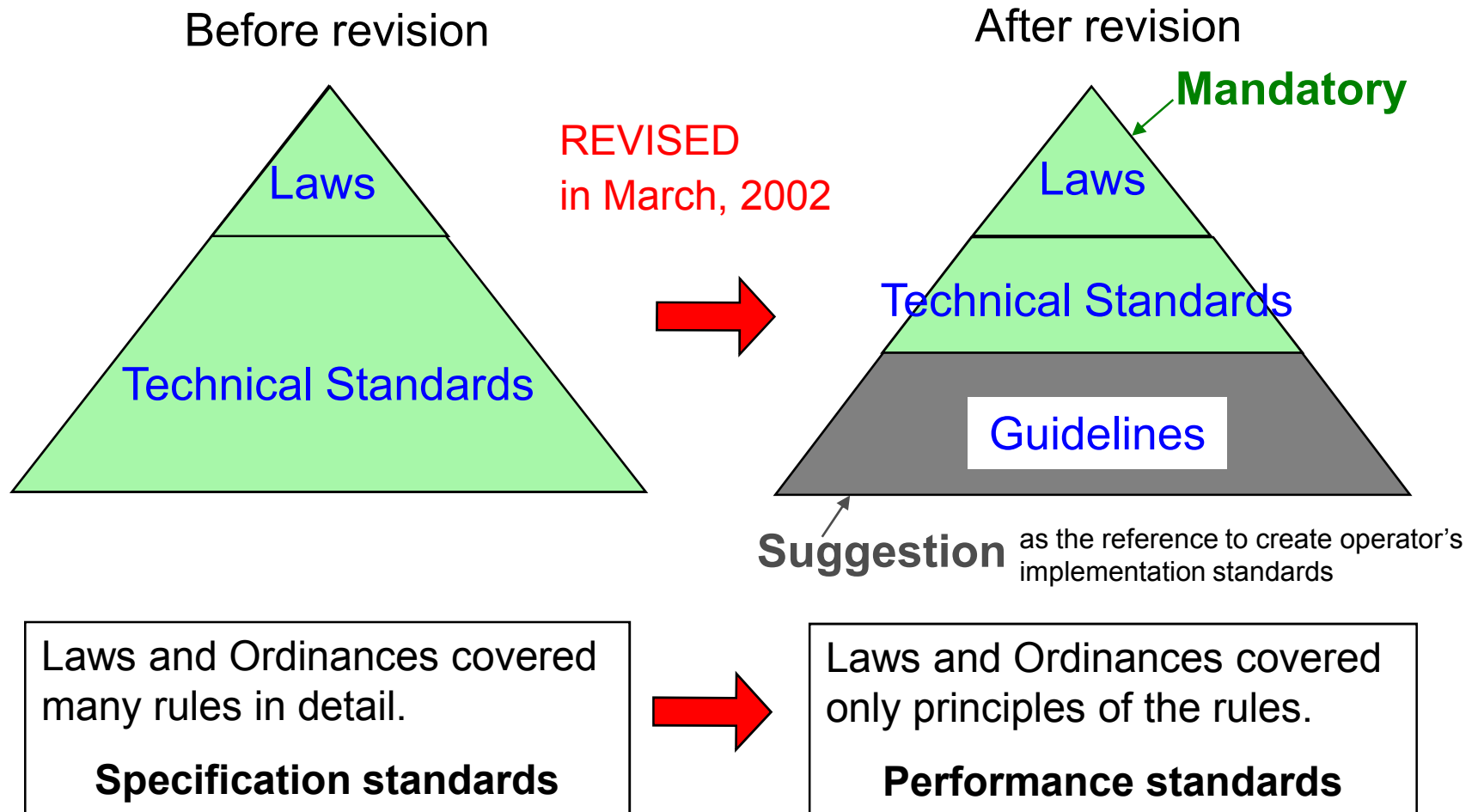
These rules are applied both for Shinkansen and conventional lines.



Railway companies have to set their own criteria, **"Implementation Standards"**, based on the above.

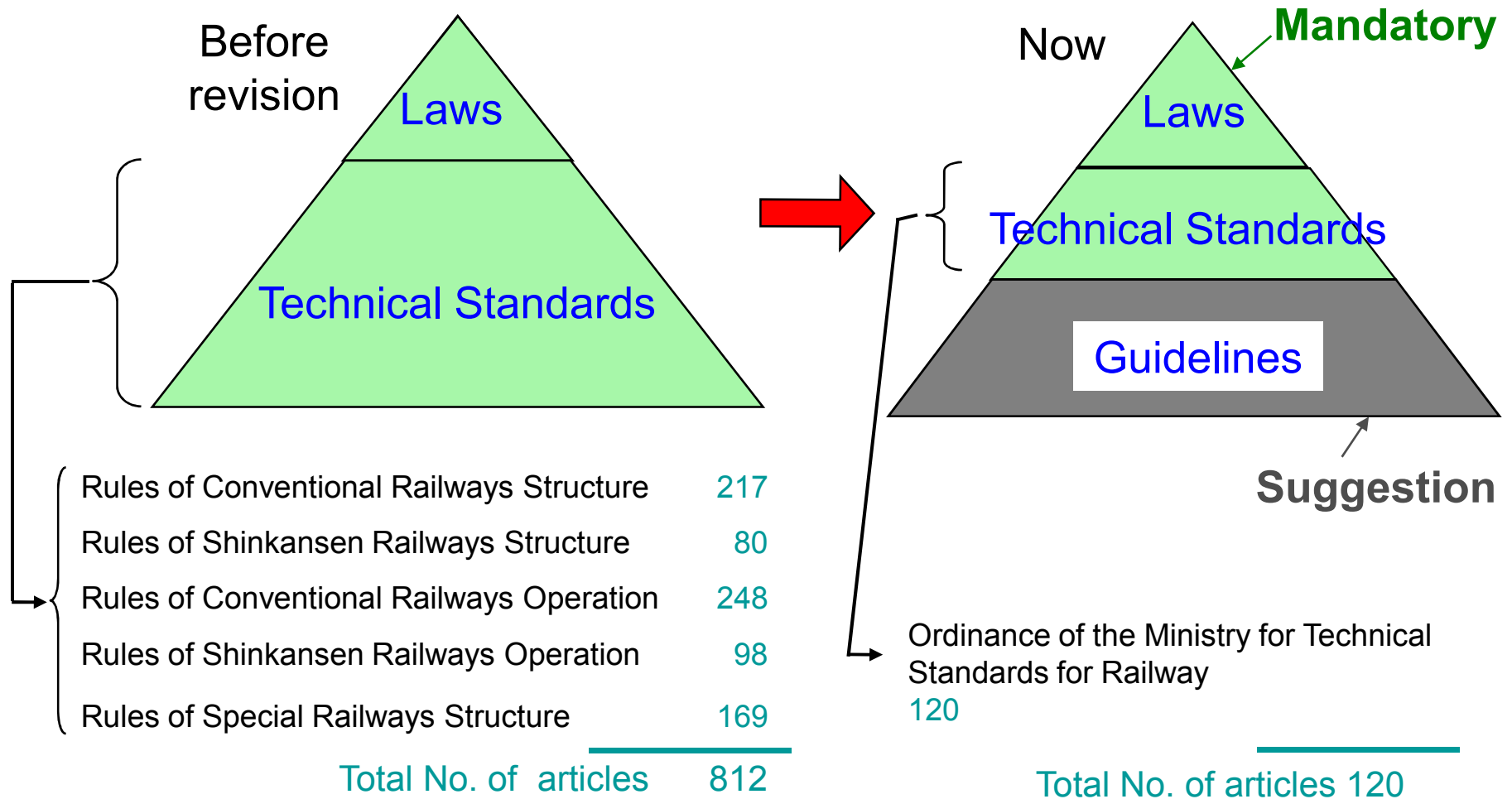


Technical Standards for Japanese Railways





Technical Standards for Japanese Railways





Example of the Revision (In the case of “radius of curve”)

Before the Revision

Rules of Shinkansen Railways Structure (Ordinance of the
Ministry)

Article 9. The minimum radius of curve of the main track shall be 2500 meters. In prohibitive cases from the standpoint of topography, it could be 400 meters, taking train speed into consideration.



Example of the Revision (In the case of “radius of curve”)

After the Revision

Ordinance of the Ministry for Technical Standard for Railway

Article 14. Radius of curvature shall be set in order not to impair safe car operations, taking the performance capability of negotiating a curve, the operation speed, and other relevant factors into consideration.

Interpretation Criteria

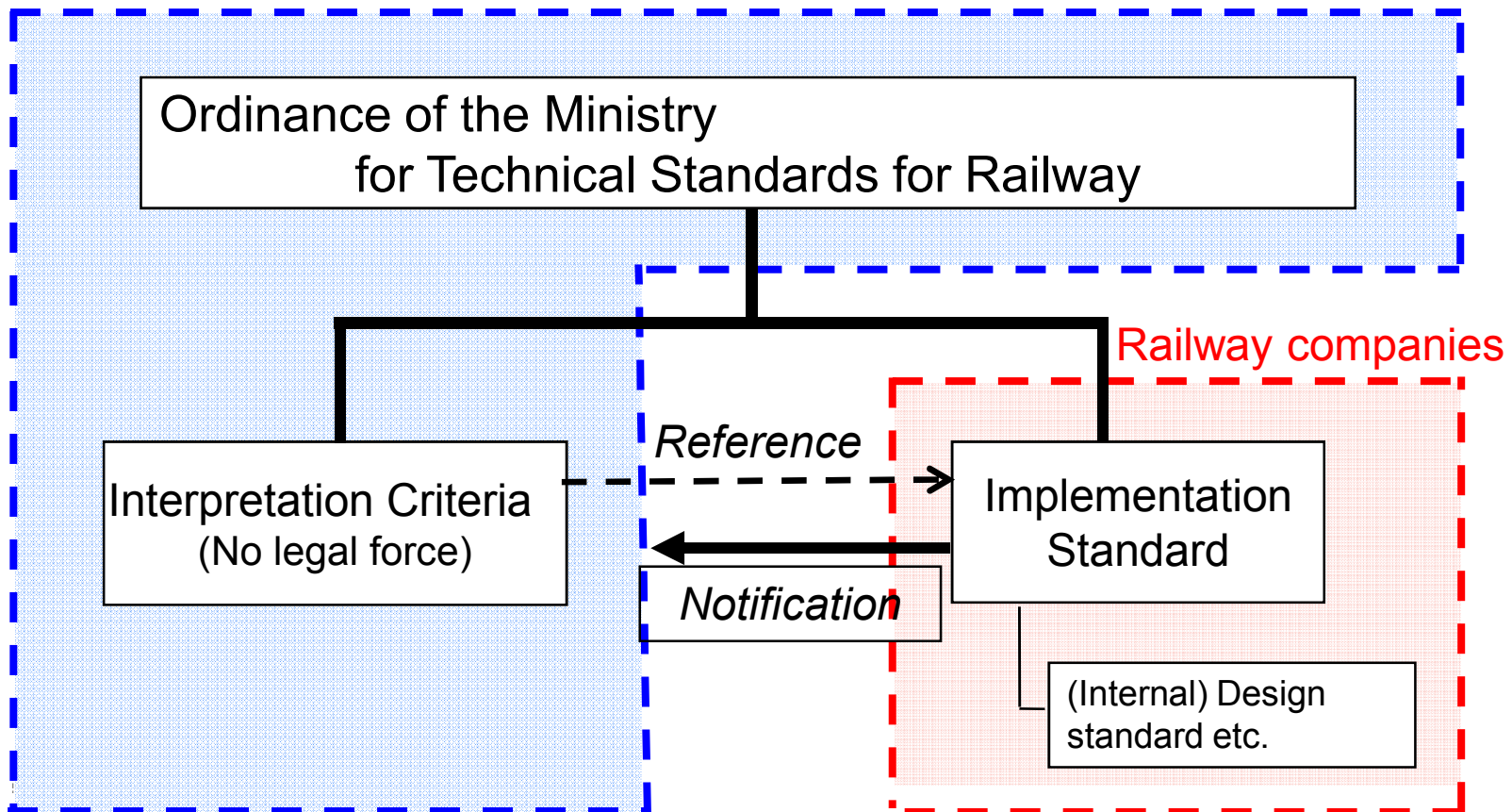
Concerning Article 14. Radius of curve of the Shinkansen main track shall be 400 meters or more.

Interpretation Criteria is only the guideline - **You do not need to follow these criteria if you can prove that operations are safe.**



Structure of technical standards between the government and railway companies

Ministry of Land, Infrastructure, Transport and Tourism





Why did the Government revise the system?

Unchangeable principle : **Safety as the top priority**

Based on this principle, the autonomy of railway companies should be respected.

The former laws and ordinances described the details.

- It was impossible for railway companies to change their rules by introducing new technologies.
- The system of standards had been a barrier to improving safety & service quality (that is, customer satisfaction).

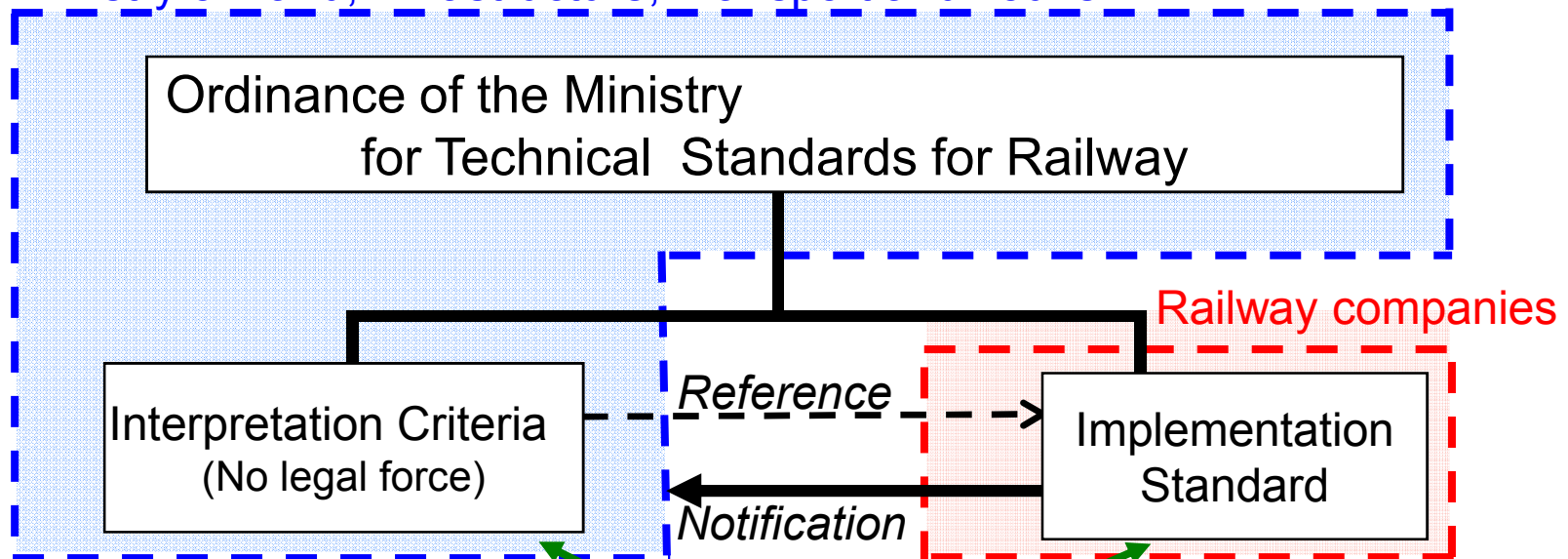
As a result, railway companies

- can adapt more easily to the progress of technologies.
- Must instead take responsibility for the results.



Change Rules for Implementation Standards

Ministry of Land, Infrastructure, Transport and Tourism



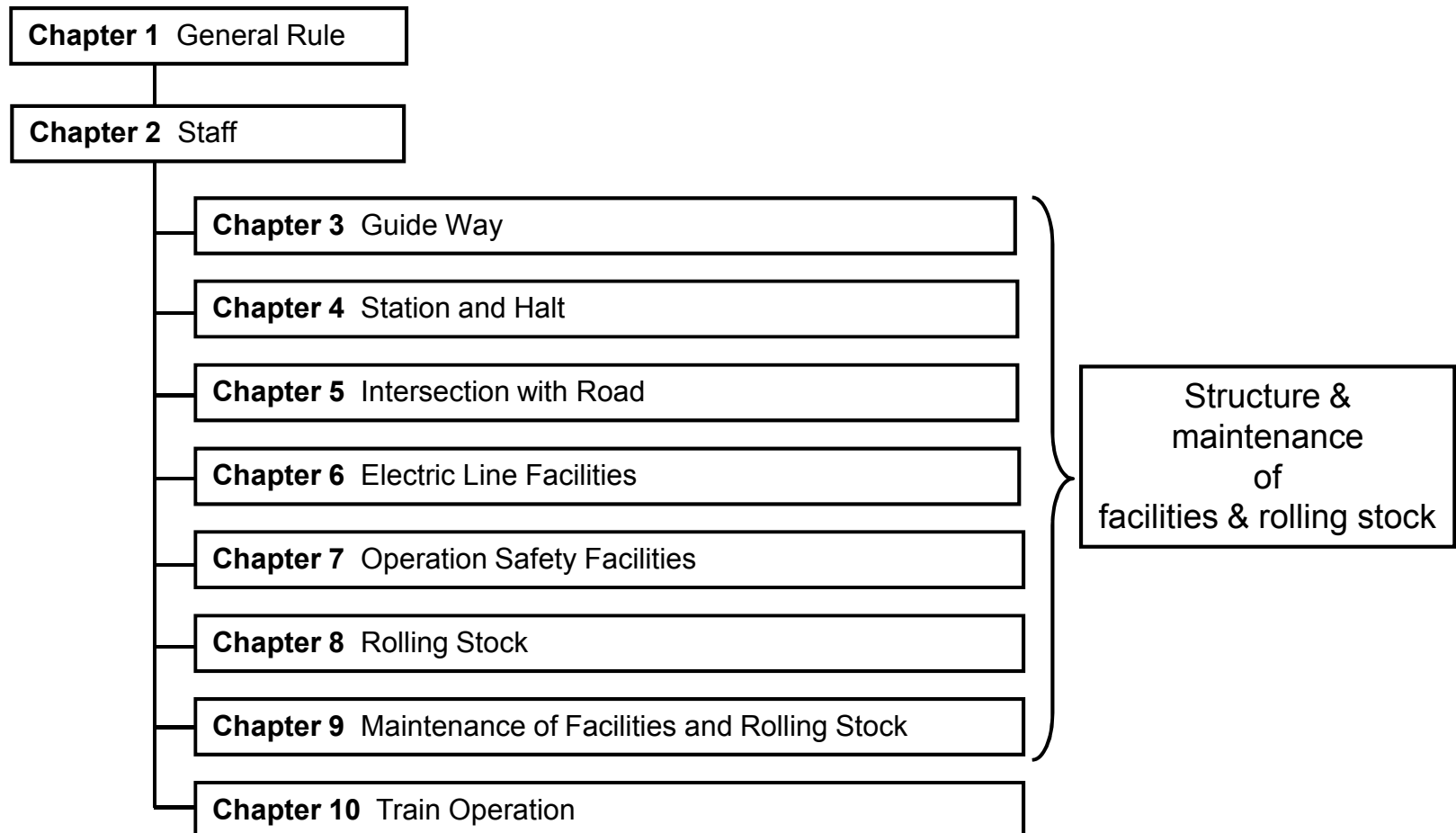
Actually they are nearly the same at the first stage

Railway companies can change the Implementation Standards, even if the change will not meet the Interpretation Criteria, ONLY WHEN they can show the Ministry that the safety level will not decrease.



Structure of Ordinance

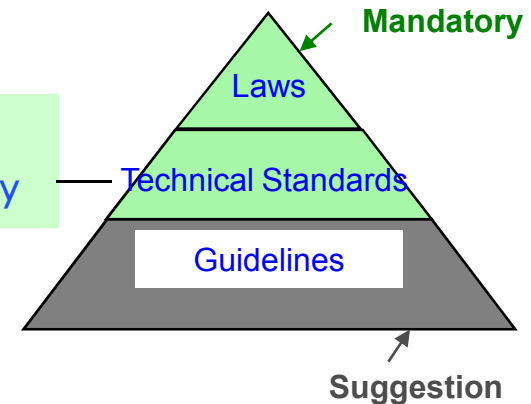
Ordinance of the Ministry for Technical Standards for Railway





Particular rules for Shinkansen in Ordinance

Ordinance of the Ministry for
Technical Standards for Railway



There is **no big difference** between Shinkansen
and Conventional lines **EXCEPT**

Article 25. Shinkansen guide way shall be equipped with the devices to **abate extreme noises** generated from the high-speed operation, depending upon the situation or condition along the right of way.

Article 31. 2. Adequate devices shall be installed for Shinkansen **to prevent persons from entering guide ways**, except those areas such as bridges, tunnels and other hard to trespass structures.

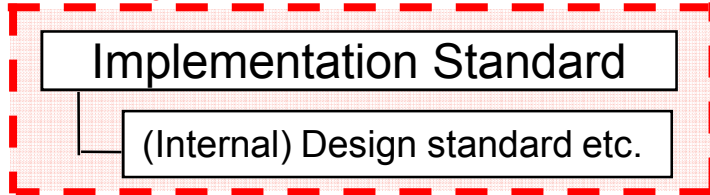
Article 39. Shinkansen railway **shall not intersect with roads at grade.**

Article 71. Rolling stock to be used by Shinkansen shall **abate extreme noise** generated from high-speed operations. However, rolling stock used for accident recovery, testing of facilities, and inspection or maintenance is exempt from this standard.

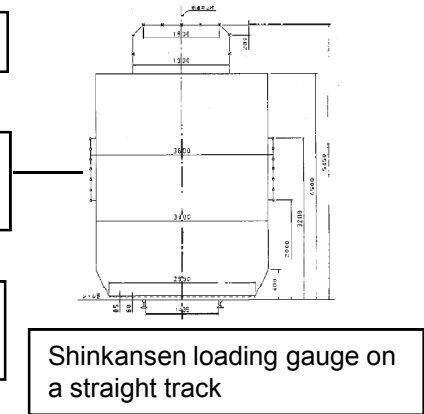
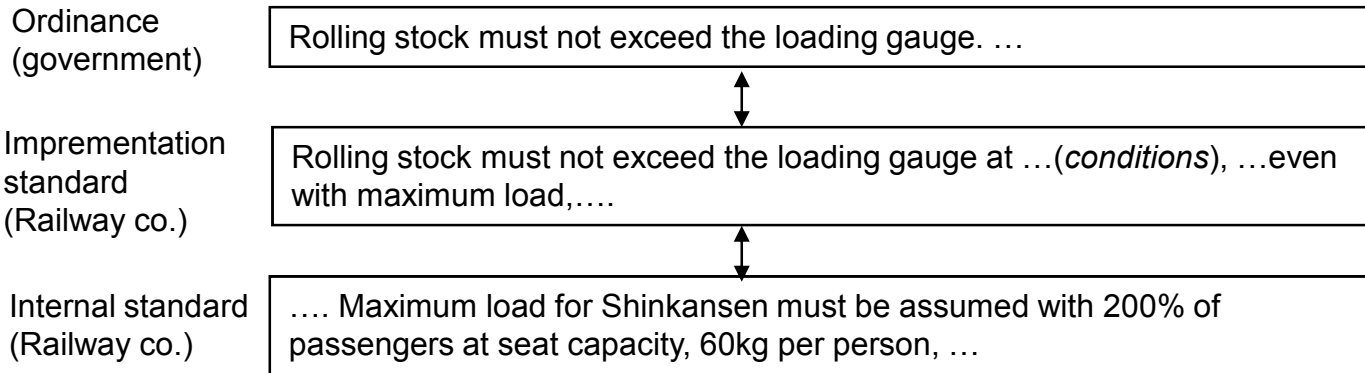


Structure of technical standards in railway companies

Railway companies



• Example in rolling stock



- JIS (Japanese Industrial Standards)
Some internal standards require the conformity of JIS



Certification of conformity to the national technical standard

- National government issues the certification of technical conformity.
- National government can certify “Certified railway company”.

Certified railway company

- It is delegated authority from the government by the deregulation.
- It makes it possible to certify the conformity to the standard by qualified people inside the railway company.
- Some important parts remain to be certified by the government (braking system etc.)



Remarks

- The Japanese government and operators have modified the standard system so that laws / ordinances would not disturb each railway company's efforts to enhance the safety and the service quality, respecting companies' autonomy.
- Based on the Technical Standards and Guidelines, railway companies shall set their own Implementation Standards.
- Railway companies have obtained much more freedom and responsibility to set high levels of safety and quality of service. This situation will support and motivate them to survive the competition with other transportation modes.





2011 International Practicum on Implementing High-Speed Rail in the United States



AMERICAN
PUBLIC
TRANSPORTATION
ASSOCIATION



INTERNATIONAL UNION
OF RAILWAYS

Track 201

**Thank you very much
for your attention**

