



RESEARCH ARTICLE

COMPARATIVE ANALYSIS OF RAILWAY RELATED LAW SYSTEMS BY VARIOUS COUNTRIES

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ABSTRACT

The companies in the world have been continuously trying to export railway vehicle parts to overseas. However, it is difficult to gather information on related laws and technical specifications of export target countries, and it is difficult because of procedural problems. Therefore, it is necessary to compare and analyze the railway related laws of various countries. In this paper, the railway related law systems of Korea, Japan, Europe analyzed and systems are compared for the reliability system guideline.

Key words:

Law,
Railway,
Safety,
Reliability,
Guideline.

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INTRODUCTION

Due to the rapid development of technology all over the world, the railway system has become more popular and efficient transportation system than airline and automobile. As a result, the companies in the world have been continuously trying to export railway vehicle parts to overseas (Chang-Hwan Mo, 2013). However, it is difficult to gather information on related laws and technical specifications of export target countries, and it is difficult because of procedural problems (Kyeong-Hyeon Kwon, 2013). Therefore, it is necessary to compare and analyze the railway related laws of various countries. In this paper, the railway related law systems of Korea, Japan, Europe were analyzed and are compared for the reliability system guideline.

Railway Related Law System by Various Countries

Korean Railway Related Law System

The railway related laws of Korea include the railway industry development law, the railway construction law, the railway safety law, the railway business law, the urban railway related law and the track transportation law.

As shown in Figure 1, interregional railway related law includes the fundamental law of railway industry development, railway safety law, railway service law, and railway construction law. The urban railway related law includes railway safety law, railway service law, urban railway related law and track transportation Law. The Ropeway track law specifies the orbit transportation law (Ministry of Government Legislation).

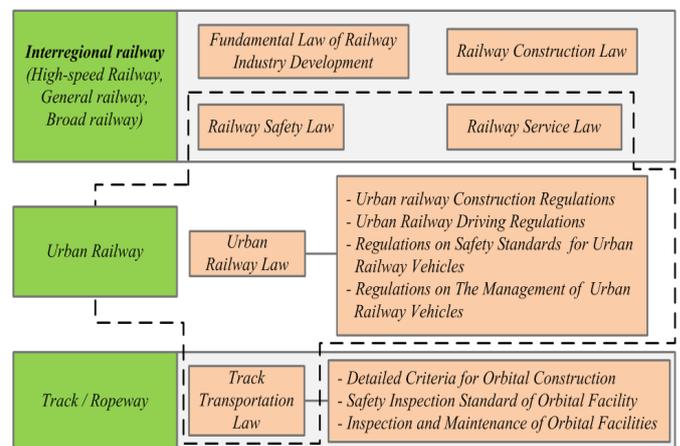


Fig. 1. Korean Railway Related Law Systems

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The railway safety law is a law for ensuring the safe operation of railway vehicles. It includes the safety management system, safety management, and maintenance of the railway. In addition, the contents related to reliability are mainly specified in the railway vehicle technical standards in the railway safety law, among domestic railway related laws. Figure 2 shows the system of railway safety law. There are railway-related laws as the upper law and enforcement ordinances and enforcement regulations as the lower law. There are also technical standards and regulations.

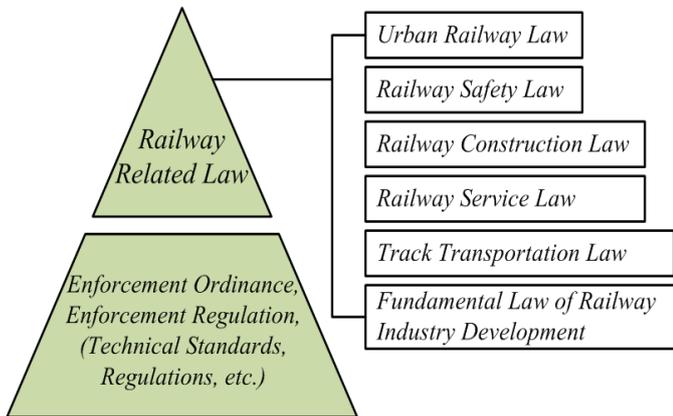
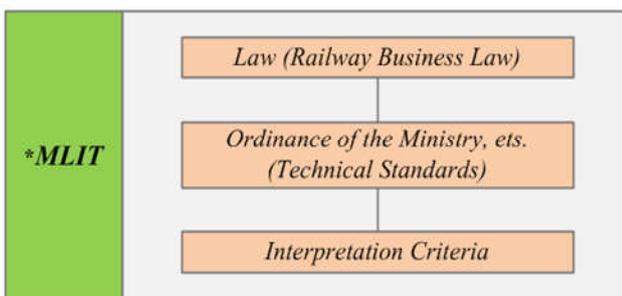


Fig. 2. Korean Railway Related Law System

In general, the Korean railway related law has legal obligations for railway related laws, enforcement ordinances, regulations, technical standards and regulations. Especially, the contents related to reliability include general contents in the high speed railway technical standard, and the contents of reliability test are also specified in general railway and urban railway technical standard. In addition, it was confirmed that the railway safety law lacked detailed information on the safety management system and reliability of the railway.

Japanese Railway Related Law system

All laws related to railway in the railway six have been publishing law through the ministry of land, infrastructure and transport in Japan. The railway six law is divided into the railway service law, the railway business law, the railway maintenance law, the track law, the national railway reform law, and the facilities / Vehicles / driving / signal / communications law. Figure 3 shows the Japanese railway related law system. In Japan, railway six law is based on the railway pedestrian law, and there are 'ordinance of the ministry' and interpretation standards including technical standards.



*MLIT: Ministry of Land, Infrastructure, Transport and Tourism

Fig. 3. Japanese Railway Related Law System

Figure 4 shows the analysis and changes of the Japanese railway related system. Before revision law system, the specifications of the railway components were specified in detail in 'ordinance of the ministry' of strong (technical standard). Also, it can be confirmed that due to the difficult examination conditions, the technological burden of the company deepens and the barriers to enter the business were high. In view of these problems, 'ordinance of the ministry' (technical standards) was redefined in 2002 by presenting only the direction of the approximate technical standards and the government guidelines to present the details to the interpretation criteria without legal force. This interpretation standard have maintained the basic regulation that the law and the safety of the 'ordinance of the ministry' of the highest priority. Also, since there is no legal compulsion, if the safety is verified by checking the ministry of land, transport and tourism, it can be used without following these guidelines. As the interpretation standard was introduced, technical burdens and business entry barriers were lowered, which made it easier for SMEs to enter the business.

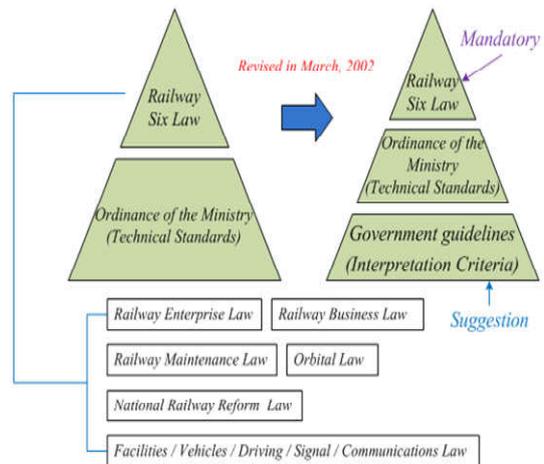


Fig. 4. Japanese Railway Related Law System

Other features include regulatory and governance of government regulations, standards, etc. on some technical and technical aspects of facilities, vehicles, operation and safety management.

European Railway Related Law system

European railway technical standards are managed by the European railway authority (ERA) and the European committee for standardization(CEN), and the TSI and EN standards mandate compulsory compliance within the EU member states by compulsory European legislation. Figure 5 shows the analysis of the European railway legal system.



Fig. 5. European Railway Related Law System

Additional considerations are UIC Leaflets catalog, UIC code, which is not regulated but is referenced in national and international norms and regulations. These European railway technical standards consist of TSI → EN → UIC code. In order to ensure interoperability and technology homogenization in the EU, TSI serves as a guideline for the highest technical standards. In addition, detailed technical solutions within TSI are proposed to use EN standards and UIC codes. TSI was adopted in 2002 by the European association for railway interoperability (AEIF). Since then, the TSI has been enacted under the European railway administration (ERA) and in 2008, the railway system interoperability law (2008/57 / EC) in the European community for the integrated operation of railways in member states of the EU. This aimed to minimize the technical disparity between the railway systems of EU member countries and to establish a homogeneous and interoperable European railway network. TSI has eight sub-systems by sector: Rolling Stock, Infrastructure, Control-Command and Signaling, Energy, Maintenance, Operations and Traffic Management Operation and Traffic Management, Telematic Application for Passenger Services and Telematic Application for Freight Services.

TSI will be finally evaluated in conformity with the NoBo (Notified Body), which will be reflected in the EC declaration to ensure technical reliability.

Comparative Analysis of Law system

The Korean railway related law and the Japanese railway related law System have a similar structure. Table 1 shows comparison the Korean railway safety law, the Japanese railway six law and the EU Directive. As shown in Table 1, Japan has legal binding force in the railway method and ordinance of the ministry (technical standard), and the interpretation standard (guideline) has no legal force. Europe is legally binding on the EU Directive, TSI. And the UIC code, which can refer to national and international norms and regulations, is not legally binding. On the other hand, it can be confirmed that Korea has legal binding force to railway related laws, enforcement ordinances, enforcement regulations, and detailed standards. In addition, Korea has been able to confirm that there is no guideline (no legal binding force) showing consistent management systems (norms and regulations) and detailed specifications of parts, such as Japan and Europe.

Table 1. Comparison of domestic law and Japanese law

| | Korea | Japan | Europe |
|------------------------|--|--|--|
| Binding force | Railway Related Law (Railway safety law, urban railway law, etc.) Enforcement Ordinance Enforcement Regulation Detailed Criteria, etc. (Technical standards for railway vehicles, Technical standards for railway equipment) | Railway Six Law Ordinance of the Ministry (Technical Standards) | EU Directive TSI (Technical Specification Interoperability) |
| no legal binding force | | Interpretation Criteria (Guideline) | UIC code |

These eight sub-systems define technical interrelationships between the subsystems for the purpose of ensuring interoperability of railway systems and optimizing performance of railway systems for the purpose of TSI technical standards. In addition to the requirements for technical standards that must be met, detailed technical specifications are suggested to make use of the EN standard. This is shown in Fig. 6 "European Standards", it includes not only the EN standard but also the UIC code and national regulations.

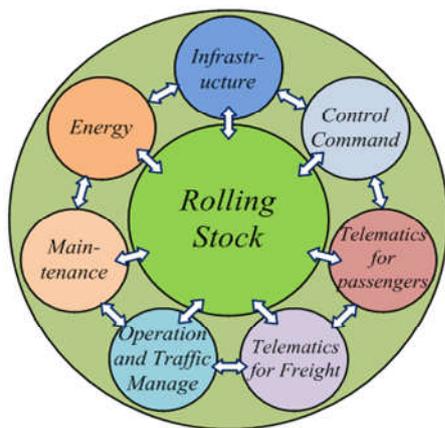


Fig. 6. Systematic relationship of TSI

Through the above system and procedures, the products made in compliance with the technical provisions and guidelines of

The technical standards of Korea are limited to parts because it is a certification for essential parts of railways, and it is technically burdensome for small / medium-sized enterprises which lack technical skills because of their legal binding force. currently, the railway safety law lacks detailed management information on the reliability management system and it is necessary to introduce guidelines without legal force such as Japan and Europe in order to continuously maintain and manage RAMS.

Conclusion

In this paper, railway related law systems by various country were analyzed and compared. The railway related law systems of Korea, Japan, Europe were analyzed and systems according to the enforcement of law were compared. In the case of the Korean railway related law, there are enforcement ordinances and enforcement regulations that represent legal obligations, and technical standards and type approval certification are included in the enforcement decree. This is due to the limited number of certified items and strong legal force, which makes entry barriers high for SMEs that lack technology. In addition, the method of safety management system (reliability related) specified in the railway safety law is not on the other hand. And it can be confirmed that Korea has legal binding force to railway related laws, enforcement ordinances, enforcement regulations, and detailed standards and guidelines. On the other hand, in Japan, there is a legal force in the railway six law and the ordinance of the ministry (technical standards). The

ordinance of the ministry presented only the direction of the approximate technical standards, and the details were presented to the interpretation criteria without legal force to promote business expansion. The case of Europe was similar. The TSI and EN standards are mandatory in EU member States. On the other hand, UIC code, which is a catalog of UIC leaflets, which has no legal force but can be used as a reference for national and international collective norms and regulations, is specified in detail.

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