中国高铁安全保障体系

Safety Guarantee System of Chinese HSR

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主要内容 Contents

一 中国高铁发展概况

1. Overview of Chinese HSR Development

1.1 路网规模持续扩大 The scale of the HSR network continues expanding

截至2018年底，中国高铁营业里程达到2.9万公里，超过世界高铁总里程的2/3。中国成为世界上高铁里程最长、运输密度最高、成网运营场景最复杂的国家。

By the end of 2018, Chinese HSR operating mileage reached 29,000 kilometers, more than 2/3 of the world's HSR mileage. China has become the country with the longest HSR, the highest transport density and the most complicated network operation scenes in the world.

1.2 技术装备水平不断提高

The level of railway technical equipment is constantly improving

在高铁里程不断攀升的同时，中国铁路装备发展迅速。截至2018年底，中国拥有高铁动车组3268列。特别是中国成功研制了拥有完全自主知识产权、具有世界先进水平的复兴号中国标准动车组。

While the mileage of HSR is rising, Chinese railway equipment is developing rapidly. By the end of 2018, China had owned 3,268 EMU trains. Especially China had successfully developed the "Revival" EMU trains, which with complete independent intellectual property rights and reaching the world-class level.

1.3 运输安全和服务水平稳步提升

Transport safety and service are steadily promoting

2018年，中国高铁旅客发送量达到20.05亿人次，占铁路总旅客发送量的60%以上。中国高铁已累计运输旅客突破90亿人次，正点率连续多年达到99%以上，成为大众出行的首选。

In 2018, Chinese HSR totally send 2.005 billion passengers, accounting for more than 60% of the total railway passenger. Chinese HSR have accumulated more than 9 billion passengers and the punctuality rate has reached more than 99% for many years, making it the first choice for mass travel.

中国高铁取得的这些成绩，得益于可靠的安全保障体系。它是根据中国铁路多年来建设及运营维护经验建立的，贯穿高铁系统全生命周期。

Such great performances of Chinese HSR cannot achieved without escort of safety guarantee system. The system is established on years of construction and maintenance experience of Chinese Railway, which could cover the whole life-cycle of HSR system.

二 中国高铁安全保障体系

2. Safety Guarantee System of Chinese HSR

2.1 工程建设质量保障 Guarantee of engineering and construction quality

严格落实高速铁路勘察、设计、施工、监理等过程标准，加强工程建设质量问题的检查整治，加强开通验收等关键环节的管控，形成高速铁路工程建设质量源头保障体系。

Strictly implement the process standards for HSR survey, design, construction, and supervision. Strengthen the inspection and rectification of the quality of engineering construction. Strengthen the control of key links such as opening and accepting. A quality source guarantee system for HSR construction is formed by these measures.

2.2 设备质量保障 Guarantee of equipment quality

强化高铁物资采购审核和产品质量检验，实施行政许可、产品认证、上道审查等准入制度，加强高速列车及其重要配件的监造管理，强化铁路统一的物资供应商信用评价，建立了高铁设备质量源头控制体系。

Strengthen the procurement inspection of HSR materials and product quality testing. Implement the admission system for administrative licensing, product certification, and on-the-rail review. Strengthen the supervision and management of high-speed trains and their important parts. Strengthen the railway supplier's credit evaluation system of uniform suppliers, and establish a HSR equipment quality source control system.

2.3 联调联试及运行试验 Integrated test and commissioning

(1) 联调联试：主要检验动车组运行的安全性、平稳性、舒适性；检验基础设施的安全性、稳定性，评价其设计参数和设备选型的合理性；验证减振降噪措施和系统接口。

Integrated test : mainly verify EMU safety, smoothness and comfort; verify the safety and stability of infrastructure, evaluate the reasonability of design parameters and equipment modes; validate the vibration and noise reduction methods, and system interfaces.

(2) 运行试验：主要检验设施和设备及行车组织方式能否满足运营要求；检验各种非正常行车的能力；为优化设备配置、提高设备性能、制定科学合理的运输组织方案和应急救援方案，提供技术依据。

Commissioning: mainly test whether facilities, equipment and train running organizations can meet the operation requirements; test the capacity of various abnormal movements; provide technical basis for equipment configuration optimization, equipment performance promoting, making scientific and reasonable transport organization proposal and emergency rescue proposals.

2.4 开通运营安全评估 Safety assessment for Operation

(1) 在新建高速铁路开通运营前，组成各专业管理和技术专家构成的安全评估组，对相关运营维护单位的安全管理、规章制度、员工素质、设备管理等方面开通运营准备情况实施安全评估。

Before the new high speed railway opening to traffic, safety assessment group composed of management and technical experts of each field is organized to conduct safety assessment on the preparation for operation in such aspects as safety management, rules and regulations, quality of employees and equipment management of related operation & maintenance units.

(2) 安全评估按照铁路各专业分为安全管理、规章制度、车务、机务、工务、电务、车辆、供电等多达10多个小组实施安全评估。

Before the new high speed railway opening to traffic, safety assessment group composed in accordance with the railway fields. HSR's safety assessment group is divided into 13-17 teams, such as safety management, rules and regulations, operations & traffic organization, public works, signal & telecommunication, EMU, power supply etc.

(3) 2008年以来，所有高速铁路都实施了开通运营安全评估，确保了各条高速铁路顺利开通和安全运营。

Since 2008, safety assessment on openness to traffic has been conducted to all the HSR, to ensure the smooth opening and safe operation of various high-speed railway.

2.5 设备设施安全检测及监测 Safety inspection and detection of infrastructure

(1) 综合维修天窗，为了保证行车安全，高速铁路运行图一般在夜间设置4~6小时的综合维修天窗，对线路、通信信号和供电设备进行综合维修。

Comprehensive maintenance time, For the safety of trains, the timetable of Chinese HSR is generally set up at 4 to 6 hours of comprehensive maintenance time at night to comprehensively maintain the line, communication signals and power supply equipment.

(2) 在实时监测方面，利用三维精测网、地质雷达、视频监控等网络监控手段，实现对路基沉降、隧道断面变形和路桥、路堑、路隧过渡段、曲线、道岔、伸缩调节器等主要基础设施和关键设备状态的实时监测。

In the aspect of real-time monitoring, network monitoring methods such as three dimensional precise measurement network, geological radar and video monitoring are used to real-timely monitor subgrade settlement, deformation of tunnel cross-section and the condition of main infrastructures and key equipment such as and road bridges, road cuts, road- tunnel transitional sections, curves, switches and expansion joint.

(3) 在精细化检测方面，运用大数据等方法，定期评估设备设施状态，实现设备设施养护维修精准化管理。

In the aspect of refinement detection, we use methods such as big data to regularly evaluate the state of equipment and facilities to achieve precise management of equipment and facilities maintenance and repair.

2.6 确认车检查及高速综合检测列车检测制度
Inspection of validation train and high speed comprehensive inspection train

(1) 确认车检查：以每日首趟列车（不载客）为确认车，检查基础设施状态或夜间(天窗)维修后线路安全状态，确保高速铁路旅客列车安全运行。

Inspection of validation train: the first train runs every day (without passengers) is the validation train. Check the infrastructure condition or line safety after night maintenance (shutter) to ensure that passenger trains run safely on the high speed railway.

2.6 确认车检查及高速综合检测列车检测制度
Inspection of validation train and high speed comprehensive inspection train

(2) 高速综合检测列车：每月开行两次高速综合检测列车，对高速铁路轨道状态、接触网状态、轮轨动力学性能、通信信号设备等实施检测，为高速列车运行安全和养护维修提供指导。

High speed comprehensive inspection train: High speed comprehensive inspection trains are open to traffic twice a month. High speed railway track condition, OCS condition, kinetic performances of wheel-rail, communication signal equipment, etc. shall be inspected to provide guidance for safe operation and maintenance of HSR.

2.7 动车组运行状态监测及监控 Inspection & monitoring of EMU status

通过列车网络控制系统，对动车组高压系统、牵引系统、制动系统、监控系统、车门系统、通信系统等方面监测（控），实现了高速动车组运行状态自诊断监测功能。

HV system, traction system, braking system, monitoring system, door system, communication system, etc. of EMU are monitored (supervised) through train network control system, which realizes the self diagnosis and monitoring function of high speed EMU to operation condition.

通过车载计算机及车地通信系统，实现动车组运行状态实时监测和报警。

Real-time monitoring and alarming to EMU operation condition is realized through on-board computer and train-ground communication system.

2.7 高速铁路防灾 Disaster Prevention of HSR

中国所有高铁根据线路所处的自然环境、地理条件以及灾害类型，各自建立了风、雨量、雪深、地震等自然灾害监测系统，通过实时监测、采集和分析灾害数据，为行车安全及时提供报警、预警信息，有效避免和减轻了自然灾害对高铁运行安全的影响。

All HSR in China have established disaster monitoring system based on natural environment, geographical conditions and disaster types, which consists of wind, rainfall, snow depth, earthquake, etc. The system can supply real-time alarm and warning information according to disaster severity to effectively prevent and reduce the impact of natural disasters on HSR operation safety.

2.8 职工队伍建设 Staff team construction

严格执行关键专业技术岗位资格准入制度，建立培训、考核、任用相统一的高铁职工培训机制，持续优化人力资源配置，创新教育培训模式，深化安全文化建设，保持人才队伍质量。

Strictly implement the qualification system for key professional and technical positions, establish a training mechanism for high-speed train staff with unified training, assessment and appointment, continuously optimize the allocation of human resources, innovate education and training models, deepen the construction of safety culture, and maintain the quality of the talent team.

三 中国高铁的政府监管

3. Governmental Supervision of Chinese HSR

3.1 健全法律法规及标准体系 Improve the legal regulations and standard system

坚持依法行政，着力健全铁路安全监管法规制度和标准体系，加快推进铁路安全监管法治化进程，促进依法治国方略在铁路行业的落实。

Adhere to administrating legally, focus on improving the railway safety supervision laws and regulations system and standard system, accelerate the process of rule of law in railway safety supervision, and promote the implementation of the strategy of governing the country according to law in the railway industry.

铁路法 Railway Law of P.R.China
铁路安全管理条例 Regulation on the Administration of Railway Safety
铁路交通事故应急救援和调查处理条例 Regulation on Railway Traffic Accident Emergency Rescue and Investigation & Handling ……

政府规章 Government regulations

铁路机车车辆驾驶员资格许可办法 Qualification of Drivers for the Railway Locomotives
铁路机车车辆设计、制造、维修、进口许可办法 Design, Manufacture, Maintenance, Import License for Railway Locomotives and Vehicles
铁路基础设备生产企业审批办法 Approval of the Enterprises of Infrastructure Production for Railway
铁路运输企业准入许可办法 Access Qualifications of Railway Transportation Enterprise
铁路旅客车票实名制管理办法 Management Measures of Passenger Ticket Real Name System for Railway
高速铁路基础设施运用状态检测管理办法 Management Measures of Infrastructure Utilization Status Detection for High-Speed Railway
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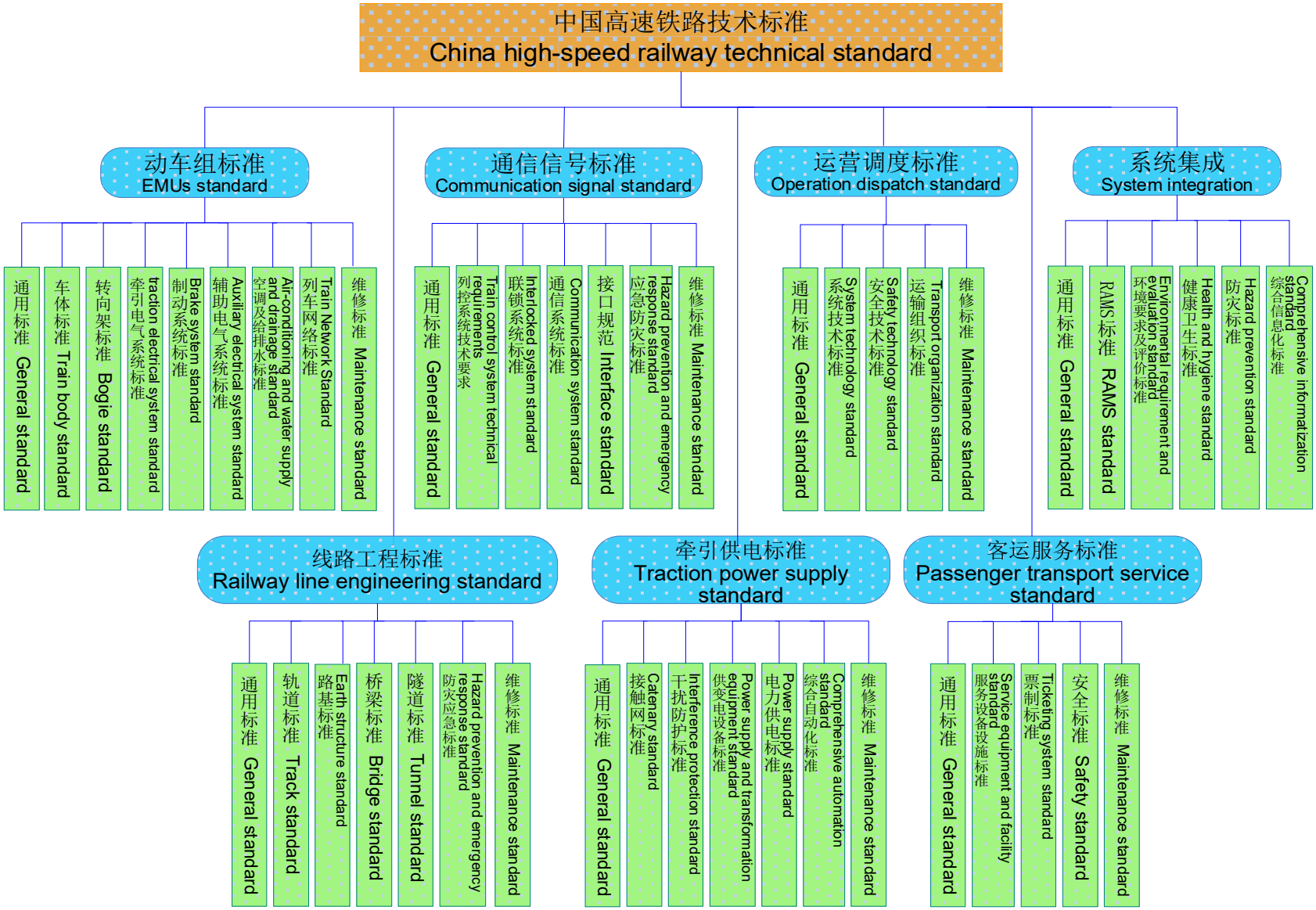
3.1 健全法律法规及标准体系 Improve the legal regulations and standards system



3.2 强化高铁安全行政执法 Strengthen safety law enforcement supervision of HSR

实施运输企业准入许可、安全关键设备生产企业资质认定和机车车辆驾驶员资质许可，强化建设项目质量监督，净化高铁沿线外部环境，依法严厉打击危及高铁安全的违法行为。

Implement access permit of transportation enterprise, and qualification certification of safety key equipment production enterprise and locomotive vehicle driver. Strengthen the quality supervision of construction projects, and purify the external environment along the high-speed railway, "Crack down on illegal activities" has been persistently carried out.

铁 路 运 输 许 可 证

企业名称：中铁电气化铁路运营管理有限公司
企业住所：北京市平谷区山东庄镇府前路9号B座101室
许可范围：铁路货物运输
证书编号：TXYS2018-01076
有效期限：至2038年12月28日有效
证书查询：www.nra.gov.cn　　发证日期：2018年12月29日

国家铁路局

3.3 加强高铁安全监督检查 Strengthen Safety Supervision and Inspection of HSR

研究铁路安全生产特点和规律，坚持目标和问题导向，围绕安全隐患排查和风险防范，加强安全监督检查，努力构建计划统领、分工负责、程序规范、闭环管理的安全监督检查体系。

Study on the characteristics and laws of railway safety production, stick on the goal and problem orientation, focus on safety hazard investigation and risk prevention, strengthen safety supervision and inspection, and build a safety supervision and inspection system for planning, division of responsibility, procedures, and closed-loop management.

3.4 完善高铁安全应急机制 Improve the safety emergency mechanism of HSR

完善应急机制，建立安全监管数据库，充分运用大数据、互联网等方式作为及时妥善处置突发事件的重要基础和保障，提升安全监管的针对性和时效性。

Improve the emergency response mechanism，establish a safety supervision database, make full use of big data, Internet and other ways as an important basis and guarantee for timely and proper handling of emergencies, while improve the pertinence and timeliness of safety supervision.

3.5 推进安全监管体系建设 Promote the construction of safety supervision system

坚持综合治理，协同监管，通过完善工作机制，积极构建“企业主体、政府监管、社会监督”的工作格局，进一步推进铁路安全监管工作的开展。

Persist in comprehensive management, coordinated supervision, improve the working mechanism of “Corporate Entities, Government Regulation, Social Supervision” principle by improving the working mechanism, and further promote the development of railway safety supervision.

结束语 Conclusion

综上所述，中国高铁已经形成了企业主体，政府监管，社会监督的“三位一体”的安全保障体系。贯穿从项目启动、可研、设计、设备制造、工程施工、静动态试验、联调联试、运行试验直至运营管理的各阶段，形成了中国高铁全生命周期安全保障体系，保证了中国高速铁路的安全、高效运营。

In summary, Chinese HSR has formed a safety system for corporate entities, government regulation, and social supervision. Such system can go through initiation of the project, feasibility research, design, equipment manufacturing, engineering construction, static/dynamic experiment, integrated test & commissioning, operation management, which formed a whole life-cycle safety guarantee system for Chinese HSR, ensuring the safe and efficient operation of Chinese HSR.

THANK YOU