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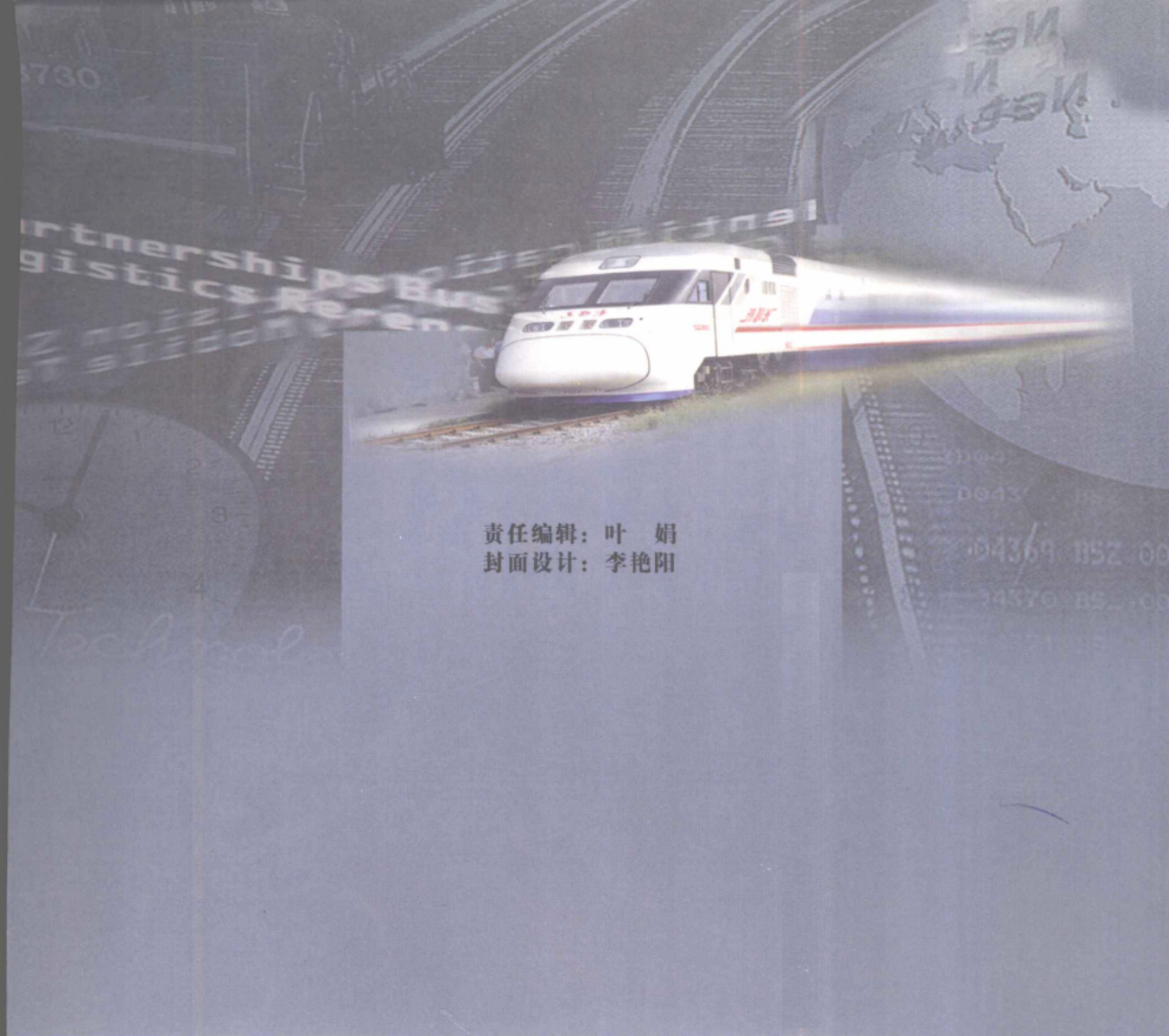
杨寿康 编著

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内 容 简 介

该书结合我国国内外具体情况,介绍铁路车、机、工、电等方面的基础知识和新技术、新设备、新工艺。书中材料绝大部分选自英、美原文书刊,语言纯正,便于读者学习标准的英语表达方法。本书可供铁路院校理工科高年级学生和英语专业学生,以及铁路部门英语培训作教材使用,也可作为有一定英语水平的铁路工程技术人员、科研人员和管理人员的自学用书。

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前 言

随着我国改革开放的发展以及最近西部大开发战略的实施,铁路运输的作用更趋重要。铁道部领导适时地提出“科技兴路”的号召,要求铁路更有效地为经济建设服务。与发达国家相比,我国铁路的科学技术还比较落后,因此,借鉴发达国家的先进科学技术也就十分必要了。本书编写的目的就是为广大铁路科技人员和铁路院校师生提供铁路专业英文书刊中的有关资料,为了解和借鉴国外先进的铁路科技打下英语语言基础。

书中绝大部分内容选自英美出版的英文铁路书刊,主要包括两项内容,一是关于铁路的基本概念和基础知识;二是关于新近铁路科技,特别是高速列车的发展。全书共 20 课,每课有单词表、复杂句型和语言难点的详细注释、练习以及课文的参考译文,供学员对照学习。

本书读者对象广泛,可供铁路院校英语专业学生、理工科高年级学生以及铁路部门的英语进修班、培训班使用,也可作为有一定英语基础的铁路科技人员的自学教材。

在编写过程中,铁道部科学研究院信息情报所的字红,中国铁路机车车辆工业总公司的杨继联,株洲车辆厂的陈旭华,北京“二七”信号公司王大东等同志提供了宝贵的资料,并给予了热情帮助,谨在此表示衷心感谢。

由于编者水平有限,书中难免存在一些缺点和错误,恳请广大读者批评指正。

编 者

2000 年 3 月

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Lesson One

Railway's Strategic Position in China's National Economy and Social Development

Railways are the main force in China's medium and long distance freight transportation for aggregate, heavy and bulk goods. The country's continental nature with its vast boundaries and the malposition of regions with higher productivity and those with rich natural resources make for great challenges.

China is so large that she ranks third in the world in terms of area. Her west-east span is 5,400 km and her north-south span is 5,200 km. The rectilinear distance between the capital cities of the provinces, municipalities and autonomous regions is on average 1,400 km. Features of this vast land have made the demand for medium and long distance transportation a dominant need. What is more decisive is that out of various natural and historic reasons, the distribution situation of productivity is obviously malpositioned with that of natural resources. The coal reserves and output in Shanxi, Shaanxi and Inner Mongolia region make up 59% and 31.6% of the reserve and supply of the whole country respectively. More than a half of timber is from the northeastern part and most of the petroleum and ores are distributed in the northeastern, central and western parts. Meanwhile, the productivity level is higher and workers are better educated in the country's eastern region where there is a lack of natural resources. Such malposition between regions of productivity and natural resources objectively results in a consumptive eastern zone of major energy and raw materials, and supply zones in the northeastern, central and western regions. Therefore traffic pattern of medium and long distance transportation of south-bound and east-bound coals, south-bound and east-bound oils will not be changed in the near future. This fact has essentially put the railway mode in a major position to carry out the above-mentioned traffic loads. The railways current task is to transport about 7,000t for every 10,000 t coal output, 3.5 t smelting goods and materials for every 1t steel output, 33,000t for other materials yielded by every 100 million yuan value of industrial and agricultural production, and over 40,000 t building materials for every 100 million yuan investment in capital construction.

Railways are the top mode of transportation for most Chinese passengers. National conditions including a great population and a low average personal income are reasons for this.

China's high railway passenger traffic results from the country's great population, low average personal income and unbalanced development between eastern, central and western regions. One apparent fact abroad is that with a country's economic development and the increase of average personal income, it is inevitable that the average travel time per person should increase accordingly. In our case, with the country's development toward a market economy, the

rising level of people's living-standards and the increase of leisure time, the number of outgoing travelers and tourists will be increased. In addition, surplus labor of rural areas will transfer and flow in great quantities for a rather long period. Passengers taking trains will likely rise considerably. Although it is obviously advantageous to take air planes for long distance travel and expressway coaches for short distance travel, the comparatively low fare of the railway mode is so attractive that it remains the top mode of travel for most Chinese passengers. The result of a sampling survey among Chinese medium and long distance passengers is that 82.9% passengers choose travel by train as the top priority (if high - speed railway is available, the travel - by - train percentage would be around 90%).

Railways aim to open the country's new market, reclaim land and dominate urban mass transit.

China is in a crucial era trying to establish a socialist market economy system. Now that economic development is very much unbalanced among eastern, central and western regions, especially with increasingly rapid development in the eastern region, it is becoming more important to deal with matters of speeding up the economic development in the western region, strengthening national defence, promoting national unity, etc. Railways are imperatively needed for both economic development and land exploitation in the western region. As reality has shown, wherever a railway is built up, the market will be opened up, the land be exploited and the economic and social development be boosted in place.

Many major cities in foreign countries are dependent upon railways for their main public transportation system in urban areas. Such practice and experiences are worth using for our reference. Since China's major cities have not yet established rapid mass transit systems using urban railways, the problem of urban traffic is becoming more and more serious. The only way to improve this situation is to make more effort in constructing the suburban railways, elevated and underground urban railways.

To sum up, China's national conditions have made full use of the railway's advantages for passenger and freight traffic and put the railway in an unusual position and role in the country's comprehensive transportation system and the transportation corridors as well. The railway takes a very important strategic stand and is the backbone of the country's comprehensive transportation system. Therefore we must be well aware of the transportation corridors' important role for economic development, acknowledge that the railway is the most important transportation mode and is the skeleton of the transportation corridors. The railway's advantages must be best used and its disadvantages must be avoided. The strategic focal point of railway development is to greatly improve traffic capacity, service quality and operation benefit of the railway passage in the corridor. Meanwhile the railway should best function for reclaiming the country's land by constructing railways lines which are favourable to boost economic development in the northwestern and southwestern regions and to promote the national unity. In the Ninth Five-Year Plan on Development of National Economy and Society and Up-to-2010 Long-Term Aim's Outlines of the People's Republic of China which got passed and approved in the Fourth Session

of the Eighth National People's Congress, it is stated as "stressing on the increase of railway transportation capacity while making the best use of various transportation modes of highway, shipping, airline, pipeline ,etc., the establishing of comprehensive transportation system should be expedited so that several N-S, W-E corridors with huge transportation capacities can be formed. " The above analysis shows that such a decision has best suited the country's actual situations and is fully correct. It makes clear and definite that railway development is the focal point and several transportation corridors need to be built up. It shows clearly the direction of establishing the country's comprehensive transportation system. The railway should find its proper stand in the comprehensive transportation system: the railway's advantage is aggregate freight and passenger transportation over medium and long distances and it has great potential for urban transit system yet to be constructed extensively.

New Words and Expressions

strategic	a.	战略的
economy	n.	经济
market economy		市场经济
medium	a.	中等的, 适中的
freight	n.	货物
aggregate	a.	聚集的, 合计的
bulk	n.	大体积、大批, 散装
continental	a.	大陆的
transportation	n.	运输
boundary	n.	边界
malposition	n.	错位
productivity	n.	生产率
resource	n.	资源
natural resources		自然资源
challenge	n.	挑战、异议
feature	n.	特征
span	v. 跨越 n. 跨度	
rank	v.	名列, 列为
rectilinear	a.	直线的
municipality	n.	市、市政府
autonomous	a.	自治的
dominant	a.	支配的
dominate	v.	支配, 控制
distribute	v.	分配, 分布
Shaanxi		陕西

Shanxi 山西

Inner Mongolia 内蒙古

reserve v. 储备、保存 n. 存储量

timber n. 木材

petroleum n. 石油

ore n. 矿石

consumptive a. 消费的

zone n. 地帶

bound a. 开往...的

traffic n. 交通, 往来, 运输量

smelt v. 熔炼

capital n. 首都, 省会, 资本 a. 基本的

capital construction 基本建设

balance v. 平衡, n.天平

inevitable a. 不可避免的

surplus n. 剩余 a. 过剩的

expressway n. 高速公路

coach n. 客车车厢

priority n. 优先、优先权

sample n. 试样 v. 进行抽样调查

survey n. 测量、调查

reclaim n. 开垦, 开拓

urban a. 城市的, 都市的

transit n. 运输, 公共交通系统

crucial a. 决定性的, 关键的

exploitation n. 利用, 开采, 开拓

boost v. 提高, 促进, 增加

reference n. 参考

accumulative a. 积累的

suburban a. 郊区的

corridor n. 狭长地带, 走廊, 通路

skeleton n. 骨架, 梗概

avoid v. 避免

outline n. 大纲、概要

expedite v. 加快

focal a. 焦点的

* * * * *

in term of 按照，就……而言

on average 平均

make up	组成, 占
in place	适当的, 在适当的位置
sum up	总之, 总而言之
as well	同样地
be aware of	认识到

注 释

1.Features of this vast land have made the demand for medium and long distance transportation a dominant need.

have made the demand for...a dominant need 意思是“使得对……的需求占了统治地位”。
a dominant need 是 have made 的宾语补足语。

2.What is more decisive is that out of various natural and historic reasons, the distribution situation of productivity is obviously malpositioned with that of natural resources.

这是个复合句, 主句的主语是名词性从句 What is more decisive; 系动词 is 后是 that 引导的表语从句 the distribution situation of productivity is obviously malpositioned with that of natural resources. that 指代前面名词短语 distribution situation. out of...reasons 的意思是“由于……的原因”。

3.Although it is obviously advantageous to take air planes for long distance travel and expressway coaches for short distance travel, the comparatively low fare of the railway mode is so attractive that it remains the top mode of travel for most Chinese passengers.

这是个复合句, 前面是由 although 引导的让步状语从句。在这个从句中 it 是形式主语, 真正的主语是不定式短语 to take air planes for…。接着是主句 the comparative low fare of the railway mode is so attractive. fare 一般是指车船票价。最后是由 so...that (如此…以致) 引导的表示程度的状语从句。mode of travel 意思是“旅行方式”。

4.As reality has shown, wherever a railway is built up, the market will be opened up, the land be exploited and the economic and social development be boosted in place.

As 在这里是关系代词, 相当于 which, 代表后面的句子的全部内容, as reality has shown 意思是“事实已经证明”。Wherever a railway is built up 是一个表示地点的状语从句, 后面是主句, 主句是个并列句。三个句子并列, the market will be opened up, the land (will) be exploited and the economic and social development (will) be boosted in place. 由于三个句子并列, 后面两句的助动词 will 可以省略。in place 是状语短语, 意思是“适当地”。

5.rapid mass transit system 意思是“快速公共运输系统, 包括郊区的铁路, 高架铁路和地铁”。

6. In the Ninth Five-Year Plan on Development of National Economy and Society and Up-to-2010 Long-Term Aim's Outlines of the People's Republic of China

《中华人民共和国国民经济和社会发展“九五”计划和2010年远景目标纲要》

Exercises

I. Translate the following terms into Chinese:

freight, coach, transit, traffic capacity, bulk, zone,
market economy, fare, rapid mass transit, underground urban railways

II. Translate the following terms into English:

经济 运输 生产率 交通 铁路 旅客
长途运输 货物运输 公共运输 运输方式

Lesson Two

Speeding up Modernization of Railway Science and Technology

At the Railway Science and Technology Conference of China held in October, 1995, it was put forward to apply the strategy of railway rejuvenation with science and education. Also established were the important documents of “ the Decision to Accelerate Railway Scientific and Technological Progress,” and “ the Ninth Five-Year Plan and up-to-2010 Long-Term Aim’s Outline for Railway Scientific and Technological Development ”. When we were drafting the documents, the matter we thought over was that any country’s scientific and technological development must be based on its own national and geographical conditions, existing economic strength and existing productive and technical levels, and the direction, stress, method and course of its scientific and technological development should be in agreement with the features of technical and economic development and should enable to solve the key problems which restrict the development. As for our country’s railways the questions posed include what the national and railway conditions are which govern the basic conditions for railway scientific and technological development, and what a technical system should be established that could most economically, reasonably and efficiently serve to solve the key problems for railway development. We acknowledge that our national and railway conditions have some similarities with these of foreign countries, however they have much more unique features. The technical level and the views on technology-adopting for our country’s railway are somewhat different from those of foreign ones. The advanced technologies of foreign railways should be introduced but not be indiscriminately imitated. Our country has to establish a railway technical system with the unique features of our country. This is a key point that is related with the major governing principle of our country’s railway technical development and with railway rejuvenation with science and education.

Our country is a developing country relatively lacking funds. In the progress of railway development, there are certain constraints on construction scale, outfitting level, technical importation etc. For example, it is impossible for the technical outfit to adopt the most advanced technology and to rely on great quantities of imports to realize railway modernization. Therefore, when we are positively importing and introducing high technologies, the applied advanced technologies have to be actively developed and used extensively. In order to exert the limited funds for better benefit, varied levels of technologies and outfit are adopted depending on the traffic burdens for different lines. For extra-busy transportation passages, high technologies are gathered, using advanced operational organization methods and means; running heavy-haul

goods trains; increasing passenger train speed; densifying travelling trains; greatly improving transportation capacity and quality. For the usual-busy trunk lines, the applied advanced technologies and outfit are adopted extensively. For the other lines, suitable advanced technologies may be adopted according to actual transportation needs. Existing technical outfits should be utilized as much as possible so that the goal of higher output with limited investment can be obtained. Hereby it can be seen that our country's railway technical system has very definite levels: hi-tech outfit collocated with great efforts where huge capacity required; medium-tech outfit collocated where medium capacity required; otherwise normal or conventional technical outfit collocated for other lines.

Combining our own research and development with the importation of foreign technologies is the technical line we should adhere to. The relation between self-reliant development and technical importation has to be well dealt with in order to expedite our railway modernization and establish the railway technical system. We must adhere to the principle of combining independent research and development with importation of foreign advanced technologies. In order to push scientific and technological progress and raise the technical starting levels, the railway sector must introduce and import advanced technologies home and abroad because of the current lower level of our railway outfit. In particular, international standards and governing technologies in terms of locos, rolling stock, CE construction etc. and some hi-tech are needed urgently in our country, such as information technology, and high-speed technology. In some cases, a "take and use" practice may be applied. Direct use of them will greatly narrow the gap between our current levels and foreign advanced levels. However, it must be clearly seen that our country's technical development has different features from those of the developed countries in the world. We must be self-reliant and creative when digesting and grafting imported foreign advanced technologies. Mr. Jiang Zemin, the Chinese President, said that initiative is the soul for a nation's progress and is the endless power for the country's development and prosperity. As a matter of fact, governing technology can not be bought, and for some technologies if we are not already up to certain technical level ourselves, the introduction cost may be much higher by times. Therefore, constantly depending on technical importation without sufficient self-reliance and initiative, we will never shake off the backward technical situation. During the establishing of the Chinese-featured railway technical system, the spirit of self-reliance and initiative must be our soul. This is a very important principle.

Establishing of the railway technical system with our country's features will be an important task for the railway sector and will also be the major responsibility of our personnel in railway sciences and technologies. We shall undertake this historic assignment and make our railway sciences and technologies the technical pillar for the task of "the railway rejuvenation with science and education".

The railway technical system with Chinese features is a new subject which has very extensive coverage. It may be summed up that development of our country's railway will be accomplished by positively introducing foreign advanced technologies while adhering to self-reliant

development. It will gradually take the shape of a system that lays equal importance on hi-tech and applied advanced technologies and in which varied levels of technical outfits co-exist; a system that satisfies the need of transportation patterns compatible with weight, density and speed; and that takes in the strong points of all other countries so that the objectives of great capacity, top quality, high efficiency, low cost and much benefit for the comprehensive transportation may be achieved.

The above description sums up the basic features of the Chinese railway technical system, i.e. adhering to the technical development line of combining self-reliant development with technical importation; in technical grade, laying equal importance on hi-tech and applied technologies; in outfit collocation, having different levels of technical outfit “co-exit”; in technical characteristics, meeting the need of the transportation patterns compatible with weight, density and speed; and finally to serve the objectives of the railway transportation for obtaining enormous capacity, top quality, high equipment utilization coefficient, low transportation cost and raised railway economic benefit.

To increase passenger transportation capacity we shall not only raise the max. and average running speeds of passenger trains, but also enlarge the passenger train capacity, in short, “higher speed plus greater capacity” to adapt to the Chinese feature of great-quantity passenger flow. Therefore, on the premise that turnouts, track structures, bridges etc. are not to be extensively transformed, it is a very arduous task to make a technical breakthrough in raising both axle weight and running speed. During the Ninth Five-Year period, it is planned to run trains at the max. 140~160 km/h speed on the major busy trunk lines and to introduce the double-decked coaches for medium and long distance express train to satisfy the developing passenger traffic need, and meanwhile, work will be started to construct the special lines for high-speed passenger traffic to meet the special demand of high quality passenger transportation service for the relatively developed economic zones. The Chinese high-speed railway should adopt operational organization of “the mixed high and medium speed running”. All these are the features of Chinese railway. But on common trunk lines, it should still take the extended formation of passenger trains and an increased speed up to 120 km/h to satisfy the travel need of the majority passengers. Special attention must also be paid to measures such as lifting the coach grade, improving service quality for passenger transportation with major efforts to meet the need of the people’s raised living standards and the competition as well.

New Words and Expressions

- rejuvenation n. 恢复活力
accelerate v. 加速
draft n. 草稿, 草图 v. 起草
document n. 文件、文献
matter n. 问题, 物质

geographic a. 地理的
 stress n. 紧张, 强调
 outline n. 纲要, 概要
 importation n. 进口, 输入
 pose v. 提出,
 unique a. 唯一的, 无可比拟的
 imitate v. 模仿
 indiscriminately ad. 不加区别地
 constraint n. 限制
 heavy-haul n. 重载
 collocate v. 搭配
 adhere(to) v. 坚持
 outfit n. 装备, 全套器械
 loco = locomotive n. 机车
 CE = civil engineering 土木工程
 hi-tech = high technology 高新技术, 尖端技术
 graft v. 嫁接, 移植
 initiative n. 主动性, 首创精神
 sector n. 部门, 部分
 personnel n. 全体人员
 assignment n. 分配, 任务, 作业
 pillar n. 支柱
 coverage n. 所包括的范围(区域、数额等)
 compatible a. 可共存的, 兼容的
 occupy v. 占据, 占有
 transform n. 改造, 改革
 coefficient n. 系数
 investment n. 投资
 premise n. 前提
 turnout n. 道岔, 生产量
 breakthrough n. 突破, 重大成就
 utilization n. 利用, 使用

* * * * * * * * * * * *

in agreement with 与……一致, 符合
 as a matter of fact 事实上
 on the premise 在……前提下
 to sum up 总结一下, 总之
 rolling stock 铁路车辆
 axle weight 轴重

注 释

1. Also established were the important documents of “ the Decision to Accelerate Railway Scientific and Technological Progress,” and “ the Ninth Five-Year Plan and up-to-2010 Long-Term Aim’s Outline for Railway Scientific and Technological Development ”.

这是个倒装句，句子的主语是 the important documents 因为主语后面带有很长的介词短语 of the “Decision…” and “the Ninth…” 作后置定语，为避免句型结构头重脚轻，因此句子进行倒装，把谓语放在主语前面。不定式短语中 up to 是“直到”的意思，up-to-2010 是到 2010 年。

2. As for our country’s railways the questions posed include what the national and railway conditions are which govern the basic conditions for railway scientific and technological development, and what a technical system should be established that could most economically, reasonably and efficiently serve to solve the key problems for railway development.

这是一个复合句，开头 as for our country’s railways 是一个介词短语用作状语，说明整个句子。as for 是复合介词。主句是 the questions posed include…, posed (提出的) 是过去分词，用作后置定语，修饰名词 the question。主句谓语 include 带有两个宾语从句，what the national and railway conditions are 和 what a technical system should be established。每个宾语从句均带有一个从句，前面的宾语从句带有一个定语从句 which govern the basic conditions for railway scientific and technological development。Which 指代前面的名词 the national and railway conditions。后一个宾语从句带有一个定语从句 that could…serve to solve the key problems…。在这个从句中 that 指代前面的名词 technical system。

3. It may be summed up that the development of our country’s railway will be accomplished by positively introducing foreign advanced technologies while adhering to self-reliant development.

It may be summed up that… 是一个复合句，it 是形式主语，真正的主语是 that 引导的名词性从句。类似的表达方式还有 it may be concluded that…, it may be noticed that…。主语从句中的 while 是等立连词，连接两个动名词短语 introducing foreign advanced technologies 和 adhering to self-reliant development。

4. Therefore, on the premise that turnouts, track structures, bridges, etc. are not to be extensively transformed, it is a very arduous task to make a technical breakthrough in raising both axle weight and running speed.

这是一个复合句。on the premise 是个介词短语用作状语，说明整个句子。这个短语又带有一个同位语从句 that turnouts, track structures, bridges, etc. are not to be extensively transformed, 具体说明 the premise 的内容。主句中的 it 是形式主语，真正的主语是不定式短语 to make a technical breakthrough…。