

Research of Construction Management Situation of High-Speed Railway Abroad and at Home

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Abstract—Construction quality management is the core for high-speed railway construction. This paper analysis the situation of construction quality management of high-speed railway abroad and at home, proposes the suggestions of the quality management of constructing the high-speed railway in China.

Index Terms—High-speed railway, quality management, situation

I. INTRODUCTION

During the last end of 20's century, people required much swifter, safer and comfortable transportation facilities since the economics of every country developed well and people's life condition got better all over the world, and the speed and quality became the important technology indicator for judging transportation. High-speed railway came to a tide of transportation development, which's improving human's development and also motivating the development of world's economics, and it has been proved by Japan, France, Germany's development and so on. China is a large population and abundant sources country and requires much more about the capacity of railway transportation along the fast and sustained national economy development, which compel the development of railway to swift, heavy-load, environment and automatic transportation, therefore the construction of high-speed will be no time to delay. The key point of construction of high-speed is quality, and that's closely bound up with people's life and work. Nowadays the quality is not the pronoun of reliability and durability any more but responses the describable nature and measurable indicator when the product or service satisfy all requirements of contract, regulations, standards, technical documents and desires of clients and society. The construction quality management is significant core of high-speed construction, and it's a kind of complicated system work relating too much majors. Because our construction of high-speed railway breaks the ice at present, scientific quality management is on the way of evolution and an impeccable quality management mode is urgent to be established so that guarantying the construction quality of high-speed railway. Hence this research and grasp of construction management situation of high-speed railway abroad and at home is the definite requirement for our first-strat high-speed railway

construction.

II. ANALYSIS OF CONSTRUCTION MANAGEMENT MODE ABROAD AND AT HOME

Construction management mode means the mode of all parties participating and managing a construction work. Specifically, it's how the competent authorities, employer, financial agent, investor, contractor (design, construction and supplier), consultant and supervisor works and executes its own function during construction quality management within the construction law and regulation's scope. For quite some time, western developed countries usually adopt the employer responsibility and construction supervisor, and under the mode of employer responsibility, the relationship between employer and competent authorities, financial agent, investor, contractor, consultant and supervisor accommodates the market economy. The employer is the main body and center of construction management and employer will be responsible for competent authorities, financial agent and investor. Design, construction and supplier bear the construction work by bidding, consultant and supervisor will supply all parties with consultant service or execute daily management with employer authorize.

During the practical execution, the construction management mode especially the quality management modes are totally various in different countries due to disparate national condition.

The competent authorities of US Government would like to show positive attitude to participate in construction quality work, especially the public work invested by Government, in which the quality control will be much more rigid. According to the Unite Construction Regulations, all projects to draw a license shall be under main officials of competent authorities' supervision and inspection, and penalty, suspension and signing any improve agreement etc. will be applied if necessary.

The supervision and management of project quality in Germany is extremely successful with characteristics. Expect self quality control of project from the contractor, the quality supervising company recognized by the nation and authorized by the construction management department of state government executes compulsory supervision and inspection for all newly built projects and rebuilt and expanding projects of structure safety. The quality supervising company is on behalf of the government instead of the owner to execute quality supervising. The inspection fee is paid by the owner through the way of tax to the construction management department, which can avoid the employment relationship between the quality supervising company and the owner, so as to ensure the independence, impartiality and authority of the supervising work.

When the first high-speed railway was constructed in Spain, in order to guarantee the project quality, the Railway

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Transportation Infrastructure Bureau adopted a special feedback system to organize the construction management for the project so as to obtain feedbacks during the construction period and remedy and improve requirements of quality management and construction measures. Since the new high-speed railway is such a huge and complicated project, it is impossible to confirm all technical requirements and measures before construction. So the process tracing management and information feedback shall be emphasized. The analysis shall be conducted according to supplementary investigation and observation data of all subdivisional works. If failure of achieving the expected target is found, the requirements of design and construction technology shall be adjusted timely.

III. ANALYSIS FOR QUALITY MANAGEMENT MODE OF RAILWAY PROJECTS IN OUR COUNTRY

A. *Development of Railway Project Quality Management*

After founding of new China, the quality management of railway construction has experienced several ups and downs. At the early years of new China, we adopted the specifications and regulations of the Soviet Union, which worked during the first five-year plan. However, the natural and social conditions of the Soviet Union are so different from our country. So far the current specifications and regulations for railway construction of our country has come old trace of the Soviet Union in 1950s. At the beginning of new China, the management mode of a situation of tripartite confrontation was used for railway construction quality management which is relative independence and mutual restriction among infrastructure, project and operation. This has certain function for guaranteeing and improving project quality. Since 1958 Great Leap Forward began, in the situation of lacking experience for railway construction, we also were eager for creating an independent system with a wrong method. But the result was a kind of failure with cancelling some effective regulations. The basic system for railway construction was changed to execute integration of project and management and cancel the supervision and restriction, which reduced the strength of quality management of railway construction and resulted in the aimless big plan and high target and stasis of the whole railway construction. The investment of railway construction was reduced greatly. Objective reality made people recognize the results from Great Leap Forward. Through adjustment of national economy, recovery of railway system, cancelling some bureaus and rebuilding regulations, issuing of rules of construction and design, the investigation, comparing of schemes and scientific tests was re-established. However, it was difficult to put the management for railway construction system into the right way in the short term. Then the Great Culture Revolution made the railway construction system frustrated again and led to the long construction period, bad quality, great waste and low benefit of the railway construction. After policy of reform and open, through enterprise adjustment of railway construction, everything was done better and better. With progress of scientific technology and implementation of policy of reform and open, the total quality management training was conducted for railway construction system. After several years, the quality consciousness of the staff and quality of construction was

improved. Organization for quality management and theory was developed. The quality management teams and high-quality products appeared.

In recent years, there are great changes in the management system of railway construction. The enterprises really come into the market. The quality management for railway construction was integrated with international convention. With absorbing advanced overseas management experiences, the EPC and bidding system and supervising system are carried out for railway construction, which foster the management of railway construction and improve the quality of railway projects. The first high-speed railway in our country is Qin-shen Line, which can entirely reflect the level of quality management for railway construction in our country.

B. *Quality Management of Qin-Shen Passenger Railway*

The management model of "Strategy of Quality" is determined before the commencement of construction of Qin-Shen Passenger Railway. It turns out that the model of the quality management and operation system is successful. That is to say that to conduct the quality management system of Self-controlled by Enterprise, Supervised by Society, Monitored by Government and Evaluated by Client, under the practice of Responsibility System of Legal Person and the Employer of the Project for construction and management of high speed railway project. Through scientific organization and dedicate arrangement, the Construction Headquarter of Qin-Shen Passenger Railway has effectively commanded and coordinated the works belonging to building, design, supervising and construction, established a comprehensive quality monitoring system, worked out a complete quality management & operation system, fairly completed responsibility of legal person and the Employer of project, perfectly completed all tasks including quality, investment and duration. Therefore, Qin-Shen Passenger Railway is honored the new milestone in the history of railway building of China.

IV. SUGGESTION FOR QUALITY MANAGEMENT MODEL FOR HIGH SPEED RAILWAY PROJECT

A. *Legal Person Responsibility System should be Adopted for Quality Management Model for High Speed Railway Building Project of China.*

In order to adapt to communist market economy and make quality management of high speed railway building gradually act on international convention, considering characters of high speed railway, Legal Person Responsibility System should be adopted for quality management model for high speed railway building project of China.

B. *Separation Enterprise from Administration and Clarification between Finance and Right*

Not only enterprise should be separated from administration, but also finance should be clarified from right for high speed railway building. Only through this way, Legal Person Responsibility System can be practiced, so as to make the following realized:

- 1) The practice of Legal Person First and Project Later not only strengthens self-control awareness of legal person

and all investing parties, but also benefits raising investment for railway building in multiple ways.

- 2) To make property relation clear as well as one way management and fully taking in charge of investment, building, operation and loan repaying benefits practice investment responsibility and at the same time it also overcome the disadvantage of disjoint between investing building and producing operation.
- 3) To conduct project building and producing operation according to contemporary enterprise system, you can promote China's railway transportation enterprises to adapt to the market economy as soon as possible to become a legal entity and the main competition. can promote the railway transportation of China.

It is possible to promote the healthy development of the project bidding, construction supervision and project management system, and it is conducive to investment in railway construction, progress and quality control.

It is conducive to the realization of the unified command of the operation of the high-speed railway line scheduling, and to play the overall function of the high-speed railway.

It is conducive to the realization of the excellent quality of high-speed railway construction. Without good construction quality, it will affect the effect of transportation, obtaining of the maximum profit, the survival and development of enterprises. Quality is the real life of enterprise.

C. Improving the Legal System of the Project Construction

As for punishment for engineering construction liability, it is required for clear metrics, with high operability legal norms. Project quality management should be incorporated into the legal track, so as to establish and improve the quality of the project management laws and regulations, with a purpose of truly a legal basis, laws must be strictly enforced, violators are prosecuted. Punishment of corrupt practices in the field of construction should be strengthened, units and individuals with construction funds should be given severe punishment for dereliction of duty, fraud, corruption, withhold, and divert public money to private, so as to strive to eradicate disadvantages of the various construction projects from the fundamental disease and hidden. Construction market should be regulated, so as to make it follow the objective laws of the market economy, and to ensure the quality of construction projects on the basis of the rectification building market.

D. Emphasis on Building A Comprehensive Quality Management

Emphasis on engineering construction quality supervision and management of the entire process should be given, including the feasibility study stage, survey and design stage, construction preparation phase, the implementation phase of the construction, completion and acceptance stage. It is required to use the maintenance phase of the project quality supervision and management, to strengthen the quality of the project investment in the early design phase flea control awareness and to promote all aspects of quality management of construction projects are to be fully guaranteed. Attention should be paid to the full quality control, quality control of the full range of materials, equipment, technology, information, environment, so as to really do comprehensive quality management ills and eliminate potential dangers in

the cradle.

E. The Government Strictly Control Market Access

Government departments should, through formulating rules and regulations, promulgating the level of qualification and inspection of law enforcement, strengthen supervision of the construction market in accordance with the law. It is required to strictilize practitioner organizations and practitioners in the individual qualification management, strengthen the continuing education of technical staff, pay special attention to the quality of the workforce and training and education, and to strengthen the effective management of the construction workers appointment card system, provide the necessary Quality Assurance to the first line staff.

V. CONCLUSION

High-speed rail is a much more ambitious and complex systems project, inevitably bringing together China's railway research, design, construction, and management of all aspects of elite forces. During building high-speed rail, not only advanced technology should be applied to solve technical problems in settlement on soft ground, no gaping rail laying, and bridge, but also more efforts should be in the scientific management. The above research and advice on the high-speed rail project quality management model is only reference for leadership and quality management department. It is expected to be helpful to ensure and improve the quality of China's high-speed rail project. In the future, we will continue following the unified leadership of the relevant departments of the Ministry of Railways, to constantly study new situations, solve new problems, joint efforts out of one of China's high-speed rail project quality management new road together with the railway research, design, construction, supervision, and other units.

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