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CHINA - REPUBLIC OF BELARUS CONSTRUCTION SITE MANAGEMENT FOR BUILDING PROJECTS

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Abstract: With the development of current era, the construction projects are undoubtedly an important component of this process, and the increasing number of construction projects has greatly contributed to the development of the world construction industry. At the same time, lots of issues in connection with the management of the site have arisen. Therefore, this paper focuses on the construction site management of China - Republic of Belarus construction cooperation projects, analyzes the existing problems in detail, and proposes corresponding solutions to make the China - Republic of Belarus construction cooperation projects carry out and land successfully.

Keywords: Construction Project, Construction, Site Management, the Belt and Road.

КИТАЙ-РЕСПУБЛИКА БЕЛАРУСЬ: УПРАВЛЕНИЕ ПРОЕКТАМИ В СТРОИТЕЛЬСТВЕ

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Аннотация: С развитием современной эпохи строительные проекты, несомненно, являются важной составляющей этого процесса, и увеличение числа строительных проектов в значительной степени способствовало развитию мировой строительной индустрии. В то же время возникло множество вопросов, связанных с управлением в строительстве. Таким образом, в этой статье основное внимание уделяется управлению строительной площадкой в рамках проектов сотрудничества в области строительства между Китаем и Республикой Беларусь, подробно анализируются существующие проблемы и предлагаются соответствующие решения для успешного осуществления и реализации проектов сотрудничества в области строительства между Китаем и Республикой Беларусь.

Ключевые слова: строительный проект, строительство, управление площадкой, «Один пояс, один путь».

INTRODUCTION

With the development of the Belt and Road Initiative proposed by China, China and Belarus have achieved significant cooperation in construction projects, and engineering management plays an essential and important role therein. The level of engineering management directly affects the quality and efficiency of construction project construction, and also relates to the overall benefit of construction project construction. The construction site management is the key management content in the construction of all engineering projects, and is also the key to the management of construction engineering projects. In order to better improve the safety and stability of construction projects during construction, it is necessary to take a variety of effective measures in the construction management

process. For example, Wang Yukun proposed that the main measures of construction site management are construction engineering construction personnel management, construction technology management, construction material management and coordination, etc [1]. Of course the basic purpose of carrying out these tasks is to comprehensively promote the effective development of construction projects, improve the efficiency of construction works, and ensure that all aspects of construction works can be completed in a fast and standardized scope. Therefore, the China - Republic of Belarus cooperation on the safety and stability of the construction project requires refining the construction work and grasping the quality of each link in the construction stage, as well as to strengthen the concern and attention to the management of the construction site, through the modern management mode and management measures, and constantly improve the management level, so as to ensure the smooth construction of construction projects.

With the introduction of China's "One Belt, One Road" strategic development plan in 2013 and the outline of the "13th Five-Year Plan", Chinese construction enterprises are involved in more and more overseas construction projects. Chang Wenjie proposed that construction site management can improve the economic efficiency of the whole construction project and affect the image of construction enterprises [2]. The management of the construction site reduces the cost of enterprises under the premise of effectively ensuring the quality of construction, and improves the core competitiveness of construction enterprises in the construction industry. The adoption of scientific construction site management coordinates the optimal allocation of resources throughout the construction process and strengthens the overall control of project quality, safety, progress and cost.

RESULTS AND THEIR DISCUSSION

1.1 Overview of Management of Construction Site in China

Qi Muren proposes that construction enterprises or project departments manage the content contained within the construction site, outside the main body of the project, in accordance with the content specified by the construction management laws and regulations of government departments [3]. The rules about the management of construction site stipulated by the Chinese government specify the site plan management, environmental management, material and equipment management, safety management, personnel management, etc. However, on the basis of actual management, all of such rules fail to be followed completely. Although there are strict requirements for supervision units, testing units, government departments and third-party supervision departments, China is a human relationship society, and there are always exceptions for someone's favor when each relevant department carries out coordination work, which leads to lax quality of construction site management and more serious functionalization of leadership.

1.2 Management of Construction Site in Republic of Belarus

Due to the different national conditions, Belarus still retains the shadow of the Soviet-era, and the construction implementation under the joint supervision and management of the design institute, the State Construction General Administration, the Fire Prevention and Fire Department and other multi-departments. Each building requires multi-departmental acceptance signatures, design supervision, technical supervision is only part of the construction site management of the main building. In general, the site management in Belarus is more standardized and qualified. However, due to the weather and local characteristics, the construction progress management lags behind, and the overall information management application on the construction site is not strong and needs to be improved.

RESEARCH OVERVIEW

2 Problems of Site Management in China - Republic of Belarus Construction Projects

2.1 Personnel Management Problems

First, the basic professional quality of the personnel involved in the management is not enough. Only such personnel who are equipped with the professional skills and knowledge of construction, could control the quality problems that may occur at the construction site, safety hazards for effective in a well and efficient way. On the Chinese side, due to the huge construction market in China, which is a big

country with a demographic dividend, but there is also a low level of popularity of higher education, so the construction site managers with professional skills and knowledge are still short, which also leads to a large number of private subcontractors gathered. The problem they face is that on the one hand, the requirements for construction site managers are not strict, and the review of qualifications is not in place, so they think of saving costs and hire many unqualified personnel to manage the site. On the other hand, due to their weak capacity and lack of professional and systematic training, it is difficult to meet the needs of the management of the construction site, which easily causes confusion in the management of economy, cost and quality. The status quo in Belarus is diametrically opposite, with a small population and a higher education level, which is more standardized in terms of the rigor of technical knowledge of personnel and the responsibility of subcontractors contracting, technology, etc. At the same time, with the continuous development of the times, a large number of new management tools are adopted on the construction site, making changes in the factors affecting the quality and safety of construction, especially the application of personnel information management tools and the combination of cloud intelligence management can better deal with the problems that will arise on the construction site. But the site in Belarus in this regard there are serious shortcomings, relative to China's intelligent site construction management has lagged behind. With the rise of various APPs in the construction market in recent years, our country has made better achievements in cloud intelligent site management. Therefore, in order to improve the existing site personnel management situation, Belarus it is still very necessary for Belarus to realize the information management in the management of the construction site for site personnel information management.

2.2 Problems of Construction Materials

In order to ensure the quality of construction, the construction materials are also the top priority of construction site management, with strict requirements for the source, transportation, storage and quality of materials. However, China has a large land area, various resources, and construction materials are available. However, the quality of materials is also uneven, and the outgoing quality of the construction materials is not strictly controlled. In order to save costs, such construction materials just barely meet the national standards or even below the national standards, and the factory testing is not fully carried out in accordance with national norms. In addition, some construction enterprises and project departments do not have a perfect set of material management measures. After the materials are transported to the construction site, they are not properly classified, and various materials are piled up randomly, and there is a lack of protection measures for the materials. Along with the continuous development of construction technology the use of new materials is becoming more and more widespread, and different materials require different humidity and temperature for storage, which will become a direct factor affecting the management of construction materials. In Belarus, due to the small size of the country and the lack of abundant building resources, more construction materials are imported from Russia, Poland, China and other countries. The problems of transportation, quality and different standards of imports can cause problems in the management of materials on site. Especially the COVID-19 pandemic lasting for these two years, it is easy to lead to imported goods can not arrive on time, the site can not be a good coordination of the materials stacked, resulting in materials can not be well protected resulting that the quality of construction materials is difficult to guarantee, the intermediate loss also gradually increased.

2.3 Management of Construction Machinery and Equipment

Construction machinery is an important part of the construction site, and also one of the indispensable factors in modern construction projects. The site machinery and equipment management mainly involves the storage, use and maintenance aspects. In some construction sites in China, there is a lack of construction machinery information management for machinery and equipment, and there is no unified placement area, which is usually used and taken as it is, causing no difficulty for construction site management. This has caused many problems such as improper use of construction machinery and equipment. Because different machines require different methods of use, and different models of machinery and equipment are applicable to a very different range of environments, the lack of information technology machinery management intervention, many construction personnel do not have

a full understanding of the equipment, can not be arranged according to the construction plan to reasonably use construction machinery, so resulting in low construction efficiency. On the other hand, the same is true for construction sites in Belarus, where the lack of information-based management has caused a lack of comprehensive management of construction machinery and equipment and confusion of machinery and equipment. However, Belarusian construction companies value the use of machinery and equipment light maintenance, while China fails to provide the regular and good maintenance of machinery and equipment, which will lead to a significant shortening of its service life and may cause the overload of some parts leading to mechanical failure, thus affecting the construction progress.

2.4 Management of Construction Site Safety

In 2018, the cooling tower platform Jiangxi Fengcheng Power Plant collapsed, resulting in a particularly significant accident, directly leading to 73 deaths, 2 people injured, direct economic losses of RMB 101.972 million yuan. Therefore, doing a good job in the management of the construction site is an important measure to prevent construction site safety problems. However, at present, lots of construction sites still have various safety hazard problems. For example, some site construction managers have a perfunctory attitude towards safety inspection work, and their work is not meticulous enough to find and deal with some safety problems in time, such as no warning signs beside the door and window openings with edge protection, and electricity irregularities, which largely increase the risk of construction safety. Secondly, the safety management and supervision mechanism of some construction enterprises at the construction site is not sound and complete, and there are problems such as safety inspection and inspection work cannot be implemented, which brings hidden dangers to the construction site. In addition, due to the relatively low level of safety management informationization at the construction site of construction projects, some modern intelligent methods of safety management cannot be implemented, which reduces the level of construction projects and hinders the play of safety management.

3 Research on countermeasures for on-site management problems

On-site construction management is inseparable from the construction organization management of the project under the macro control. In the process of on-site construction management, the management level and method of the management organization is the premise of improving the effect of on-site management. In order to ensure that all aspects of the construction project can run smoothly according to the established plan, it is necessary to improve the management level of the construction management organization, which is the ultimate goal of project management. The establishment of an efficient organizational structure and system is the basis for successful construction management. And the entire project management organization to be under the leadership of the right project manager can play the appropriate effect, the project manager must have a wealth of practical experience and important control of time management capabilities.

First, the project manager should carefully study and understand the "supervision plan" and "supervision implementation rules" prepared by the project supervision department, as well as national acceptance standards and other policies and regulations when formulating the project management implementation plan. According to the construction contract and relevant laws, regulations, codes, standards, procedures, etc., to determine the construction process of site management program and acceptance standards to cooperate with the supervision and government acceptance functions.

Secondly, the project manager should establish and improve the management system with project manager responsibility system as the core, such as project manager appointment system, project subcontracting management system, material and equipment procurement system, project cost accounting system, project management implementation planning certification and approval system, project management assessment and evaluation system, etc. These reasonable and effective management systems should be used to ensure that the construction project management runs in accordance with the established procedures, so as to promote the development of project management in a reasonable and orderly direction.

Third, in the process of construction project management, the use of the PDCA cycle principle is also very necessary, as shown in Figure 1, that is, Plan, Do, Check, Action in the process of continuous

cycle and continuous improvement of this principle, so as to achieve continuous problem, problem identification, problem solving and problem correction, feedback, sum up the lessons learned from failure and success, the Continuous improvement of various management measures.

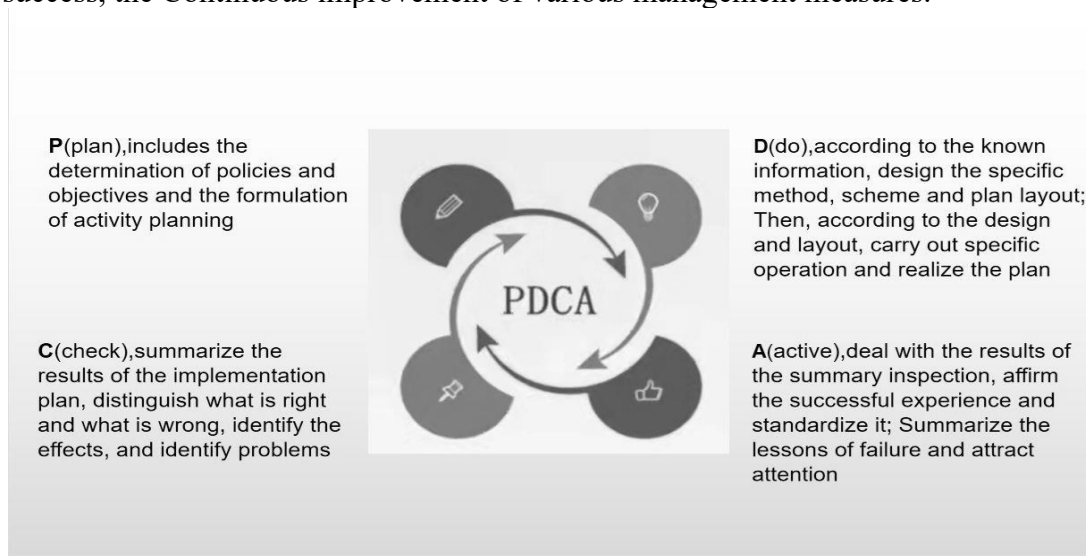


figure 1: PDCA cycle diagram

3.1 Personnel Management

The management of the construction site is a particularly professional and complex work, in the construction projects of China and Belarus, people work as the main driving force in the construction projects and the weight of its responsibility, must first give full play to the subjective initiative of human in construction. People are the creators of quality, and the core of quality control should be workers as the core. The managers shall fully mobilize the enthusiasm of workers in construction, creatively increase the sense of responsibility of workers, and establish the concept of quality first in construction. Based on the current situation of personnel management in China, building construction enterprises should strengthen the qualification review of subcontractors, and at the same time make strict requirements for the professional knowledge and skills of management personnel to ensure that all construction projects and construction processes can be completed with quality and quantity in the construction process. Through regular training and technical briefing for workers and technical managers, they can have a better grasp of new construction techniques and new material characteristics, and improve construction techniques together to ensure construction quality. Belarus needs to improve information management technology. In view of the huge flow of project labor, all information of personnel must be entered manually one by one, and the lack of information technology intelligent management of various information is not updated in the background in a timely manner, Chinese scholar Li Di has proposed that information technology management is conducive to the improvement of the efficiency of site personnel management [4], while on the other hand, the slow development process of information technology management is not conducive to on-site construction management. Belarusian scholar Пижук, Д. М proposed that in information management can significantly improve the efficiency of construction site management [5]. In order to promote the information management of personnel, the first step is to start with the promotion and maintenance of information management software to ensure that the software can be used in the process of smooth and timely summary of the situation for management and improve the efficiency of its use. Secondly, the information entry work should be apportioned to individuals to reduce the waste of unnecessary labor while strengthening the information technology awareness of construction personnel.

3.2 Construction material management

At present, in view of the problems in connection with the on-site management of the construction materials in China, first of all, it is necessary to fully grasp the latest market prices of various materials required, procurement to ensure the best quality of the premise of price screening, choose the construction materials with good cost performance. Secondly, the construction materials must be sent

out after strict quality review, through the third-party testing organizations to produce a complete test report to ensure the safety and reliability of the materials, and the need for a sound testing policy to ensure. The supply of materials must be sufficient to fully meet the site construction smoothly. In Belarus, for the transport of imported materials, they shall make contingency plans in advance, especially in the past two years under the impact of the COVID-19 pandemic, how to ensure the timely supply of materials to the construction site, is a huge challenge. As for the standard of imported materials, they shall increase the testing of imported materials to strictly meet the specifications of domestic construction materials. Belarus and China share the same problem in terms of material storage. The material engineers need to be set up to inspect each material, and materials should be taken with complete procedures. Different types, models and applications of materials need to be stored separately. The engineering department and the material department shall establish a detailed material model database, which is convenient for the construction management personnel to compare the specifications, construction scope and cost of materials in the use of materials, so as to reduce the disadvantages of the site management personnel to grasp the material situation, and also to control the cost management in the construction process in a timely manner.

3.3 Construction machinery and equipment management

Before making the machinery and equipment enter the site for construction, the construction units shall coordinate and communicate with various departments in place to ensure that they can actively cooperate with the construction and testing the whole process. At the same time, it is necessary to be equipped with the dedicated maintenance as well as requirement, which can effectively promote the operation of the equipment, stabilize the original plan of the construction progress. The safety and protection work shall be done, and the construction personnel shall be strictly prohibited from working on demanding construction projects without the use of machinery and equipment. Belarusian scholar CH Ковшар in the economic organization of construction mentioned that in the process of construction, orderly management of construction machinery facilitates the implementation of various tasks at the construction site [6]. The placement of construction equipment also requires strict requirements to ensure that construction machinery can effectively meet the needs of on-site construction. In order to promote the information-based site management, the equipment department can also establish a database of machinery and equipment information, monitor the maintenance and use of various machinery and equipment, and timely find and deal with problems in the use of machinery and equipment.

3.4 Management of Construction Site Safety

At present, in order to improve construction progress and construction quality while reducing project safety risks, construction-related personnel must improve their own safety awareness and have good occupational safety literacy. The preparation of multilingual rules and regulations and the extensive use of common signs are used to improve management efficiency by visualizing the way to always remind construction personnel to operate in accordance with the safety code of conduct. From time to time, the managers inspect the construction site and conduct surprise checks on the operations of the construction personnel, such as electricity safety, scaffolding, safety ropes, safety helmets, etc. The unsafe construction behavior is stopped and punished in a timely manner. In terms of improving construction safety information management, they can use the unmanned aerial vehicle technology, cameras and other equipment to monitor the construction site in the cloud intelligence, so as to ensure the supervision of the construction site and ensure construction safety.

CONCLUSION

Under the efficient process of China-Belarus Belt and Road Project construction, the importance of the management of the construction site should be further strengthened. It is necessary to deepen the reform in the direction of personnel management, material preservation and use, maintenance and repair of machinery and equipment, and safe construction of site management. It is also necessary to improve and optimize the construction site management system, develop reasonable and effective management

measures, do a good job in all training and education, and improve the quality and safety level of engineering construction. At the same time, the two countries shall establish a perfect construction management system, improve the management organization, the professionalism and management ability of construction site managers, as well as properly deal with the construction materials, ensure the normal operation of construction machinery and equipment, increase the awareness of safety precautions of the personnel involved in construction, and popularize information management methods, thus ensuring the smooth implementation of construction projects.

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