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Research Article

The Application of Principle of Automatic Control in the site Management of Electric Power Construction Enterprise

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Abstract: It is need to establish site project department during the construction of electric power project. The head office should design and build the main structure, continually improve structure of project department, meantime, positively apply principle of automatic control to improve the site management of electric power construction. In this article, the application strategy of principle of automatic control is analyzed focusing on the site work of electric power construction.

Keywords: Principle of automatic control; Electric power construction; Construction; Site management

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It is important to manage the construction site during the process of electric power construction. The construction involves plenty of construction techniques and operators, so there will be many factors, automatic control theory should be mastered and principle of automatic control should be flexibly applied by relevant operators to enhance the construction quality of the project, improving site management level.

1 The establishment of stable construction management team applied by concept of stability

1.1 Significance of stability

Stability is essential for the normal operation of power construction. Based on principle of automatic control, it is known that during the system operation, whether there can be high stability is closely associated with the parameters and structure of the system itself instead of necessary connecting with the outside. In the electric power engineering project management, building team with rational structure and keeping it as a three-dimensional lattice shape will exert greater combat power, more stable than the linear and planar personnel teams. The project management team responsible for construction site should have a perfect professional structure with each dedicated professional whose age, personality and work experience should be taken into comprehensive consideration. When the construction team and the management team have reached a certain level of stability, the relevant staff can further understand the construction personnel's ideology and technical level. The continuous running-in of the two can help effectively meet the quality, schedule, construction safety and other demands. Based on this, the construction management personnel can adequately manage other matters such as further study of drawings, reasonable adjustment of the construction process, comprehensive inspection of the construction quality, scheduled accomplishment of the construction, and technical study of strange project. If the personnel team is not stable enough with frequent personnel changes, many operations need to be repeated from the start, and it will also waste more training time in personnel, causing an adverse impact on the construction period and construction quality. What's worse, managers have to focus on personnel stability management and cannot deal with other tasks, which thereby reduces the overall construction management efficiency.

1.2 Complete analysis and objective judgments of system stability

In power construction, both management personnel and construction personnel should have strong stability. Only with sufficient stability of construction team and management team can they provide a solid foundation for the stable operation of power construction. It should be based on automatic control theory during the analysis and judgement of the system stability, putting forward effective opinions that can improve the system stability, providing a reliable judgment basis for the stability of the construction team and system management and fundamentally promoting the static performance and dynamic performance of the system.

1.3 Improvement of the team robustness

It is really important for the management team to have good robustness which mainly refers to the system stability, and whether the relevant performance indicators have strong sensitivity to parameter changes and structural changes. There is no need for managers to be allergic to changes in conditions in the period of on-site operation management, keeping the unity of the team as a whole means a lot that each member can communicate effectively, achieve seamless connection in various construction operations and overlap of each other no matter in professional knowledge or operational skills. Even if internal and external changes comes up, management personnel can respond quickly to make sure that the overall work can proceed smoothly. As a result, the management team members should have strong psychological quality, good operation skills, ensuring the normal operation of the construction site.

1.4 Importance of feedback

Based on the principle of automatic control, we need to do feedback well if pursuing strong stability of the system. Through the feedback results, targeted adjustments of the system can be made to meet the relevant output requirements. All personnel should have a strong sense of feedback during the site management that when a certain amount of work is done, they should give feedback on the quality of the task completion in time, thus the relevant management personnel can know the task completion well. The construction personnel should keep communication with the management personnel longing for doing well in feedback then to improve the feedback effect.

2 Enhancement of construction site management level with matrix calculation principle

2.1 Increase the number of active sites

The construction process can be regarded as a dynamic matrix calculation process during the electric power construction. In site management, it mainly involves equipment, schedule, quality, safe and civilized construction, etc. Professional management personnel are required in different management content to be responsible for comprehensive adjustment of various influencing factors, making sure that smooth implementation of each process. In practical management, the principle of rectangular operation has greater application value. Managers should reasonably analyze the corresponding work relationship, identify the role and status of each job in the rectangular operation, and then get accurate calculations. For example, it is necessary to do full planning and prepare all construction conditions to ensure that each engineering operation can be started on time when arranging the construction schedule. Though its construction work is small, it should also be given high priority instead of being ignored to ensure that the key construction path can be smoothly implemented. In the on-site management, there have been such a situation that some technically complex construction tasks with large engineering volume can be completed on schedule, but some smaller simple systems cannot, thus affecting the on-time completion of the project overall progress. It is known that according to the principle of the matrix, when calculating the matrix, the accurate calculation result cannot be obtained if lack of a factor. In the project team management, each member is one of the necessary elements in the matrix, and the relevant responsible personnel should adopt management in time without delay. However, when arranging every task, full consideration should be taken by the relevant management personnel to calculate the accurate matrix results. When all people participate in the matrix calculation, they will play their own initiative, thereby promoting the efficiency of on-site management.

3 Site management applied with principle of proportional integral control

3.1 Integration work with patience

In the electric power construction, if the stable

operation of the project can be guaranteed following the linear development, then all aspects of the conditions and construction operations should be properly arranged to build a certain balance in the field management. However, in terms of the construction fact, there are strong imbalance characteristics in various conditions on the construction site, sometimes a large amount of work are in completion requirement, and sometimes it has to be shut down. Therefore, the on-site management personnel should develop a strong awareness of integration and quickly adapt to unbalanced conditions. Technical personnel and relevant key staffs should continually enrich own technical knowledge, especially full grasp of the construction drawings and understanding of the relevant laws and regulations. In the construction site management, it is necessary for them to reasonably arrange for the workers' construction operations and effectively adjust each process to ensure that the construction operations on the site develops in a linear direction, thereby achieving brilliant on-site management. Managers should put integral work into practice. Make clear goals of work and work hard toward the established ones so as to achieve satisfying management results. There are many factors that can impede the impletion according to the established goals in the infrastructure operation. For example, the tower crane can't be used as normal because of a certain damaged component without a suitable accessory purchased in a short time. In such circumstances, the follow-up construction operations cannot be postponed, but manage the relevant construction contents in the follow-up operations to basically ensure the overall progress without change, and develop the spirit of persistence and bravery of the on-site personnel, hence achieving the desired results.

3.2 Differentiation work with carefulness

The concept of effectively preventing the controlled object from appearing delay and inertia through differential control can be applied in site management. It is important to differentiate well whether for personnel management or operation management. In the time of site management, once a deviation occurs without effective countermeasures, the relevant management personnel should do adjustment work, comprehensively observing the managed personnel, understanding their ideological problems, and helping them out of the predicament. In the construction site, the schedule, supply and construction quality are in need to be effectively managed. Besides, find and correct deficiencies through careful division. Regardless of the technical staff, or management personnel should implement differential work with patience, study the construction drawings in-depth, learn and understand relevant rules and regulations, and make great use of construction equipment and construction materials. On-site survey should be carried out before the actual construction, and the construction management work should be carried out strictly follow the demand of time and space.

4 Regulation of relationship between the related factors in site management with decoupling principle

4.1 Team manage with the application of decoupling principle

In power construction, there have been situations that some construction workers with strong personal abilities have difficult in playing their due role after being integrated into teamwork. Faced with this problem, the decoupling concept should be applied to make superimposed effects between team members. Managers should have a comprehensive grasp of team members' conditions, guide and help them adjust their work status, make them carry out effective self-control so as to achieve the management goal of $1 + 1 > 2$.

4.2 Daily management work applied with decoupling concept

It is necessary to grasp the key points and difficulties to manage daily work, focus on specific problems and take effective measures. Management staff should develop good habits to optimize the associating work reasonably, make sure the orderly implementation of each process, and effectively adjust complex relationship between each process, thus improving the quality of power construction.

5 Conclusion

In a word, principle of automatic control has been applied in various industries to different degrees. The application of this principle in power construction can help improve the management method effectively, coordinate the relationship between all aspects and establish a solid base for the orderly progress of on-site work, improving the quality of power construction.

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