

Quality Control of Transmission Line Engineering in Wind Power Plant

Peng Wang

SPIC GuangXi XingAn Wind Power Co., Ltd. Guilin 541399, China

Abstract: The most critical component of a wind power plant is the transmission line, which carries two key tasks – the transportation and distribution of electricity. The transmission line is also responsible for the various substations, wind power stations to contact to its safe and smooth operation. As the competition order of wind power projects is more chaotic, the quality of the project cannot be supervised and controlled by the whole process. The quality control of the project is not up to standard, and the overall quality of the transmission line will be affected. This paper focuses on two aspects of the elaboration, one is the wind turbine transmission line project common quality problems; the other is how to build wind power plant transmission line quality assurance system.

Key words: Wind power plant; Transmission line; Engineering quality

Introduction

Enterprise survival, development and efficiency are the fundamental qualities. If there is no guarantee of quality, long-term development of enterprises will be out of the question. The first principle of power grid operation is safety, and to fully implement the safety of the working principle. We must ensure that the quality of transmission lines, the safe operation of the power grid is not only related to the enterprise, and the relationship between the various sectors of the industry, ten thousands of people's personal and property safety, but also a social stability and harmony. The construction of transmission lines aims to ensure the quality of transmission lines as an important part of the construction unit must pay attention to the quality of supervision and management. In recent years, there are more wind power projects. Hence, the construction of the competition is more chaotic, the construction side in order to blindly reduce the cost, and ultimately lead to the quality of the project greatly reduced. The quality of the transmission line project must start from the construction phase.

1. Common quality problems and causes analysis of wind power plant transmission line project

Copyright © 2017 WANG Peng

doi: <http://dx.doi.org/10.18686/wc.v6i1.104>

This is an open-access article distributed under the terms of the Creative Commons Attribution Unported License

(<http://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

1.1 Quality problems

1.1.1 Design unit of the problem

The technical level of the designers and the survey personnel needs to be strengthened. The overall ability to work and the relevant design specifications of the knowledge is not solid, ultimately lead to the design of the finished product does not meet the requirements of the specification. The design line path, fork transmission lines and beyond in the process of some obstacles, the staff did not fully grasp the exact situation of the scene and the relevant departments, institutions approved, and ultimately lead to the design results and the construction environment of some facilities and equipment conflict, hinder the smooth construction. The design results in too idealized, lack of construction experience of practical guidance, leading to design results cannot serve the construction.

1.1.2 Construction unit of the problem

The overall quality of the construction staff varies greatly, many construction workers did not accept the formal professional training, so the operational capacity, poor job responsibility, the construction of the relevant norms and regulations are not enough attention. Therefore, the construction of transmission lines cannot be in accordance with the original plan. The construction process is not strict enough, such as concrete running pulp and pulp leakage problem, concrete label, concrete ratio is not accurate, concrete curing stage of the strength of the problem, the concrete foundation pouring and grounding laying process, the excavation of the trench is not up to standard, resulting in grounding network group and the actual requirements do not match.

1.1.3 Raw material problems

Materials procurement lacks of standardized management. A lot of materials do not meet the national standards, so the quality of transmission lines cannot be guaranteed. The construction site of the lack of rigorous control of the material, a lot of material models and specifications do not meet the construction requirements, leading to quality problems; responsible for quality supervision departments there is not the phenomenon of the lack of supervision, the construction unit to cut corners or the use of poor quality materials frequently occur. In addition, many of the construction environment is rather special, leading to the preparatory work before the construction is not in place, did not develop a sound, detailed construction measures, especially in winter construction, concrete strength is difficult to meet the required standards.

1.2 Analysis of causes

1.2.1 Design unit of the problem analysis

Wind power plant transmission line construction of the key points is survey. The construction program is often determined by the scientific transmission of the final technical indicators, the cost and the operating environment is reasonable. In order to minimize the investment in the transmission line, the safety of the line as reliable as possible, run as easy as possible, so designers should strive to improve their own business capabilities, and strictly control the quality of the problem. Transmission line measurement is a very simple work for professional designers, but in the actual work need to pay attention to measuring the transmission lines and measuring roads, channels, etc. require a high degree of accuracy, only need to measure some key data can be, such as the distance between the tower pile and the corner, the key data record requirements are accurate, the measurement must follow the relevant operational procedures. Designers need to have superb mapping knowledge, but also to understand the geological, transmission lines in the field of some knowledge. However, the actual situation is the adverse effects of the chaotic market environment, many designers of the transmission line mapping and did not give enough attention, cannot be fully and thoroughly study, and the design team is relatively young, the actual work experience of the designer lacks of knowledge and cannot be applied to

practice. The design results are often on paper, cannot guide the actual construction operations, so that in the construction process but also continue to adjust and modify the original design.

1.2.2 Analysis of construction unit problems

There is no perfect quality assurance system, quality management department, quality management system; construction quality management measures simply cannot serve the actual construction. For example, many project leaders did not develop a transmission line project quality control programs and measures, or, although already developed, did not report to the supervision department for review, usually as long as the construction unit approved the direct implementation. Before the construction of the project, the same did not go to the project department, enterprises, construction team transmission line project quality problems prevention and control programs and measures to the end of the problem of the record, summary, prevention, governance and other measures and secret acceptance, technology, such as the lack of information at the end of the lack of integrity. Professional subcontractors did not introduce sub-project quality control measures, the supervision unit and the total package unit has not been reviewed, nor given the approval advice.

Construction workers and managers of professional capacity is insufficient, because the construction industry entry threshold is not high, the industry's staff composition is very complex, the gap between the business capacity of the larger, difficult to strictly control the construction process and supervision. Such as muddy water, mountain, quicksand, rice fields before digging, did not lead to the center of the tower, nor the auxiliary pile to do a good job of security measures, when the foundation pouring construction, the tower center pile has not been restored; Before, and no one on the basis of the actual depth of the detailed examination, before the pit is not measured before the error will be set to -50 mm to +100 mm map, so that there are often shallow digging, digging the problem. Pit process is not the center of the tower as the standard height of the pile, the cable base of the main cable drawing pit depth and design requirements of the far cry. In the rock digging the foundation, did not use multi-point small digging method, but directly through the amplification gun to blasting, the original geological structure was destroyed. Foundation pit excavation after the end of the next process is not enough time, when the bad weather conditions, the construction staff did not base the pit of snow, rainwater and other clean-up. Foundation pit excavation before the construction staff and again for the verification of the basic center pile, nor check the center pile is correct, auxiliary the location of the set of deviation, the direction of the base leg is not accurate. Basic support after the end of the construction, before pouring and pouring process and for repeated inspection of anchor bolts, base templates and angle steel insertion position. Cement, gravel construction materials and in order to obtain the quality of the laboratory issued by the inspection report, especially before the construction of concrete, and for the laboratory to obtain the exact ratio.

1.2.3 Analysis of raw materials

The lack of a complete security system, transmission line construction costs, nearly 70% is used for raw materials, so the quality of raw materials to strictly control. In fact, it is equivalent to saving the actual construction costs, and the final quality of the project will depend on in the quality of raw materials. Raw materials are not up to standard, mainly because the third party test is not accurate, even though repeated testing, there are still poor quality of raw materials used in the construction. In the new materials, there is no complete technical information; accessories, raw materials in the test. The system of witness and sampling is not objective and perfect. There should be a product quality certificate, in addition to the relevant departments to give proof of identification, but also to re-inspection, when the quality of raw materials fully qualified before they can be put into construction.

2. Wind power plant transmission line project quality assurance system

2.1 Establish quality management responsibility system

Quality pre-control for the transmission line project electrical installation, civil construction and other important construction links, through new technology, new methods, new equipment for special quality prediction and pre-control, the full implementation of quality management system and easy to quality problems. Construction of the second process of planning for the construction of transmission lines to lay the foundation for the quality of construction.

Job responsibility system establishes a quality-oriented concept of work, according to the construction of quality management regulations of the construction staff to implement a comprehensive and comprehensive assessment of the construction quality of the construction and construction personnel linked to the establishment of incentives, with salary, performance to stimulate the work of the work of the sense of responsibility to ensure the smooth development of transmission lines and to ensure its final quality.

Clinging to the quality of production departments responsibilities: First, the unified organization of technology to the end of the trial construction of drawings and other management work; Second, to ensure that the construction in accordance with pre-designed programs and construction instructions, the full implementation of all the quality of the project implementation of measures and measures; Third, strengthen the new technology, new technology, new materials to promote and promote; Fourth, actively participate in the construction of the problem analysis, and timely solutions; Fifth, strengthen the training of construction personnel training and transmission lines file management.

Clinging to the quality of corporate materials division responsibilities: First, the development and review of construction materials program, and actively participate in the transmission line project procurement products, and fully competent assessment work; Second, in strict accordance with the relevant requirements of the procedural documents into the construction site of the material, and the procurement, storage of materials to identify; Third, the inspection, management of the construction site equipment and equipment; Fourth, in accordance with the requirements of the relevant documents stored in the transmission line required for all materials.

Clinging to the quality of the corporate budget section responsibilities: First, the development and management of transmission line project construction program, progress and contract; Second, inspection, guidance, supervision of the implementation of the construction contract and put forward constructive comments; Third, the assessment of the transmission line project contractor management.

Grasp the quality of the construction team captain duties: supervision of the construction team to seriously implement the quality management requirements, the full implementation of the project construction of each system regulations.

2.2 Management of quality responsibility system

In the quality-first principle of work, to establish a scientific, comprehensive, systematic project quality management system, strict implementation of the quality of responsibility system, careful measurement, testing, management of the work site construction, training personnel to form a scientific work awareness and the successful realization of quality objectives.

The most effective assessment of quality responsibility is based on quality indicators, adhere to the implementation of rewards and punishments and the right, responsibility and benefit of a high degree of unity, the full implementation of the quality of the veto system of work, so as to ensure the transmission line project quality management system to run smoothly.

The core concept of quality control should be people-oriented, unified organization of the transmission line project responsible person to participate in the quality assessment meeting, and actively exchange the quality of the project information, collective discussion to solve the problem of construction quality and effective strategy.

3. The transmission line of the way

Mainly including direct burial and tower two ways, the former is mainly applicable to relatively open lots, while the latter is particularly critical quality control. The staffs need to carefully analyze the construction plan of the tower to understand which links are relatively weak need to focus on supervision, after a comprehensive analysis of the construction process, combined with the construction of the status quo to be set up to be checkpoints, side stations and patrol points to the three supervision points as the center, dynamic monitoring tower construction process of the various processes, focusing on monitoring the construction of difficult, citing new technology, new materials, new equipment to ease; ahead of the development of risk accident plans, so that in the first time to properly handle emergencies.

Conclusion

In conclusion, we introduces and analyzes the common problems in the construction of transmission lines in wind power plants, and then puts forward the main duties of the quality management department, the full implementation of the quality management responsibility system, the technical requirements of the construction process and the technical requirements and measures to ensure the quality of construction. In short, wind power plant transmission line project quality control is important. We must establish and improve the theoretical guidance system, and in the construction of the theoretical guidance and practice a high degree of unity to ensure the quality of the project.

References

1. Ren Y. Analysis of wind power plant investment status and development prospects [J]. Shandong Industrial Technology, 2016, (22): 195.
2. Kan J. Composition and site selection of wind farms [J]. New Technology & Technology New Products, 2015, (3): 45-45.
3. Wen X, Li Y, Duan C, et al. Study on construction technology of power transmission lines [J]. Urban Construction Theory Research (Electronic Edition), 2014, (13): 4545-4548.
4. Wen X, Li Yao, Duan Chao, et al. Power engineering transmission line construction technology research [J]. Urban construction theory research, 2014, (13).
5. Yang X. Transmission line failure of the calculation of wind power capacity credibility [J]. Computer fans, 2016, (8): 131.