



Research on Construction Quality Management of Power Distribution Lines in Electrical Engineering

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Abstract

The most important thing in electrical engineering is the quality of the distribution line, which will not only directly affect the project results, but also has a direct relationship with future maintenance and operation. Under the premise of safe production, the construction quality of the distribution line is analyzed, and the construction quality is strengthened under the condition of compliance and qualification. Especially in the current era when the market share of electrical engineering is increasing year by year, it is particularly important to improve the quality management effect of distribution line construction. This article briefly introduces the relevant content of PLC technology, analyzes the advantages and disadvantages of PLC technology, and discusses the application of PLC technology in electrical engineering automation control, so as to strengthen the research on PLC technology, give full play to the effective role of PLC technology, and improve the level of electrical engineering automation control, so as to implement effective electrical engineering automation management, meet the development needs of electrical engineering, and promote the modernization of electrical engineering.

Keywords

Electrical engineering; Power distribution line; Construction quality

1. Design Principles of Power Distribution Lines

1.1 Architectural function principles

The original intention of the distribution line is to meet the power supply needs of the building, so the core goal is to meet the functional needs of the building, which is the principle in the actual design. It mainly targets the aesthetic needs of the building; the power supply needs of the lighting system; the load needs of basic electrical equipment such as air conditioners and refrigerators; special power supply needs, etc.

1.2 Energy saving principles

my country strongly advocates energy conservation and emission reduction and takes the path of sustainable development. Therefore, it is also necessary to reflect this in the design of power distribution lines in the construction industry and actively respond to the national call. In the design of electrical lines, energy-saving modes are reserved, the location of electrical equipment that can reduce energy consumption is clearly defined, and the design is carried out in combination with the actual needs of the building. In addition, the design of the line's consumables and energy should also be considered. This is an energy-saving design carried out under the comprehensive consideration of the later operation and maintenance.

1.3 Principle of economic benefit

This principle aims to avoid blindly saving energy. The upper limit of the building's power supply demand and the lower limit of the energy-saving mode need to be considered and designed. Priority should be given to the normal operation of the building to prevent power outages and power shortages. Ensure that the distribution line design is optimized, guarantee economic benefits, and select materials and equipment of appropriate quality.

2. Construction Quality Management Issues of Electrical Engineering Distribution Lines

2.1 Process issues

When constructing electrical projects, it is necessary to strictly manage them in accordance with the electrical engineering technical documents to ensure that the overall project is safe and stable. When technical personnel formulate construction plans, they need to inspect the site in a practical manner, design them in a comprehensive manner, and be able to communicate effectively with on-site construction personnel to ensure that their own design plans are effectively implemented. Generally, problems occur when there is no good communication between designers and construction personnel, which leads to a long-term problem and the laying of lines does not meet the design. In addition, there will be problems with the review mechanism. After the responsibility for electrical engineering is implemented to individuals, the person in charge needs to review the construction plan, strictly follow the construction standards, report to the relevant departments for approval, and some staff who do not strictly follow the regulations will carry out construction while the plan is being approved, which will endanger construction safety. And if the plan is unqualified, it is necessary to conduct another on-site inspection based on the situation, modify the plan, and then the designers and construction personnel will communicate effectively, which will cause the construction project to be dragged down by staff who do not strictly abide by the regulations.

Widespread problems exist in technical standards. Most domestic electrical projects will allow construction workers and technical personnel to communicate and complete the design requirements. However, there is less communication on technical aspects, which often leads to front-line workers using effective methods and not strictly following technical requirements, resulting in inconsistent technical specifications in construction projects, causing calculations and analysis in the design plan to deviate from the actual situation, causing safety hazards.

2.2 Construction inertia problem

Because leaders of construction projects often lack experience in field tracking and inspection, it is difficult for them to detect problems when they occur. In actual work, the results of supervision of construction personnel are not in place, resulting in no unified standards for operations and technical problems.

2.3 Construction management issues

When some construction parties carry out the construction of power distribution lines, their management mode is not reasonable enough, there is a certain degree of confusion, the formalization is strong, and the emphasis on construction management is insufficient. Some construction parties fail to carry out construction based on the operating conditions specified in the project, which easily leads to safety hazards and serious safety accidents; due to the needs of social construction, in many companies, there are few relevant professionals in power engineering, and the late start of my country's power engineering automation technology has led to the low integration of the entire power engineering, which is very unfavorable to industrial development. There is no good connection between the various systems, and there is a lack of necessary connection between the sub-units. Some information is in an isolated state, which often makes it impossible to integrate information, which brings certain difficulties to the overall development of electrical engineering. On the other hand, many companies currently use different construction standards, resulting in inconsistent standards, some software and hardware cannot be well matched, and the compatibility between them is poor.

2.4 Issues regarding personnel functions

In terms of the capabilities of construction personnel, their safety and responsibility awareness, the existing construction technologies effectively mastered by different types of work, and their professional knowledge, etc., will have a

potential impact on safety management and indirectly affect the personal safety of the relevant operators. Some construction parties do not provide sufficient skill training for construction personnel and operators, resulting in low attention and implementation of construction steps, construction specifications, and precautions, resulting in illegal construction or operation still occurring, which directly affects the development of safety management.

2.5 Material issues

Construction materials need to be strictly inspected before use. However, due to the large workload of material inspection, there are often problems of staff missing inspections or insufficient inspections, and the use of substandard materials in actual construction causes safety hazards. Before the construction unit accepts the materials, it is necessary to conduct strict inspections, have a sense of process and norms, improve the contemptuous attitude, and take the acceptance work seriously. Once quality problems are found or problems with the certification documents are found, the supplier must be contacted in time to request a quality inspection certificate for multiple comparisons to ensure that materials with quality problems are not used during construction to ensure safety.

3. Strengthen the Construction Quality Management of Distribution Lines

3.1 Strengthen the awareness of quality management

The construction party must first ensure the construction quality of each process, control the construction process, and dynamically control the factors that affect the safety and quality of the construction. In addition, the construction party must supervise and inspect the construction quality on site, and the constructors must carry out the construction according to the corresponding technical specifications and construction drawings to avoid safety problems caused by illegal operations, ensure timely contact with technical personnel during the project, prevent differences of opinion, and strictly carry out construction in accordance with the design in the design plan.

Quality management requires a lot of time and a rigorous attitude. Construction personnel must abide by the provisions of laws and regulations and perform standardized operations according to operating specifications. Management inspectors also need to inspect and assess the quality of the project to ensure that the distribution line construction is compliant and qualified. A reward and punishment system should be established to reward employees who strictly follow the specifications for construction. When violations are found, the construction party must be able to inspect the construction site in a timely manner, resolve construction safety and quality issues caused by the violations, and ensure that the construction results are as expected.

Finally, the construction process of power engineering will be affected by many factors, mainly depending on the actual situation of each construction site. Therefore, the safety manager should be able to improve the construction rules and regulations based on the actual situation and personal experience, ensure that they are suitable for the construction of this project, and make safety management more effective.

3.2 Enhance the safety and stability of electrical lines

During the construction process, it is important to ensure that the line quality is up to standard. These problems often occur in the distribution box and line material quality. It is necessary to provide targeted operation and maintenance plans and corresponding prevention and control methods to effectively improve the stability of the electrical line and enhance the safety of the construction process. For the distribution box, it is necessary to refer to the design plan and strictly select according to the parameters to ensure that the opening position meets the design requirements. It is necessary to ensure that the construction is carried out as desired to prevent dangerous and unfavorable factors such as side openings and rear openings. After the line design and construction, it is necessary to strictly follow the construction specifications, distinguish the wire colors, follow the horizontal and vertical, non-hinged working principles, and tie them neatly to maintain cleanliness for the convenience of later maintenance work. Pay special attention to the metal frame of the distribution box close to the ground and clearly mark the non-insulated positions.

When managing the quality of distribution lines, special attention should be paid to the lightning protection effect of buildings to avoid safety hazards caused by leakage and other situations, strengthen the management of distribution lines, regularly inspect distribution lines, formulate maintenance and care plans, and improve the lightning protection

performance of lines. According to the actual local conditions, comprehensively consider the possibility of consumables and lightning strikes, and selectively set up lightning arresters to prevent lightning from striking the lines.

3.3 Control the quality of materials and equipment

The management of the construction quality of power distribution lines also requires overall control of materials and equipment, which is also a more important link in project control, which indirectly affects the cost of the project. Based on this, in the early stages of project construction, it is necessary to control the suppliers of equipment and materials to ensure the quality of the various materials they provide. At the same time, the person in charge of material procurement and the person in charge of project construction are divided into teams to ensure good communication between the two. At this time, the procurement engineer can provide better service quality for the person in charge of project construction. The two work together to strictly control the entry of materials into the warehouse in accordance with relevant rules, regulations and standards, and clear out those materials that do not meet the construction quality in a timely manner. At this time, it is also necessary to contact the company's financial department in a timely manner to report the process accounts of those cleared materials.

3.4 Strengthen the detailed management of distribution line construction management

The details of distribution line construction management can often affect the final result of the entire project, so it is particularly necessary to emphasize the importance of detail management when training managers. For example, when managing the equipment used in the construction of power engineering distribution lines, because most of the construction equipment has the characteristics of large size and complex parts structure, managers need to take different management methods in a targeted manner according to the characteristics of the equipment, so as to avoid unnecessary engineering losses caused by failures during equipment storage and use. The detail management of power engineering distribution line construction covers all aspects of the construction process. First of all, based on the safety and reliability of power engineering construction, it is necessary to strictly assess and inspect the construction technology and qualification certificates provided by the responsible unit to ensure that the construction personnel meet the technical standards and ensure the authenticity of the data. It is also necessary to formulate certain principles and standards for the three links of construction, acceptance and maintenance of the project. When problems or accidents occur during the construction of power engineering distribution lines, it is necessary to have an in-depth understanding and investigation of the causes, and accurately implement the responsibility for the accident to individuals, which not only protects the legitimate rights and interests of other staff from losses, but also can serve as a warning to the members of the entire construction team.

In recent years, the rapid development of society and economy and the improvement of people's quality of life have promoted the improvement of power energy output and quality. But at the same time, the competition in the power market has become more and more fierce. The proportion of electrical engineering in the construction industry project market has increased year by year. China has also clearly pointed out the future development direction of intelligence and automation. Therefore, it is necessary to improve the quality of electrical construction, strengthen the management level, strictly require technical personnel to carefully control the key issues of safety and stability, do a good job in distribution line quality control and management, formulate scientific and effective construction plans, and strictly control the quality of the project according to technical specifications. Therefore, power companies must do a good job in the construction management of power engineering distribution lines to ensure the stable development of the power market.

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