

## Quality Management of Building Electric Engineering

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**Abstract**—In view of the analysis on the common quality problems of building in electrical engineering, this paper describes the reasons which lead to these quality problems. Based on this, from three aspects of technology, personnel and material, this paper put forward to corresponding management measures, in order to promote the building electric development toward the direction of automatic, intelligent and ecological.

**Keywords**-Building Electric; Quality; Management; Measure

### I. INTRODUCTION

Because the service life of the building electric engineering is relatively long and the maintenance is not convenience, the quality of the building electric engineering has attracted the construction units and the user's attention. To ensure the quality of the building electric engineering, the key lies in the scientific and standard construction of the building electric engineering. The quality of electric engineering is the lifeline of the electrical engineering construction units, and it is the foundation and power to improve the economic benefits of the construction unit.

### II. THE REASON FOR THE QUALITY OF BUILDING ELECTRIC ENGINEERING

The factors of inferior building electric engineering are the following four aspects:

First, design is incomplete. Design is the core of the project instruction. If there is no complete and effective design, it is difficult to guarantee the engineering smoothly.

Second, the comprehensive quality of construction workers is low. If the professional level and the work enthusiasm of the construction workers is low, it is hard to guarantee a qualified engineering.

Third, the quality control of material market is not strict. Now many engineering are made by private contractors. Basic on the interests of money, lots of not qualified materials are used in engineering, thus, the quality of the project is impact seriously.

Fourth, the management of construction enterprise is bad. The requirements of progress and cost is higher than the requirements of quality. Blindly drive progress and festival cost will lead to the quality problem of construction.

### III. THE EMPHASIS AND DIFFICULTY OF BUILDING ELECTRIC ENGINEERING

#### A. The Laying of Steel Pipe Indoor

The first step of the steel pipe laying is make sure the position of pipe into the equipments and tool box. Then, calculate the length of pipe line to do the pipe processing. In civil construction, the pipe and the box has been connected at the installation position determined. And weld the ground jumper in the joints of pipe and pipe and the joints of pipe and box. Thus, the metal shell will change into an organic whole repeatedly. Pay attention to the following matters:

First, when steel pipe and equipment directly connected, steel pipe should be layed into the junction box.

Second, when steel pipe and equipment indirectly connected, wire protection hose or block metal wire protection pipe should be added at the end of the steel pipe first, then steel pipe is layed into the junction box. And the pipe mouth of the steel pipe should be closely wrapped. As to the damp places, the waterproof elbow should be added at the end of the steel pipe, the protection hose should be set around the wire and bend dripping arc shape, then into the junction box of equipment.

Third, when between two black steel pipes and between the pipe and box is threaded connections, in order to ensure the pipeline system grounding good and reliable, the ends of the pipe joint should be welded ground wire with corresponding round steel or flat steel, thus make the whole pipeline become a conductive whole.

When galvanization steel pipe or flexible metal pipe are grounded, it must use ground clamp. Common installation method of ground clamp are as follows: first, the joint line is twisted into a stream and embedded line groove, second, the joint line are added to and cover the pipe outside wall with clamp, third, make the clamp ends up and down bite, and clip flat with pliers pointed, then press it hard.

#### B. The Installation of Lightning Rod

The installation of lightning rod can reference to the standard atlas of national general electric device. The precautions are as follows:

First, when choose an independent installed site for lightning rod, we should ensure that lightning rod and its

grounding device keep the following regulation distance with the power distribution equipment. On the ground, the space distance between the independent lightning rod and the conductive parts of the power distribution equipment should be not less than 5 meters. In the underground, the recent land distance between the grounding device of lightning rod and the earthing network should be not less than 3 meters. The independent lightning rod and its grounding device should keep more than 3 meters with the building passageway.

Second, the grounding resistance of the independent lightning rod should not be more than  $10\ \Omega$  commonly.

Third, from lightning rod and ground net joint to the transformer or to the electrical equipment of 35 KV and under and the ground net joint, the distance along the ground net should not be less than 15 meters. In case when lightning rod discharge, the high pressure counterattack against the low pressure lateral line cycle and other equipment.

Fourth, when lightning strikes lightning rod, in order to prevent the ray waves along the wire into indoor and endanger personal security, it can not allow to erect low pressure lines and communication lines on lightning rod structure. The illuminator power cord which on lightning rod structure must use the wires buried underground with metal jacket cables or wires wear into the metal. Cable security layer or metal pipes must be grounded. The buried length should be more than 10 meters.

Fifth, when its thickness more than 4 mm, the metal cylinder with lightning rod can be used as the down lead of lightning rod.

#### IV. MEASURES TO ENSURE THE QUALITY OF CONSTRUCTION ELECTRICAL ENGINEERING

According to the analysis of the causes which lead to project quality and the understanding of the Important and difficult points, we from the following several aspects to control the quality.

##### A. *Ensure the Integrity of the Design Drawing and the Construction Drawing*

First, design specifications.

The design specifications of the building electrical engineering must includes the following content.

Design is based on the design scope, the power supply design, the strong electrical design, the weak electrical design, the building lightning protection, the special equipment protection, all sorts of circuitry prevent inductive, and all sorts of equipment prevent inductive, etc.

Second, planar graph.

The original planar graph of the electrical engineering should be given the related civil part content, such as the outline of walls, column, expansion joint, door and window. Still the planar graph should explain the name and the house layer high of each room, the position and direction of the door, etc.

Third, system diagram.

System diagram is used to show the system composition, to explain the relationship between each

system, and to provide the parameters of the power supply and distribution equipment.

To construction unit, the construction drawing have two aspects of effective use. One is the construction basis. The other one is the settlement basis. The effective construction drawings must have three conditions. First, the design should within the scope of the qualification certificate. Second, the design should based on the First Party's design letter of attorney. Third, the construction drawing and the design drawing approved by the First Party are legal drawings. In modern architecture electrical engineering, in order to explain the power distribution situation, the line relationship needs an electrical system graph. In order to explain various equipment, the electrical position needs a planar graph. In order to illustrate the equipment working principle, it needs a working principle. In order to illustrate the position of each equipment and electrical apparatus, it needs a working principle. In order to illustrate the connection relationship of various element, it needs an equipping circuit configuration. In order to illustrate the properties and parameters of all sorts of equipment and material, it needs the number of equipment and materials. In the modern building electrical construction process, the drawing explains each other. The standards and repeated water are allowed. But these standards must be coordinated to ensures that the consistency between each drawing. These standards are the most important aspects of the construction design. So as to ensure the integrity of the engineering design.

##### B. *Quality Management of Constructer*

First, engineer should review the business license, the enterprise qualification certificate, the professional level permit and the post certificate of the electrical contractor units. Second, engineer should review the electrical contractor units' relevant certificates of electric construction, such as the electrical engineering & technical personnel and the electrical foreman should have the post certificate which issued by the local urban and rural construction committee, the installation electrical and the electric welders should have the special operations personnel certificate which issued by the Ministry of Labour. If it is not conform to the specified conditions, the supervising units have the right to prohibit the electrical contractor unit to approach. In the construction process, the number of professional technical personnel which have the electrician certificate should be more than 50% of the total number of construction personnel.

The staff should be trained the necessary professional technical training, in order to ensure that the staff can control the latest professional technical knowledge. At the same time, the unit also should pay attention to the effective incentive management of the staff, in order to improve the staff's working enthusiasm and efficiency, so as to ensure the smooth progress of the project.

### C. *Pay More Attention to the Quality of Construction Material*

Under the condition of market economy, there are wide varieties of equipment for electrical material, and the price is uneven. The shoddy products common occurrence also. So, in construction process, we must pay more attention to the quality of material equipment. Materials must be checked item by item after arrived the construction site. First check the model is in accordance with the drawings demand or not, and check the price is consistent with the contract cost or not. Then check the reliability and practicability. For some equipment, we should unpacking to check it is intact or not. According to the packing list, the table machine accessories, contract certificate and explain material are checked. It is suggestion that the second party should use the copies of the installation explain material, and keep the original material. After the materials and equipment are certificated, the engineers and quality inspector should sign an agreement of "the confirmation of material which is allowed to approach" first, then, the materials and equipment can be use.

To every procedure of electrical installation engineering, the whole management is need to do. The first is combine with the civil subject construction, pays special attention to the corresponding quantity of the electrical construction, such as the bending radius of embedded pipe must meet the requirements, the concrete layer of pipe is not less than 20mm. The second is control the process of progress strictly. It is not allow each process in advance because of schedule blindly. Threading must be

after the architectural structures and the civil construction. Otherwise, it will cause the wire damp, even insulation and damage.

### V. CONCLUSION

In the 21st century, with the rapid development of modern science and technology, the industry competition is more and more fierce. Science & technology and social life should develop faster, especially large bank enterprise. The building electrical is not exceptional. The development of building electrical is also toward the direction of automation, intelligent and greening. In view of the common quality problems of the building electrical engineering, this paper describes the reasons which lead to these quality problem. Based on this, from three aspects of technology, personnel and material, this paper put forward to corresponding management measures. The study results has certain directive significance to the actual building electrical engineering.

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