

Analysis of Technical Problems and Construction Safety Measures of Rural Power Grid Engineering

Anfa Liu

Xichang Electric Power Engineering Co., Ltd. Ningnan Branch, Xichang 615400, China

Abstract:

In recent years, the state attaches great importance to the construction and improvement of the rural power grid, and the implementation of a series of power grid engineering transformation and new projects, such as a new round of rural power grid transformation project has effectively improved the power supply capacity of the rural power grid, for the agricultural development of rural areas to provide a solid and powerful power grid foundation. This paper probes into its technical problems and construction safety.

Keywords:

Rural power grid; electric power engineering; technical problems; construction safety

Introduction:

At present, the scale of rural power grid project is gradually expanding, the power resources carried by it are significantly increased, and the corresponding equipment composition structure is becoming more and more complex. In order to make the effective connection of each unit in the power grid and the efficient operation of various power equipment, on the one hand, it is necessary to break through technical problems, control the operation parameters of power equipment within a reasonable range, scientifically lay power lines, and standardize the establishment of power design models. To ensure the safety of power grid operation; On the other hand, it is necessary to pay attention to the construction safety measures in the power grid project, and strengthen the publicity and education of rural residents to ensure the reliability of the power grid in subsequent use.

1 Analysis of technical problems of rural power grid power engineering

1.1 Technical issues of power grid legitimacy

Power grid planning is the front-end link of rural power grid construction, which not only needs to plan the materials and equipment required for power grid construction, but also needs to take a professional method to calculate the voltage and power load of the power grid to ensure that it is within a reasonable and controllable range. China has strict norms and requirements for power grid construction, and has defined the materials and technologies required for power grid construction. Therefore, in the grid planning stage, it is necessary to carry out relevant planning work in accordance with the standards of national laws and regulations and relevant policy documents. The legitimacy of power grid is the basis of power grid security. If the legitimacy of power grid and relevant standards and norms set by the state are ignored in order to expand the scale of power grid, it will lead to power grid overload and overvoltage, and even cause serious security accidents, which will not only affect the social benefits of power grid construction, but also make power grid enterprises face huge economic losses.

1.2 Technical Problems of voltage level setting

Voltage level refers to the rated voltage level of the rural power grid and power equipment. Under normal circumstances, the actual voltage of the rural power grid power project can be slightly greater than or slightly less than its rated voltage, but if the difference with the rated voltage is large, it will affect the operation of the power equipment in the rural power grid. Voltage level setting is one of the key technologies of rural power grid power engineering. Before setting, if the relevant personnel have not conducted a detailed investigation on the demand for power resources in the surrounding area, the overall plan for regional development, and the actual demand for power grid construction, etc., to understand the power consumption in the region, such as the planned transmission lines, power enterprises and individuals in the region, and transmission losses, etc., the set voltage

level and other parameters are likely to have the problem that the transmission and distribution capacity can not meet the needs of public production and life in the region, resulting in the rural power grid construction can not meet the regional power consumption planning and subsequent operation, and it is difficult to create social and economic value.

1.3 Technical problems of power grid load transfer

Load transfer refers to the redistribution of power grid load when there is a risk of failure or failure has occurred. The main purpose is to give full play to the potential of power equipment in the power grid, balance the power generation, power supply and allocation units in the rural power grid power project, so as to avoid the waste of power resources and meet the electricity demand of economic development and public production and life to the maximum extent. There will be many uncontrollable factors in the load carrying process of the power grid. If the load transfer mode is unreasonable and the load setting of the power grid is not standardized, the security of the power grid load transfer will be reduced, and then the load of some power grid circuits will be too large or too small. When the power grid load is too large, the power equipment will be overloaded, which will not only shorten the service life of the power equipment, but also shorten the service life of the power equipment. It will even lead to more serious security risks, and even lead to security accidents; When the load of the power grid is too small, the overall active power of the power grid is low, and the operation of the power equipment is poor, which will cause the waste of power resources and reduce the economic benefits of the power grid construction.

2 Technical and construction safety measures of rural power grid engineering

2.1 Attach importance to safety supervision bidding

Before carrying out power engineering construction, it is necessary to implement effective bidding work first, and find safety supervision departments that meet the qualification requirements to participate in the construction process. The selected supervision department should clarify its own responsibilities, give full play to its supervision and management role, strengthen the audit of the power engineering construction unit, and ensure that the construction unit is qualified and has the construction license and business license. Attention should be paid to the inspection of various equipment of the construction unit to ensure that the construction equipment meets the construction requirements of electric power engineering and provides safety guarantee for the construction of electric power engineering [1]. The supervisory department shall urge the construction unit to report for examination and inspection, formulate a safety responsibility letter according to the actual requirements, and protect the legitimate rights and interests of the owner. At the same time, the safety management personnel should make clear the construction plan of the power project and do a good job of design disclosure.

2.2 Make preparations for construction

The construction of power engineering involves many aspects and is complicated, so systematic management is needed. Attention should be paid to each construction link to avoid safety problems and affect the final construction effect. Before carrying out power engineering construction activities, corresponding preparations should be made and corresponding safety supervision should be implemented to lay the foundation for subsequent construction. Based on the characteristics of the power project and the actual situation, the corresponding preparations should be made. For example, before laying the wire, the foundation pit excavation should be carried out and the construction materials needed for excavation should be prepared. The construction personnel and supervision personnel should make technical disclosure to improve the construction efficiency of the foundation pit excavation. Before the formal launch of the power project, it is necessary to organize a meeting of all participants, take safe construction as the theme, and let supervisors explain the key points of safety management to other relevant personnel, strengthen safety education and publicity, and enhance the safety awareness of construction personnel [2]. At the same time, the construction technology proposed in the construction plan should be audited, the safety risks in the construction process should be identified, and the corresponding emergency plans should be formulated.

2.3 Strengthen safety supervision in high-risk areas

There are safety hazards in the construction process of electric power engineering, and some construction needs to be operated in high-risk areas, which is a high-incidence project of safety accidents in electric power engineering construction, which must be attached great importance to and needs to implement efficient safety supervision work for maintenance. When

carrying out a comprehensive on-site investigation, the surrounding environment of the construction should be mastered, the power supply and transformer should be protected, and the corresponding protective measures should be taken. When laying wires, it is necessary to judge whether to excavate after clarifying the underground situation to avoid damage to the pipelines that have been laid underground, and when carrying out earthwork excavation construction, the excavation angle of the slope should be monitored to avoid the occurrence of safety accidents such as slope collapse [3]. In addition, attention should be paid to the safety management of the construction site, the safety warning slogans should be posted on the construction site, the entry and exit of non-construction personnel should be strictly managed, the night construction should be supervised, the normal operation of lighting equipment should be ensured, and the construction must be stopped immediately and solutions must be formulated if there are potential safety hazards in the construction.

2.4 Strengthen publicity and education for rural residents

First of all, through the radio and other media channels in the village to inform the residents of the project construction site, possible security risks, completed equipment and sub-projects, so as to improve the safety awareness of rural residents; Secondly, set up a warning device around the construction site or spray reflective paint around the tower to attract the attention of drivers and avoid safety accidents; Thirdly, the use of online monitoring equipment to supervise the whole construction process, construction site, construction personnel and materials, on the one hand can ensure the quality and safety of construction, on the other hand can identify safety risks in time; Finally, give full play to the safety supervision role of the surrounding masses, and call on the masses to report to the relevant departments the safety accidents that occur during the construction of the project or the construction links that affect the safety of the surrounding masses, so as to ensure the safety of the construction from the inside out.

2.5 Add protection measures for power transformers

The subsequent operation environment of the rural power grid project is more complex, and the factors that affect the stability and safety of the project operation are also more diverse. Power transformer is an important part of the power grid power system, responsible for transferring electric energy and converting voltage. Once the power transformer fails, it will not only affect the stable operation of the power system, reduce the efficiency of power transmission, but also cause expensive maintenance costs [4]. Therefore, it is necessary to add power transformer protection measures to reduce the failure rate of power transformer. When the power transformer fails, the protection system will automatically locate the fault, and the maintenance personnel will remove the fault according to the position displayed by the computer.

Conclusion

To sum up, at present, in the construction of rural power grid in our country, the technical problems mainly include the legitimacy of the power grid, the voltage level setting problem, the power grid load transfer problem. In order to solve the above technical problems, it is necessary to plan the scale of the power system, select the appropriate power equipment, set the voltage level scientifically, and match the power grid level reasonably, so as to improve the stability of power supply and distribution of the power grid project.

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