Electrical power project like most of the construction projects are complex, dynamic, unique and prone to uncertainties, hence pose challenges even to the best of the project managers. The project team faces unprecedented changes in addition to constraints of budgets, time and quality. Review of literature reveals diverging opinions as to which factors are critical for successful implementation of a project in a given industry and environment. Moreover there are few studies on critical factors affecting project performance in developing countries, and especially Kenya. For KenGen such study has never been conducted. Hence owing to uncertainties and challenges in project implementation, this research is conducted to investigate on the critical factors that most significantly influence performance of electrical power projects. Therefore the study fills the research gap by analyzing, grouping and establishing the relationship among critical factors, influence implementation of electrical power projects in Kenya. The research study adopted descriptive survey design. Descriptive method depicts an accurate profile of population on its existing present condition. The target population for the study was sixty five (65) KenGen staffs in project departments. The research employed stratified random sampling to select sixty five (65) respondents from the research population. Semis-structured and Structured questionnaire based on Likert scale, was used to collect qualitative and quantitative data. Twenty eight survey questionnaires out of Sixty five sent out were received from the respondents. Based on the findings of the questionnaire critical factors were ranked according to their impact on performance of electrical power project. Moreover critical factor interrelationship was studied in order to study the importance of each factor in depth. Data analysis was by descriptive statistics and Spearman's rank correlation (Pearson's correlation) method. The researcher identified various critical factors in five logical groupings; project characteristics, Project management and organization human management, and environment. The findings may be used as guideline to successful implementation of electrical power projects in Kenya and other developing countries in Africa.