Design of an Electrical Supply System for an Automotive Parts Manufacturing Plant

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***Abstract*—This thesis presents the design of an electrical supply system for an automotive parts manufacturing plant. The author, Lương Việt Hoàng, designed the system based on the current state of the power grid and the specific requirements of the plant. The work includes load calculations, design of electrical diagrams, and the selection of appropriate equipment. The author also considered lightning protection measures for the plant. The design process followed international and Vietnamese standards to ensure technical, safety, aesthetic, and economic requirements. The author calculated the load for each workshop and the entire plant, designed the electrical supply diagrams, selected appropriate equipment, and designed electrical cabinets. Lightning protection measures were also calculated and implemented. The thesis concludes that the design process was completed according to the standards, and the author gained valuable experience and knowledge in electrical supply design. The use of design software such as Visio, Excel, and AutoCAD Electrical was recommended for future work.**

***Index Terms*—electrical supply, load calculation, lightning protection, automotive parts, plant design**

I. Introduction

The thesis provides an overview of the automotive parts manufacturing plant, including its history and layout. It discusses the current state of the power grid and the general requirements for electrical supply design. The author then proceeds to calculate the load for different workshops and the entire plant, and designs the electrical supply diagrams accordingly. The design process followed international and Vietnamese standards to ensure technical, safety, aesthetic, and economic requirements. The author also considered the specific needs of the plant, such as the layout and equipment requirements, to ensure the design met the plant's operational needs [1].

II. Methods

The author used various methods to determine the load, including calculations based on installed capacity, area production, energy consumption per unit product, and maximum load factor. The design process followed international and Vietnamese standards to ensure technical, safety, aesthetic, and economic requirements. The author utilized software tools such as Visio, Excel, and AutoCAD Electrical to assist in the design process. The design included load calculations, electrical diagrams, equipment selection, and electrical cabinet design. The author also considered lightning protection measures, which involved calculating the protection radius and selecting appropriate lightning protection devices [1].

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III. Results

The author calculated the load for each workshop and the entire plant, designed the electrical supply diagrams, selected appropriate equipment, and designed electrical cabinets. Lightning protection measures were also calculated and implemented. The design process was completed according to the standards, and the author gained valuable experience and knowledge in electrical supply design. The use of design software such as Visio, Excel, and AutoCAD Electrical was recommended for future work. The design met the technical, safety, aesthetic, and economic requirements of the plant [1].

IV. Discussion

The design process was divided into several parts, each following international and Vietnamese standards. The author completed all the requirements, including load calculations, electrical diagrams, equipment selection, electrical cabinet design, and lightning protection calculations. The design met the specific needs of the plant, ensuring that the electrical supply system was both functional and safe. The author's experience in the design process provided valuable insights into the challenges and considerations involved in designing an electrical supply system for a manufacturing plant [1].

V. Conclusion

The thesis concludes that the design process was completed according to the standards, and the author gained valuable experience and knowledge in electrical supply design. The use of design software such as Visio, Excel, and AutoCAD Electrical was recommended for future work. The design met the technical, safety, aesthetic, and economic requirements of the plant, ensuring a reliable and efficient electrical supply system [1].

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