



GGGS College of Modern Technology, Kharar

COMPANY PROFILE

As a part of the curriculum, and for the partial fulfillment of the requirements for completion of the B.Tech degree from GGS College of Modern Technology, Kharar I, Hardeep Singh, underwent an industrial training at Bharat Electricals for 4 months during the period of January-April, 2018.



Bharat Electricals, located at plot no. D-123, industrial area, phase-7, Mohali, is a vast industry with wide variety of disciplines. Bharat Electricals is an ISO 9001:2000 Certified Company they deals in the fields of Chartered Engineers, Consultants, Class 'A' Govt. contractor & Manufacturers of (Type Tested by CPRI), Power Coated Electrical Power & Control Panels.

During the training period I worked under the guidance of Mr. Rajinder sharma. This department is concerned with design and manufacture of electrical control panels. These equipments have vast application and demand in every industry like chemical industries, paper plants, petroleum refineries, substations etc. and even at any building. The designs of these equipments are performed in multiple stages involving detailed calculations and complex analysis to provide maximum safety. But care also

needs to be taken to prevent over designing, which will otherwise increase the material and manufacturing costs as well as the equipment weight making the transportation difficult and expensive.

Hence the Bharat Electricals has a huge department concerned with the designing of the equipments, besides the gigantic workshops where manufacturing of the equipments take place.

Under the guidance of Mr. Rajinder Sharma, foreman of the division, I got the opportunity to have exposure to the works carried out in this department of the industry, and hence learn a good deal from them. During the period of four months of industrial training, the works primarily assigned were concerned with finite element analysis and allied topics. A brief discussion on the assignments given and training undergone during this period follows.

INTRODUCTION TO PROJECT

A control panel is a flat, often vertical, area where control or monitoring instruments like, ammeter, voltmeter, frequency meter, etc. are displayed or it is an enclosed unit that is the part of a system that users can access, as the control panel of a security systems (also called control unit). Control panels are mainly contains several bus bars with which systems and sources are connected (for e.g. generators or mains) control panels provide complete control over system and perform several actions like fault detection, provide protection from faults and merging two or more systems together. Control panels are very useful while fault occurs as it senses and indicates quickly and if the fault is sever it trips the circuit too. The main faults that often occurs over current and over voltage faults.

They are found in factories to monitor and control machines or production lines and in places such as nuclear or other power plants, power substation, ships and aircraft and mainframe computers, paper mills, etc. Older control panels are most often equipped with push buttons and analog instruments, whereas nowadays in many cases touchscreen are used for monitoring and control purposes. And some of many of them can be reprogramed anytime with little or no extra effort and the programing can be locked so no other than its operator can reprogram it.





Simplification of engineering and precise control of manufacturing process can result in significant cost savings. The most cost-effective way, which can pay big dividends in the long run is flexible automation; a planned approach towards integrated control systems. It requires a conscious effort on the part of plant managers to identify areas where automation can result in better deployment/utilization of human resources and savings in man-hours, down time. Automation need not be high ended and too sophisticated; it is the phased, step-by-step effort to automate, employing control systems tailored to one's specific requirements that achieves the most attractive results. That is where Industrial electronics has been a breakthrough in the field of automation and control techniques. It is required System design and specification, Electrical and mechanical design using industry standard CAD tools and E plan, PL software development Panel manufacture to highest quality Panels and systems can be tested to customer specification and test procedures On-site Commissioning using equipments. Diagnostics and troubleshooting Control Panel as the Name implies, are used to provide proper control of operations of any electrical equipments. These are also used to protect the electrical equipments from being damaged due to various Faults like short circuit, overload and earth leakage etc.

OBJECTIVES

Control panels are used to regulate functioning of electrical equipment. Electrical panels fitted with necessary relays are also used to protect electrical equipment from being damaged due to short circuit and over-loading. Light roof trusses are required for construction of ware-houses, community hall and light Industrial Sheds. These two fabricated items are widely used in engineering and construction industry.

Main objective of the project:

- Complete control over the system can be obtained without leaving its place (by the operator).
- Live Observation of equipments and its operation may be possible while in their in working condition.
- Fault detection and its solution can be done easily and randomly.
- Handling of different sources and their parameters can be done easily.

PROJECT DESCRIPTION

The Control Panel is sheet metal fabricated in closure open, semi-enclosed or totally enclosed type, which provide and control electric power to equipment and appliances. Provision for indicating electrical parameters like voltage, current, frequency, power factor etc. will be available on the face of the panel. Regulation of the power supply is also possible with the help of auto transformer switches and circuit breaker. The sheet metal enclosure for the Control Panel is designed and fabricated in the unit. The components are bought out from the reputed sources and fitted at appropriate places on the panel as per manufacturers design. The circuit as per the design is laid out and the control panel is tested for the proper functioning as per relevant specifications.

- Quality Control: The LT Control Panel shall be tested as per IS: 8623-1977 regarding technical aspects.
- Production Capacity (per annum): LT Control Panel of a short range - 300 Nos. per year.
- Approximate Motive Power Requirement: 20 KVA
- Pollution Control Requirement: No Objection Certificate to obtain from DIC level.
- Energy Conservation Requirement: The product under question itself plays vital role in energy conservation. The suitable tripping devices in case of automatic tripping devices etc. is required to be provided to minimize the unwanted use of electricity.

FUTURE SCOPE

With the rapid electrification and industrialization and by virtue of being a functionally integral part of all electrical equipments like Motor, Generator, Transformer, Motor Control Centre, Incinerator etc. the control panel has get immense scope. The phased increase in power generation and transmission has by itself necessitated increased production of electrical equipments thereby creating a good scope for the control panel. In the present industrial world, a flexible system that can be controlled by user at site is preferred. Systems, whose logic can be modified but still, used without disturbing its connection to external world, is achieved by PLC. Utilizing the industrial sensors such as limit switches,

ON-OFF switches, timer contact, counter contact etc., PLC controls the total system. The drive to the solenoid valves, motors, indicators, enunciators, etc. are controlled by the PLCs. The above said controlling elements (normally called as inputs of PLCs) and controlled elements (called as outputs of PLCs) exist abundantly in any industry. These inputs, outputs, timers, counters, auxiliary contacts are integral parts of all industries. As such, it is difficult to define where a PLC cannot be used. Proper application of a PLC begins with conversion of information into convenient parameters to save money, time and effort and hence easy operation in plants and laboratories.

CONCLUSION

In conclusion it is seen that control panels plays a vital role in protection and monitoring, controlling the system for which it is designed for. Control panels creates protective barrier between supply mains and the system and other equipments, and guides them in critical conditions. Control panels also provides complete control over every aspect of the system like its behavior, its starting time, its stopping time etc. and monitors the working parameters of each equipment on its own and alarms the operator when needed. Control panel also work as programing module for the operator to reprogram the whole system with ease or no extra efforts.

REFERENCES

- User Manual, Allen Bradley™ Micro Logix 1500 Programmable Controller
- User Manual, Allen Bradley™ 160 SSC Variable Speed Controller
- Allen Bradley™s URL <http://www.ab.com/plclogic/>
- Rockwell Automation™s URL www.rockwellautomation.com
- MicroMentor, Allen Bradley™, Rockwell International Company