

INDUSTRIAL AUTOMATION

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ABSTRACT

Automation are automatic control is the use of various control systems for operating equipment such as machinery, processes in industries, boilers , heat treating furnace , switching in telephone networks, steering and aircraft and other applications with minimal or reduced human intervention. The biggest benefit of automation is that it saves labour, save energy, materials and to improve quality, accuracy and precision. The wireless communication technologies are widely applied in the fields like Industrial Automation. Injection molding machines can fasten the molds in either a horizontal or vertical position. Wireless communication and smart sensors and actuators pose means to sustainably improve automation technology. To learn about Industrial Automation, a review process involving 2 stage approaches has been undertaken for 20 research papers which were published in the period of year 2000 to year 2018. After an exhaustive review process, four key issues were found “Controlling method of injection molding machine for new technologies, new trends in industrial Automation, Energy Storage in co-generation power plant & Wireless Data Transmission” which is mostly need to enhance of Industrial Automation aspects to get better solution approach. The outcome of the review was in the form of various findings, found under various key issues. The findings included algorithms and methodologies used to solve particular research problem, along with their strengths and weaknesses and the scope for the future work in the area.

Key words:Co-generation power plant, save Data transmission, program logic control.

1. INTRODUCTION

The plastic injection molding machine control system is composed of driving system and electronic controller. There are three forms of electronic controller which include traditional relay controller, PLC controller and microcomputer controller. A traditional relay controller has less been applied at present, because this have complexity hardware, low precision and difficult for adjusting and maintaining.

The PLC controller have many benefits, such as features high reliability, easy programming, strong anti-interference ability and easy maintenance and so on, but the cost is much high. Zigzag is the only standards-based wireless technology designed to address the unique needs of low-cost, low-power wireless sensor. IEEE standard 1588 is a faster approach for control mechanism and the best part of IEEE 1588 that it removes delay of the process. Energy storage of the power plant becomes easier by using modern approach of energy storage system. Capacitor bank can be extended easily whenever their required value needed to improve. The automation control system are generally apply larger industry. They work are easily in a automation help and no extra requirement in work. They are worker are easily work and no extra consume a energy. If automation are work very fast and not wastage the material. The automatic control in industries.

2. REVIEW PROCESS ADOPTED

A literature review is necessary to know about the research area and what problem in that area has been solved and need to be solved in future. This review process approach was divided into three stages in order to make the process simple and adaptable. The stages were:-

Stage 1: This stage provides the details to be checked while starting literature survey with a broader domain and classifying them according to requirements.

Stage 2: The groups of research papers are prepared according to common issues & application sub areas. It is necessary to find out the answers to certain questions by reading the Title, Abstract, introduction, conclusion and section and sub section headings.

Stage 3: It deals with going in depth of each research paper and understand the details of methodology used to justify the problem, justification to significance & novelty of the solution approach, precise question addressed, major contribution, scope & limitations of the work presented.

Various Issues In The Area After reviewing 20 research papers on Controlling Parameters of Injection Molding Machine we have found following issues, which has to be addressed, while the designing and implementation of the Injection Molding Machine these issues are:

1) Controlling method of injection molding machine for new technologies

2) New trends in industrial Automation.

3) Energy Storage in co-generation power plant

3. ISSUE WISE DISCUSSION

Issue1:- Controlling method of injection molding machine for new technologies

Controlling method of injection molding machine for new technologies is one of the issue, some approaches were used for this issue which is injection molding machine controlling process very hard with relay logic, so embedded system controlling process (logic) used for injection molding machine, this process is better than the relay logic & it provides an effective & easy way to control the hydraulic system. The increasing complexity of automation applications needs new framework architecture to development automation control system. By using automation components like that component oriented design, reusability & picture structure is better way for reduces increasing complexity of automation. This approach reduces valuable development time because the component can be tested with their internal test functionality. By using hardware structure, system software architecture & experimental plate form give a better approach to development of a distributed control system for PLC based applications. PLC based applications & technology is very effective and useful technique to improve product quantity & quality.

Issue 2:- New technique in industrial Automation-

New technique in industrial Automation is second issue, some approaches were used for this issue which is simulation approach for speed control of Induction motor using Lab view software. Lab view software is one of the most significant software & with the help of LABVIEW, today's industries control applications are done by remote processes only, user normally sits somewhere safe place away from the working environment from there he/she has to control the plant and also make sure that the system parameters should be optimized so here simulation Software plays a vital role in Industrial Monitoring and Control system. Actually the main issue in the designing field is that most of the problems occur while using large no. of control circuits, since increase in no. of control circuits lead to superfluous no. of wires. To reduce the no of hardwire circuits and to see things moving or happening graphically can be easily seen so we can implement these circuits on simulation level using Simulation software.

Issue 3:- Energy Storage in co-generation power plant-

Energy Storage in co-generation power plant is third issue, some approaches were used for this issue which is comparison of two methods of electrical power storage. One of them is conventional method on other side another is modern system. In conventional power storage method has taken the battery storage method and in modern method has taken capacitor bank method for electrical storage. It's not sufficient because new installation of capacitor bank storage contain many difficulties and connection complex-city. By some of the way tried to solve the problem of conventional storage of electricity by giving a better alternative for electrical storage. Limitation of the given alternative is so much similar to the conventional method al-thought this is only suggested method of the electrical power storage. With the less complexity of the circuitry and the less economical investment this will become a better alternative for electrical storage in solar plants.

4. ISSUE WISE DISCUSSION ON RESULTS

Issue 1:- Controlling method of injection molding machine for new technologies

Table 1.1 Issue wise Solution Approaches & Result

Sr no.	Solution Approach	Results
1.	Injection Speed Controlling Algorithm	Product quantity increases
2.	Numerical Control of Machine Tools	Reduce dangerous ,boring & difficult jobs in manufacturing plant
3.	Class 1 PC programming software , Class 2 PC monitoring software	Flexibility , Scalability increase
4.	Direct Teaching Algorithm	Automation operation easy for not trainer worker
5	Use new Automation components i.eMechatrical components	Reduce valuable development time

Issue 2: New technique in industry automation

Table 1.2 Issue wise solution approaches & result

Sr.no.	Solution Approach	Results
1.	Law view is suggested to be good simulation software with easy understanding and simple functions.	It is easy to integrate with other devices. It has less no. of voltage divider frequency. It is better software in comparison to other.
2.	The proposed solution relies on a series of simple concept of new architecture with different layers.	Author defends the solutions with new architecture approach.
3.	Simulation software lab View, lab view virtual instrument development platform is a graphical programming language.	This approach reduces the development time. DP provides the needed flexibility & scalability in control plants desgins.

Issue 3:- Energy Storage in co-generation power plant

Table 1.3 Issue wise Solution Approaches & Result

Sr no.	Solution Approach	Results
1.	Alternative of energy storing system	Alternatives for energy storage system proves better storage system compare to conventional one.
2.	Cogeneration heating of working fluid in plant	Fluid heating can be done in much economical way by using given method in the paper
3.	Two stage thermal energy storage system	Plant can be operated in two stages it will reduce the cogeneration problems

5. COMMON FINDINGS

Issue 1:- Controlling method of injection molding machine for new technologies

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□□□□□PLC based applications & technology is very effective and useful technique to improve product quantity & quality etc.

□□□□□Hydraulic circuit & microcontroller based embedded system provides an effective & easy way to control the sequence of injection molding machine.

□□□□□Controlling process is very hard with relay logic, so embedded system controlling process used for injection molding machine.

Issue 2:- New technique in industrial Automation

Choosing Lab View as the human machine interface for the implementation is a proper decision as it has various types of application s and functions that are easy to understand and use, secondly this approach is more economical as the objectives and system defects can be identified without the implementation of the circuit.

□□□□□The area of research is a trend in manufacturing towards faster and higher precision part production with the help of an Application of IEEE 1588 that is Time based control system rather than using traditional control techniques.

□□□□□R-Field bus is a radio based physical layer based on the existing and available radio technologies in the LAN and WAN world.

Issue 3:- Energy Storage in co-generation power plant

□□□□□Conventional energy storage system is not reliable compare to the modern energy storage system available in present scenario solar energy storage system should be replaced with the new and modern storage system.

□□□□□Solar power tower plant discussed and analysis done for verifying various performances of two–stage thermal energy storage system.

6. CONCLUSION

The review of 15 research papers has been carried out in the area of Industrial Automation and find out current challenges and scope of work. After the review, we were found many issues like that Controlling method of injection molding machine for new technologies, New trends in industrial Automation, Wireless Data Transmission & Energy Storage in co-generation power plant which should be given proper concern, when the enhancement of security takes place. These

papers are a survey of different security issues & controlling related work that carried out in the area of integrity. Propose of these models are to reduce the security risks and improve system reliability.

The technology and trends are changing day by day in industrial automation, nowadays simulation software have made their own place. We can see the plant response be far before starting the plants. Time is also important; IEEE standard 1588 is a fast time based control algorithm to improve the system delays.

The exhaustive review could finally lead to extract findings in the area of Industrial Automation strengths and weaknesses and scope of work during M. Tech 1st semester Research work.

7. REFERENCES

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