

# Commissioning Of Water Treatment Plant and Packer Plant with PLC and SCADA

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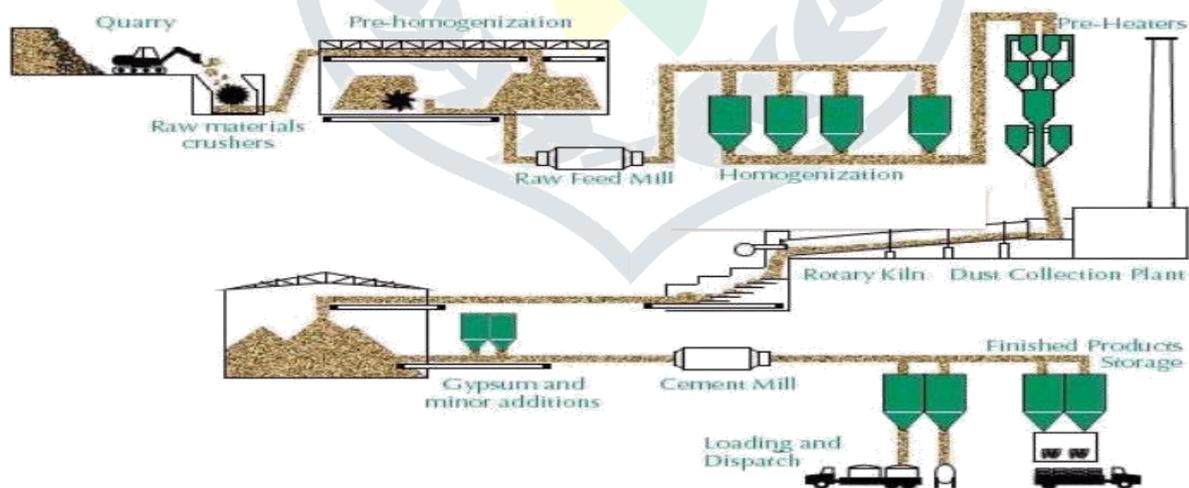
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**Abstract** -: automation of manufacturing operations helps in increasing the production, improving the product quality, enhancing the safety of the operators as their role get transformed to supervisors and decreasing the cost of production. A programmable logic controller ( plc) is nowadays key component for industrial automation. Plc helps in making the automation more flexible. Scadas systems became popular to arise the efficient monitoring and control of operation . Cement plants are one of the largest consumers of energy. Their electrical energy costs account for about 15 -20 percent of the total production cost. The large fans and motors used in the production process consume a major part of electrical energy. With the use of variable frequency drives (vfds) the energy consumption can be reduced from 90 kwhs/ton to about 70 kwhs/ton of cement produced. Vfds offer much more flexibility in operating ranges like speed variation from 0 to 100 percent and a considerable reduction in maintenance costs based on the above concept a control system is developed for the packer plant and water treatment plant used in cement industry using plc, and which can be interfaced using scada in my project we are concentrate automation design part , commissioning of water treatment plant and packer plant.

**Index Terms** : plc , scada

## 1. INTRODUCTION

Cement is a mixture of limestone, clay, silica and gypsum. It is a fine powder which when mixed with water sets to a hard mass as a result of hydration of the constituent compounds. It is the most commonly used construction material. Type of Manufacturing: **Wet** process, **Dry** process -74 % cement produced . In the dry process, dry raw materials are proportioned, ground to a powder, blended together and fed to the kiln in a dry state. In the wet process, a slurry is formed by adding water to the properly proportioned raw materials. The grinding and blending operations are then completed with the materials in slurry form. After blending, the mixture of raw materials is fed into the upper end of a tilted rotating, cylindrical kiln. The mixture passes through the kiln at a rate controlled by the slope and rotational speed of the kiln



## 2.METHODOLOGY

This my project includes two section in cement plant .

- 1) Water treatment plant
- 2) Packer plant

1) **In water treatment plant** works is includes erection commissioning and calibration , and the main part of my work is commissioning of automation through plc and scada .In my water treatment plant simenns -300 cpu is using and plc **step-7** software is using for controlling the network .

For graphics design works using **wincc -7.0** software. In this help of software we design a graphics of various filter , motor and valve .Use of this software we can control the all filter and valve on off .



**Fig 1 .water treatment plant**

2) **Packer plant** : cement packing **magic box** Infrared data transmission device for connecting the bag filling units(mounted on the rotating part)with the operator panel and the control system ventodigit III Multi-microprocessors electronic weighing unit designed for bag filling application. Bag support saddle Available for wide-range of bag types and sizes and for manual or automatic leveling (two or multi-positions) .**Encoder** For tracking the angular position of each bag filling unit and to control the bag filling cycle. Filling unit Impeller, fluidization system, guillotine valve, nozzle and supporting frame, all designed for high weight accuracy, high output and low dust emission .**Impeller** Vertical or horizontal shaft impeller configuration for optimal filling according to the particle size distribution of the product being space. Slide valve for material flow controlling .Motor directly coupled with impeller shaft. Absence of pulleys and belts, eliminates entirely the wearing and potential breakages of these components .Due to the efficiency of the bag filling process a minimum of power 3KW motor is required Simplified supporting frame facili- tates the operator access and the maintenance Static micro switch for detecting of bag presence; Slimmer and more rigid .



Fig- 2 packer machine

**Automation in packer plant :** In packer plant we are using FIs- automation scada for making a graphics design work and for plc using step -7 .In this software we can group control of the system .

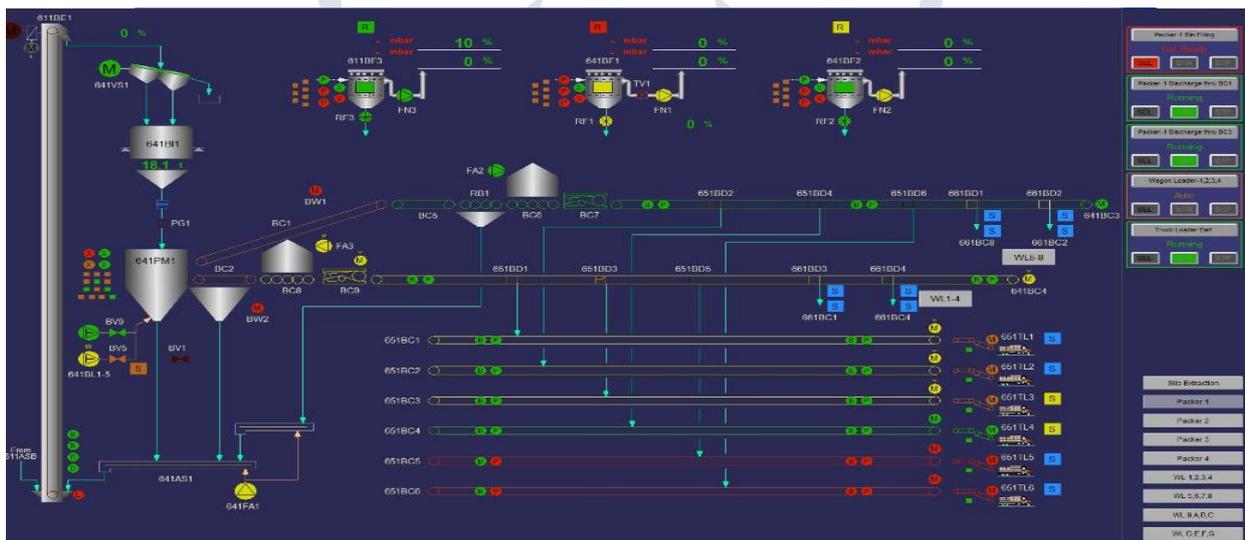
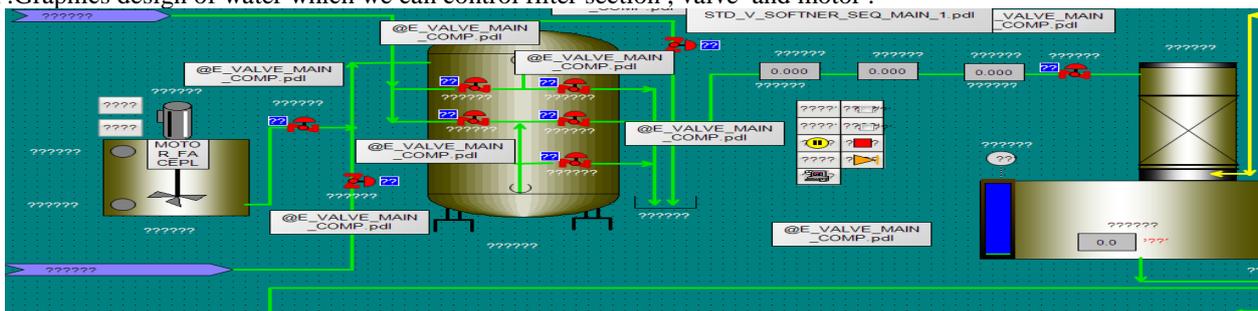


Fig 3. scada Representation of packer plant

**3.Result :** In cement plant we are controlling various type motor through plc step-7 .All this motor and belt conveyor ,valve all the network made in plc step -7 software .This step -7 we can make analog scaling program .All this programming can control Ecs system .we can control all the system through group control and individual also .Ecs having advantage we can control in group also . In packer plant packer win -7,wagon load ,Truck load like group section .This is a result of water treatment plant in scada system .Graphics design of water which we can control filter section , valve and motor .



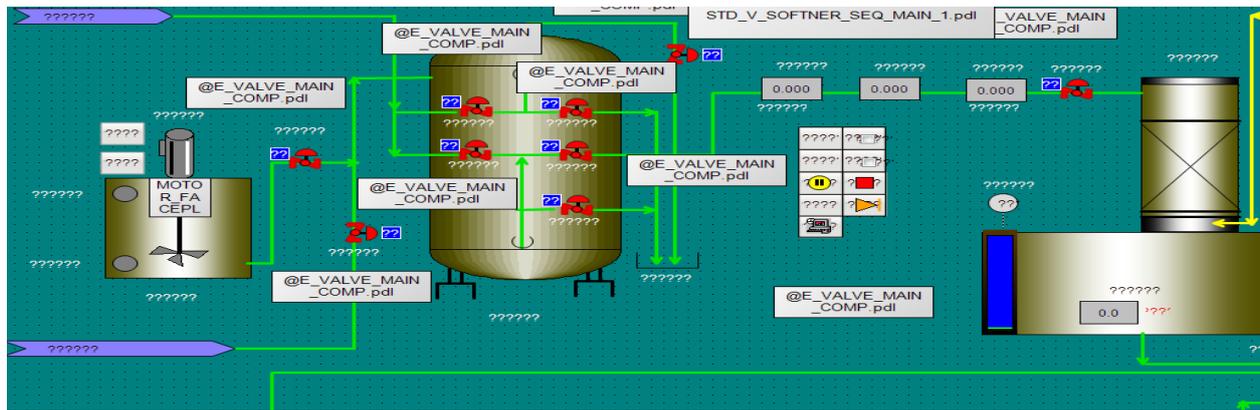


Fig4. Result scada representation in water treatment plant

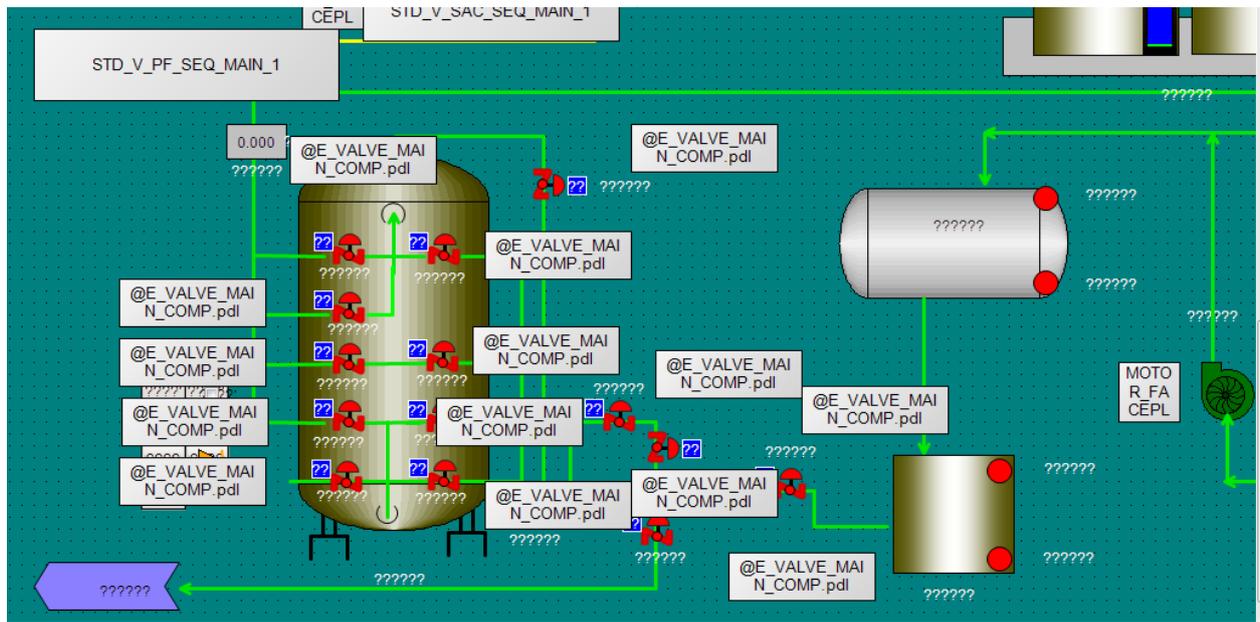


Fig5. Result scada representation in water treatment plant

**4.Conclusion**

In this project the programmable logic controller for the packer plant and water treatment plant was developed and the static screens for the overview of the plant . PLC & SCADA for the both of the plant automation system was proposed. GRAPHICS DESIGNER Siemens’s (wincc) 7.0 SIEMENS process SIMATIC MANAGER S7 was used to design the programmable logic control and supervisory control . And for the PLC we are using control flow chart that is functional block diagrams. The static screens for the overview of the plant and also the individual tank farms were also designed and substation overview. In these static screens are used to see about the process of loading the Cement ,coal from the tank to the truck or wagon. And for the programmable logic controller having two systems i.e. process and safety PLC. For safety system we are using emergency shutdown.

**FUTURE SCOPE**

For this terminal the mode of control used in this project is semi automatic control. That means some of the works will be done automatically and some works will be done manually. And also the development of the logic and static screens were not done completely for the whole plant. In future this work can extend to do the full control that is fully automatic. In packer plant for wagon loading system fully automatic system through wireless system can de develop..

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