

Automatic Gate Opening System of Coal Crusher Mill of Thermal Power Plant

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Abstract— Compared with actual situation of the current thermal power plant, this project studies operation process of coal handling system in thermal power plant. Analyze technical characteristics of coal handling system and operating characteristics of the relevant machinery and equipment. Then, the safe operation of coal handling system and the proper method of the equipment maintenance are summed up.

Keywords: India Coal Grades, Crusher, Construction, Crushing Stages, Defect Identification

I. INTRODUCTION

At present, coal is the preeminent fuel of thermal power plant. Continuing up the large unit, and large capacity, the demand of coal is very large. Coal need to process from loading and unloading to stockpile, this procedure can finish by coal conveying system. This system includes add up to tens mechanical, guarantee the important of these mechanical are normal operation, it is very important for this system stable operation. And it is a key problem of reduce costs, ensure safety in production, improve the efficiency of work.

The coal handling plant (CHP) in a thermal power station covers unloading of coal, its crushing, storage and filling of boiler bunkers. Coal unloaded in the wagon tippler hoppers/ track hoppers is conveyed to crusher house.

A. Different Type of Coal Grade

Details Mostly E and F Grade Coal used in India.

Grade	C.V.(KCal/Kg)	%Ash+Moisture
A	>6200	19.57
B	5601-6200	19.57-23.97
C	4941-5600	23.92-28.69
D	4201-5940	28.69-34.05
E	3361-4200	34.06-40.14
F	2401-3360	40.14-47.10

Table 1: India Coal Grades Details



Fig. 1: Coal Handling Plant

II. PROJECT OBJECTIVE

This project is used in Coal crusher Mill where many power plant uses manual operation for carry the crushed coal to the pulverizer by using conveyor belt

Therefore if the belt get stop in emergency that the coal remain falling down at one place which is very hot and cause fire on the belt .

If we use automation in opening of inlet and outlet door for coal that this problem will be eliminated and the process will get smooth and fast. It will also protect the person who will work near to the belt.

III. WORKING & METHODOLOGY

In this project we have use two mode of operation.

- 1) Auto mode
- 2) Manual Mode

1) Auto Mode:-

When we put selector switch on Auto mode than complete process will be automatic As soon as auto process start than very first operation will be. Close the inlet gate solonide valve and keep it on for 5sec in this case the coal from crusher will stop entering into the hopper. Than open the outlet gate solonide valve and keep it open for 60sec in this case the coal will drop down on belt .Than close the outlet gate solonide valve and keep it close till the process cycle complete. Than open the inlet gate solonide value for 5 sec in this case coal will come into the hopper.

It's a process for 1 mill.

2) Manual Mode:-

For manual operation this complete process will done manually by using pushbutton.

In this case selector switch will set to manual mode.

IV. LITERATURE REVIEW

- 1) Avadhesh etal. (2008), explained in detail about performance modeling and behaviour analysis of coal handling system of a thermal power plant. This paper describes the behavior analysis of coal handling system of a thermal power plant. The detailed study was done on various handling systems. On the basis of various factors analysis of coal handling system was done. The performance modeling is explained in detail.
- 2) Arora n. Kumar. (1997), written a paper about Availability analysis of steam and power generation system in thermal power plant. In this paper the analysis of availability of steam & power generation system in thermal power plant is done. Various system one studied and on basis of the data and information comparison is made for analysis of availability of steam & power generation system in thermal power plant.
- 3) "Bhattachrya, etal. (2009) Written a paper about Impact of Coal Beneficiation on Rail transport in India Thermal

Coal, which is the mainstay of India's power generation, contains as high as 50% ash, to meet the rapidly growing demand for thermal power the transportation facilities need to be significantly expanded. The present work examines the impact of beneficiation on thermal coal transportation by railways and finds that it would considerably improve the loading capacity of wagons,

there life and also release carrying capacity on the saturated rail network.

V. SOFTWARE USED

- 1) Simatic manager (Programming software)
- 2) WinCC SCADA (Controlling software)
- 3) Factory IO (Simulation Software)

VI. ARCHITECTURE OF PLC PANEL

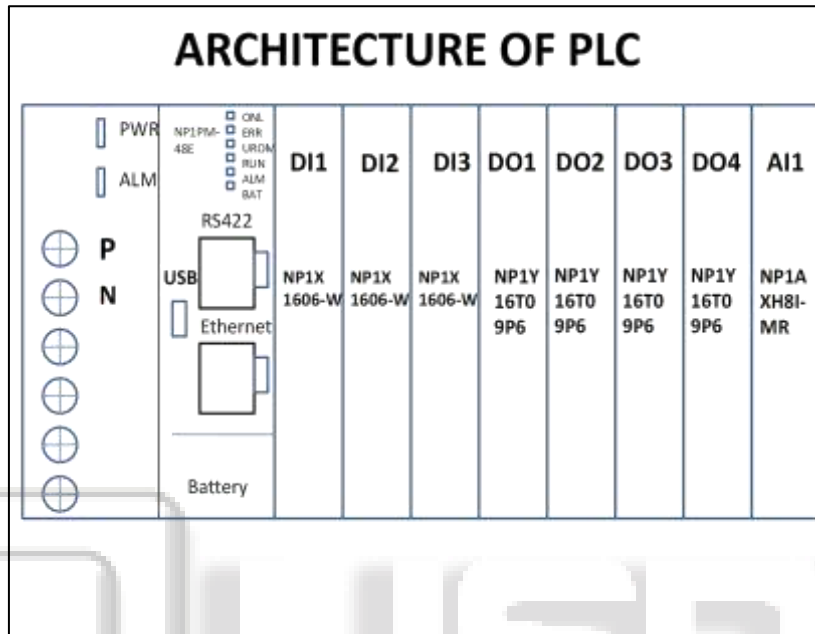


Fig. 2: Architecture of Plc

It Contains the Fuji PLC of 48E Modal, 3 Digital Card, 4 Digital Output Card, One analog input Card

VII. WIRING DIAGRAM OF DIGITAL INPUT

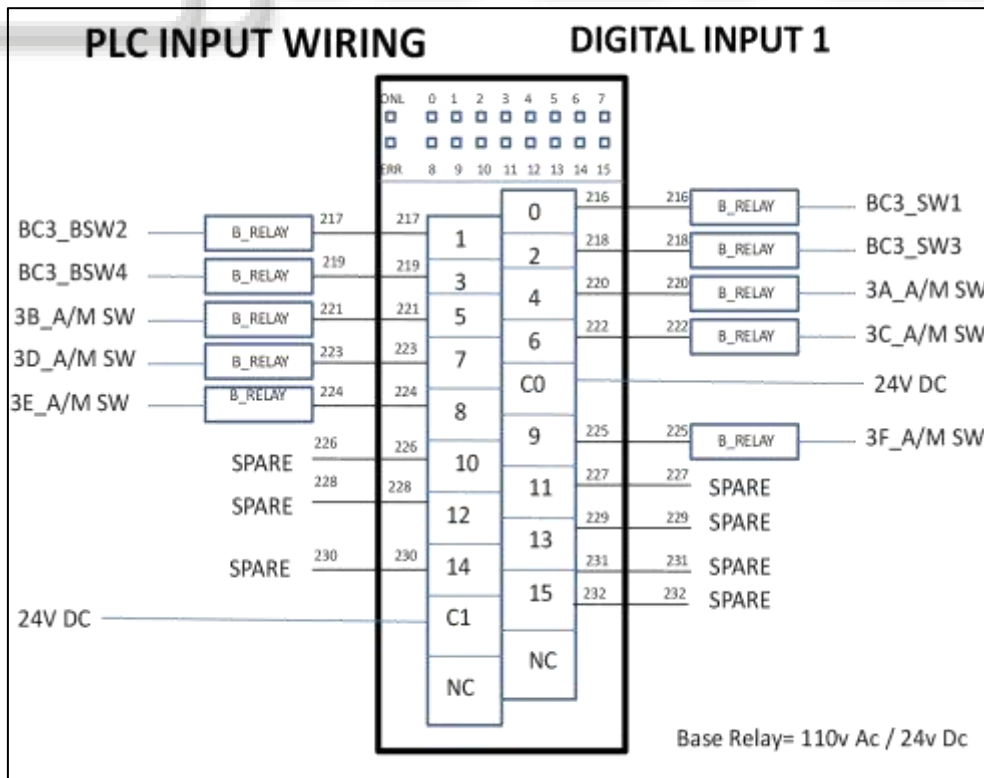


Fig. 3: Diagram of Input PLC Module 2

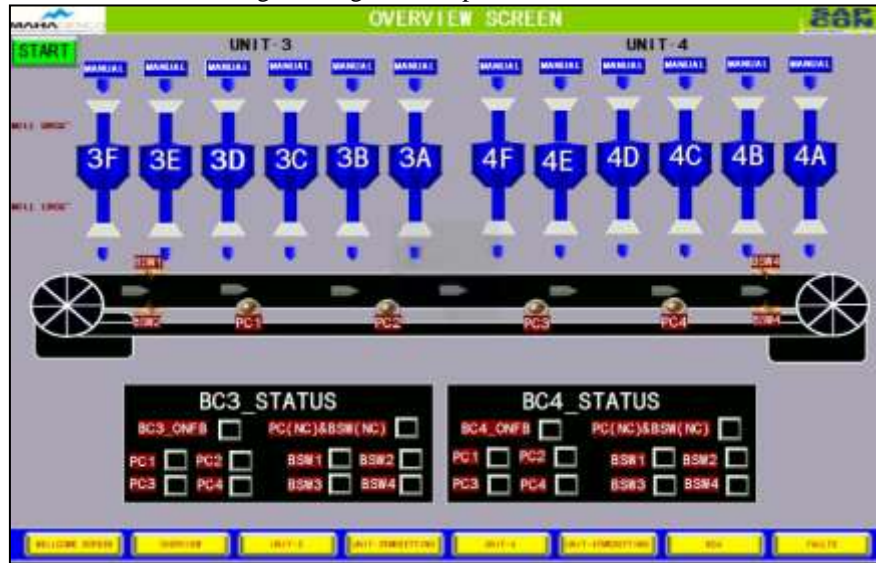
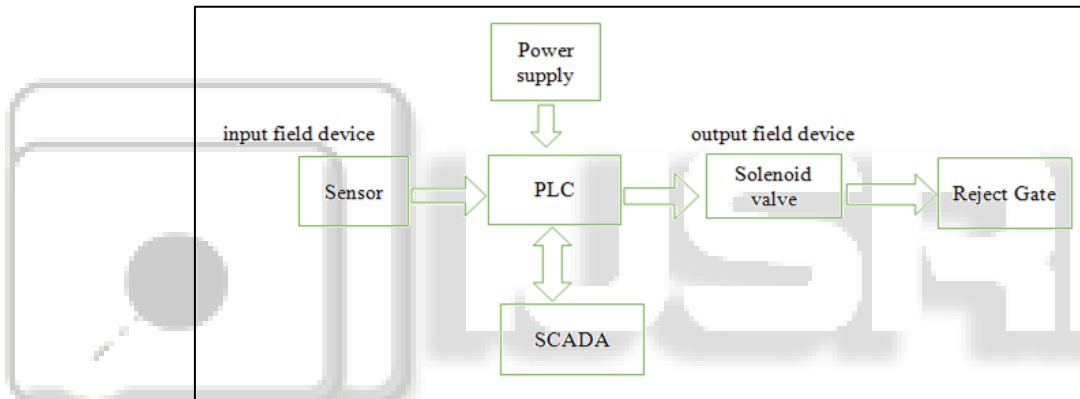


Fig. 1.3: Overview of Project

VIII. BASIC SCHEME & BLOCK DIAGRAM



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