

# MECHATRONICS BOOK SERIES

## CONTROL AND INTELLIGENT SYSTEMS

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Momoh Jimoh E. Salami  
Abiodun Musa Aibinu  
Yasir Mohd Mustafah



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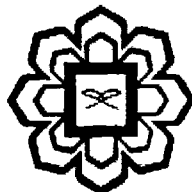
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# Chapter 6

## Development of Intelligent Belt Conveyor System

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### 6.1 Introduction

This chapter will describe design technique for Intelligent Belt Conveyor System. However, the conventional conveyor system has some serious problems, which are summarized as follows: Very inflexible and standalone system. In most cases each installation requires proprietary hardware and software for control and integration. Its Time consuming to set up. Once installed, it is almost impossible to change the system configuration, routing, speed, control rules and many more. In a multitude of commercial applications, it is common to employ a heavy duty conveyor belt for the purpose of transporting product and material. The belts so employed may be relatively long, on the order of miles, and represent a high cost component of an industrial material handling operation. In many applications, the belts are susceptible to damage from the material transported thereby and a rip (slit, cut or tear) may develop within the belt. A torn or ripped belt can be repaired once detected. The cost of repairing a heavy duty conveyor belt and the cost of cleaning up material spilled from the damaged belt can be substantial. If, however, such a rip or tear commences and the belt is not immediately stopped, the rip can propagate for a substantial distance along the belt.

### 6.2 Draw Back Of Existing System

The main problem of this system is required to keep continuous watch on each conveyor current because of choking of transfer chute or jamming of conveyor. Many times it is required to reduce the feeding rate by adjusting feeder to reduce the current of conveyor. When current comes to normal again it is tried to establish the required feed rate, if it is not again establish by stopping the conveyor system the problem is identify and attended. This problem majorly occurs in rainy season when coal is in wet condition. Sometimes operate specially cannot identify the increase current it will cause heavy coal spillage from transfer chute. This will tend to interrupt the supply of coal to boiler.

For sensing of speed simple proxy switches are used. These switches always cause problem due to coal spillage when they are mounted on tail end pulley. As proxy switches are basically on/off switches equipped with timer, they are less reliable. Some of CHP used centrifugal switch, which is driven by the conveyor. The main problem of this switch occurs when the spring functioning is improper i.e. reduction of spring tension.

The major problem of this system when the conveyor motor power fuses blows off, it will stop the rotation of conveyor but will not stop the upstream conveyors as controller sense motor is running because the control supply does not pick up motor off relay. Because of this the logic of system fails. The control of the system is not depending [1] on the quantity of dust emission and measurement of coal flow is not play any roll for controlling the system.