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Real-time Inventory Monitoring System

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Introduction

The objectives of this project as identified include “Real time Inventory Management” & “Tracking of Pallets movements”

Problem Statement

The company faced shortcomings in being able to maintain accuracy of record log of the present stock position for panels being pressed & to identify the rejection rate.

Pressing & Blanking Process: Presently blank sheets of steel are cut into sheets & pressed into forming various parts of the car like doors, body, etc. With an annualized capacity to manufacture nearly 7 million panels of differing car models such as SX4, Ritz, Alto, etc, it becomes imperative to capture the movement of the stocks alongwith an ability to trace the rejection rate.

The produced panels are then stored onto Pallets which are of metallic nature. Forklifts & other forms of mobile transport medium carry the pallets from one place to another with a max tonnage capacity of 2.5 tonnes.

Welding Process: The separate parts are welded together by a process called “Spot Welding”. Rejected parts at this stage are also not accounted for.

VEHICLE MANUFACTURING PROCESS

Pressing and Blanking Process

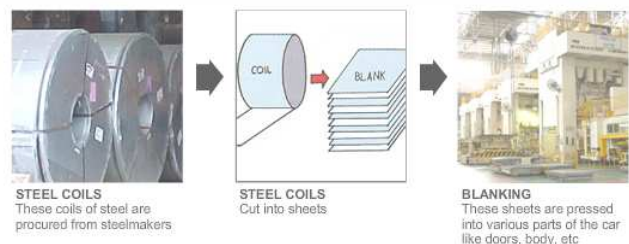


Fig 1.1 – Pressing & Blanking process

Previous Options

The only manner of taking stock position was through manual intervention but it seems a near impossible task given the production capacity of the Press Shop to convert blanks to panels at a rate of 1 panel per 1-5 seconds.

EssenRFID Solution

EssenRFID proposed an automated “intelligent RFID system” that tracks the production rate, identifies wastage, accounts for wastage, tracks the pallet movement & helps build greater process efficiencies into the system.

Each of the multiple Press shops would be equipped with Essen’s Proximity Reader which in turn interfaces with Essen’s Real-time tracking system as well as the Program Logic Controller (PLC). Data from PLC is fed into the back-end system after a task for say the first batch of 80 panels is produced.

The rejection rate is fed onto the system alongwith the pallet carrying capacity which is picked up by the reader.



Fig 1.2 – EssenRFID’s Touch screen kiosk

The forklift truck then picks up the filled pallet & transports it to the Weld shop facility.

When the filled pallet is being transported, a RFID enabled portal shall help determine the exact movement of the pallet in real-time, besides calculating pallet carrying capacity, type of panel being carried, etc.

Moreover the UHF tag will help define which type of pallet is carrying what kind of panels, determine as to whether the pallet is fully loaded or otherwise, etc

The panels then reach the weld shop wherein a second stage of QA process is undertaken resulting in a likelihood of greater number of rejections which is then fed onto the system.

Benefit 1

Appropriate stocking of inventory being maintained by the server & Oracle applications in real-time

Benefit 2

Tracking of movement of pallet & being able to identify its exact location & its loading/ unloading status

Benefit 3

Track rejection rate & help create & maintain process efficiencies

Implementation

All press shop machines are equipped with EssenRFID’s Proximity readers (near range) & all pallets are affixed with highly specialized UHF tags (Metallica™). The RFID portal is equipped with EssenRFID’s long range readers Xtenna™ capable of reading the pallets at a comfortable distance of upto 17 metres (50 feet).

The touch screen interface placed near the press shop contains all the relevant inputs being entered onto it on a regular basis.



Fig 1.3 – Aligning the panels onto a Pallet

Summary

The overall benefits accrued to the manufacturer would include the following:

- 1) Real-time Inventory Monitoring system
- 2) Identifying wastage thereby taking corrective steps to minimize on potential wastage
- 3) Real-time Trace & Track solution for pallet movement
- 4) Helps build process efficiencies & leads to further internalization of cost efficiencies adding to the overall cost competitiveness for the product.

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Essen RFID products used for the project:



Long range UHF reader



Short range UHF reader



Metallica™ UHF Tag