



Improvements to the bullion production process to improve quality, increase production levels and to improve safety by implementing a dual channel safety system for the conveyor.

Conclusions

In conclusion the project was successful. Through studies by the quality team, all damage that was occurring to silver bullion coin was eliminated leading to higher customer satisfaction. The lane shuffling device worked as desired ensuring production was more efficient. This led to an increase of 25% in the production rate. The conveyor system safety upgrade was also successful, following commissioning and testing, and complied with all relevant regulations which makes the equipment safer for the employees.

The Issue

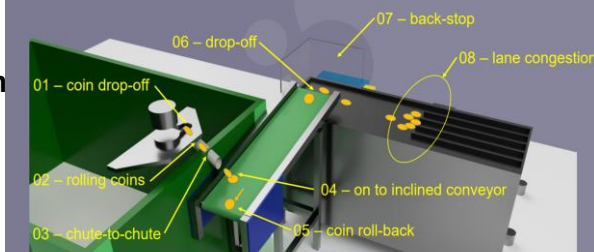
Damage was occurring to silver bullion coin, as seen in the image below. The damage was occurring during transfer of coins from the press to the packaging equipment as seen in the current state defect locations image. Production rates were also being affected due to the lane congestion and the operator needing to load the press with blank coins by hand.

SILVER BULLION



BRITANNIA 2022 1 OZ SILVER
BULLION COIN
BULLION | 999 FINE SILVER

The Current State Defect Locations



Introduction

Due to high customer demand and quality complaints, modifications to the bullion production line were required, to eliminate damage and to improve production rates.

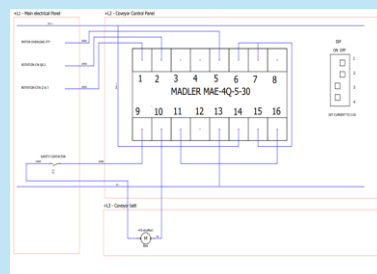
Aims

- Introduce a lane shuffling device to reduce lane congestion, stopping coins wedging together on the conveyor leading to the packaging machine, causing damage and lost production time
- Install conveyor to load blank coins into bullion press to improve production rates
- Design and implement safety control system to conveyor to ensure it is safe to use

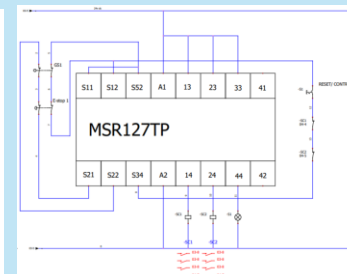
Design

Circuit diagrams were designed to control the lane shuffling device and to control the conveyor system safely

Lane shuffling device:



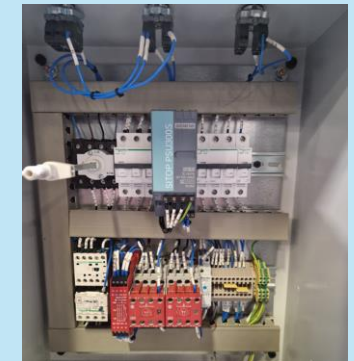
Conveyor safety control:



Implementation

Parts were purchased to build the panels following the circuit diagrams designed. A MADLER motor controller was purchased to control the shuffling device. A Rockwell MSR127 safety relay was used to integrate safety contactors and an emergency stop switch. The panels built are picture below:

Shuffling device control: **Conveyor control system:**



Recommendations

Due to the success of the shuffling device, I suggest that this system is implemented on other lines to improve other processes.

As the conveyor upgrade was successful and approved by the health and safety department, this exact control circuit can be used on other conveyors in our workplace, ensuring greater safety to employees that use them