

Evaluating And Implementing Improved Safety Systems In Vertical Milling Machines

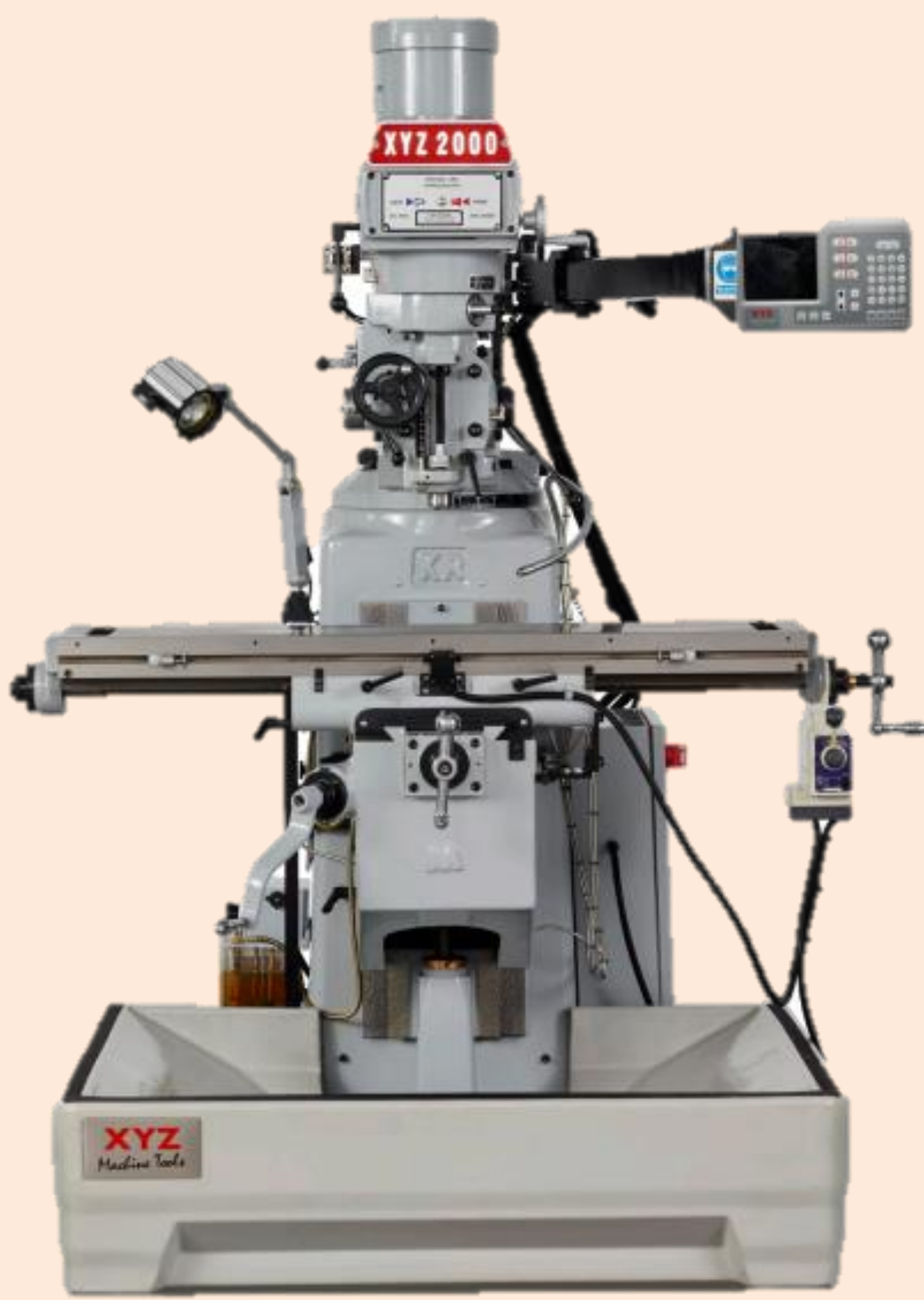


Fig 1 – XYZ 2000 (XYZ, 2025)

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Introduction

This project, based in Renishaw’s Custom Workshop at the Miskin Site, aims to improve safety on vertical milling machines, which pose serious risks like entanglement and amputation. The goal is to identify hazards, evaluate safety systems, and implement the most effective solution within budget, ensuring safer operations without compromising productivity.

Objectives	Methodology	Results
1. Identify current safety risks. 2. Evaluate existing and potential safety systems. 3. Select and integrate the best safety system within the budget. 4. Measure the effectiveness of the selected safety system. 5. Assess cost-benefit analysis. 6. Analyse data and provide recommendations.	The project reviews the evolution of safety standards and the historical accident rates associated with vertical milling machines. The project also discusses the financial implications associated with workplace injuries and highlights that the average HSE fine companies receive for machining related injuries in the UK is £250k. It also explores relevant enterprises and alternative safety technologies such as sensors and camera systems.	Interlocked spindle and drawbar guards fitted, along with additional kick e-stop. - Project cost: £3.4k 12 month labour cost saving: £16k - Return on Investment: 11 Weeks 

Future Recommendations



Based on operator feedback recommendations include;

- Andon-style colour coded light to show machine status as shown in fig 2
- Audible alerts to warn of hazards like unattended operation

This multi-sensory approach; system will:

- Boost operator awareness
- Strengthen safety protocols
- Improve overall machine safety

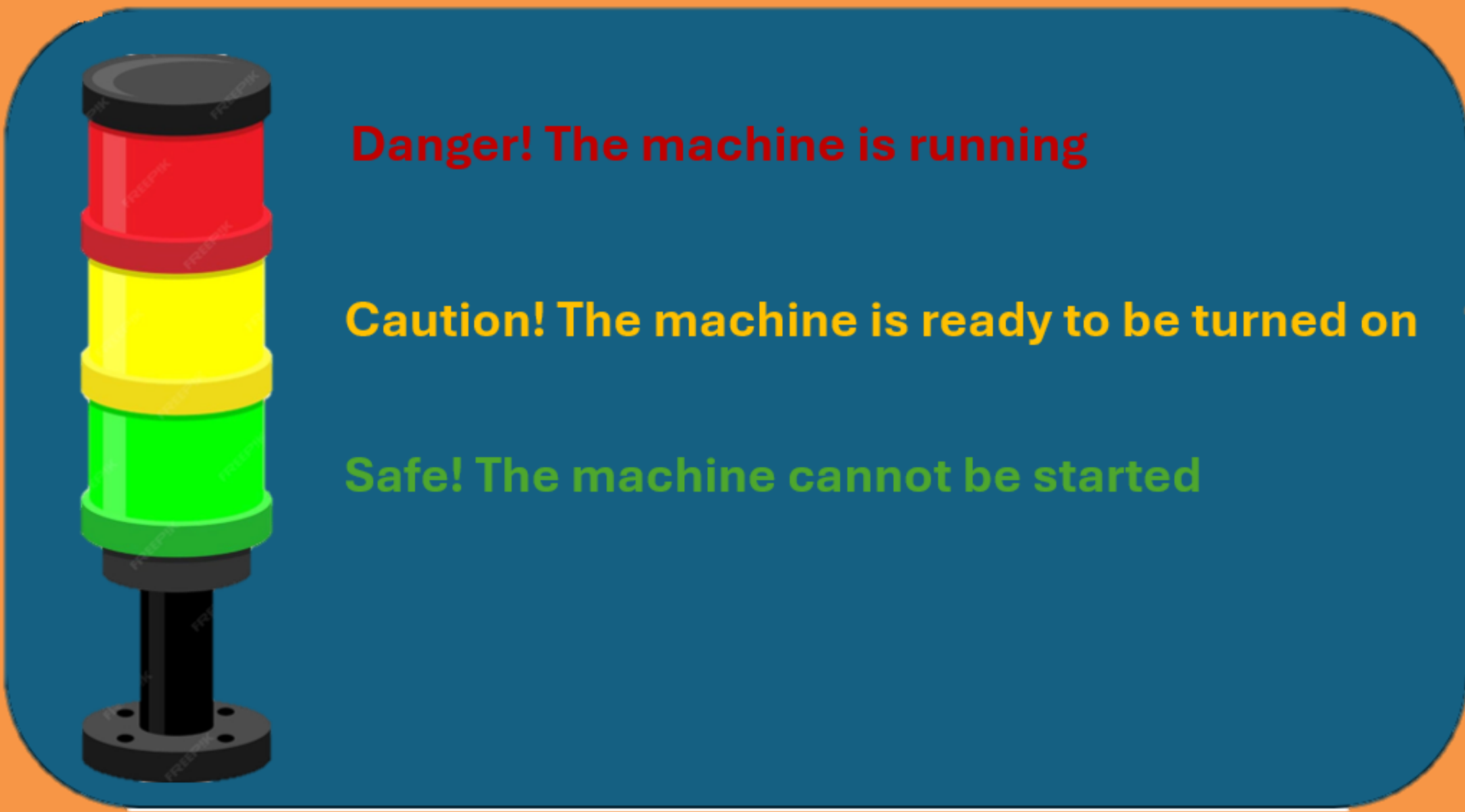


Fig 2 - Andon Light Tower (Korosi, 2025)

Conclusion

An enhanced safety system was implemented for vertical milling machines at Renishaw’s Custom Workshop, targeting entanglement risks. Using FMEA and MCDA, an **adjustable interlocked guard** was chosen over sensors and cameras due to integration challenges. The solution improved operator efficiency by **20%**, saved **£16k annually**, and achieved **ROI in 11 weeks**. This project showcases effective planning and provides a scalable model for future safety upgrades.