

Date: October 2025

Incident Summary

Conveyor belt started unexpectedly during maintenance despite active work permit and interlocks. Pull chord failed to function. The objective of this pilot is to demonstrate a live, digital barrier verification system connecting permits, PLC interlocks, and safety devices.

Barrier Effectiveness Overview

Barrier	Type	Owner	Effectiveness	Next Due	Remarks
Digital Work Permit (MCC handshake)	Preventive	Ops Supervisor	■ Weak	15-Nov	Needs PLC link
Smart LOTO QR Validation	Preventive	Maintenance	■ Good	10-Nov	Tested
Pull Chord E-Stop	Mitigative	Electrical	■ Failed	10-Oct	No heartbeat
Restart Interlock	Preventive	Automation	■ Weak	20-Nov	Pending update
Torque/Vibration Monitoring	Mitigative	Reliability	■ Good	25-Nov	OK
Incident Response SOP	Recovery	Safety	■ Good	20-Oct	Active

Digital Signals Integration

Signal	Source	Function
permit.active	Work Permit App	Inhibits restart while permit open
isolation.status	MCC/PLC feedback	Confirms de-energization
pullchord.health	E-Stop loop	Verifies emergency readiness
restart.request	HMI/SCADA	Cross-checks permit + isolation
alert.broadcast	Dashboard Gateway	Notifies anomalies before restart

Outcomes & Next Steps

- High residual risk due to non-verified barrier states.
- 80% of physical barriers effective; missing digital synchronization.
- API connection between permit system, PLC, and barrier monitoring recommended.
- Pilot rollout proposed for BF Raw Material Handling conveyor line.

Live Demo: <https://bowtie-eight.vercel.app>

