



Enterprise Innovation & Critical Infrastructure Deployment

PROOF OF CONCEPT (POC) ACCOLADE

Project Mandate:	Next-Generation Correctional Facility Security Ecosystem
Funding Body:	Financed and Appointed by an Independent Third-Party Agency
Core Strategy:	Reverse-Engineered Enterprise Optimisation of Off-The-Shelf Products

Executive Summary

Retrospective Trading has successfully conceptualised, engineered, and delivered a groundbreaking Proof of Concept (POC) that redefines high-security infrastructure management. Tasked with modernising a high-risk correctional facility under rigorous infrastructural and operational constraints, our team bypassed traditional proprietary limitations. By utilising optimized, commercial off-the-shelf (COTS) products, we engineered a unified, self-healing security ecosystem that meets stringent national security benchmarks while guaranteeing long-term financial and operational sustainability.

Challenge & Mandate Criteria

An independent third party financed this mandate to prove that a modern, multi-layered correctional defense system could be deployed without locking the facility into expensive, single-vendor proprietary software. The project demanded the seamless convergence of heavy physical engineering, digital networking, cutting-edge signal detection, and automated failovers. The POC successfully met and validated all the following criteria:

- **Pneumatic Infrastructure Automation:** Engineered direct digital control interfaces to safely command and monitor the facility's heavy, pre-existing pneumatic door infrastructure.
- **Legacy Backbone Optimisation:** Leveraged and hardened the facility's existing IP network backbone, eliminating the need for disruptive and costly structural recabling.
- **Commercial Off-The-Shelf (COTS) Sourcing:** Sourced 100% of the hardware from readily available, off-the-shelf products, completely eliminating reliance on specialized, low-availability components.
- **Self-Healing Architecture & Redundancy:** Designed an automated, decentralized network architecture that features built-in self-healing routing and instant hardware failovers to ensure zero operational downtime.
- **Intelligent System Health Analytics:** Implemented automated reporting protocols that continuously perform system health checks, instantly flagging and diagnosing offline devices.

- **Open-Source & Non-Proprietary Integration:** Utilized non-proprietary software frameworks to bridge disparate systems, ensuring the client retains complete ownership and flexibility over their software stack.
- **Airspace Drone Detection:** Integrated localized airspace monitoring to detect, track, and alert operators to unauthorized drone presence over the facility perimeter.
- **Contraband Cellphone Detection:** Deployed highly sensitive radio-frequency (RF) monitoring within lockdown zones to detect and geolocate active, unauthorized mobile devices.
- **Localized Panic Duress Alerts:** Engineered emergency panic buttons featuring general geolocation tracking to instantly feed spatial data to central command during an incident.
- **Interactive AV Overlay & Intercoms:** Developed a synchronized two-way communication framework that automatically initiates instant visual identification and projects a live video overlay onto the operator's console upon call activation.
- **Future-Proof Scalability:** Guaranteed a minimum 10-year technological lifespan, built on modular architectures that allow for limitless hardware and software expansion without systemic bottlenecks.

The Retrospective Advantage: Reverse-Engineered Correction

The true triumph of this POC lies in Retrospective Trading's unique ability to reverse-engineer and correct commercial off-the-shelf hardware. Standard mass-market products are typically restricted by factory firmware limitations, generic software bugs, or weak out-of-the-box cybersecurity.

Our engineering team stripped down, hardened, and custom-programmed these affordable COTS products. By forcing mass-market devices to communicate via sophisticated, open-architecture industrial protocols (PLC integration) and custom software layers, we achieved enterprise-grade, militarized reliability at a fraction of the cost of legacy defense-brand systems. This successful deployment establishes Retrospective Trading as a tier-one systems integrator capable of conquering the most complex critical infrastructure challenges on the globe.