



CASE STUDY  
ENHANCING LITHIUM-ION BATTERY SAFETY  
ACROSS A BLUE LIGHT ORGANISATION

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## THE CHALLENGE

A national policing authority, operating across critical national infrastructure, faced increasing risks associated with the storage of confiscated lithium-ion batteries. Due to the sensitivity of the information and to protect critical national infrastructure, the client has chosen to remain anonymous. The authority initially proposed a centralised model, requesting several large battery safes with full fire suppression systems. However, operational analysis revealed significant challenges, including:

- Increased risk during the transportation of **hazardous** batteries.
- **Inefficiencies** from moving items across geographically dispersed sites.
- **Budget constraints** limiting full network coverage.

The authority required a safer, more practical solution that would protect both personnel and infrastructure without compromising operational effectiveness.

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# THE SOLUTION

After a comprehensive risk assessment and consultation, a decentralised approach was recommended.

The focus shifted to providing on-site storage at each operational location, eliminating the need for hazardous transportation and ensuring immediate secure storage.



## KEY ELEMENTS OF THE SOLUTION INCLUDED:



**Decentralised Storage Model:** Instead of a few large central safes, smaller, strategically placed safes were installed at each site, making secure storage readily available where needed.



**Battery Storage Units:** Smaller units, such as the **Model 1283 – Battery Titan Large Model** and **Model 0442 – Battery Fighter Medium Model**, were deployed, offering digital locking, smoke detection, robust steel construction, and internal shelving. Larger units, such as the **Model 1934 – Battery Commander Large Model** (available in charging and non-charging versions), were reserved for forensic investigation sites, ensuring compliance with specific forensic security protocols.



**Focus on Fire Prevention:** By opting for safes without integrated charging where unnecessary, the risk of thermal runaway incidents was significantly reduced.



**Digital Access Control:** A unified code system was implemented, enabling authorised officers to access the safes swiftly while preventing unauthorised entry.



**Cost Efficiency:** Recalculations showed that decentralised safes allowed almost every operational site to be equipped, enhancing safety coverage across the network with only a marginal increase in investment.



**Future Scalability:** The solution allowed for the easy addition of safes if operations expanded or safety regulations evolved.











## THE IMPLEMENTATION

The project was carefully phased and coordinated to meet the unique challenges of a live operational environment.

Key implementation aspects included:

-  **Stakeholder Engagement:** Regular consultations were held with procurement and operational teams to align technical specifications with operational needs.
-  **Site Surveys and Risk Assessments:** Before installation, fire risk assessments and operational surveys were conducted at each location to determine the safest and most practical placement for the battery storage safes.
-  **Flexible Deployment Scheduling:** Installations were planned to minimise disruption, taking into account periods of low activity, staff relocations, or station refurbishments.
-  **Direct Communication with Sites:** A project contact was assigned to each location, ensuring clear communication about delivery times, installation procedures, and access codes.
-  **Training and Handover:** Officers at each site received guidance on safe usage, access codes, and basic fire safety protocols.
-  **Quality Assurance:** Post-installation inspections ensured each unit was correctly installed and compliant with fire and security standards.

Despite numerous challenges, including staffing levels and construction work at some stations, the project was completed successfully across nearly 150 sites, achieving full operational readiness without major disruption.



## THE OUTCOME

The project delivered significant and measurable improvements to the authority's fire safety framework:

- All sites are now equipped with lithium-ion battery safes, greatly increasing fire safety compliance.
- Transportation and handling risks related to hazardous batteries have been reduced.
- Officers now have immediate access to secure storage, improving operational efficiency and enforcement capabilities.
- Digital locking systems provided secure access control, reducing the risk of unauthorised handling.
- Fire safety standards for forensic investigations were maintained through the strategic placement of larger specialist safes.monitoring, tailored for forensic investigation sites.

## THE CONCLUSION

This project demonstrates the success of a decentralised safety strategy tailored to operational needs. Through collaboration, innovation, and flexibility, fire safety was enhanced, operations were streamlined, and battery storage practices were future-proofed across a critical UK policing network

## MODELS

### SPECIFICATIONS & FEATURES

**Model 1934:** Large capacity unit with integrated fire suppression and temperature monitoring, tailored for forensic investigation sites. (Available in charging and non-charging versions).

**Model 1283:** Large-size unit with advanced security features, ideal for larger batteries like those used in e-bikes and power tools.

**Model 0442:** Medium-size unit with digital locking and enhanced fire safety features.



## THE RISKS

Lithium-ion (Li-ion) batteries, commonly found in portable electronics, power tools, e-scooters, and electric bikes, are increasingly prevalent due to their high energy density and rechargeability. However, their widespread use also poses notable risks, primarily thermal runaway—a chain reaction leading to battery overheating, combustion, or even explosions. Common triggers for thermal runaway include:

- **Manufacturing defects**
- **Physical damage or impact**
- **Improper storage conditions**
- **Overcharging or charging faults**

Given these factors, the storage and handling of lithium-ion batteries demand specialised safety solutions to protect property and lives, especially in public or densely populated settings such as transport hubs.

# TECHNICAL INNOVATION

The battery storage units utilised in this project incorporate advanced technological features tailored specifically to mitigate the inherent risks associated with lithium-ion batteries:



**Thermal Management Systems:** Safes are designed with heat-resistant insulation (Styronite F), ensuring prolonged protection against internal battery fires.



**Integrated Smoke Detection:** Early detection is vital to prevent catastrophic events. Each safe features built-in smoke detectors linked to external wireless alarms for immediate alerts.



**Automatic Ventilation and Isolation:** High-capacity units like the BS1934 Battery Commander include heat-protected ventilation ducts with thermal fuses to automatically seal in the event of fire, preventing oxygen influx and isolating the threat.



**Multipoint and Automatic Locking:** Robust locking mechanisms secure contents, ensuring that even under extreme conditions, doors remain sealed, protecting first responders and property.

## COMPLIANCE

Compliance with national and international safety standards was paramount throughout this project:

- **NT Fire 017 Certification:** Safes tested to withstand intense fire conditions and impacts, crucial in public safety environments.
- **ISO 3864 & ISO 7010:** Ensuring clear hazard communication via mandatory safety labelling to alert users about potential risks.

Maintaining rigorous compliance with these standards not only protected the client operationally and legally but also ensured peace of mind for the workforce and general public.

## SUSTAINABILITY

The decentralised storage approach significantly reduced the carbon footprint associated with transporting hazardous batteries between locations. This reduction in transportation mileage has contributed positively towards sustainability goals, aligning with broader governmental objectives to reduce emissions and enhance environmental stewardship.

Additionally, by preventing battery fires and incidents, the project supports longer-term sustainability by reducing environmental harm caused by battery combustion byproducts and waste disposal issues.

### LESSONS LEARNED AND FUTURE RECOMMENDATIONS

Throughout this project, several key insights were identified, which are valuable for future initiatives:

- Effective collaboration with operational stakeholders at all levels significantly enhances implementation success.
- A decentralised model not only mitigates risk but also provides greater operational resilience and flexibility.
- Ongoing training and regular refresher briefings for personnel are critical in maintaining safety awareness and effective operational practices.
- Future recommendations include continuous monitoring of technological advancements in battery storage and fire prevention, ensuring that installed solutions remain at the forefront of safety technology. Regular risk assessments and audits are recommended to accommodate evolving safety standards and operational requirements.

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