



CASE STUDY THE ROYAL NAVY

SAFE CHARGING FOR HIGH CAPACITY DRONE BATTERIES

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THE CHALLENGE

In October 2024, Phoenix Safe received an enquiry from the Royal Navy's Drone Squadron regarding the safe storage and charging of high capacity lithium ion batteries used for tactical unmanned aerial vehicles. The existing options on the market simply did not make the cut. Most lacked the shelf loading, internal volume or safety features needed to handle the Navy's growing inventory of powerful T150B Malloy Aeronautics batteries.

Each battery weighed 26 kilograms and delivered up to 5.44 kilowatt hours, making them serious pieces of kit. At the time, the squadron held 20 of these, but they expected that number to double to 40 in the near future. On top of that, there were another 140 smaller drone batteries needing secure containment. They needed more than just a steel cabinet. They needed a safe, smart solution that could:

- Safely store and charge high capacity batteries
- Handle future growth in battery numbers and formats
- Offer integrated fire suppression, detection and alert control
- Prevent overloads and provide real time warnings
- Fit within strict site and security requirements
- Come fully supported with technical guidance and servicing options

A Teams meeting was booked immediately, and within 24 hours the Phoenix team was walking them through their safest option.

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THE RECOMMENDATION

After discussing the site constraints, battery specifications and operational workflow, it was clear that the Phoenix Battery Commander BS1934 was the only unit that ticked every box. With over 626 litres of internal capacity, heavy duty adjustable shelving, fire protection and built-in charging support, the BS1934 could comfortably accommodate the Navy's current needs and future growth.

The recommendation also included additional components to tailor the cabinet to the specific operational risks involved. These included fire suppression systems, external control units, upgraded power distribution units and a three phase power supply for high demand charging.

To speed up the procurement process, Phoenix Safe supported the Navy through the Unite Tailspend framework to allow fast and compliant purchasing.



THE SOLUTION – BS1934E SPECIFICATION

HERE IS WHAT MADE THE BS1934E THE STANDOUT OPTION

STORAGE AND WEIGHT CAPACITY

- Three adjustable heavy duty shelves
- Each shelf rated to 100 kilograms, ideal for the 26 kilogram batteries
- Secure layout for up to 40 large format batteries.

FIRE PROTECTION AND CONSTRUCTION

- 90 minute fire resistance tested to EN14470 Part 1
- Double wall construction with Styronite F fire resistant insulation
- Doors fitted with automatic closing and locking mechanism
- Drop tested to simulate structural failure in building collapse.

SUPPRESSION AND SAFETY SYSTEMS

- Integrated aerosol based fire suppression unit
- Internal smoke detector and alarm
- External temperature display for early warning
- Multi point locking system to keep doors sealed under extreme conditions.

CHARGING AND POWER CONTROL

- Supplied with 4 two gang power distribution units
- Upgraded to 3 phase supply to prevent overload
- External extraction vent provided for safe heat dispersal during charge cycles.

VENTILATION AND CONTAINMENT

- External duct ready for forced extraction fan
- Reduces heat build up and oxygen influx in the event of thermal runaway.

SMART MONITORING AND ALERTS

- Optional SP Safe Monitor connects to mobile app for alerts
- Fitted with full fire suppression, control unit and visual alert system.

MOBILITY AND PRACTICAL DEPLOYMENT

- Cabinet supplied on a plinth with removable cover
- Easy to site, reposition or remove from premises if required
- Locking system upgraded to high security electronic version.



THE DEPLOYMENT TIMELINE

- OCT 2024** **October 2024:** Initial enquiry received. Virtual meeting held next day to assess needs
- NOV 2024** **November 2024:** BS1934E confirmed as viable solution following battery analysis
- DEC 2024** **December 2024:** Configuration finalised. Procurement supported through Unite Tailspend
- JAN 2025** **January 2025:** Specification agreed including suppression, control system and power upgrades
- FEB 2025** **February 2025:** Delivery logistics and site access agreed
- MAR 2025** **March 2025:** Cabinets delivered, installed and fully operational



THE OUTCOME

Phoenix delivered a future ready solution that gave the Royal Navy operational confidence and peace of mind. With the BS1934E installed, the squadron can now:

- Safely charge up to 40 large format lithium ion batteries at once
- Prevent overloading during charge cycles
- Expand to accommodate additional drone batteries in future
- Meet strict safety and compliance standards with no compromise.

THE CONCLUSION

This partnership reinforced Phoenix's role as a trusted supplier to the United Kingdom's most critical services, including defence, emergency response and public safety organisations.

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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