

Memorandum (MEMO-EL-001)

Report Name	SEARS - Batteries and Diesel Storage Hazard Mitigation
Project	Station Road Data Centre Expansion
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Objective

This memorandum will provide a plan to demonstrate compliance with minimum requirements outlined in Planning Secretary's environmental assessment requirements (SEARS) in regards to the batteries and diesel storage proposed on the Station Road data centre expansion project.

The memorandum is addressing the following item that is outlined as an additional assessment requirement in the Station Road Data Centre Expansion (SEARS) letter no. (SSD-33781208):

- Hazards – For any batteries and diesel storage, the EIS must demonstrate the development

would comply with the following standards:

- o AS/NZS 4681 – Storage and handling of Class 9 (miscellaneous) dangerous goods and articles
- o AS IEC 62619 – Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications
- o FM Global Property Loss Prevention Data Sheet 05-32 – Data Centres and Related Facilities
- o AS 1940 – Storage and handling of flammable and combustible liquids.

Quantifying Compliance

The SEARS outlines minimum requirements which must be demonstrated in preparation for the environmental impact statement (EIS), these include compliance with the following standards,

- AS/NZ S4681 Storage and handling of Class 9 (miscellaneous) dangerous goods and articles

- AS IEC 62619 – Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications
- FM Global Property Loss Prevention Data Sheet 05-32 – Data Centres and Related Facilities
- AS 1940 – Storage and handling of flammable and combustible liquids.

Demonstration of Compliance

Diesel Fuel

Site Planning Considerations

- The location of diesel generators with integral bulk fuel storage have been developed with the requirements of AS1940 dictating the distance from on-site protected places. The proposed locations, approximately 4.75m from the building and minimum 600mm from other fuel tanks, are in compliance with Tables 5.3 and 5.4 of AS1940 for the 37500L integral fuel tanks.
- Roadways have been designed to accommodate the turning swept paths of heavy vehicles and wide enough to accommodate a re-fuelling truck width plus additional vehicle to pass adjacent.
- Client standard requirements do not allow any permanent equipment to be located within 3m of the roadway kerbs without crash barriers to protect the equipment.

Fire Protection Systems

- Generator containers are walk in plant rooms fully fitted with lighting, egress pathways, security systems, ventilation and fire protection systems. This is inclusive of thermal and smoke detectors interfaced to the overall building system.
- Fuel transfer pumps are fitted with fuseable valves in the occurrence of a fire event, these will automatically, physically interrupt the flow of diesel fuel from the bulk tank to the generator / generator enclosure. This is aligned with the requirements of FM global guidelines.
- Generator enclosures are fitted with fire extinguishers to suppress a diesel fire.
- Sound suppression material is of a non-combustible type in accordance with FM Global Datasheet 05-32.

Leak Detection Systems

- Generator fuel tanks are designed with double walls in accordance with AS1940. The void between these two walls are provided interstitial leak detection interfaced to the sites building management system to alert personnel of a leak.
- Generator enclosures are provided an integral fill point with visual indicators alerting of the fill level of the diesel tanks. Fill points are also provided a minimum 15L overflow containment as per AS1940, as well as spill kits local to the fill point.

- The bulk fuel tanks are set to a fill level 20% less than the total capacity of the tank. This mitigates the risk of overflow with sufficient time for an operator to take action when filling fuel.
- The generators internal plant space is also provided leak detection interfaced to the sites building management system.

Vendor Product Selection

- The diesel generator systems are a pre-engineered, tested and enclosed type. The enclosure is manufactured with an integral bulk fuel tank under the enclosure. The standardised construction and typical arrangement across the clients global fleet provides added assurance of increased mean time before failure.
- As part of the generator procurement, the design team will mandate compliance with AS1692 which specifies requirements for the design and construction of steel tanks for the storage of flammable and combustible liquids.

Hazard Event Mitigation

- Generator fuel tanks are provided diesel fuel polishing systems to maintain the integrity and stability of the fuel.
- Generator enclosures are provided several emergency stop buttons in accordance with FM global requirements, external to the enclosures as well as hazard indicator strobes which activate in an alarm condition.
- Diesel generators are provided battery powered controls and starting system, as well as water jacket heaters to maintain ideal operating temperatures for starting as per FM global requirements.
- A standardised maintenance plan is proposed by the client, aligned to their global standard. This includes for testing as well as inspection of all systems.

Battery Systems

Building Planning Considerations

- The uninterruptable battery systems proposed have been designed to have the battery cabinets remote to the UPS power modules. The batteries are located within 120/120/120 FRL rooms accessible via the same electrical room as the UPS power module. This provides the benefit of maintaining UPS general controls in a safe location separate from the hazard.

Fire Protection Systems

- The battery rooms are provided smoke and thermal detectors interfaced to the building system as well as fire sprinklers.
- Battery rooms are provided battery exhaust fans supplied via the life safety services low voltages supply, including fire rated wiring system in accordance with AS3013. The battery exhaust system also serves to exhaust smoke in the event of a fire.

Battery Monitoring Systems

- A battery monitoring system is provided to each battery cabinet. The system is standalone to each cabinet meaning there is no single point of failure. Additionally, the system is independent of the UPS power modules and are provided an external LV battery power source to ensure controls and monitoring are online in all conditions.
- The battery monitoring system is interfaced to the building management system to alert personnel of a failing battery module. Additionally, battery temperatures are monitored and the system automatically shuts down an out of tolerance cabinet to mitigate thermal runaway.

Vendor Product Selection

- Battery cabinets are a UL9540A compliant product. This standard outlines the performance of the battery cabinets in a thermal runaway event, where compliance ensures a fire hazard does not spread to surrounding cabinets.
- Vendor selection is undertaken via a process of due diligence, ensuring the products are compliant to relevant standards including IEC 62619. Test reports via an independent and accredited lab are reviewed and verified.

Hazard Event Mitigation

- In addition to the fire suppression system proposed, the battery cabinets are provided a remote isolation facility to shutdown the battery demand. This facility is proposed to be adjacent the battery room, within the electrical room but segregated from the hazard.

General Statement

Typical engineering practice requires due diligence to achieving project requirements in regards to technical parameters, permitting, best practice and safety. These considerations are integrated throughout the early design phase via engagement with specialist consultants, vendors and other stakeholders. The data centre expansion project is currently undergoing this design phase and will mandate compliance with requirements which mitigate the hazards presented by batteries and diesel storage. Compliance with these requirements will form part of the builders contract for delivery of the project.