

**ELECTRICAL
ENGINEERS'
NOTEBOOK**

LIMITED EDITION

E-TEC Power Management Ltd

E-TEC Power Management Ltd is an engineering led business with bases in the UK, Ireland, the Netherlands and Germany. Since its formation in 1999, the E-TEC group of companies have been supplying a full range of fully integrated, innovative Complete Power Solutions into a broad spectrum of companies and businesses.

The E-TEC name is synonymous with engineering excellence and technical competence in the provision of power solutions. Complimenting this, with project experience spanning Europe and many locations globally, the group is internationally recognised and respected for its endeavours in the field of data centre infrastructural solutions.

E-TEC services include:

- Design & Consultancy
- Fire Protection
- Generator Systems
- DC Systems
- UPS Systems
- SCADA & Remote Monitoring
- Battery Replacement
- Virtual Engineering (PEARL)
- LV & MV Switchgear
- Service, Maintenance & Support
- Cooling Systems
- Site Surveys
- Rack Systems
- Building Construction & Fit-Out

Turnkey Data Centre Solutions

E-TEC specialises in the provision of turnkey solutions whether upgrading an existing power supply or installing a complete end-to-end solution. With decades of combined experience, our project management and engineering team can design and implement the best technical solution from MV intake right down to PDU distribution including Generator and UPS systems, Switchgear and Infrastructural Solutions.

Working with our partners, E-TEC can provide the physical building, the fit-out and environmental solutions that create the complete turnkey package.

Standby Generating Systems & Fuel Systems

E-TEC offers a full range of services:

- Design & Consultation
- Standby Generating Systems & System Upgrades
- Attenuation & Exhaust Systems
- Bulk Fuel Systems
- Control Systems
- Full Turnkey Solutions
- Containerised & Temporary Generator Systems

UPS Systems

E-TEC offers a full range of services:

- Design & Consultation
- UPS Systems & System Upgrades
- Containerised & Temporary UPS Systems
- Full Turnkey Solutions
- Battery Systems including Installation, Commissioning & Replacement

SCADA & Total Power Monitoring

Our in-house software team have developed a uniquely powerful Total Power Monitoring system which can accurately measure and monitor the power consumption within a building or data centre. We specialise in designing and implementing SCADA (Supervisory Control And Data Acquisition) based solutions which integrate all key areas of the power distribution network from the incoming HV supply down to individual LV supplies feeding the data cabinets. The SCADA system offers equipment specific graphics and incorporates user manuals and commissioning data for each system element, providing the end user with greater ease of use and familiarity.

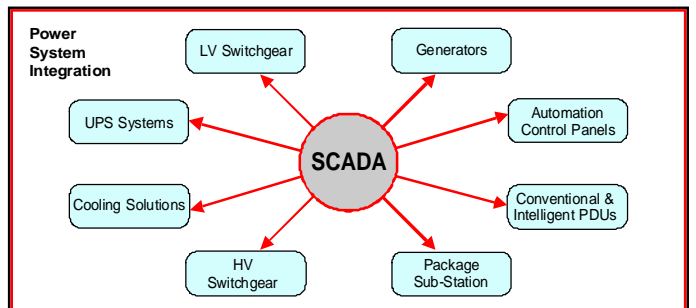
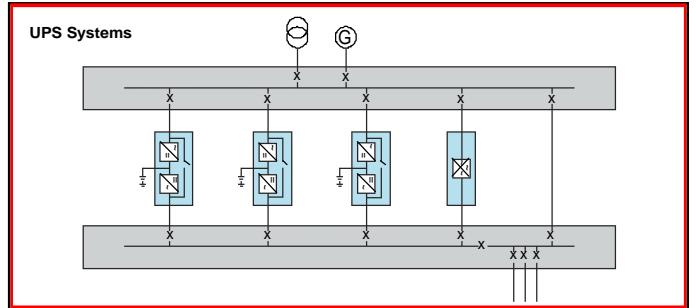
Virtual Engineering (PEARL)

E-TEC has developed its **PEARL** (Package Engineering Application and Reality Layout) software which allows us to easily visualise in 3-D any real or proposed changes to plant rooms and data centres alike, as well as develop new designs with our clients in real-time. **PEARL** gives us the opportunity to work from a realistic virtual test bed and adjust it to simulate and demonstrate current and future needs. It also enables us to measure power, space, structural requirements and provide costs for a variety of proposed equipment and installation options. It can even incorporate all the technical aspects of a project from electrical schematics and specifications to animated installation processes.

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Service & Maintenance

E-TEC's highly qualified and trained service teams have a wealth of experience working on Generator & UPS systems. We operate a 'Best-in-Class' approach in all our working practices and are highly regarded within the building services and data centre market place. We offer a full range of maintenance regimes to suit each individual client including:

- Generator Maintenance
- UPS Maintenance
- Switchgear Maintenance
- Battery Maintenance, Replacement & Disposal

Design & Consultancy

E-TEC can offer design and consultation services in all aspects of backup power system design and are capable of providing full turnkey solutions that are catered to the individual needs of each and every client.

Within the UK alone, E-TEC has an ever growing installed base providing fully integrated, cost effective and scalable solutions within a wide range of systems and environments. Additionally, E-TEC's innovative and bespoke solutions provide increased flexibility, adaptability and redundancy to suit each specific application.

E-TEC
POWER MANAGEMENT

E-TEC Power Management Ltd

Turnkey Projects for Computer Rooms & Data Centres

E-TEC works closely with clients to design, implement and support, complete "Best-in-Class" data centre infrastructural solutions, to ensure maximum availability for mission critical processes. From small scale computer rooms to large scale data centres, E-TEC specialise in providing complete turnkey solutions involving the full integration of power, cooling, physical infrastructure, network management and monitoring, fire protection and security.

Case Study Summary No. 1

(Financial Sector)

Project Type: Data Centre Enhancement | London

Project Brief: Design, supply and install 3 No. 2.5 MVA diesel generators in bespoke acoustic enclosures, together with all associated control systems and equipment.

Project Description: When originally established, the data centre was powered by 4 No. 2.5 MVA generators. When the decision was made to extend and enhance the data centre capacity and upgrade all support services to suit, E-TEC Power Management Ltd was selected to provide all aspects of the new power generation requirement. As well as the new generators the contract included provision of an additional 60,000 litre bulk fuel tank with all associated pipe work and controls, feeding fuel via a ring main circuit to 1000 litre double skinned day tanks, each tank located adjacent to the generating set within the acoustic enclosures.

Design Criteria & Scope of Supply:

- Design, supply & installation of 3 No. 2.5 MVA sets powered by MTU 20V4000G22 engines, complete with switchgear & control gear
- Integration of the new control system with the existing generator controls
- Provision of modular acoustic enclosures to achieve a specified noise level of 68 dB(A) @ 1m with all sets running
- Extension of the fuel farm to cater for the additional sets
- There was to be absolutely zero risk of power loss to the building whilst the new system was commissioned & made 'live'

Case Study Summary No. 2

(Business & Financial News, Media Sector)

Project Type: Generator Upgrade | London

Project Brief: Remove and relocate existing generator radiators to create space for the new equipment. Design, supply and install 2 No. 2.5 MVA diesel generators in bespoke acoustic enclosures, together with all associated control systems and equipment.

Project Description: The client appointed E-TEC Power Management Ltd to carry out the generator upgrade works at their prestigious London building. E-TEC was chosen for our specialist experience in the provision and execution of particularly difficult projects such as this. In short, an external location on the ninth floor was chosen for the new equipment which was already occupied with two large cooling radiators serving the existing sets. Since the proposed location for the new equipment was away from the central core of the building, the weight limitation of loading allowed per square metre was dramatically less than the proposed load to be installed. The solution was a radical design change which saw the cooling radiators sited remotely from the engine and suspended on steelwork from the floor above. In addition, the massive engine exhaust silencers were to be acoustically housed and given the same treatment, also suspended from the steelwork of the floor above. It was necessary to raise all this equipment to high level prior to locating the generators and associated acoustic housings.

Design Criteria & Scope of Supply:

- Design, supply & install 2 No. 2.5 MVA diesel generators together with all associated control systems & equipment
- Bespoke acoustic enclosures designed to achieve a maximum noise level of 65 dB(A) @ 1 m
- Generators were unable to be installed in conventional form due to a major weight restriction
- Project management, logistics & sequencing of events to locate the new equipment on the mezzanine section of the ninth floor of the building
- Integration of the new E-TEC technically superior control system with that of the existing equipment

Case Study Summary No. 3

(Co-location, Data Centre Hosting Sector)

Project Type: Data Centre Enhancement | London

Project Description: This project formed Phase 1 of the works to design and build a fully self-contained POD architecture, providing the 'A' side of the desired final A and B system. The 'B' side to the system shall form the future Phase 2 works.

The Role of E-TEC: Design and Build, Full Turnkey Package, E-TEC working direct with the client at every point.

Scope of Supply:

- 3MVA of UPS (N+1)
- GRP Enclosures
- 11kV Packaged Sub with Input/ Output Switchboard
- Raised Flooring
- Cabling & Containment Systems
- Static Transfer Switch PDU (600A) with Isolation Transformer

Additional information:

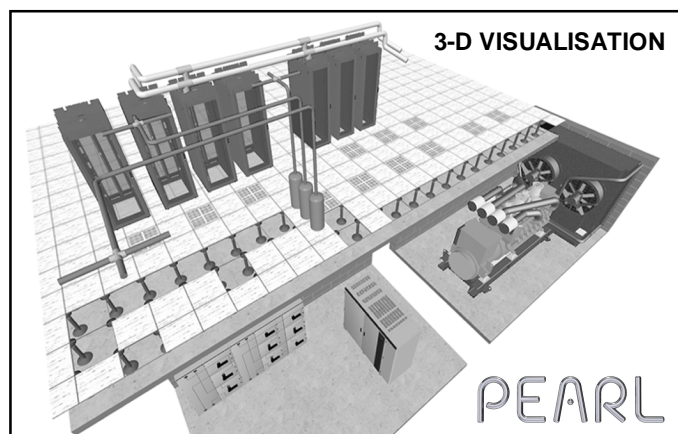
- The project was finished in its entirety within 3 months & on time
- E-TEC was chosen on the basis of their technical competence & expertise
- The project included E-TEC SCADA & Total Power Monitoring System, allowing full energy management from incoming supply right down to individual server cabinets

Client Focus & Commitment

E-TEC Power Management Ltd has undertaken projects across a broad and varied range of market sectors, with each project presenting its own unique requirements and challenges. Our technical knowledge combined with our focus and commitment has enabled E-TEC to provide tailored solutions to the highest design standards. As a company we continue to grow and develop on this reputation to an ever expanding customer base of blue-chip companies.

Client List (Extract)

- Morgan Stanley
- T-Mobile
- Sungard Availability Services
- IBM
- Thomson Reuters
- BNP Paribas
- Lloyds TSB
- Level 3 Communications
- Barclays
- Global Crossing



E-TEC Power Management Ltd Provides:

- Standby Generating Systems - 20kVA to 3MVA +
- Fuel Systems
- UPS Systems - 3kVA to 2MW +
- Switchgear - LV Switchgear up to 6000A & MV Switchgear up to 1200A
- Cooling Systems
- Server Rooms & Rack Systems
- Raised Flooring
- Data & Power Cabling
- Fire Alarm & Protection Systems
- Energy Efficient Lighting
- SCADA & Remote Monitoring
- Security, Access Control & Video Monitoring Systems
- Building Construction & Fit-Out