

# Case Study: RAF Lakenheath



USAF (Defence Sector) Modular Data Centre Project –£5.3m

**Workspace**  
Technology Limited  
Data Centre Solutions Expertly Engineered

## The Challenge

As part of ongoing I.T infrastructure investments the USAF commissioned a 190 Rack 2MVA standalone data centre facility at RAF Lakenheath. The project involved the Design & Construction of a two-storey steel frame, modular building, as well as complex technical fitout works. Workspace Technology undertook a complete “Design & Build” engagement for the USAF successfully delivering the project within a 12 month construction period whilst ensuring compliance with both US and UK Defence Sector Standards.

## Bespoke Offering

### Ground Works & Building Construction

Workspace Technology developed a bespoke design based around a 720m<sup>2</sup> double storey modular building located within a limited compound area. The project included foundations, trenches, perimeter fencing, steel erection, modular building construction, stairwells and drainage systems. A plant room was also constructed to house Switchgear, UPS & battery systems.

As Principle Contractor Workspace Technology engaged Building Control throughout the construction process to ensure full compliance with all UK statutory fire and building regulations

### Multi-Denco Downflow Air Cooling

A total 15 of Flakt Group Multi-Denco high efficiency down flow perimeter cooling units were deployed across three Data Compartment's and external



Plant Room. The units were fitted with a number of features designed to maximise energy efficiency including:

- **Inverter Driven Compressors**  
EEV electronic expansion valves paired with inverter speed-controlled compressors support responsive control and improved energy efficiency.
- **EC Plug Fans** – allow fan speeds to be modulated in-line with cooling demand.
- **Large Filter Surface Area** reducing pressure drops for extended maintenance intervals.
- **Load Sharing Mode** – The CRAC units were configured to operate in a load sharing mode allowing the installation to benefit from EC fans and inverter driven compressors.

### Fire Suppression

IG55 Fire Suppression & Detection was installed throughout all areas of the building linked to the central monitoring facility. The installation also benefited from a combined fresh air and gas extraction arrangement.

### Schneider Electric Integration Partner

Workspace Technology implemented a Tier II electrical infrastructure including:

- **Electrical Design** - Workspace Technology's design team used AMTECH ProDesign electrical design tool as part of the pre- construction design process to ensure appropriate cable sizes, discrimination, breaker ratings and settings were implemented.
- **Schneider Electric Switchgear** supported both primary and secondary power distribution throughout the facility.
- **Modular Critical Power Distribution** Flexible 300mm wide Schneider Electric's flexible In-Row Modular Power Distribution was deployed within technical space.
- **APC by Schneider Galaxy VX UPS** Scalable, high-performance Galaxy VX UPS system configured with 4 x 250kVA/kW Power Chassis, Static Switch Module battery shelves.

### Power Generation

Workspace Technology supplied a total of 4 x 500KVA Himoinsa generator sets designed to operate in parallel with a no break return to mains. Each set included a Scania low emission engine, Stamford Alternator, DeepSea Controller and an extended run base fuel tank supporting circa 20-hour run time.

## I.T Infrastructure

Workspace Technology deployed 190 x Schneider Electric APC NetShelter multivendor equipment racks, top of rack cable troughs, APC rack PDUs and a range of inter-rack and inter compartment fibre optical links.

## Data Centre Infrastructure Management

Schneider Electric vendor-neutral StruxureWare Data Centre Expert offered scalable monitoring throughout the facility including generators, UPS, In-Row PDUs CRAC Units and other critical 3rd party infrastructure services.

## RF Shielding

Each compartment was fitted with independent EMC Shielding including screening, high performance power filters, low voltage filters and bespoke waveguides for all mechanical service penetrations.

## Project Success Overview

The USAF data centre was an exceptionally challenging project from both technical and practical deployment aspects. Key challenges faced during the project included space planning, and RF design demands that imposed restrictions on services entering and exiting data compartments that would otherwise not need to be considered. The Project was delivered by Workspace Technology's directly employed, experienced, knowledgeable engineers whose "day job" is working within mission critical environments. Excellent site planning throughout this 12-month, large-scale, complex and high-risk strategic project ensured that the USAF have an exceptional data centre that will see them through for the next 15 to 20 years.

## Lessons Learned

- Performing detailed Power Discrimination Studies ensured the final installation was fully compliant and robust.
- RF Shielding required out of the box thinking to ensure EMC integrity is maintained.
- Supporting both US and UK Defence Standards requires dedication and perseverance.
- Careful planning is absolutely critical when available space is limited.
- By implementing a strict design review and approval regime the team were able to engineer absolute levels of accuracy which paid back ensuring first time success.



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