

Lights Out, No Drama

Replacing an ageing emergency lighting system at the London's National Theatre found a replacement that not only fulfilled the technical requirements but also consumed less energy, generated less CO₂ and saved valuable floor space

WHenever the public are involved, safety is always a primary concern. Theatres in particular require total reliability from their emergency applications. If unprotected, a loss of power in a packed auditorium could not only ruin a theatre goer's evening, it could also cause unnecessary panic or even risk endangering lives.

With this in mind, when the Royal National Theatre (the NT) recently decided it needed to replace its emergency lighting power protection system, it turned to Kohler's Uninterruptible Power Supplies Limited (UPS) and its PowerWAVE 6000 range to provide the necessary support.

The National Theatre is the UK's most prominent publicly funded theatre company. The theatre complex on the South Bank of the Thames was designed by architect Sir Denys

Lasdun in the 1970s. As with any public building, the NT is required by health and safety, building regulations and its own insurance agreement to ensure that, should the mains power fail, emergency lighting immediately kicks into operation, enabling the facility to be evacuated in a safe and orderly manner. The Fire Safety Guide and British Standards stipulate emergency lighting should be designed to 'promptly provide appropriate levels of lighting, automatically and for a suitable time in the specified area'. In a property of this size, which can seat more than 2000 people across its three auditoriums, it could take up to an hour for a safe evacuation to be completed.

Kieron Lillis, Head of the NT's Engineering Department explains the need for total reliability from its UPS system: "We obviously

take compliance and the safety of our visitors very seriously. In the unlikely event that our mains power is interrupted, we need to know that the systems we have in place are going to deliver, without exception. Our old UPS had been in place since 1996 and was becoming more difficult to service, with parts not always readily available, so we knew it was time to review the system. The UPS is there to support our front of house emergency lighting and allows us to evacuate the auditorium quickly and efficiently, with minimal disruption caused to our performers, staff and patrons. It also needs to have the potential to repeat the operation (should the power be returned and lost again before the batteries have fully recharged). In total, it means the system has to power the emergency lighting for around two and a half hours – not an insignificant amount of time!"

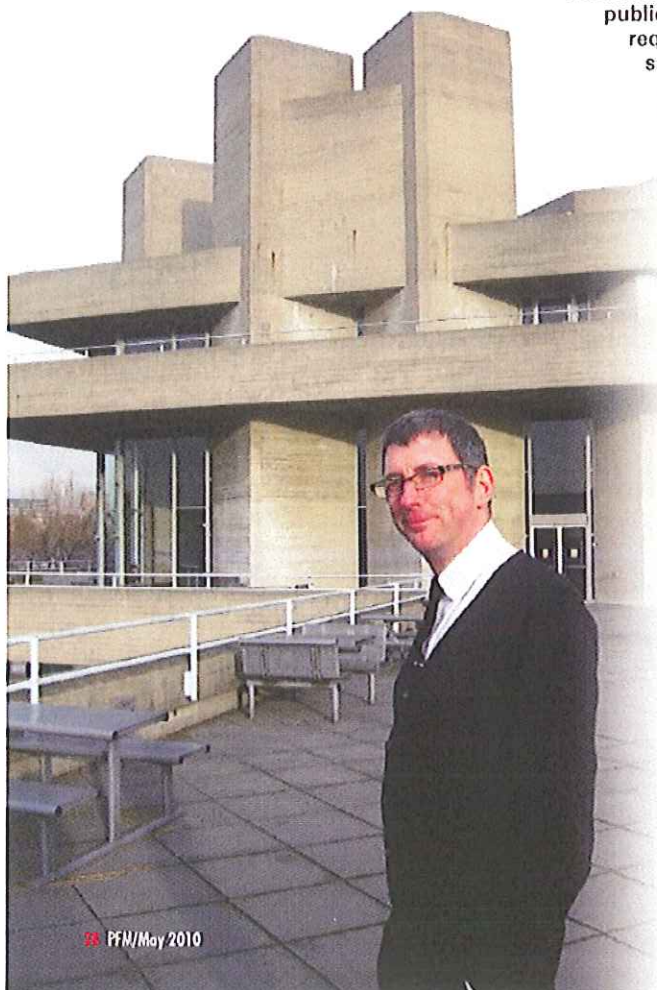
It was at this point that the NT contacted UPS, as Contracts Engineer, Wayne Poole, explains: "Bearing in mind the age of the existing units, we knew UPS would be able to install a system, which not only offered increased protection but also dramatically reduced the system's physical footprint, running costs and CO₂ footprint."

The new system – a three-phase, true online, double conversion UPS – the PowerWAVE6000 – offers the best combination of energy efficiency and overall power performance in its class. The advanced UPS delivers intelligent energy management and maximum power protection – helping the theatre to consume less energy, generate less CO₂ and save valuable floor space.

In order to provide the most efficient system possible, whilst still offering the NT the flexibility and scalability to easily increase its power protection in the future, two 100kVA PowerWAVE 6000 units were specified, halving the space used by the existing system. Using advanced transformerless technology to further reduce physical footprint, the system was designed with n+1 redundancy and a near unity input power factor. This minimises the input current drawn in relation to the critical load size, allowing reduced sizing in input cabling, switchgear and associated components.

Poole clarifies: "Today, with the cost of energy constantly on the rise and reducing emissions playing an increasing vital role in an organisation's CSR strategy, UPS systems have become one area where big savings can be

Kieron Lillis, Head of National Theatre Engineering Department



made. The future of power protection is leading to more intelligent UPS, with enhanced flexibility featuring alongside higher power density. This 'modular' approach enables UPS systems to be right-sized from day one, with a facility for simply adding capacity or redundancy as and when it's required. This meets the organisation's requirement now, any possible changes in the future and reduces environmental impact."

In addition to the main emergency lighting UPS system, the NT also decided to upgrade its bookshop server power protection and chose a self contained, 15kVA PowerWAVE 3000T. Similar to the UPS already in place to protect the NT's box office servers, the PowerWAVE 3000T is a single-phase output UPS, designed specifically for small to mid-size server rooms, networks, telecommunication systems, industrial processes or medical equipment. With its internal battery configuration the UPS also offers a small physical footprint and high double-conversion efficiency of up to 95 percent - minimizing operational and cooling costs.

When assessing which UPS supplier was best qualified to fulfil the NT's brief, Uninterruptable Power Supplies Limited, which recently became part of the Kohler Group, was able to demonstrate significant advantages, as Lillis explains: "We have worked with UPSL on

another area of the business for some time. UPSL were able to take care of all the electrical installation, making the whole process a lot less stressful and minimising disruption to our busy schedule. The installation team even worked into the early hours to update the existing battery configuration and get it finished on time. The new system has now been installed and is working perfectly, reducing our energy costs and emissions, giving us total peace of mind and making sure the show will go on!"



The Installed PowerWAVE9000DPA Modular UPS System and battery banks supporting all emergency lighting for both front and rear of house

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