

ARE YOU AFRAID OF THE DARK?

We talk frequently about controlling energy expenditure, but what happens when energy supply fails entirely? What does full blackout protection look like, and to what extent can facilities managers help insure against the worst? *Sara Bean* reports

On Friday November 25th 2016 at sixteen minutes past five, London's Soho district suffered a massive power blackout. 2,300 properties were affected, with shops and offices, theatres and bars plunged into darkness. The cause of the blackout, which wasn't resolved until after nine that night was due to a fault on an underground electricity cable on UK Power Networks' high voltage network; but blackouts can be caused by any number of reasons.

There are 'normal' causes such as substation failure, flooding, or project failings, (for instance there's a contractor on site and the supply is cut) and there are potential threats from cyber-attacks and terrorist attacks.

However there's also an increasing likelihood of brownouts (partial loss of power) and blackouts due to the pressure being put on the UK's already energy strapped national grid.

Explains David Stevens, co-vice chair and secretary of the CIBSE facilities management group: "Power-Gen has warned that the chances of a blackout has trebled from one in 12 years to one in four years and meanwhile the reliance of the UK on wind and renewables has risen, for instance the UK recently ran for an entire day on renewables, but if the wind drops it's like turning off four power stations at once."

Dark days ahead

So how prepared are businesses in coping with a blackout? Not well enough if the Soho example is anything to go by – theatres without any alternative source of power were forced to cancel performances, while the bars had to turn away customers. Unfortunately this lack of preparedness is not unusual. According to a survey by British Gas Business, only 17% of SMEs consider loss of energy supply to be a major risk to their business.

In larger organisations, such as financial institutions just minutes of power loss can mean millions of pounds' lost in business or, in the case of hospitals, could result in life threatening situations, which is where back-up systems become an essential.

According to Andy Sparrow, energy services director ISS, utilising a combination of UPS' (Uninterruptible Power Supply systems), back-up generators and battery back-up system packages: "Allows an organisation to keep the site [with these] running at anywhere from 99.995% availability, down to 99.671%.

"In the normal domestic household, the level of difference may seem imperceptible, but for a critical business function, the percentage point range can represent a huge difference in business success."

It's not just the power going out which poses a danger, but what happens when there's even a short-



“WHAT IS IT THAT YOU CANNOT AFFORD TO DO WITHOUT? IS IT YOUR HELP DESK? IS IT YOUR FRONT OF HOUSE SERVICES? WHAT ARE YOUR KEY AREAS?”

lived blackout or a brownout and the electricity comes rushing back into the building.

Explains Stevens: "If a big in-rush happens when all of your electricity starts, you can trip your main breaker and if you're an older office block you might have a fuse rather than an circuit breaker – so you'll need to get an electrician out to fix it. So a very simple five-minute blackout or blip could mean you're out of power for many days."

Blind optimism

There will of course be a degree of variance in how businesses prepare for blackouts and power losses, but the sort of organisations that should be doing most to

FACILITATE

AVOIDING BLACKOUTS

protect themselves would include those that deliver residential care, particularly to vulnerable people; hospitals - particularly where there is a dependency upon life support systems; detention centres, prisons and those sites where security and integrity of personnel is paramount; financial institutions, including critical datacentres; technology based organisations, where a service is provided upon which other organisations depend upon the infrastructure and / or connectivity provision and Emergency Services Hubs.

All these facilities explains Keith Jones, director of hard FM at G4S Facilities Management UK: "Require the maintenance and support of installed power and distribution systems including stand-by power systems and UPS which takes transient loads at the point of the power outage for a defined minimum period of time, sufficient to allow the site based stand-by generator to operate and maintain critical site loads."

It's important to note that a UPS is not there to keep all the lights on all of the time, but to allow you to continue operating certain types of equipment (usually computers); until a generator kicks in and takes the load; or to operate equipment until it can be safely closed down.

In practical terms this means that a smaller business or a large institution with a site which is not mission-critical, may opt for a small UPS which will allow the computer systems to shut down correctly, but not keep the site running for long.

This approach might be suitable for an office site, but an international trading floor, a manufacturer or a major hospital will typically opt to install back-up generators. This will require some consideration on which items should be linked to the generator.

Even in a hospital, it's going to prove difficult to run the entire building on a generator for very long, so you might designate power to every third light fitting, 50% of socket outlets (which are clearly identified as red), all of the operating theatres, all of the lifts, but perhaps none of the offices.

In a hotel it could be all of the kitchens, meeting rooms, front of house but none of the bedrooms; and within a large bank the IT systems and perhaps a mission-control boardroom for key personnel. But you can't assume all of these systems will fire up again once they've experienced even a brief lack of power.

Explains John Evoy, regional engineering manager, VINCI facilities: "It's difficult sometimes with electrical equipment as each building has its own personality and

"A VERY SIMPLE FIVE-MINUTE BLACKOUT OR BLIP COULD MEAN YOU'RE OUT OF POWER FOR MANY DAYS"

the ways that systems have been set up and switches age will determine whether they come back on when they should do. You'll also find other factors that are unique to each building, so if you've a power outage it's essential to go round and check that each item has been reset, and that everything has come back on again."

"This is why, when we begin a project we'll check whether the electrical equipment including fridges, freezers, automatic valves, fire alarm systems, security systems or computer equipment are vulnerable to disruption."

The role of FM

Pre-planning and maintenance of assets is an essential part of this process, and all of the experts agree that while it's fine to





GUIDANCE

There is a range of official guidance available to help FMs for potential blackouts. These include:

CIBSE Guide M: Maintenance Engineering & Management

This guide aimed at designers, maintainers, building owners and operators and facilities managers includes a focus on the lifecycle and the effective life of your plant. For example, if you've got an air conditioning unit which is 15 years old in your server room, the guide will help you determine what steps you should take to maintain it.

BSRIA: Business-Focused Maintenance (BG53/2016)

This provides a methodology for utilising maintenance budgets more effectively to help you ensure that the most critical assets are maintained whilst the less critical assets are managed as well as possible within budget.

ISO 31000:2009, Risk management – Principles and guidelines,

Planning for a blackout also comes down to risk and probability and this standard can be used by any organisation regardless of its size, activity or sector.

ISO 22301 Business Continuity Management

This international standard for business continuity specifies the requirements for a management system to protect against, reduce the likelihood of, and ensure your business recovers from disruptive incidents.

BS 5266-1:2016 Emergency lighting. Code of practice for the emergency lighting of premises

Emergency lighting is provided in buildings for evacuation purposes only, not for continuation of services. Its provision is typically for just three hours at just 1 lux, (the minimum requirement in offices is between 300 and 500 lux). However, you might choose to ensure that a reception area will be lighted to 50 lux or a main board room where critical functions could be carried out and/or where a major incident team could sit.

bring in outside M&E expertise, it's the facilities manager who needs to manage the maintenance routine.

David Brown, Sodexo's head of energy and sustainability services, says a calculation must be made around what will be required to maintain power supplies – “and this where it gets a bit interesting. Because full power requirements for critical organisations aren't always understood.

“There might be an assumption that [the generator] will get the basic emergency functions on, such as lifts, lighting, security systems, the data centre or comms room, but beyond that the critical operational requirements may be unclear.”

Maintenance essentials include testing and running the standby generator for minimum periods of time with full load testing, as well

as ensuring that sufficient fuel supplies are available and the replenishment of any ready use tanks can be facilitated for the duration of the power outage. And because most standby power systems operate automatically, it is essential that every organisation provides sufficient time to test the systems at set intervals not exceeding a 12-month period, to ensure the integrity of the system.

This planned preventative maintenance approach, should be of course part of a wider business continuity plan, which says Stevens is most definitely an FM task.

“It's the FM that has to lead business continuity planning and it's the FM who has to work with the business to identify what the core and critical business activities are of that organisation. What is it that you cannot afford to do without? Is it your help desk? Is it your front of house services? What are your key areas? And then look at how you're going to transfer those services and those duties in the event of a power out.”

This may include setting up alternative offices for essential staff and in the case of smaller businesses ensuring that servers and software are cloud based so staff can work from home.

Says Stevens: “A common mistake that FMs make is that they don't consider staff welfare. It's important to get them out of the building and home. The facilities manager may also have written a business continuity plan but if they haven't rehearsed or communicated them to senior managers, it's like they haven't got any plan in the first place.

“So, do not prepare for a blackout in isolation, think holistically – and concentrate on what matters to you as a business.” **FM**