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Power Distribution Support Services

Key services that EME Power Systems provide:

- High Voltage Installation
- High Voltage Maintenance
- Transformers
- High/Low Voltage Switchgear
- Cabling
- High Voltage Testing and Diagnostics
- Full Design and Install Service
- Senior Authorised Persons
- Earthing
- Power Factor Correction
- Power Quality Surveys, Investigation and Diagnostics
- Emergency Support
- Site Appraisals, Recommendations and Scheme Proposals
- Protection Grading Studies
- Cable Fault Location

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Fact Sheet – HV Maintenance & Emergency Support

This fact sheet is designed to assist in compliance with the Health and Safety at Work Act 1974, The Management of Health and Safety at Work Regulations 1999 and The Electricity at Work Regulations 1989. Further and more in depth guidance can be obtained from the HSE's guidance leaflet "Electrical Switchgear and Safety" ISBN 0 7176 2187 1.

The organisation responsible for a high voltage system must ensure that:

- An appropriate management system is implemented.
- Keeping of records, including network diagrams, equipment schedules/asset registers and inspection & maintenance reports.
- Details of operational restrictions are available (SOPS).
- Recording of any switchgear mods carried out.
- Policies and procedures are developed & implemented.
- Safety Rules and Safety Documents are adhered to and used.
- Persons operating & working on the high voltage system are suitable competent and authorised to do so.
- The equipment is regularly inspected and maintained.

Compliance:

In practice many organisations find it difficult to comply with their responsibilities by relying solely on in house staff; the knowledge required is technical and specialist in nature. It is for these reasons that EME Power Systems have developed a bespoke HV service contract that is designed to comply with the legal obligations and to cater for the on-going requirements of the business and the networks for which you are responsible.

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Our service system comprises of 3 components:

"Set Up":

As the name suggests this is the first aspect that we undertake when you decide to initiate a service system. An EME Power Systems engineer will after an initial assessment of your site produce network drawings, a register of the HV assets and a 5 year programme of inspections & maintenance that is tailored to your site's equipment. Our engineer will also check that your existing substation signage is adequate and that switchgear locks are fitted.

"Annual Maintenance Requirements":

Here we spell out precisely what work is required year by year for the next 5 years; the requirements will depend on the type and age of your equipment but will usually be a mix of full intrusive maintenance and inspection works. If you do not have any previous records of inspection works we will also undertake PCB testing of transformer oils at this point.

If our initial site assessment has noted any issues that require immediate attention, or that consumable items such as transformer breathers require replacement then these issues will also be addressed at this stage.

The works will be carried out by competent and authorised staff all of whom are extremely experienced in carrying out this type of work. Our Senior Authorised Persons (SAPS) are informed on the key issue of operational restrictions (SOPS) and the affected switchgear types and models.

These works will be carried out in full compliance with the Distribution Safety Rules; issuance of appropriate safety documents being an integral part of this safe system of work.

Upon completion a set of inspection and maintenance records will be filed on our server for future reference & a copy forwarded to you for your own records. Any recommendations for incorporation into your future site policies and procedures will be highlighted to you at this stage.

"Customer Support":

At EME Power Systems we understand that continuity of electricity supply is a business fundamental and that power failure means that the business cannot operate. The final element to our service contract therefore is to provide an emergency cover for both inside & outside of normal working hours. Our 24 hour / 365days a year cover provides peace of mind that when the lights go out you can have confidence that a professional engineer is working on a solution from the moment the call is received.

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Fact Sheet - Cable Fault Location

Have you ever considered what you would do if your site experienced an HV or an LV underground cable fault? How would you restore supplies whilst fault finding was under way for example? How would the fault be located and who would be able to do this for you?

We at EME Power Systems believe that we are the best equipped organisation, in terms of people, skills and equipment to be able to assist you in such an event. We own all of our own specialist test equipment & do not need to hire in test instruments from external sources. We know from our many experiences of fault location & repair that you need to have all instruments, calibrated, tested & available ready to draw on immediately when needed, after all these things never tend to happen when the shops are open. Included within our arsenal of equipment are Surge Generators, “Biccotest” oscilloscopes & acoustic listening devices. These are all extremely expensive pieces of kit & we are very aware that most of our competitors (in fact we are not aware of any) have not invested in procuring their own equivalent equipment (we know this because we regularly receive requests from them to use ours!).

We also of course have a full range of LV fault location devices for deploying on low voltage networks.

All of this, coupled with our out of hours call out facility & supply agreements with generator companies means that we are extremely effective at reacting quickly when an emergency occurs & we have a great track record when it comes to responding, identifying & repairing faults (please take a look at our website for real life examples & customer testimonials).

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Fact Sheet – Private HV System Alterations & Upgrades

With the high level of risk associated with operations at HV, persons need to be competent and authorised to carry out any works on or near high voltage, plant or equipment.

Works should only be carried out under a "Safe System of Work" i.e. Permit to Work, Sanction for Test or Limitation of Access etc. and this documentation can only be issued by a Senior Authorised Person (SAP) who is both authorised and nominated by the network owner/ controller.

Network designs should be produced to take account of prevailing conditions, known future change and with a designed in flexibility.

The EME Power Systems HV Project:

The EME Power System Project allows the custodian of the network to have access to technical support, help and advice as soon as a project has been conceived.

Business expansions or new projects often run in to difficulties due to power requirements not being considered until the latter stages of design and it is only then that some of the engineering issues are belatedly considered. By this stage it may be too late to design out the problem or as is so often the case; costly and unnecessary modifications may need to be incorporated within the project plan.

With our electrical engineering expertise and industry experience, we aim to assist business from the very earliest stages of your project or expansion. Our engineers can provide you with:

- Comment on technical feasibility of project
- Costed proposals including any alternative options identified
- Guidance on any likely affects to the DNO network (available capacity)
- Full design and installation project package
- Turnkey installation
- Commissioning
- Ongoing maintenance and system support

EME Power Systems only charge for the actual on site project installation works & we make no upfront costs for our design work.

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Fact Sheet – HV Diagnostics

Have you ever considered what you would do if your site experienced an HV fault? How would you restore supplies whilst fault finding was under way for example? How would the fault be located and who would be able to do this for you?

HV Faults:

We at EME Power Systems believe that we are the best equipped organisation, in terms of people, skills and equipment to be able to assist you in such an event. We own all of our own specialist test equipment & do not need to hire in test instruments from external sources. We know from our many experiences of fault location & repair that you need to have all instruments, calibrated, tested & available ready to draw on immediately when needed, after all these things never tend to happen when the shops are open. Included within our arsenal of equipment are Surge Generators, "Biccotest" oscilloscopes & acoustic listening devices. These are all extremely expensive pieces of kit & we are very aware that most of our competitors (in fact we are not aware of any) have not invested in procuring their own equivalent equipment (we know this because we regularly receive requests from them to use ours!).

We also of course have a full range of LV fault location devices for deploying on low voltage networks.

HV Protection Systems:

Correct Operation:

It might sound like a strange thing to say, but it is extremely important that your system acts in the correct way when a fault does occur. Firstly it is important that the protective device operates in the way that it should and that it operates within the correct time; this is important because if it doesn't then additional damage (over and above the actual fault itself) will occur to your system – lengthening the time of repair. Correct operation can be proved prior to such a situation developing & the way that this is carried out is by the method of secondary injection testing - a simulated fault current is injected into the device and then its operation timed & verified as being within an acceptable tolerance.

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Correct Grading:

In essence this is the ability of the HV electrical system under fault conditions to be able to operate the protective device that is nearest to the fault within a time that prevents further damage occurring to electrical plant or equipment; in many respects it is similar in philosophy to the "discrimination" that should occur between LV devices. The stakes though in achieving correct grading across HV devices (as it also is between HV devices & main LV switch board incomers) are high; if a system is poorly designed and/or devices are incorrectly set then a comparatively minor event (perhaps even one occurring on your low voltage system) could result in a total loss of supply to the entire site (which could result in the need to call out the local DNO in order to re set their circuit breaker) – highly undesirable.

The solution of course is to verify that the system's protective relays & devices have been correctly selected and set; EME Power Systems have in house technical expertise capable of carrying out this work for you; we achieve this through first of all carrying out a site survey of the system & it's associated protective devices which we then utilise in a technical desktop study of the network. We utilise the latest industry design software to examine how the system would react under fault scenarios and with the grading study complete, we are able to advise of any suggested changes to devices or their settings, a preventative measure to protect site production against unnecessary outages occurring in the future.

All of this, coupled with our out of hours call out facility & supply agreements with generator companies means that we are extremely effective at reacting quickly when an emergency occurs & we have a great track record when it comes to responding, identifying & repairing faults (please take a look at our website for real life examples & customer testimonials).