The Production / Site / Venue Electrician and Generator Engineer

The electrician will normally work for an event power and distribution company as an employee or on a self employed basis. The power company will usually provide generators (including back up generators, twin synchronised generator systems, uninterrupted power supply units), cabling and power distribution, fuel (diesel) management, emergency lighting systems, flood, tower and festoon lighting and maintained exit lighting where and when required on site. On site the electrician will report to his crew boss and company and the Production Manager. Power supplies used in live event production are often heavy duty three phase supplies in excess of 300 or 400 amps.

The work must be carried out by qualified electricians (with assistance from labourers) to meet the requirements of the Electricity at Work Regulations 1989. All temporary supplies must be in accord with BS 7909: 1998 Code of Practice for temporary distribution systems for AC electrical supplies for entertainment lighting, technical services and related purposes and the 17th. Edition of the Institution of Electrical Engineers Wiring Regulations (BS 7671:2008).

Hours are often very long and the work dirty (especially on a large green field festival site). Good maintenance and troubleshooting skills are essential together with the ability to get on well with people and work as a team.

The Role of the Electrician
At it's simplest, in an indoor situation the role of the stage electrician is to connect equipment to the mains supply and to disconnect after the event, this will include equipment such as rigging, lighting, audio, video etc but is more likely the role will be as follows:

1. To ensure the safe and correct installation and removal of the electrical generation and distribution system.

2. To liaise with other parties on site to ensure that all activities are carried out without conflict. This may breach safe conditions.

3. To test the system prior to use, in particular the earthing and RCD trip times and to record the results.

4. To provide appropriate written certification to the client prior to its use. Local Authorities will often insist this is provided by a qualified electrician who is registered with the National Inspection Council for Electrical Installation Engineers. (NIC - EIC).

5. To deal with any emergencies, equipment failures and other unforeseen requirements

System Design

All systems will be designed in advance of the event to ensure that adequate and suitable equipment is taken on site and to highlight any additional issues prior to arrival.

When designing the system to be installed at any event, the following will be taken into consideration:

1. The location of the end users of the power supply and the type of connection required (C. Forms, Cam Locks etc)

2. The type of equipment to be used.

3. The location and type of any protection devices.

4. Any requirements for a permanent supply for safety lighting, fire alarms, sprinkler systems, maintained exit signs, medical and emergency units etc.

5. That safety systems such as the above are given priority if the supply is overloaded

6. Any special instructions to be communicated to the end user e.g. with regard to the type and number of pieces of equipment permitted to be connected to the system.

7. The times when power will be required eg. rigging power.

Maintenance and Testing

All equipment provided by the generator and power distribution company will be subjected to full Portable Appliance Testing on an a basis determined by risk assessment and in accordance with the HSE publication “Maintaining Portable and Transportable Electrical Equipment”.

On occasion more frequent intervals of thorough inspection and test may be adopted for equipment that is at high risk from damage from use on event sites.

All items of electrical equipment provided will be individually identified by means of unique serial number, allowing PAT test records and other maintenance information to be readily related to specific items. A database of all such test records must be kept by the company.

Methodology

Equipment is usually packed onto stillages or pallets and loaded into trucks for transport, fork lift trucks are employed due the heavy nature of the equipment. Generators are transported on flatbed trucks and either left on the truck during use or craned off using a Hi-Abs or lorry loader, despite this mechanisation a great deal of manual handling is still required.

Fuel is carried in drums or bunded bowsers, spillage kits must also be carried in case of emergency.

Equipment and cabling is often required to be installed at height eg emergency and flood lighting, festoon lighting etc.

Generator Safety

Generators will be sited and installed so that controls are easily accessible and that refuelling operations and maintenance may be readily undertaken. All items will display the necessary warning signs. Control panels must be kept locked when not in use. All generators will be protected from access, tampering and damage by unauthorised persons particularly in public areas by fencing, the supply of fencing in normally made by the Client as a condition of supply. Generator sets will be located in positions agreed with the relevant site manager/safety officer.

Cabling and Distribution

1. All cables, plugs and socket connectors will be arranged to avoid any severe bends or trapping.

2. All cables will be arranged so that they do not form trip hazards

3. Where cables cross vehicle, pedestrian or other (e.g. livestock) traffic routes they must be protected so that they will not be damaged by or cause a hazard to those using the route.

4. All circuits should be protected in accordance with BS 7671

5. All circuits should be protected against surges, over loading and earth faults.

6. All parts of the installation should be protected by a circuit protective conductor, which in turn should be connected to the earthing terminal of the power source.

Safety Checks

During installation of the system and prior to signing it off as being safe to use the Electrician must undertake general electrical safety tests, record and assess the results and undertake any corrective work to be done.

Sign off Certificates

On completion of the installation, the Electrician will provide the client with written certification that the system is safe for use and complete any relevant and appropriate sign-off forms provided by the client.

The system will only be considered complete and safe when the following apply:

1. The Electrician is satisfied that the system is running correctly and safe to use

2. The results of safety checks show that the system is running correctly

3. The system is protected where necessary from access and tampering by unauthorised persons

4. All cables are routed so that they do not cause trip hazards or obstructions and are not exposed to potential damage

Generator Engineer

Where generators are in use a good generator and power distribution company will also provide a Generator Engineer is install, maintain and fuel the generators.

The Generator Engineers responsibilities will include installation, servicing and repairs at depots and on site. A Generator Engineer must be a mechanical engineer with electrical experience, in particularly with diesel generators (servicing and fault finding). They will usually work as a team along side the Electricians. Experience has shown that generators must be located at least 3 meters for stage structures as sensitive microphones can pick up sounds from the generator not audible to the human ear. The use of silent diesel generators acoustically enclosed I now standard, petrol is normally banned from event sites for fire safety.

For stage areas it is generally safer and good practice to have several smaller generators instead of one large one, this reduces the problems (and noises) caused by having audio and lighting on the same circuit and ensures the show can proceed (albeit limited) in the event of one generator failing.

Core Skills

To be able to set up, maintain, trouble shoot and repair electrical equipment and distribution systems.
A ability to design electrical distribution systems.
Ability to perform simple calculations
Keeping of simple financial records and accounts.
Ability to understand and interpret written material incl. circuit diagrams, plans, schedules and risk assessments.

Must be able to get on with people easily and have good communication skills.

Qualifications
City and Guilds qualified electrician.
Training and certification for ladders and steps.
Plant operator training and certification by one of the following recognised training bodies certification by one of the following recognised training bodies;

- Construction Industry Training Board
- LANTRA National Training Organisation
- The Independent Training Standards Scheme and Register (ITSSAR) is the administrative arm of the Association of Industrial Truck Trainers training accreditation scheme.
- National Plant Operators Registration Scheme
- Road Traffic Industry Training Board

Drivers using Lorry Loader Cranes or Hi-Abs will also require training and certification and training by one of the above organisations.

Training and certification is also available from IPAF (International Powered Access Association) for Scissor Platforms, Cherry Pickers and PASMA for Aluminium Access Towers.

Underpinning Knowledge
Conversant with BS 7909: 1998 Code of Practice for temporary distribution systems for AC electrical supplies for entertainment lighting, technical services and related purposes
An understanding of Health and Safety practice particularly manual handling, plant and machinery operations, work at height and fire safety.
A more advanced understanding of heath and safety practice for work with industrial standard electrical distribution equipment.
A through understanding of event production process, methodology and terminology.
Basic IT skills.
A practical understanding of Environmental Safety in case of diesel spillage.

Insurance
Self employed caterer will require there own Public Liability Insurance, Employers Liability Insurance will be required if caterers instruct local crew or other members of the catering crew.