GUIDANCE NOTE

BS7909:2011

Content

Overview guidance note, outlining the industry advisory for compliance with BS7909

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1. Introduction

1.1. The law

All employers have a legal duty to ensure that working environments are electrically safe (Electricity at Work Regulations 1989; 'EaWR'). They also have a duty to ensure that the equipment used in the workplace is electrically safe as well (Provision and Use of Work Equipment Regulations 1998, 'PUWER').

In essence, PUWER requires us to inspect work equipment regularly to make sure it is safe to use, and this is where the concept of 'portable appliance testing' (more colloquially known as 'PAT Testing') stems from.

The EaWR is concerned with the electrical system as a whole, which includes the distribution cables and boxes as well as the equipment connected to it. It requires the system to be designed and installed by competent people and for it to protect against the hazards that electricity can create.

1.2. Complying with the law

British Standard BS 7671 is the principle guide to electrical safety in the UK. It is better known as the IET Wiring Regulations, currently in its 17th edition (and often referred to as such). The Health and Safety Executive holds BS 7671 in high regard, to the extent that it has written an endorsement in the introduction which states that installations that comply with BS 7671 are likely to enable the requirements of the EaWR to be met.

BS 7671 does invoke the use of other standards which may have to be used alongside it. In this context the most relevant is BS 7909 which is a guide for temporary power systems at events. So to comply with the IET Wiring Regulations at an event, BS 7909 has to be complied with too. By inference both standards are therefore required to enable compliance with the EaWR. Both are also listed in the Memorandum of Guidance on the EaWR published by the HSE.

BS 7909 deals specifically with the setting up, management and some related technical issues for the temporary electrical systems used at events. Events usually include (but not exclusively) festivals, location filming, agricultural shows, TV OBs, theatre, sporting events, pageants, concerts and so on.

1.3. What is a temporary electrical system?

Although BS 7671 is concerned with 'electrical installations' it calls any assembly of electrical equipment an 'installation', whether temporary or permanent. If it is temporary, it is designed for a particular purpose and will be removed when no longer required for that purpose. That purpose may a one-off gig, a film shoot, a winter ice-rink or a summer festival. There is no defined period of how long *temporary* may be. It's better to consider it as not being *permanent*.

Equally it is important to note that BS 7909 applies to systems of a 'plug'n'play' nature, where all the distribution equipment and cables are ready made and the whole system can (largely) be assembled without the use of tools. If it is being manufactured from scratch then BS 7671 only applies, but most production companies only use pre-assembled and tested distribution stock equipment, so BS 7909 would more often than not apply.

A further note for notice is that BS 7671 has particular requirements for fairgrounds and exhibitions which are not covered by BS 7909 specifically. So, it doesn't matter whether the power comes from a generator or a building, the event is indoors, outdoors or in a marquee. If the intention is to remove it at some point, it's temporary.

1.4. BS 7909 Basic Overview

Essentially BS7909 requires events/production companies to design their systems in accordance with the Wiring Regulations; i.e. to ensure systems work effectively and protect against the risks of shock and fire. The main focus is on management of the event and it tries to help contextualise the requirements of the Management of Health and Safety at Work Regulations 1999.

The standard requires the event manager (which may be a promoter, event manager, producer, production manager etc) to appoint someone electrically competent to oversee the electrical system. Under BS 7909, this person is called the 'Senior Person Responsible' (SPR).

The standard also splits electrical distributions into two categories; 'small/simple' systems and 'large/complex'. The guideline is that anything under 6kVA (typically the same as 6kW worth of power, equivalent to around three kettles) is classed in the small/simple category. The key to the application of the small/simple category is that it is simple and typically used within a building - the supply would usually be derived from the ordinary sockets on the wall. There won't be much equipment – examples may be small press conference; indoor display stands or filmed interviews. It also allows for the SPR to be an instructed person who has been directed in the use of a simple plug-in tester, but who may not be electrically skilled. There are no requirements for completion documentation, but PAT records for equipment must be checked and the supply verified.

Anything else that doesn't fit into that classification is considered large/complex. That may include relatively small systems but which are run from a generator, or extension leads taken from a building to deliver power to an outdoor event. All of these situations require someone electrically skilled[1] to assess the additional risks and put in suitable protection methods.

Large systems need a bit of planning and should be designed and tested. The testing need not be done on every circuit, the designer just needs to ensure that the protective measures will work effectively for the supplies used. Documents showing that the system has been designed and checked need to be completed (called 'completion certificates') and copies should be given to the person ordering the work as well as the property/venue owner if requested.

The testing needs to be completed before the system is handed over to the rest of an event crew for general use and the test results noted. The certification would normally be completed when everything is operational and the SPR has satisfied himself that the system is safe and works effectively.

Temporary systems need re-testing and re-certification (or amended certificates) when substantial changes in the distribution occur. Each event is different, but examples may be:

- New locations – each time a system is put together in a new location or venue;
- Significant additions of equipment; e.g. a new multiple channel dimmer and lighting circuits or a dining bus, rather than a couple of individual light fittings or an extension lead to power a kettle.
- Changes of supply – e.g. going from using a building or venue supply to a generator.
- Damage or interference to the equipment, including unforeseen environmental effects (flood, fire etc).

Note that the context should be considered in each case - consider a small film shoot using a few lights, associated distribution and a generator moving from location to location. If the same cabling, distribution, equipment and source of supply are used at each location, then the results will always be broadly the same. Accordingly, some rudimentary checks at each subsequent location may suffice after the first full assessment.

BS 7909 also discusses earthing practices and procedures in some detail. Basically, the mass of earth that you stand on is often (but *not always*) used as a safety measure by providing a route back to the power supply for fault currents, which in turn causes fuses or circuit breakers to operate when there is a problem. The earthing arrangements in a temporary system need careful consideration particularly where generators are used or cables are taken in/out of buildings.

If you see an earth 'spike' (normally a metal rod or tray) under the wheels of a generator or an earth cable connected to an item of street furniture such as lamppost or bus shelter, questions should be asked as these are indicators of ineffective or even potentially dangerous earthing practices.

[1] Electrically skilled competence outlined within the competence section

1.5. Lack of Standard Awareness

Why don't more production companies, producers and events know about the standard? In the world of Standards, BS 7909 is relatively new; the current version being issued in 2011 and its predecessor in 2008. The IET Wiring Regulations on the other hand date back to the late 1800's. It takes time for Standards to be widely understood and adopted but BS 7909 has in the last two years or so been more widely specified. A further revision of BS7671 is currently entering its final consultation phase, with an assessment ongoing to identify implications or changes to BS7909. The new IET Wiring Regulation is expected to be formally updated soon and will be referred to as the 18th Edition.

An electrical safety training programme is currently running throughout the UK, specifically designed to ensure productions and their third parties comply with BS7909, and relevant sections of BS7161 (17th edition). This takes the form of a two day course with an assessment of competence at the end of the final day (exam). The course is known as the Creative Skillset Certificate in Temporary electrical systems.

Other than this Certificate, there are no formal qualifications specific to temporary electrical systems, or to working as an electrician in the concert, production, event, film or television industry. Formal Electrical qualifications are typically geared towards domestic and commercial installation work.

1.6. Can I use our NICEIC contractor to do checks?

There are several 'Competent Person Scheme Operators' including the NIC EIC, ECA, NAPIT and BSI for example. All assess their members against the 'Electrotechnical Assessment Specification Document' (EAS) and so all provide the same basic level of assurance as to the competence of electrical contractors.

However, these schemes assess contractors in their *normal work activities* and so unless the NICEIC registered contractor has been assessed doing temporary systems under BS 7909, they may be completely unaware of the requirements, which is more than likely in most situations. There are many examples of accredited contractors mis-applying the IET Wiring Regulations at temporary events or venues because they don't understand some of the unusual demands of the equipment and systems, or even the requirements of BS 7909.

Currently the EAS Document does not include assessment criteria for temporary systems coming under the scope of BS 7909. So, while using an accredited contractor could well prove useful and they may give helpful advice, it is important to realise that their accreditation is unlikely to be for such work and so they may not give you valid assurance unless they have a good understanding of BS 7909.

2. Assessing Electrical Competence

2.1. Purpose

This section outlines the requirements for assessing the competence of staff or freelancers who will be responsible for designing, erecting, installing or maintaining electrical systems. The aim is to provide advice to allow staff to make a reasonable judgement about whether a person or company is competent to carry out the required work.

2.2. Requirements

Competency in relation to electrical work is broadly defined as a person having appropriate technical knowledge, skills and experience to prevent danger or injury. This can be further broken down into:

- Adequate knowledge of electricity and electrical protective measures;
- Adequate experience of electrical work, including an understanding of the type of system to be worked on;
- An ability to recognise the hazards that may arise and whether it is safe to continue work.

The degree of knowledge, experience and skills necessary will vary according to the work undertaken. Evidence of technical knowledge is usually demonstrated by training, qualifications and/or experience (TES). Experience is either ascertained by following up references for previous employment or checking CVs or work portfolios. Membership of a competency assessment scheme may provide further assurance that a person or organisation has both the knowledge and experience.

A system that is put together, such as a tour etc., will have an electrical system specifically designed for the event. The design is assessed prior to being installed, looking at cable runs, protection of the system etc.

Whilst on the event, the SRP, whom may be someone with sufficient technical experience and has been given instruction relating to testing procedures and readings and to be conducted prior to the system being energised. The SRP on site will have received adequate instruction relating to testing, results and what to do in the event of incorrect readings. The company policy will then be for the engineer on site to interpret these readings and obtain further advice where necessary. The access to further source of competent advice is sufficient.

2.3. Domestic work

Electrical installation work carried out in a domestic property (such as for a program like DIY SOS for example) is under the scope of Part P of the Building Regulations in England and Wales. Such work should either be carried out by using a Part P registered contractor (listed at http://www.competentperson.co.uk/) or it must be notified to the Building Inspector at the Local Authority concerned. In Scotland, the requirements are slightly different.

2.4. Qualifications for Domestic Work

Generally electrical work as outlined above, namely domestic installation work should be conducted in accordance with BS 7671; the IET Wiring Regulations, currently on the 17th Edition. There are a range of 'update' courses which are designed to bring candidates up to date with the latest changes in this standard (e.g. City & Guilds 2382). These qualifications do not provide evidence of technical knowledge and are not, in themselves, adequate. They should be considered as professional development for people *already* electrically skilled.

2.5. Suggested Training for SRP

It is suggested by the industry overall that the following courses are relevant and applicable (in addition to the sufficient experience and technical knowledge appropriate to the activity) for the SNR supervising a temporary installation;

- Recorded training from competent person, outlining testing results. This should outline who to contact (and what to do) if certain readings vary from expected. The course should outline and instruct simple testing (for systems below 6KVA), using plug and play testers (Martindale's etc.) as well as meter readings (and the use of) for larger systems – plug and plan systems as defined in BS7909;
- SRP would benefit from completing the two-day Skillset Certificate in Temporary Electrical Systems. This course is delivered by one provider –
    - Roy Fernley
      Event Technical Support ltd
      4 Glencross Avenue
      Manchester
      M21 9NF
      Mobile 0777 5518 958
      Email royfernley@yahoo.co.uk

These above courses are following the assumption that the equipment in use is within an adequate testing and maintenance regime and that the system (above 6KVA) has been designed and signed off prior to works commencing.

Further advice specific to the industry can be obtained from James Eade, a specialist within entertainment industry and temporary electrical systems via http://www.eade.uk.com