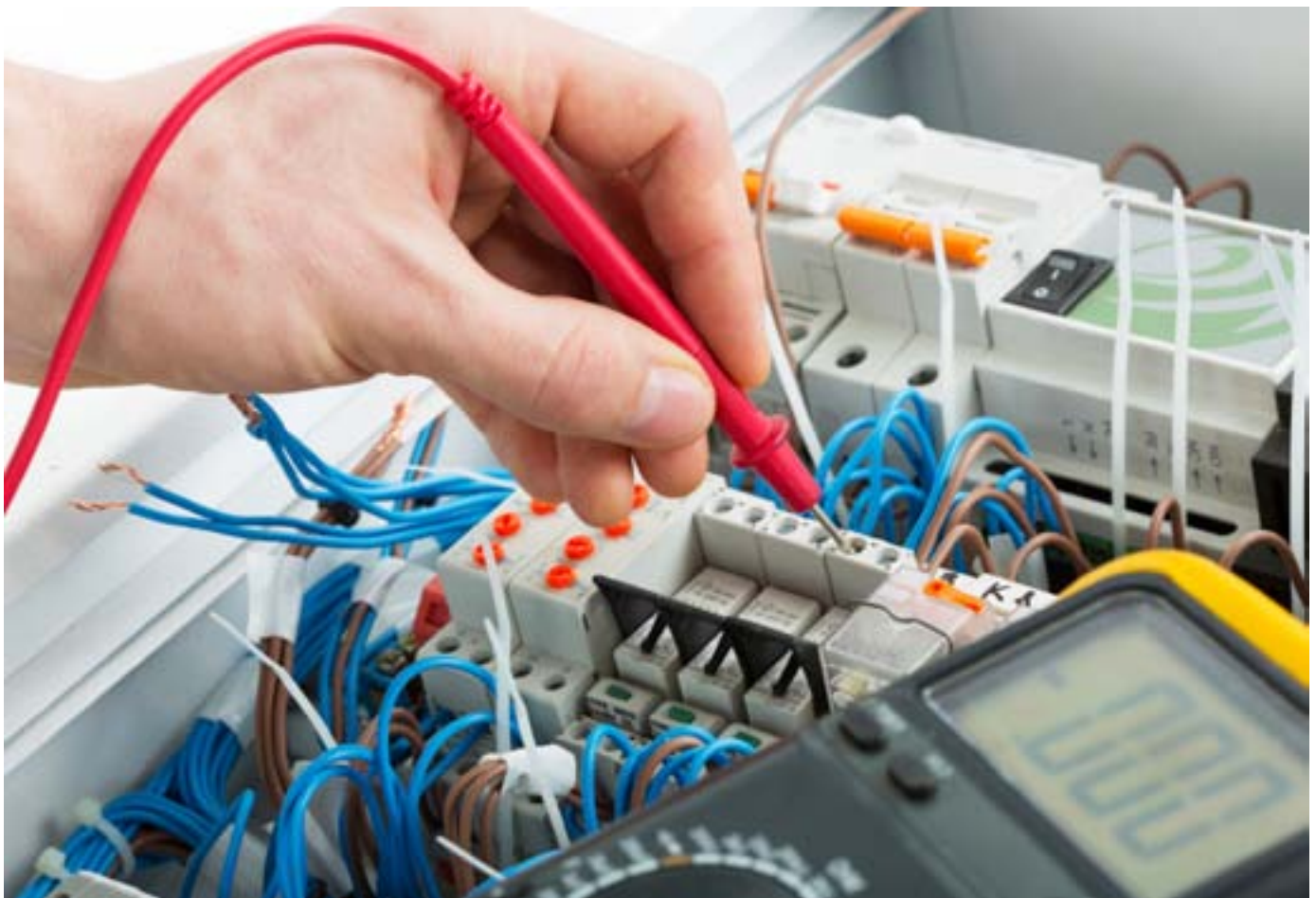


## Periodic inspection and testing of electrical installations

Fires attributed to electric faults or failures continue to be a major cause of loss in commercial, industrial and residential premises. Whilst there will always remain an inherent risk, implementation of a structured and comprehensive inspection and testing regime can significantly reduce the potential for loss.



### Are you confident that you are taking reasonable and practical steps to maintain electrical installations in a safe condition?

The Electricity at Work Regulations 1989 requires that:

***As may be necessary to prevent danger, all systems shall be maintained so as to prevent, as far as is reasonably practicable, such danger.***

How this is achieved is open to interpretation but it is generally accepted that, by ensuring installations comply with the IET Wiring Regulations (BS 7671) and are inspected and maintained in accordance with IET Guidance Note 3: Inspection and Testing, then 'reasonable and practical' steps have been taken – and that these steps will also provide an adequate level of protection against fire risks.

This document is not intended to provide details of how to implement these standards. Instead it is intended to clarify QBE's understanding of and expectations regarding periodic inspection and testing of electrical installations.

## Initial verification

Before being put into service, all new installations should be confirmed, through inspection and testing during construction and on completion, as compliant with The IET Wiring Regulations BS 7671.

BS 7671 and Guidance Note 3 explain the extent and expectations of this initial verification and ultimately this should result in the issuing of an Electrical Installation Certificate. Any significant changes to the electrical installation should result in the certification being reissued in respect of the modification works, although minor modifications can be captured through a Minor Electrical Installation works certification.

The initial verification forms the baseline of future periodic inspection and testing.

## Periodic inspection and testing

The purpose of periodic inspection and testing is to provide 'an engineering view' on whether the installation is in a satisfactory condition so as to continue to be used safely. It addresses four specific concerns. Three of these quite correctly relate to the ongoing and assured safety of personnel; one specifically refers to 'protection against damage to property by fire and heat arising from an installation defect'.

## Routine checks vs formal inspections

Formal inspections are discussed later but electrical installations should receive attention during the time between these inspections. Just because a car might only be professionally serviced once per year, it doesn't mean that it is not checked in between for general condition and wear and tear. The same applies to an electrical installation. These checks need not necessarily be carried out by an electrically skilled person, but do need to be carried out by someone who can safely use the installation and recognise defects. Table 1 gives an idea of the extent of routine checks.



Activity	Check
Inspection	Look for: <ul style="list-style-type: none"> <li>• Wear and tear / deterioration</li> <li>• Breakages or damage</li> <li>• Missing parts (covers, screws)</li> <li>• Loose fixings</li> <li>• Signs of overheating</li> </ul> Confirm <ul style="list-style-type: none"> <li>• Switchgear accessible</li> <li>• Enclosure doors are secure</li> <li>• Adequate labelling in place</li> </ul>
Operation	Operate <ul style="list-style-type: none"> <li>• Switchgear (where reasonable)</li> <li>• Equipment (switch on and off)</li> <li>• Of RCD's (using test button)</li> </ul>
Defect Reports	<ul style="list-style-type: none"> <li>• All previously reported defects have been rectified.</li> <li>• Any new defects found are prioritised for completion based on the criticality of the finding</li> </ul>

How often these checks are carried out is dependent on the nature of the premises and the age and condition of the installation. Typically for industrial and commercial premises the period between checks should not exceed one year but for specialised or higher hazard installations (swimming pools, marinas, construction sites etc.) the period can be as frequent as every three or four months.

We would encourage you to include these checks in your facility's planned preventive maintenance schedule or part of a more in-depth periodic self inspection programme for smaller sites, to ensure they are carried out at the correct frequency and to the correct extent. See IET Guidance Note 3 – Inspection and Testing for more details

Infrared thermography is discussed in a separate technical guidance note but is a valuable additional tool for use in routine checks.

## Formal periodic inspections

### Frequency of inspections

The frequency of periodic inspections is dependent on a number of factors including the age, the type and environment of the installation. The date for the first periodic inspection after installation should be considered and recommended by the installation designer. The frequency of subsequent inspections should be recommended by the competent person carrying out the current inspection. This will be influenced by the findings of the inspection. For example the frequency of inspections might be increased if an installation has not withstood the adverse effects of its environment and usage, or does not appear to be subject to adequate or appropriate maintenance. To remove some of the subjectivity over inspection frequencies, Guidance Note 3 suggests maximum periods between inspections (see summary below). We would not expect these to be exceeded without a full engineering evaluation. **Note that if there has been no inspection for a number of years or previous inspection records are unavailable, then a base line inspection of 100% of the installation will be necessary.**

Type of Installation	Maximum period between inspections and testing
<b>General</b>	
Industrial	3 years
Offices / Shops / Laboratories	5 years
Educational Establishments	5 years
Commercial	5 years
<b>Buildings open to the Public</b>	
Leisure Complexes / Places of Public Entertainment / Theatres	3 years
Restaurant and Hotels / Public Houses / Village Halls and Community Centres	5 years
<b>Special and specific installations</b>	
Swimming Pools / Marinas / Fish Farms	1 year
Laundrettes / Petrol Filling Stations	1 year
Construction Site Installations	3 months

### Extent of subsequent inspection and testing

100% inspection and testing of the installation is encouraged although this is not always possible, practical or economically realistic. It is therefore up to the inspector to determine how much of the installation will be sampled. To set this sample size, it is important that they have a good understanding of the installation, either through review of up-to-date diagrams and charts, or from a 'walk around' survey. For large or complicated installations where diagrams are not available it may be necessary to produce these before the inspection can start.

Other factors that need to be considered by the inspector when setting sample size are:

- Age and probable condition of the installation
- Type and use
- Ambient environmental conditions
- Perceived effectiveness of ongoing maintenance
- Period since last testing and inspection
- Quality of records (diagrams / drawings, installation certificates, previous inspection reports, minor works certificates, maintenance records, etc).

If, during initial inspection of the sample, results are poor or unacceptable, then this may be indicative of similar problems in uninspected / untested sections of the installation, which may prompt an increase in sample size or potentially 100% examination of the installation.

Guidance for sample sizes is given within Guidance Note 3 and a comment is made that sample sizes of less than 10% are inadvisable. Using this sample size and taking the maximum period between inspections then sections of an industrial installation could remain uninspected / untested for up to 30 years after initial installation. This is a significant time period and a minimum sample size of not less than 20% is strongly advised.

### Who is competent to carry out the testing

There is significant responsibility on the inspector not only to be able to safely and competently carry out the inspection and testing but also potentially to set the extent of the current regime and frequency of future inspections and tests. It is therefore important that those doing the testing are properly experienced and trained to carry out work on the relevant type of installation, and that this is verified by an appropriate approvals agency.

#### NICEIC

There are a number of approval agencies for electrical installers and contractors and the most prominent of these is the NICEIC (National Inspection Council for Electrical Installing Contractors - <http://www.niceic.com/industry/why-use-niceic>). NICEIC approves contractors for industrial / commercial and domestic works and it should be ensured that the contractor has the relevant approval for the type of installation being worked on.

#### ECA

The Electrical Contractors Association assesses and approves electrical contractors for technical competence for electrical installations up to 1kV. The normal ECA approval applies to commercial / industrial installations, with additional approval required for domestic dwelling installation. Contractors that are ECA approved are generally acceptable although only for systems up to the 1kV AC or 1.5kV DC limit.

#### Elecsa

Elecsa provides limited registration/approval for electrical contractors although only for domestic installations (Part P under the building regulations). Generally this is not acceptable to QBE for commercial / industrial clients. <http://www.elecsa.co.uk/Contractors/For-Electrical-Contractors.aspx>

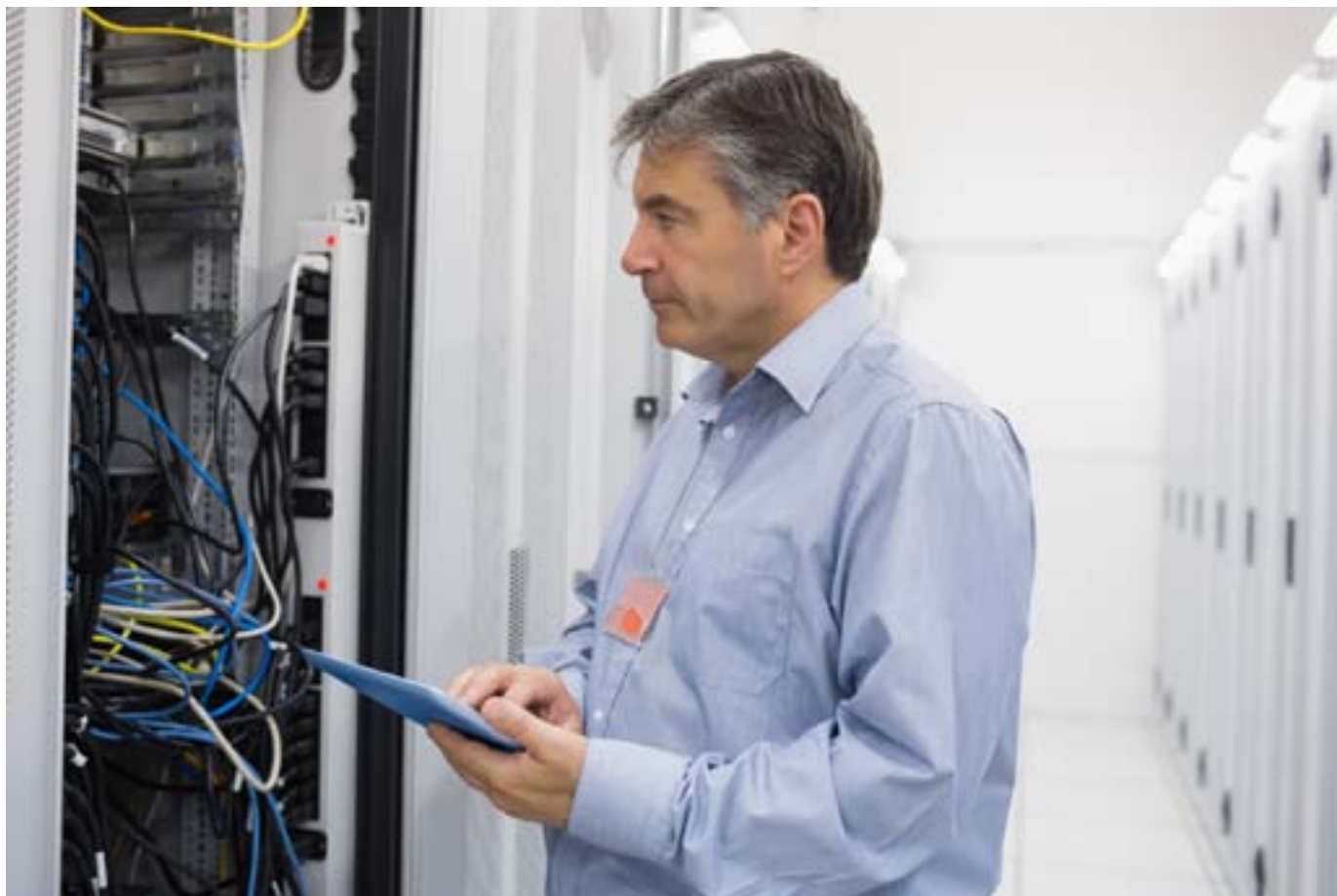
#### NAPIT

NAPIT provides limited approval of contractors, primarily for domestic installations (Part P as above) and micro-generation schemes. NAPIT also have a 'Full Scope' approval scheme so electrical contractors who have been approved under this scheme can work on / inspect / test commercial and industrial electrical systems up to a limit of 1kV AC or 1.5kV DC as per the ECA guidelines. Use of Full Scope approved electrical contractors is acceptable. [http://www.napit.org.uk/downloads/CP\\_Electrical\\_Scheme.pdf](http://www.napit.org.uk/downloads/CP_Electrical_Scheme.pdf)

#### BSI/Kitemark

BSI provide Kitemark approval for electrical contractors after assessing competency in a similar way to NICEIC and NAPIT. There are two levels of approval, Category A1.1, relating to dwellings under Part P of the building regulations and A1.2 for Premises other than dwellings. Contractors approved to A1.2 standard are generally acceptable to QBE. Approval listings can be found at [www.bsigroup.com/en-GB/Product-Directory](http://www.bsigroup.com/en-GB/Product-Directory). Under 'Category' select 'Services' then under 'Product Type' select 'Electrical Installers'.





### Own staff

Where own staff are used to inspect and test electrical installations, general guidance is that they should be assessed and approved by NICEIC, ECA or NAPIT (Full Scope). On a case by case basis it may be possible to accept electrical staff who are not approved by a recognised authority although, as a minimum, these individuals should have a demonstrable and 3rd party recognised qualification relating specifically to electrical inspection and testing (City and Guilds qualification or similar).

All inspection and testing should be fully documented in line with IET Guidance.

The Electrical Safety Register is a useful resource for finding appropriately approved electrical contractors – [www.electricalsafetyregister.com](http://www.electricalsafetyregister.com)

### Other points to note

- The electrical contractor carrying out the work must be registered / approved, not just the overall company or company owner

- NICEIC is the only approval body for work above 1kV
- When reviewing suitability of electrical contractors outside the UK, a key point to assess is whether their qualification is fully appropriate and not solely for domestic installations.

### Documentation and findings

- Records of periodic inspection and testing should be readily available. Test records similar to those within the IET guidance notes are routinely used and these detail the equipment / circuits tested, relevant test results and any faults found.
- Findings are categorised from C1 to C4 in terms of their priority by the inspector. This priority is primarily focused on life safety so findings like missing covers or cracked switches may be C1 or C2. It is not unusual for C3 and C4 findings to be deferred until refurbishments or major alterations take place. However it is worthwhile looking at the C3 and C4 findings as these may have a more significant impact from a property protection point of view.

**With electrical installations being a primary cause of harm to personnel and damage to property, maintaining them in a safe condition is essential. Implementing a comprehensive inspection and test regime for fixed electrical wiring systems is the most effective means of maintaining safe conditions and providing documented evidence of having done so.**

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