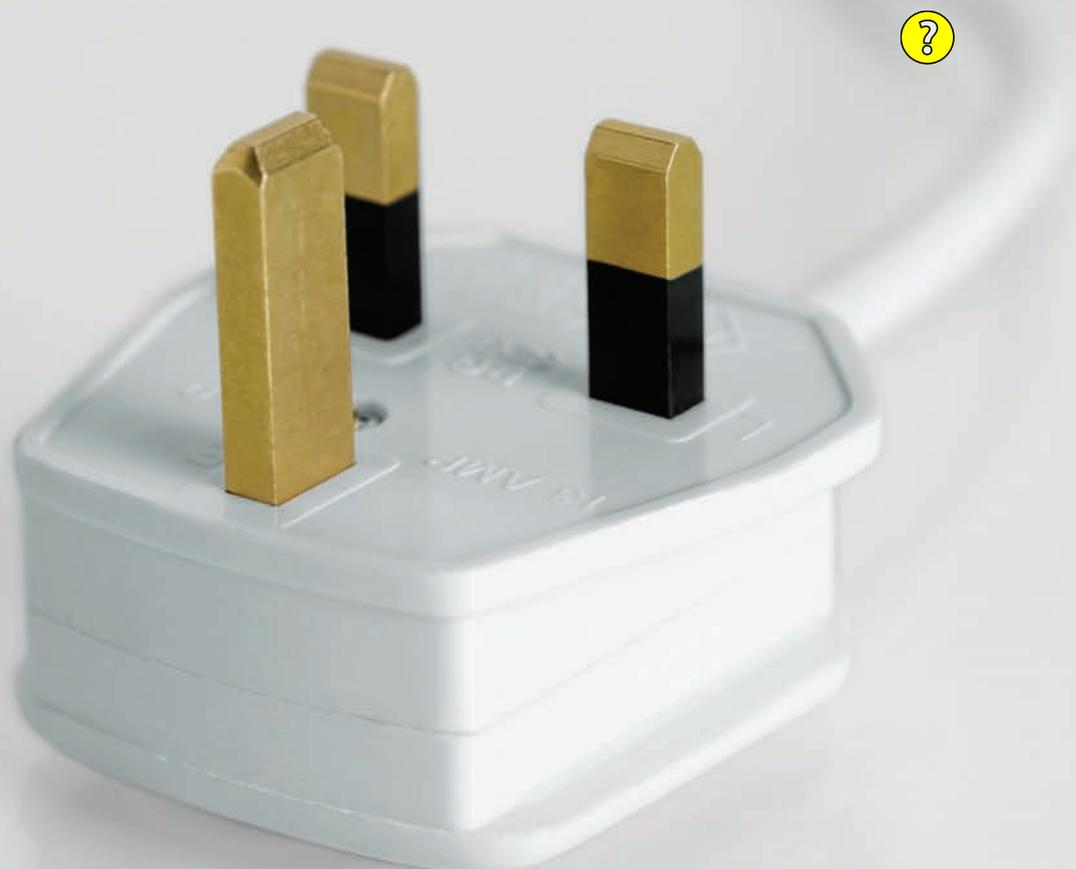


PAT Testing and the parameters affecting the frequency of testing

How frequencies of testing should be interpreted for in-service inspection and testing

By Richard Townsend



THERE IS A particularly common group of questions on the help-line, which centres on the requirement for consultants, contractors and customers to understand the frequencies of testing that should be carried out for in-service inspection and

testing of electrical equipment, commonly known as portable appliance testing (PAT).

There seems to be much confusion as to why they should comply and how to comply, with a great deal of confusion linked to types of equipment

and the environments they are used in and how this affects their testing regime.

The 'Code of Practice for In-service Inspection and Testing of Electrical Equipment' (3rd edition), produced by the IET, describes

the tests required and offers guidance on the initial frequencies that should be applied. In some cases the help-line callers possess this document but struggle to understand what is meant or implied by requirements for and frequency of tests. ►



'PAT testing' determines whether electrical equipment is safe to use

◀ The main objective for 'PAT testing' is to ascertain if electrical equipment that is in use, or likely to be, is fit and safe for continued use or if the equipment should be quarantined for repair/maintenance or quarantined for correct disposal.

Legislation

The legislation relevant to electrical maintenance is:

- Health and Safety at Work etc. Act 1974
- Management of Health and Safety at Work Regulations 1999
- Provision and Use of Work Equipment Regulations 1998
- Electricity at Work Regulations 1989
- Workplace (Health, Safety and Welfare) Regulations 1992

For the purpose of this article we will be concerned with two of these.

- Electricity at Work Regulations 1989
- Provision and Use of Work Equipment Regulations 1998

The requirement for PAT testing and maintenance is to comply with the Electricity at Work Regulation 4 (2) which states that: "As may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger". It must also comply with Regulation 5 of the Provision and Use of Work Equipment Regulations 1998, which states that: "Every employer shall ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair".

This means that any maintenance and frequencies of inspections and tests should be sufficient to prevent a dangerous occurrence, so far as is reasonably practicable.

The requirements of the Electricity at Work Regulations can be met by:

1. Performing in-service inspection and testing, which consist of three activities:
 - i user checks
 - ii formal visual inspections (without tests)
 - iii combined inspections and tests
2. Performing maintenance or, if necessary, replacing the defective item of equipment (depending upon the results of the in-service inspection and testing), and
3. Keeping up-to-date records that can be a means of showing compliance.

Information on the Electricity at Work Regulations can be found in the HSE publication 'The Memorandum of Guidance on the Electricity at Work Regulations 1989'.

When regular inspection and testing is carried out, this can form part of an ongoing maintenance programme, which in turn can be used by a competent person to determine the frequencies and level of inspections for the future on going programme.

It also allows the responsible person to monitor the ►



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◀ condition of any equipment and in doing so the ongoing maintenance programme can be modified to ensure that equipment life expectancy can be achieved or safely extended.

Frequency of Testing

The code of practice for in-service inspection and test (COP), table 7.1 gives initial frequencies of inspections and tests. These “initial frequencies” are often taken out of context and used as absolute figures regardless of any analysis of an individual business requirement. This is a common and costly error of judgement and is made quite clear on page 36, item 7.4 of the same code of practice.

The table 7.1 in the COP should be used as a guide for the initial frequency of any inspection and tests. As soon as a history of regular testing, inspection and maintenance is produced or proved, the competent person responsible for the installation can determine whether the equipment test frequencies are

acceptable and that sufficient protection is afforded to end users.

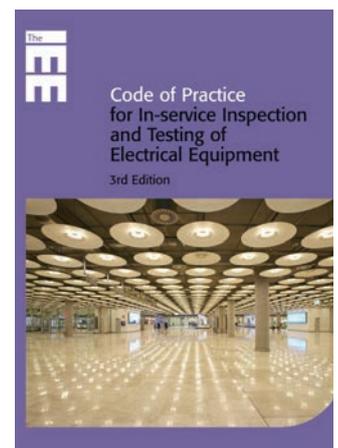
The frequencies that are used are based on general usage without any prior knowledge of the installation. Once a history of tests exists it may be acceptable to extend the frequencies beyond those used in Table 7.1. The level or time frame that the intervals can be extended is dependant on the competent persons

technical judgement using the existing data, or history, with which to make an informed decision, which again, should be backed up with continual monitoring in order to confirm any decisions made.

It should be noted, however, that in certain circumstances that the frequencies may need to be reduced if the environment the equipment is operated in, is sufficiently harsh to degrade its safe

working state, or it shows signs of requiring earlier maintenance periods due to breakdowns through damage or unreliability.

Consideration should be given to a piece of equipments position and accessibility will play a big part in its test frequencies, for example, if a television or monitor screen is wall mounted at high level and has little or no physical interaction with operators, it stands to reason that it's frequency of test could be extended due to its inaccessibility and low risk of damage from user interaction.



The Code of Practice describes the tests required and offers guidance on initial frequencies

Regular risk assessments remain key in all continuous monitoring PAT test plans and they should be re-visited regularly to prove their effectiveness. If this methodology is accepted and adhered to, the regular PAT testing programme can become a useful tool in product/asset reliability and effectiveness. This can only serve to reduce annual maintenance expenditure and ensure that the maximum life span of equipments can be achieved effectively and safely. ■

