

The Preventative Role of Portable Appliance Testing - 25 Years of the Electricity At Work Regulations 1989

An overview of the in-service inspection and testing
of electrical equipment and appliances

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Contents & Figures

Introduction	3
Industry guidance and existing practice	4
Assessing the risk	5
Who performs portable appliance testing?	6
Rates of test failure	6
The nature of electrical faults	7
The consequences of electrical faults	8
Workplace fires	9
Counterfeit electrical goods	12
Faulty equipment and product recalls	13
A common sense approach to compliance	14
The appliance of testing science	16
Conclusion	18
References indicated in text	19
Figure 1: RIDDOR figures dating back to 2001/2002, for contact with electricity or electrical discharge	8
Figure 2. Fires in dwellings and other buildings by cause, 2000/01 to 2011/12	10
Figure 3. Causes of accidental fires in buildings other than dwellings from 2000/2001 to 2011/2012	11
Figure 4. Demonstrating compliance process diagram	15

Introduction

It is doubtful whether any single issue has raised as much discussion and debate in the electrical services industry as that provoked by portable appliance testing. Although the concept of regularly testing the electrical safety of electrical equipment had been common practice in government properties, the tool hire and other sectors before the introduction of the Electricity At Work Regulations 1989 (EAWR 1989), the legislation itself provided the impetus for the much broader application of formal appliance inspection and testing programmes in all workplaces.

The EAWR 1989, which actually came into force on 1st April 1990, set out to raise the standards of electrical safety within industry and commerce. In doing so it has become firmly acknowledged as the starting point for what is now known as portable appliance testing.

It may therefore be of some surprise that nowhere in the regulation is there a specific requirement for the testing of portable appliances. There is, however, an onus on the dutyholder to ensure that equipment in the workplace is maintained so as to prevent danger. Specifically Section 4 of the regulations requires that:

4. (1) All systems shall at all times be of such construction as to prevent, so far as is reasonably practicable, danger.
- (2) As may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger.
- (3) Every work activity, including operation, use and maintenance of a system and work near a system, shall be carried out in such a manner as not to give rise, so far as is reasonably practicable, to danger.
- (4) Any equipment provided under these Regulations for the purpose of protecting persons at work on or near electrical equipment shall be suitable for the use for which it is provided, be maintained in a condition suitable for that use, and be properly used.

(Source: Electricity at Work Regulations, 1989, section 4)

It is this obligation to maintain systems (including equipment) to prevent danger that introduces the implied requirement to perform periodic inspection and testing; the inference must be that without such actions the dutyholder will be unable to establish the potential dangers exposed by faulty or unsafe equipment.

As a result, and regardless of any specific legal requirement, the consequences of an electrical fault causing a fire or resulting in somebody receiving an electric shock need to be fully considered. In the event of electrical accidents, property damage or personal injury occurring, portable appliance testing can demonstrate a responsible and diligent approach towards safety that may subsequently be required by the HSE, local authorities, insurance companies and other interested parties.

Despite the uncertainty which initially greeted the introduction of the EAWR 1989, portable appliance testing has now grown into a considerable industry with sophisticated technology making a significant contribution to a safer working environment.

With 25 years experience of the EAWR 1989 it is therefore useful to look at how the industry has developed over this period, how the regulations have helped to improve safety in the workplace – and also on the associated impact on some other electrical equipment issues that could not have been anticipated back in 1989.

Industry guidance and existing practice

After the introduction of the EAWR 1989, the initial HSE Guidance Note HS (G) 107, published in 1994, was the first comprehensive guide on the in-service periodic inspection and testing of electrical appliances. Based on the advice and experience of experts in various sectors, the initial note attempted, for example, to provide advice on those types of equipment and working environments where a simple visual inspection was adequate and those which required combined inspection and testing.

The HSE Guidance Note was then quickly followed by the first edition of the IEE Code of Practice on the in-service testing of electrical equipment. At the time, as the most comprehensive guide published on the subject, this document provided the clearest message yet of the importance of establishing regular electrical safety testing and inspection routines in the interests of workplace safety – and provided more technical information on the tests to be carried out and the suggested inspection and test intervals for different working environments.

Today the custom continues of new HSE Guidance Notes (now called Memorandum of Guidance) being published alongside revised and updated IEE (now IET) Codes of Practice.

In addition to these documents, in recent years the most marked change to portable appliance testing has been introduced by the recommendations of the Löfstedt Review in 2012. This review into a number of health and safety requirements sought to bring some clarity to a situation in which it was claimed that the implied legal requirement concerning the maintenance of electrical appliances was being applied 'too widely and disproportionately'.

In response, the HSE published new guidance on maintaining portable electrical equipment in low risk environments and the IET produced the 4th Edition of its Code of Practice on the in-service inspection and testing of electrical equipment. Both of these guides remain the most up to date formal advice and guidance available to those responsible for maintaining electrical safety in the workplace.

Assessing the risk

The 4th edition of the IET Code of Practice focuses on the importance of taking a proportionate response to the need to ensure that all workplace electrical systems should be maintained to prevent danger.

To do this the latest guide was expanded to include more electrical equipment categories and workplaces, alongside more detailed explanatory notes and definitions of inspection and testing matters.

However, the main thrust of the new edition was to highlight the importance of taking a structured approach to risk assessment for the determination of equipment inspection and testing intervals. In fact the Code of Practice had always emphasised that the frequency of inspections and testing should be reviewed on a regular basis after an assessment of the risks associated with the use of a particular appliance.

However, new prominence is given to this approach in the latest document which also reiterates that risk based assessments are the responsibility of the dutyholder (which might be the facilities manager, building manager, landlord or other such responsible person), but that a dutyholder may enlist the services of a competent person to assist in this process.

In support of this, the IET Code recognises that risk encompasses many factors that can eventually influence a final decision on electrical inspection and test frequencies, but goes on to highlight the main considerations that should enable an informed decision to be made on the inspection and test intervals:

The environment: equipment installed in a benign environment, such as an office, will suffer less damage than equipment in an arduous environment, such as a construction site

The users: if the users of equipment report damage as and when it becomes evident, hazards will be avoided. Conversely, if equipment is likely to receive unreported abuse, more frequent inspection and testing are likely to be required

The equipment construction: the safety of a Class I appliance is dependent upon a connection with the earth of the fixed electrical installation. If the flexible cable is damaged the connection with earth can be lost. The safety of Class II equipment is not dependent upon the integrity of the electrical installation. If equipment is known to be Class II and is used in a low risk environment, such as an office, recorded testing (but not inspection) may be omitted

The equipment type: an appliance that is handheld is more likely to be damaged than a fixed appliance. If such an appliance is also Class I the risk of danger is increased, as safety is dependent upon the continuity of the protective conductor from the plug to the appliance

The frequency of use: the frequency of use of an appliance is important, particularly where portable, movable and handheld appliances are concerned, as this may have implications on service life and exposure to possible damage

Type of installation methods: installation methods should be taken into account especially when assessing fixed equipment as the isolator position and cable management can be an important factor when assessing for risk

Previous records: where previous records of inspection, testing and maintenance are available, these should be used to evaluate the frequency of subsequent inspections and tests, as they will provide a history of the environment, the users and how this affects the condition of the appliances within it.

(Source: Code of Practice for In-service Inspection and Testing of Electrical Equipment (4th Edition), IET, 2012)

Who performs portable appliance testing?

An analysis¹ of the data associated with the purchase of portable appliance testing instrumentation shows that the type of users can be broken down into two groups:

Around 65% of users are individual organisations or companies who perform their own in-house testing and 35% are contractors (electrical, specialist PAT, facilities management, health & safety etc.) providing a test service on a sub-contract basis.

A further investigation of the differences in testing regimes between different types of user shows that organisations that perform their own tests tend to integrate portable appliance inspection and testing into broader health and safety asset management policies.

Rates of test failure

The nature of portable appliance inspection and testing regimes means that the number of failed appliances recorded is always likely to be higher during an initial test programme – simply because items may have been in use for an extended period before testing has been introduced.

Clearly the rate of test failures is likely to decline during subsequent reviews as more potentially defective equipment is routinely identified and rectified.

This is illustrated by evidence from sequences of tests undertaken by trading standards officers in a programme funded by the Electrical Safety Council (now known as Electrical Safety First)². In this programme the average proportion of defects discovered during ‘first time’ appliance testing of a range of electrical equipment was 12%.

For more regular routine testing of appliances, evidence from proprietary industry figures confirms the presence of different levels of danger associated with the type of equipment being used, their patterns of use and the working environment.

Detailed analysis of substantial test records gathered from testers used by PAT contractors returned to an instrument manufacturer for calibration and repair³ showed that typical office-based working environments had an in-service electrical appliance failure rate within the range of 0.5% to 1.5%. In educational and training establishments the rate was higher at between 0.5% and 3.3%, and in industrial workplaces was higher still at 1.0% to 24%.

These general results not only demonstrate the value of inspection and testing processes, but also confirm that the general advice and guidance provided by the HSE and the IET Code of Practice represent a realistic and appropriate approach to the subject.

The nature of electrical faults

Using the statistics highlighted above, an examination of the reasons for test failure showed that there is a high proportion of appliances that failed an initial visual inspection due to defects in the cable, appliance enclosure or the mains plug.

However, approximately a third of those items which failed had defective protective conductors or insulation, and these 'invisible' faults could only be detected by carrying out specialist electrical testing or checking using an appropriate test instrument.

Originally it was recommended that the maintenance of electrical equipment should be carried out in four stages - visual inspection, a test to verify earth continuity, a test to verify insulation and a functional test. Over the years, however, the range of electrical tests recommended by the IET Code of Practice has also been extended. These have included, for example, variations in applied voltages for insulation testing, changes to earth continuity currents and new requirements in relation to checking cables, leads, and RCD trip times.

In such cases visual inspection needs to be linked with a programme of testing capable of revealing any unseen electrical faults such as problems with earth continuity, insulation integrity, correct polarity, unacceptable earth leakage or other potential dangers.

The consequences of electrical faults

There is considerable evidence that faulty electrical appliances continue to pose a real threat to people and property.

In the opening remarks on electrical safety in the Löfstedt Review, reference is made to the 1,000 workforce accidents and 30 fatalities involving electric shock and burns that are reported to the HSE each year. Indeed, in its own publications, mention is made by the HSE of how ‘electricity can kill or severely injure people and cause damage to property. Every year many accidents at work involving electric shock or burns are reported to the Health and Safety Executive.’

Although the HSE is unable to provide detailed data on electricity-related fatalities, accidents and injuries going back 25 years, it seems clear that since the introduction of the EAWR 1989, the incidence of workplace accidents linked to electricity have shown a gradual decline.

Recent figures extracted from RIDDOR⁴ dating back to 2001/2002, for contact with electricity or electrical discharge, are as follows:

	Fatalities	Major injuries	3 day injuries	Total
2001/02	7	131	411	549
2002/03	12	127	447	586
2003/04	9	148	379	536
2004/05	4	118	357	479
2005/06	8	105	354	467
2006/07	11	111	359	481
2007/08	9	83	341	433
2009/10	4	93	320	417
2009/10	3	75	282	360
2010/11	7	88	299	394
2011/12	6	106	299	411
2012/13 (p)	2	90	170*	262

Source: HSE Statistics Unit (p) provisional

*The figure for 2012/13 is for ‘over 7 day injuries’ as a result of a change in reporting requirements

Workplace fires

However, potential electrocution and electric shock represents only part of the problem associated with faulty electrical items. Proper consideration also needs to be made of the contributory role of faulty electrical appliances in commercial and industrial property fires which are also a major cause of deaths, injuries and considerable costs to businesses.

In particular, successive annual Fire Statistics⁵ show that faulty appliances and leads continue to pose the single most common problem as the main cause of accidental fires in 'other dwellings' – i.e. non residential properties. Over the 25 year period of the EAWR 1989 the following overall comparison can be made:

1989 UK Fire Statistics:

45,600 fires in 'other occupied buildings (non domestic)' of which 32,400 (71%) were regarded as accidental. Of these accidental fires, the main causes were faulty appliances and leads with 6,800 incidents (21%) and misuse of equipment or appliances with 6,400 fires (20%)

2011/12 Fire Statistics Great Britain:

24,100 fires in 'other buildings' of which 16,800 (70%) were regarded as accidental. The main cause of accidental fires in other buildings was faulty appliances and leads (24%). This represented around 4,000 fires during the year. The misuse of equipment and appliances was responsible for 2,600 accidental fires in 2011-12 (15%).

Over this 25 year period these figures would appear to show that the incidence of accidental fires in commercial and industrial buildings has reduced significantly. Included in this overall trend are some interesting facts and figures:

- The 24,100 fires recorded in 'other buildings' during 2011/12 was the lowest for more than a decade.
- The 4,000 accidental fires in 'other buildings' recorded in 2011/12 was a 10% reduction on the previous year and the lowest level in more than a decade.
- Between 2000/2001 and 2011/12 (excl 2009/10 for which no breakdown is available), each year faulty appliances and leads were identified as the cause of between 24% and 32% of accidental fires in non dwelling type buildings.
- According to published statistics collated by the Fire Protection Association (FPA)⁶, between 2000 and 2005, in 346 reported fires that were electrical in origin in business premises, the reported losses totalled over £178 million, with an average loss per incident of over £51,000.



Faulty appliances and leads continue to be the main cause of accidental fires in non-residential properties.

Fires in dwellings and other buildings by cause, 2000/01-2011/12¹

Great Britain													Fires (thousands)
Year	Total	Cause											
		Deliberate ²	Accidental or unspecified causes										
			Total	Faulty Fuel Supplies	Faulty Appliances and Leads	Misuse of Equipment or Appliances	Chip/Fat Pan Fires	Playing with Fire	Careless Handling of Fire or Hot Substances	Placing Articles too Close to Heat	Other Accidental	Unspecified Cause	
Dwellings³													
2000/01	67.4	13.1	54.1	2.0	7.2	19.0	10.3	0.7	4.7	4.7	4.8	0.7	
2001/02	66.5	14.3	52.2	2.1	7.4	18.2	8.9	0.7	4.9	4.9	4.6	0.5	
2002/03	59.7	12.6	47.1	1.9	6.7	16.3	8.3	0.6	4.3	4.7	3.8	0.5	
2003/04	61.7	13.2	48.5	1.8	7.0	17.0	8.1	0.6	4.8	4.3	4.2	0.6	
2004/05	57.1	11	46.1	1.8	6.9	16.4	7.0	0.5	4.3	4.2	4.3	0.6	
2005/06	55.9	9.8	46.1	1.8	7.0	16.3	6.6	0.5	4.3	4.2	4.6	0.7	
2006/07	53.8	9.5	44.3	1.7	7.1	16.2	5.7	0.4	4.2	3.9	4.4	0.7	
2007/08	50.4	8.6	41.8	1.6	7.1	14.5	5.2	0.3	4.2	4.1	4.1	0.6	
2008/09	47.5	7.9	39.6	1.3	6.0	11.1	4.1	0.2	3.4	3.4	9.4	0.7	
2009/10	47.2	..	..	..	..	..	..	..	..	..	..	..
2010/11	44.7	6.2	38.5	2.8	5.8	14.7	2.8	0.3	3.9	4.0	4	0.1	
Other Buildings													
2000/01	39.9	17.1	22.8	2.2	6.0	4.5	0.8	0.1	2.3	1.7	4.5	0.7	
2001/02	42.3	19.4	22.9	2.0	6.1	4.6	0.8	0.1	2.2	1.5	4.8	0.8	
2002/03	38.1	16.7	21.4	1.6	6.1	3.9	0.8	0.1	2.1	1.7	4.3	0.8	
2003/04	40.4	18.3	22.1	1.9	6.2	3.8	0.8	0.1	2.2	1.6	4.8	0.8	
2004/05	35.8	14.7	21.1	1.8	6.3	3.9	0.8	0.1	1.8	1.4	4.2	0.8	
2005/06	33.8	13.3	20.5	1.7	6.2	3.8	0.7	0.1	1.6	1.4	4.3	0.9	
2006/07	31.7	12.4	19.3	1.7	5.9	3.3	0.5	0.0	1.5	1.3	4.1	0.9	
2007/08	29.2	11.1	18.1	1.5	5.8	3.0	0.5	0.0	1.4	1.4	3.7	0.8	
2008/09	26.1	9.2	16.9	1.2	5.0	2.0	0.3	0.0	1.0	1.1	5.3	0.9	
2009/10	26.5	..	..	..	..	..	..	..	..	..	..	..
2010/11	25.0	7.4	17.6	2.1	4.4	2.8	0.5	0.1	1.5	1.4	4.7	0.1	
2011/12	24.1	7.3	16.8	2.0	4.0	2.6	0.5	0.1	1.5	1.5	4.7	0.1	

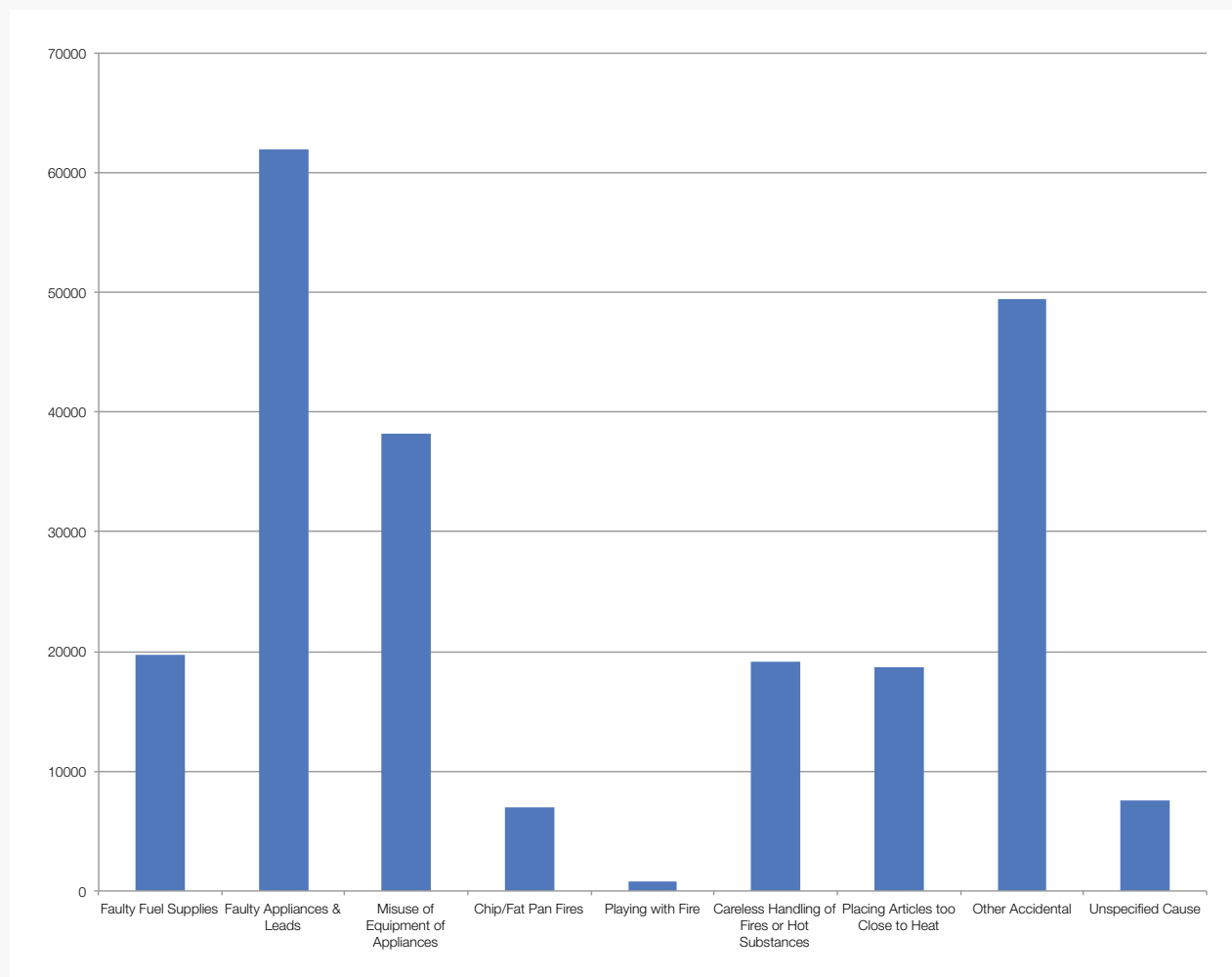
1 Figures are rounded and the components do not necessarily sum to the independently rounded totals.

2 Deliberate fires include fires where deliberate ignition was merely suspected (see explanatory note 11).

3 Includes caravans, houseboats and other non-building structures used solely as a permanent dwelling (see explanatory note 24).

From Fire Statistics, Great Britain, www.communities.gov.uk

Causes of accidental fires in buildings other than dwellings from 2000/2001 to 2011/2012*



*Excludes 2009/10 for which breakdown figures are not available.
From Fire Statistics, Great Britain, www.communities.gov.uk

Counterfeit electrical goods

Portable appliance inspection and testing is also becoming one of the main ways in which dangerous counterfeit electrical equipment is identified.

In an earlier presentation, BEAMA⁷ summarised the problems related to the infiltration of traditional supply chains by counterfeit electrical equipment that had not been subjected to normal production line compliance testing and certification. It said that:

- Approximately £30 million of counterfeit electrical products entered the UK market in 2010
- Counterfeit electrical products include everything from domestic appliances to cables and leads, lighting products, power tools and wiring accessories.

In addition, the www.counterfeit-kills.co.uk website reports that over 15 million counterfeit products have been seized and destroyed in the period 2001 to 2013 – and the number is growing monthly.

From public reports it would appear that the counterfeit problem appears to have infiltrated all parts of the electrical appliance supply chain and even large blue chip global brands are not immune. For example, during 2013 Apple unveiled a worldwide programme to replace third-party and counterfeit USB power adaptors that were available at a cheaper price. The decision came after a Chinese woman was reportedly electrocuted while answering her phone as it was being charged with a non-Apple device.



In 2013, Apple unveiled a worldwide programme to replace counterfeit power adaptors after a Chinese woman was reported to have been electrocuted whilst using one.

As another indication of the potential scale of the counterfeiting problem, it has also been reported that www.ebay.co.uk has removed over 1,000 listing for electrical products which have illegal plugs, including over 140 which did not have a fuse.⁸

In the UK, Electrical Safety First (ESF - formerly the Electrical Safety Council ESC) has campaigned to highlight the risks posed by counterfeit electrical appliances. ESF Director General, Phil Buckle, said: “Whilst everyone loves a bargain, if a cheap electrical product turns out to be fake then it is, at best, a waste of money and at worst, it could result in the death of a loved one.”

By implementing regular and systematic inspection and testing of electrical appliances used in the workplace, portable appliance testing provides an effective safeguard against the risks posed by the use of potentially dangerous counterfeit equipment.

Faulty equipment and product recalls

Of course it is not only counterfeit electrical equipment that can pose a safety or fire risk. Genuine products from legitimate sources can sometimes be potentially unsafe and become the subject of product recall notices by manufacturers.

In recent years, this potential problem has been exacerbated by failings in the product recall system. ESF has warned that millions of potentially dangerous recalled electrical products are thought to remain in use due to a worryingly low recall success rate.

The charity found that the average recall success rate is just 10-20%. With 266 known electrical product recalls in the last six years and manufacturers often producing hundreds of thousands of units, there are likely to be millions of dangerous products threatening safety every day.

Admittedly the cases highlighted by ESF involve the use of appliances in domestic residential properties – but with the problem being so large and involving kitchen appliances, heating units and other widely used electrical equipment, it seems inevitable that some of these products are also being used in workplaces, hotels, pubs, restaurants, and similar non-domestic premises.

In such circumstances, diligent and professional portable appliance testing carried out as part of proper asset management and preventative maintenance regimes can enable recalled electrical products to be identified and potentially dangerous appliances to be removed from the workplace.

A common sense approach to compliance

Although the EAWR 1989 do not formally stipulate the need for electrical testing, there is a great deal of recorded evidence that illustrates that formal inspection and testing programmes are capable of identifying many situations where defective equipment could have caused electrocution or fire.

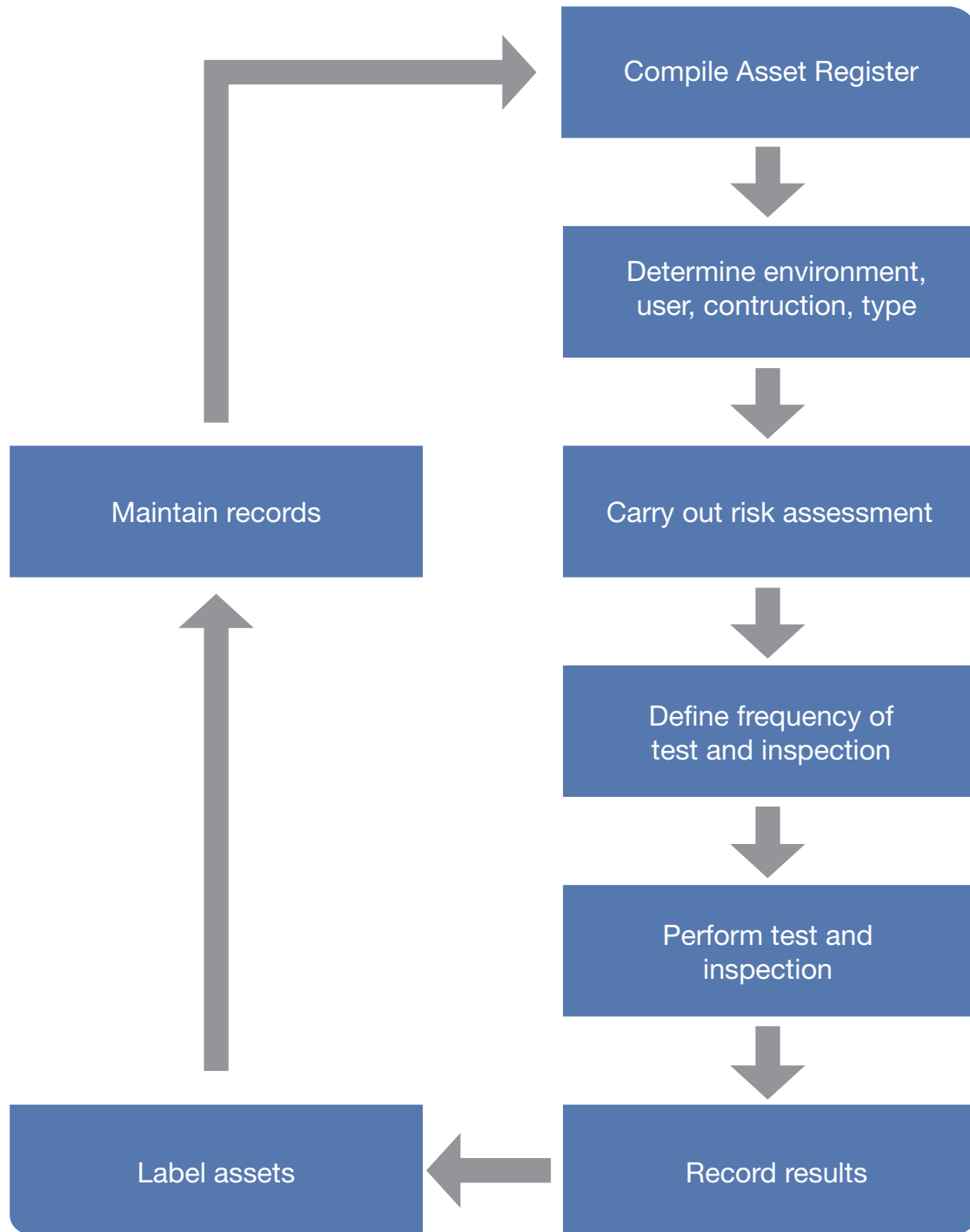
In the vast number of cases the cost of taking a reasonable approach to inspection and testing can be considerably lower than that associated with other forms of assessing and preventing any health and safety risks – and certainly lower than the resultant financial cost of any personal injury or fire damage to premises resulting from faulty appliances remaining undetected.

For example, a basic test instrument, with a training video and test record book, can be purchased for a few hundred pounds. Such a system should have a life of up to 10 years. A small organisation with 100 appliances should be able to perform the inspection and testing over less than one day each year. In this sort of example the company will therefore have a minimal cost associated with this aspect of its electrical health and safety policy.

With larger organisations the cost will be proportional to the size and type of industry and here specialist sub contract portable appliance testing services may be the answer. However, for all requirements there are excellent test products, software and accessories available which can greatly reduce the time (and therefore the cost) associated with the inspection and testing process.

In reality a duty holder can demonstrate compliance with the EAWR 1989 by a variety of means, of which inspection and testing is one, and it is up to the dutyholder to determine how best this can be achieved in relation to the risk posed in their own particular environment. In making these decisions, the latest IET Code of Practice also makes it clear that dutyholders can seek the advice of external contractors and specialists involved in testing to assist them with their risk assessments.

Demonstrating compliance



The appliance of testing science

The EAWR 1989, with the accompanying guidance notes and Codes of Practice, have proven themselves as the basis for successful preventative maintenance programmes. However, this success has also been based on the successful development of a wide range of safety testing instrumentation.

Over the 25 year period of the EAWR 1989, PAT instrumentation has not only been successful in meeting the needs of many different types of organisations and users, but has also shown constant technological innovation that has made testing faster, more efficient and cost effective for those involved – and all of this has been achieved without any compromise to the integrity of the testing being undertaken.

The initial demand for in-service electrical appliance testers was met largely by the availability of two distinct types of tester. At the basic level there were relatively simple to operate pass/fail checkers capable of carrying out fundamental tests and providing an immediate 'go/no go' display. For more demanding PAT applications, particularly in larger organisations, more sophisticated testers were available that incorporated a greater range of tests and had the ability to store and download test data into PC based record keeping systems.

Over the years these broad distinctions between manual and automatic testers have remained apparent, but the obvious differentiation between the two has closed. For example, the latest manual testers now have some basic test downloading and data storage capacity, and all PATs have much greater functionality with the ability to link to specialist accessories for more comprehensive testing.

These moves to increase the capability, versatility and functionality of PAT testers have been driven by both technical testing needs and the requirements of an expanding but relatively mature marketplace.

As successive IET Codes of Practice have highlighted the benefits of different types of electrical test, then PAT test manufacturers have responded by including, for example, the necessary technology to test appliance leads and 3 phase equipment, test RCD trip times, provide different options for insulation test voltages and utilise specialist test currents for earth continuity testing.

At the same time as meeting these changing technical demands, instrument manufacturers have responded to the growing maturity of the PAT market. For the modern PAT tester, time is money and competitive pressures mean that tests must be undertaken quickly and efficiently, but without in any way affecting the accuracy and reliability of the test results.

To meet this need a whole host of special features and PAT accessories have been introduced. The introduction of barcode labelling of products with automatic recognition of test protocols by the test instrument was an early development, and this was followed by the introduction of Bluetooth connectivity with test accessories such as label printers to speed the test process.

Lightweight and battery powered testers have further improved portability factors and reduced the downtime between tests. Improvements in test management software has allowed records to be updated automatically, reports and certificates to be produced and advance test schedules to be generated.

In the latest generation PATs all of these advances have been combined to both meet the updated technical requirements of the IET Code of Practice and comply with the risk-based approach now being emphasised by the HSE.

As well as comprehensive electrical test functions, the most advanced multi-purpose PAT tester is now equipped with an onboard risk management tool to help determine re-test intervals. This feature is included alongside a built-in digital camera to enable high quality images to be tagged against appliance records for completely traceable electrical safety record keeping and maintenance.

Continuous technical innovation has therefore ensured that portable appliance test instrumentation has kept pace with the changing demands of the workplace - and can continue to successfully meet the needs of everyone who has a responsibility for ensuring the safe use of electrical equipment.

Today, a host of PAT testers are available from simple pass/fail checkers through to advanced data capture models with onboard camera and test certificates



Conclusion

There is indisputable evidence that the periodic inspection and testing of portable electrical equipment saves lives and prevents fires that may otherwise have caused injuries, loss of life and serious damage to business and work premises.

In addition, the inspection and testing of electrical equipment as part of planned preventive maintenance campaigns have an increasingly important role to play in eliminating the risks posed by growing safety problems linked to counterfeit products and inefficient product recall processes.

In this respect the EAWR 1989, along with the HSE Memorandum of Guidance and successive IET Codes of Practice, has consistently provided sound advice based on industry experience and the electrical safety needs of the business community.

More recently, the new emphasis on a common sense approach to testing has also been useful in helping to generate a better understanding of portable appliance testing. As a result, whilst risk assessment remains fundamental to this new approach, the clarification of the responsibilities of dutyholders and contractors will further strengthen relationships between the two and help to introduce higher levels of professionalism in the industry.

Against the backdrop of 25 years of the Electricity At Work Regulations 1989, few could dispute that the process of electrical inspection and testing has made an important contribution to improving and maintaining safety in the workplace. As we move forward the recent changes have proven without doubt that adequate electrical safety measures can be effectively maintained without the imposition of an overly excessive test regime – and this can only be for the long term benefit of all those involved in workplace safety and all those in the PAT sector. Here's to the next 25 years.

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Jim Wallace is Associate Director of the Seaward Group, where he heads up the company's product development and new technology programmes.

Jim has played a pioneering role in developing new PAT testers to give those involved in electrical safety testing enhanced features and test accessories to improve efficiency and add real value to the safety testing process.

He has been with Seaward for over 15 years, during which time the company has seen significant technological innovation in its portable appliance testing products.

As Engineering Manager and then Product and Technology Manager, Jim has been instrumental in the development and introduction of advanced test equipment and technology features.

Jim is also chairman of the Gambica Electrical Test Instruments Group and an active member of several BSI and IEC working groups.

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