IET Code of Practice for in-service inspection and testing of electrical equipment

4th Edition

Seaward Group
Recent health & safety trends

- Government pressure to reduce the burden of over compliance
- HSE asked to review regulations / amend if necessary
Löfstedt changes status quo

HSE report that issue is not the Regulations but the way in which they are applied


HSE guidance for low risk environments

AIM TO ADDRESS “OVER COMPLIANCE”

Reinforcement of the need for risk based approach
As may be necessary to prevent danger, all systems shall be maintained, so as to prevent, so far as is reasonably practicable, such danger.

Electricity at Work Regulations (1989)
Every employer shall make a suitable and sufficient assessment of the risks to the health and safety of his employees to which they are exposed whilst they are at work.

Where the employer employs five or more employees, he shall record the significant findings of the assessment.

Management of Health and Safety at Work Regulations (1999)
Risk Based Approach
Risk based approach

- In-service inspection and testing reduces the risk of electric shock or fire in the workplace
- Maintenance regime should be proportionate to the risk
- Risk assessments are the responsibility of the duty holder
- Duty holder may enlist the services of a competent person
- Risk assessments should be reviewed regularly
Risk assessment

‘A systematic process of evaluating the potential risks that may be involved in a projected activity or undertaking, considering what could go wrong and deciding on suitable control measures to prevent loss, damage or injury in the workplace. An assessment should include any controls required to reduce, minimize or eliminate any risk.’
Performing a Risk Assessment

1. Potential hazards are recorded
2. Probability of an event is estimated by the assessor
3. Severity of harm is estimated by the assessor
4. Risk is calculated
5. Action is determined
What does this mean?

Table 7.1 provides *only* guidance on *initial* frequencies of inspection and testing

The duty holder:

• should determine the frequency of inspection and testing from risk assessment

• may take advice from person doing inspection and testing

• should determine the date for the next inspection and/or tests on a risk assessment basis
Changes to Table 7.1

<table>
<thead>
<tr>
<th>Environment</th>
<th>Equipment Type</th>
<th>Construction Class</th>
<th>4th Edition</th>
<th>3rd Edition</th>
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<tbody>
<tr>
<td>Industrial</td>
<td>Stationary</td>
<td>Class I</td>
<td>none</td>
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<td>Class I</td>
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Influencing factors

- The environment
- The users
- The equipment construction
- The type of equipment
- The frequency of use
- Type of installation methods
- Previous records
Example risk assessment

- Environment: Construction Sites
- Equipment Type: Stationary
- Construction Class: Class I
- User: Trained to detect and report defects
- Type of Installation: Enclosed or protected mains cabling
- Frequency of Use: Occasional
- Previous Test Results: Well within acceptable limits
## Generic risk assessment

<table>
<thead>
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<th>Risk Assessment form</th>
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<tr>
<td><strong>Site</strong></td>
</tr>
<tr>
<td><strong>Location</strong></td>
</tr>
<tr>
<td><strong>Hazard ID No.</strong></td>
</tr>
<tr>
<td><strong>Hazard Description</strong></td>
</tr>
<tr>
<td><strong>Who might be harmed and how?</strong></td>
</tr>
<tr>
<td><strong>Current Controls in place</strong></td>
</tr>
<tr>
<td><strong>Impact of Risk event</strong></td>
</tr>
<tr>
<td><strong>Probability of Occurrence</strong></td>
</tr>
<tr>
<td><strong>Priority of Risk Level</strong></td>
</tr>
<tr>
<td><strong>Advice:</strong></td>
</tr>
<tr>
<td><strong>Actions Required to Reduce Risk</strong></td>
</tr>
<tr>
<td><strong>By Who</strong></td>
</tr>
<tr>
<td><strong>By When</strong></td>
</tr>
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# Risk assessment reports

## Risk Assessment Report

**Client:** Smiths Electrical  
**Site:** Hullchester Office  
**Location:** Reception Area

<table>
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<tr>
<th>Hazard ID</th>
<th>Hazard Description</th>
<th>Who might be harmed and how?</th>
<th>Current Controls in place</th>
<th>Risk Level</th>
<th>Actions Required</th>
<th>By Who</th>
<th>By When</th>
</tr>
</thead>
<tbody>
<tr>
<td>H001</td>
<td>Pot plant is placed close to photocopier</td>
<td>Risk to users of the photocopier</td>
<td>None</td>
<td>Substantial</td>
<td>Move plant</td>
<td>Bob Smith</td>
<td>ASAP</td>
</tr>
<tr>
<td>H002</td>
<td>Cables ran across walkway</td>
<td>Anyone using reception could trip</td>
<td>Cables taped together</td>
<td>Tolerable</td>
<td>Find alternative way of organising and covering cables</td>
<td>Bob Smith</td>
<td>25/12/12</td>
</tr>
</tbody>
</table>
Test Operative Competency
Training Requirements

- Identification of equipment and appliance types to determine the test procedures
- Awareness of the risk assessment process for determining the frequency of inspection and testing
- Familiarity with the test instruments and their limitations and restrictions
- Able to fill in records and sign to take responsibility for the work.
- An understanding of how electrical, mechanical or thermal damage can occur to electrical equipment, flexes and plugs and connections
Training Requirements

- Industry qualifications for in-service inspection and testing of electrical equipment, alone, do not necessarily demonstrate competency.

- Must have an understanding of basic electrical and electronic principles, safe isolation procedures and safe systems of work, which, in some cases, may only be derived from previous knowledge, training and/or experience.
Experience

Test operative should have:

• Experience and technical knowledge to perform the inspection and testing without putting him/herself or others at risk

• Technical knowledge or experience may consist of adequate knowledge of electricity and adequate experience of electrical work

• An adequate understanding of the equipment to be worked on and practical experience of that system
Experience

Test operative should:

- Be aware of the hazards that may arise and the precautions that need to be taken
- Be able to recognize at all times whether it is safe for work to continue
- Be prepared to advise on suitability of equipment for the particular location and should be replaced with a more rugged item
- Be prepared to advise on a cost-effective maintenance regime
Fixed Equipment
Fixed Equipment

**Fixed equipment.** Equipment designed to be fastened to a support or otherwise secured in a specific location.

- Can movable or portable equipment, when connected to the fixed installation for security purposes
- Equipment types are numerous e.g. kettles, standard lamps, mini bar fridges, hair dryers, clock radios, coffee makers etc.
Fixed equipment or appliances are more difficult to inspect & test

This does not mean that only visual inspections are required for these types of equipment

They should receive a full combined inspection and test at relevant intervals

Frequencies of these inspections and tests should be determined by a risk assessment

Fixed equipment is now included in Table 7.1
Fixed Equipment

- Testing can be undertaken during periodic inspection and testing of the fixed installation where the frequencies of any combined inspection and testing are similar to those for the fixed installation.

- Additional formal inspections may be required for equipment that could be subjected to higher use or have a greater potential for being damaged, e.g. hand dryers, fixed hairdryers etc.
Competency Requirements

- Testing must be carried out by a competent person
- *must* be competent to carry out safe isolation procedures
- *must* be competent to carry out this more complex arrangement of work
- ensure safe systems of work are observed at all times
- ensure all inspections and tests are relevant to the equipment
Earth continuity testing
Insulation resistance
Labelling
Labelling

- Current safety status e.g. passed or failed
- Date of inspection/test
- Date for retesting should **not** be marked on label
Hired Equipment
Hired equipment

- Requirements for Hire Companies is not within the scope

- Hired equipment is within the scope:
  - Short term hire (< 1 week) may not require testing but should be inspected before use
  - Extended hire (> 1 week) should be added to equipment register and included in inspection and test regime
Landlords
Who has responsibilities?

- Landlords and property management companies in control of HMOs

- **Houses in Multiple Occupancy (HMO).** House in multiple occupation: - a property, rented to tenants, which fulfills one or all of the following:
  - having multiple households, with shared toilet, bathroom or kitchen facilities, or
  - utilizing a converted building which does not entirely incorporate self-contained flats (whether or not there is also a sharing, or lack, of amenities), or
  - which is comprised entirely of converted self-contained flats and where the standard of conversion does not meet the minimum that is required, in England and Wales, by the 1991 Building Regulations or in Scotland the Building (Scotland) Regulations 2004 and more than one third of the flats are occupied under short term tenancies
Surge protected devices
Surge protected devices

- Surge protective devices (SPDs) help to prevent damage to equipment from voltage spikes or surges.

- May give values of insulation resistance below normally accepted levels, by design.

- Reduce the test voltage to 250 V d.c.

- The inspector must exercise caution and record when this type of reduced test is carried out.

- A protective conductor current test (Class I devices) and a touch current test (Class I and Class II devices) are recommended in addition to the insulation test.
Microwaves
Microwave ovens

- The Code of Practice relates to electrical safety
- Microwave leakage testing is not an electrical safety test
- Visual inspection is already covered elsewhere in the document
- Section 15.11 has been completely removed
What do the changes mean for duty holders?

- Reduced cost of compliance?
- Need to take greater ownership
- Need for better understanding of EAWR
- Equipped to conduct range of risk assessments
What do the changes mean for contractors?

• Potentially reduced frequency of PAT testing
• Opportunities to provide additional services
• Raised standards of professionalism in the PAT industry
• Moving from cost-driven service to a value-added service
How can Seaward help?

- New instruments for all the requirements of the 4\textsuperscript{th} Edition
- Risk assessment training courses
- Image capture for fully traceable visual inspection and risk assessment
- Fire alarm and emergency lighting reporting & certification
- Comprehensive record management software for complete traceability
Best and fastest PAT tester around

- Earth continuity @200mA
- Insulation resistance @250V / 500V
- Protective conductor current (earth leakage) & 3 phase leakage
- Touch current (touch leakage)
- Substitute leakage @40VAC
- Load current & power measurement
- Lead polarity
- RCD trip time (without tripping RCD)
Apollo 600 provides onboard certificates such as:

- **Fire detection & alarm system inspection and servicing report**
- **Emergency lighting periodic inspection and testing certificate**
- **Fully upgradeable allowing additional certificates and reports to be added**
Capture the fault
Transfer data on the move

- Transferring data from Apollo 600 back to the office is simple

- Either
  - Pair Apollo 600 with Bluetooth-enabled smartphone
  - Transfer records to smartphone
  - Email data direct to the office

- Or
  - Transfer records to USB memory stick
  - Send memory stick to office
Thanks for your time

Any questions?

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