



Wessex Association of Model Railway Clubs

Electrical wiring regulations

Risk Assessment update in advance of the issue of revised BS 7671: 2008.

The I. E. T. Wiring Regulations are currently being revised, with a view to publication of a new edition in January 2008.

The Regulations, colloquially known as the '17th Edition' will include a new section, (section 711) specifically dedicated to Requirements for Exhibitions, Shows and Stands.

These Requirements will be mandatory from June 2008. Failure to fully comply would be construed as negligence should any mishap occur.

The official period for inspection and comment on the proposed content of the new regulations has now passed, and the text has been withdrawn from I. E. T's website. However, at my request, I. E. T. technical section have kindly provided a verbal summary of the expected provisions to me, so far as they are likely to affect the vast majority of model railway exhibitions. The salient points are set out below.

When considering a new or even previously- used venue for the purposes of risk assessment, exhibition managers or their electrically competent assistants will need to verify that the electricity supply conforms to the new requirements. Specifically, this means that the mains supply that they intend to draw from at an intended venue must be protected by Residual Current Detector(s) set to trip at not more than 300 milliamps, with built- in delay.

This may not be the case with older or less well-maintained properties, but relevant buildings constructed or re- wired since the late '90s should conform.

The onus is on the exhibiting organisation to confirm this. Any proposed exhibition environment not conforming to this standard should be rejected.

The Exhibition Manager should designate a **competent person** to be **responsible** for all electrical matters concerning the proposed exhibition, whose **authority** with respect to electrical safety will be regarded and supported as **absolute**.

The electrical part of the risk assessment should contain a statement that the requirements of Section 711 of the Wiring Regulations will be fulfilled, and that every connection to a supply socket will have to be made through a Residual Current Detector set to trip at not more than 30 milliamps and in less that 40 milliseconds.

This necessity should be conveyed to all prospective participants in the show, including ancillary activities such as catering.

(The characteristics quoted are those of the usual integral R. C. D. plugs or adaptors sold through the trade for use on outdoor tools such as lawnmowers etc. The fuses fitted to these devices must be appropriate to the cable connected to them and to the apparatus supplied.)

The new regulations will require that safety barriers made of conducting material must not be connected to earth, though other conducting structures of the exhibit or stand must be.

(It seems that I. E. T. have recognised that earthed metal barriers in exhibition conditions can be more of a hazard than a protection, and made a distinction accordingly.)

The notes below are intended as a simplified guide to achieving conformance with the Regulations, so far as they are likely to affect the vast majority of this hobby's exhibitions. They are based on existing best practice, present and expected regulatory material, plus personal experience.

Should a temporary mains supply be required for an outdoor exhibit, the Regulations should be consulted and followed by a competent person.

1) All cabling and equipment to which the Portable Appliance Testing Regulations applies should be so tested and certificated prior to use at the exhibition. N. B. Equipment containing electronic circuitry is specifically excluded from this, as the test procedures are likely to damage the electronics. Most train controllers and all D. C. C. apparatus fall within this latter category.

2) Temporary extension cables supplying parts of an exhibition must not exceed 13 metres in length, and may not be connected one after another.

(This is because the inherent resistance of the cable affects the time taken for the plug fuse to blow in the event of a fault, and a sequence of fused plugs with fuses rated for high currents may result in no fuse blowing in time, with serious consequences.)

The above statement may seem unreasonably restrictive. However, in practice where a group of exhibits need to be supplied from one fixed power point, the safe way to do it is to bring the feed from the wall socket out to the centre of the group by a cable rated at 13 amps. minimum, supplied through an integrated fuse and R. C. D. plug.

Distribute from this cable to each individual exhibit through their R. C. D. plugs with fuses chosen to suit the cables and equipment to be supplied. Very few exhibits or displays in this hobby require more than about 3 amps from the mains, so their plugs should not be fused higher than 5 amps. This means that in the event of a problem within one exhibit, the local fuse will operate within the required time, or the local R. C. D. will trip, isolating the difficulty to its origin and limiting the damage. Should the supply cable develop a fault, the fitting in the wall socket will protect the whole group concerned.

Any particularly power-demanding displays should ideally be fed straight from their own wall socket, via an appropriately fused R. C. D.

3) Where power cables must cross gangways at floor level, ensure that they are in the protective rubber trough strip available for that purpose, firmly secured. With an

increasing number of exhibitors and visitors to exhibitions using wheeled transport of various kinds, 'gaffer tape' alone is no longer an adequate protection for cabling. The Regulations are expected to be specific about this matter in any case.

4) Exhibitors and others who bring non- professionally made mains- supplied equipment to exhibitions must ensure that it conforms to the regulations in respect of insulation, prevention of access to conductive parts, proper fusing of the low- voltage outputs, ventilation and separation of the low- voltage wiring from the mains supply. By implication, this means that all mains wiring associated with a layout or other display must be kept well away from possible accidental access. The days of unprotected mains transformers mounted under baseboards for example are now definitely at an end! Best practice in this matter normally means that the mains voltage is transformed to voltages below 25 Volts within an enclosure located on the floor, correctly fused, insulated or firmly earthed as appropriate, and well ventilated at all times.

5) Do not allow any kind of connection to any piping, ducting or similar fittings. You don't know what they may contain. Crucially, keep electricity well away from any fittings that might contain or could once have contained gas or fluid fuel. Similarly, do not use ducting, piping or apparently unused fittings as suspension points, unless provided or intended for such use.

H. W. Marshall. V5 09/11/2007.