

MANAGING DIRECTORS MESSAGE

In the past eight months, since the last issue of Overview, the world has seen some surprising changes in the form of disasters – both man made and natural. Governments have tumbled and been replaced and the economic climate has reflected man's inability to control events, which have certainly tested the world's finest brains to the limit.

In such an uncertain environment, we believe that our clients need all the help they can get in maintaining both the quality of their products and their understanding of European requirements for Machinery Standards, so we have filled this issue with wide ranging information relating to legislation and Standards, which we hope will be of

significant help to all of our clients and particularly for those manufacturing products outside of the European geographical area.

All the articles within this issue have been written by our own PAC Technical Officers' who, jointly, must represent the most experienced group of qualified engineers specialising in the field of mobile

elevating work platforms in Europe.



PAUL A ADORIAN
Managing Director

GUIDANCE TO THE NEW MACHINERY DIRECTIVE

The new Machinery Directive, 2006/42/EC, came into force on 29th December 2009. The Directive itself is quite a "dry" document, couched in careful legal language and is consequently quite difficult to understand. When the previous Directive, 98/37/EC, was in force, a document was published by the European Commission entitled "Community Legislation on Machinery - Comments on Directive 98/37/EC" which was quite helpful in interpreting the requirements of the Directive.

Unfortunately, the guidance had two disadvantages - firstly, it was published in paper format and was consequently difficult to update with decisions of the Machinery Directive Working Group and secondly, was the work of one person and could not be said to present a consensus view.

With the advent of the new Machinery Directive, the Commission have drafted new guidance which is published free of charge in pdf format on the europa website at <http://ec.europa.eu/enter>

[prise/sectors/mechanical/machinery/](http://ec.europa.eu/enter/prise/sectors/mechanical/machinery/)

The guidance was prepared by the Commission and representatives from the Member States, with a wide consultation amongst trade associations, safety authorities and standards bodies to arrive at a consensus position. The guide is already in its second edition, demonstrating the flexibility of web publishing and is laid out in a logical format with each article and clause of the Directive followed by guidance,

with plenty of helpful cross referencing.

The guidance is an invaluable tool which will help manufacturers and other interested parties fully understand the requirements of the new Directive.



TIM WATSON
Technical Director

MANUFACTURING CONSISTENTLY

An EC Type Examination certificate is one issued by an EC notified body for a particular 'type' or model of machinery that has undergone an EC type examination or 'type approval'. The certificate permits the manufacturer to build units to an identical specification, without further examination by the notified body. Annex VII of the EC Directive on Machinery 2006/42/EC requires that the technical file for the product in question includes *'for series manufacture, internal measures that will be implemented to ensure that the machinery remains in conformity with the provisions of this Directive'*. If the manufacturer continues to build the product to the same specification as that which was type examined then the type examination certificate

will continue to remain valid.

Often, the manufacturer will hold ISO 9001 certification following an extensive audit of their internal quality procedures by an independent body. Whether the manufacturer has undergone this process or not, they will more than likely be in possession of a quality manual, controlling the processes that may affect the specification of type approved products.

During the course of the life of a product, however, it is inevitable that changes will be made to the specification, for example product improvement, cost reduction, etc. For products that have been type approved, the Machinery Directive makes it very clear that

these changes must be communicated to the Notified Body. This is essential to determine whether the change affects the certification for that product.



The new Directive also introduced the concept of a five yearly review of the certification. Communicating changes to the notified body therefore becomes even more important. If, for example, the notified body is faced with reviewing a considerably different product to that originally approved five years ago, the review

will likely be more extensive.

To ensure that manufacturers have the relevant procedures in place for controlling the specification of type approved products and communicating changes, PAC has introduced a 'Quality Systems Questionnaire'.

Manufacturers will be asked to complete this short document as part of future type approvals, which can be inserted into the technical file in order to demonstrate the controls they have in place.



PETER REED
Technical Officer

TESTING FOR EMC COMPLIANCE

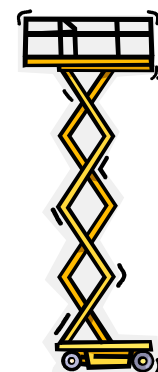
Machines are required to comply with the EMC Directive 2004/108/EC. Equipment may be self-certified, however due to the high cost of purchasing test equipment, many companies use a separate company to test their machines. Using a company that is accredited by UKAS or an equivalent body, e.g. NVLAP with a Mutual Recognition Agreement

with the EU, gives the client greater protection should any issues arise. If equipment is self-certified using purchased or hired equipment, or a company is used which has no formal accreditation, copies of the calibration certificates of the test equipment should be included in the technical file. The test methods should also be documented and

included in the technical file.



DARREN GIBSON
Technical Officer



EUROPEAN PLUGS AND SOCKETS

The differing plugs and sockets can provide equipment manufacturers with a logistical headache. We summarise the variants below, however, we recommend that you check with your customers which type of connectors are required. We also emphasise the use of Harmonized European specification cable and its associated colour coding.

1. UK, Ireland, Malta, Cyprus and Gibraltar

BS1363, 13A. Polarized, fused and has square pins. Fused selection is based on operating current.



2. Denmark

Afsnit 107-2-D1. Polarized, round pins but ground pin has flat face. For class II equipment, the Europlug may be used. However if plugs of the type used in sections 5, 6 or 7 of this table are used, the equipment will not be grounded.



3. Switzerland

SEV 1011. Polarized. 10A version has round pins and 16A version has square pins. For class II equipment, the Europlug may be used. However if plugs of the type used in sections 5, 6 or 7 of this table are used, the equipment will not be grounded.



4. Italy

CEI 23-16/VII. Unpolarized. Round pins, 10A and 16A variants have different pin diameters and pin spacing. For class II equipment, the Europlug may be used. However, if plugs of the type used in sections 5, 6 or 7 of this table are used, the equipment will not be grounded.



5. France and Belgium (May also be found in Spain)

CEE 7/5. Polarized. Round power pins with recessed receptacle to accept earth pin from socket. The CEE7/7 hybrid plug may be used, also for class II equipment, the Europlug may be used.



6. European countries not listed

CEE 7/4. Unpolarized. Round power pins with earth clips on side. The CEE7/7 hybrid plug may be used, also for class II equipment, the Europlug may be used.



7. French/German CEE7/7 hybrid plug

Combination of CEE7/4 and CEE 7/5 plugs to allow greater usage. Ground connection is a combination of the recessed acceptable and the earth clips on the side. Unpolarized.



8. Europlug (CEE7/16)

Compatible with all of Europe except UK, Ireland, Cyprus, Malta & Gibraltar and may be used for Class II (double insulated) equipment up to 2.5A. Unpolarized.



The larger CEE17 type industrial plugs and sockets are also used throughout Europe and are shown below.



Yellow: 110V



Blue: 230V



Red: 400V 3ph

LATEST UPDATE ON THE REVISION OF EN280

The public comment stage of the full revision of EN 280 ended in October last year, with a total of 200 comments being submitted by 17 EU Member States. These were a mixture of editorial and technical comments, the majority of which were submitted by just six countries – France, Germany, Italy, the Netherlands, Sweden and the United Kingdom. Some of the comments were considered by CENTC98/WG1, the Working Group responsible for the revision of EN280, at a meeting in March earlier this year and the remainder will be

worked through at a meeting in September. A final draft will then be prepared for Formal Vote by the Member States of the EU.

During the preparation of the final draft the CEN Consultant will examine the draft to ensure that it meets the Essential Health and Safety Requirements of the Machinery Directive. Once the CEN Consultant's work has been completed and any queries dealt with, the Formal Vote process will begin. Voting is carried out using the Qualified Majority Voting system, whereby voting is weighted

according to the population of each Member State.

If the Formal Vote is positive, the standard will be prepared for publication by the national standards organisation of each Member State and a reference to the standard will be published in the EU Official Journal. This will signify that it is a “harmonised” standard and that compliance with the standard will give a “presumption of conformity” with the Machinery Directive. On the other hand, if the vote is negative the Working Group will

have to review the objections of those Member States who voted against the draft and revise the document to overcome these objections. Once a new draft has been completed, the Formal Vote process will begin again.

It is very much hoped that the revision to EN 280 will get a positive vote first time around, in which case the revised standard should be published in 2012.

TIM WATSON
Technical Director

WHICH EUROPEAN STANDARD DO I APPLY?

Most manufacturers of MEWPs are well aware that if they wish to introduce a new machine onto the European market, be it a self propelled scissor or telescopic boom, EN280:2001 will be the most applicable standard. But what happens if your product falls outside of the scope of EN280? Which will be the most applicable standard to the machine? Sometimes the answer is clear, for example if the new product is a suspended platform, telescopic handler or lifting table, all of which have their own specific product standard. With certain types of lifting equipment however - those perhaps designed for a more specific purpose - the most applicable standard may

be more difficult to determine. In some cases it may even be advisable to apply more than one standard, if the product doesn't clearly fall within the scope of just one.

CEN, the European Committee for Normalisation, have published several standards in the Official Journal of the EU over the years, which relate to many types of lifting equipment.



PAC has compiled a Guidance Document listing all of the relevant types of lifting equipment for which a harmonised European standard exists. These relate to equipment intended for the lifting of persons and also equipment for lifting of goods, which may ultimately be adapted to also lift persons.

It should still be borne in mind that machinery placed on the market in Europe must first and foremost comply with the essential health & safety requirements of the EC Directive of Machinery 2006/42/EC. Since European standards have no legal standing, guidance can only be taken from these documents during the process of placing a

product on the market or an EC type examination. Nevertheless, standards are developed for a reason and should be viewed as a ‘benchmark’ for that product type, particularly when state of the art is concerned. It should also be remembered that to comply with the requirements for self certification of Annex IV equipment full adherence to the relevant harmonised standard is required.

For a copy of the PAC list of European standards applicable to lifting equipment, please contact us.

PETER REED
Technical Officer

ELECTRICAL TEST AND INSPECTION OF MEWPS

A question that we are often asked is “Does Portable Appliance Testing apply to MEWPs?” Portable Appliance Testing, commonly called PAT testing, is a process where electrical equipment in use is periodically checked for safety and this applies to appliances up to 18kg (40lbs), hence this would exclude MEWPs. However, there are non-CE marking user Directives in place throughout Europe which require an inspection of the equipment to be carried out, the UK version of this legislation is stated below:-

- Provision and Use of Work Equipment Regulations 1998 (PUWER) – Regulation 6
- Lifting Operation & Lifting Equipment Regulations (LOLER) – Regulation 9
- Electricity at Work Regulations 1989 (EAWR) – Regulation 4

The purpose of this inspection is to try and identify electrical hazards before they cause an unsafe condition to arise. A simple inspection may identify many possible defects but some testing may also be required. A summary of tests that may be applicable is tabulated below:-

Test	Purpose	Test Criteria
Impedance of earth (ground) conductor	Excess impedance in the earth conductor may limit fault current to prevent operation of the protective fuse or circuit breaker in a sufficient time	Impedance usually measured with a high current (10A or 25A) source with equipment unpowered
Electric strength (often called “flash test” or “hi-pot” test)	To verify that insulation is adequate and that creepage distances and clearances have not been compromised	Test performed with the equipment unpowered between the earth (ground) conductor or the case and the mains input conductors (live and neutral shorted together), typical test voltage: 1kV _{ac} minimum from a current limited source
Insulation resistance (often called “Megger test” after manufacturer of test equipment)	To verify that insulation is adequate	Test performed with the equipment unpowered between the earth (ground) conductor or the case and the mains input conductors (live and neutral shorted together), typical test voltage: 500V _{dc} minimum from a current limited source
Leakage current in earth (ground) conductor	To verify that current in normal operation in the earth conductor is not at a hazardous level, e.g., Y-capacitors of filters may shunt significant current to earth.	Equipment tested when powered, typical limit is 5mA.

Electrical hazards should be considered in the hazard analysis of the machine. In addition to electric shock and risk of fire, other hazards include burns and unintended mechanical movement. With regard to protection against electric shock, some machines can be argued to be inherently safe if the maximum voltage on the equipment complies with the requirements of Safety Extra Low Voltage (SELV).

Power Source	Electric Shock Protection
Battery	Usually SELV but charging circuit should be inspected and tested. Consider breakdown between mains and output of charger (EN 60335-2-29 compliance); electric strength testing may be applied
Internal Combustion Engine	Usually SELV but generators should be inspected and tested.
Mains Powered	Testing and inspection strongly recommended.

Extension cables and failure of third party equipment

A break in the insulation, resulting in a short circuit between machine structure and power, could potentially make the whole machine become live. Similarly, unsafe electrical equipment such as power tools, heaters or radios could fail so that they become live and if they are in the platform surrounded by metal, they could potentially make the whole machine become live. If the extension cable does not have integral earth fault protection, it will rely on protection from another source which may not be sufficient to disconnect the supply within 0.4 seconds for 230V supplies or 0.8 seconds for up to 120V supplies, thus resulting in an increased risk of electrocution. Protection of the cable to EN 60204-1: 2006 +A1: 2009 should be considered. However, a better solution is to fit a RCD (GFI) to this circuit.

Documentation

We recommend that the equipment manual should specify what inspection and testing is required and also the test intervals. Some sensitive electronic equipment maybe suffer damage if test voltages are applied and this should be addressed in the hazard analysis and where appropriate, a description of which part of the circuits are disconnected. We also recommend inclusion of testing procedure in the service manual to reduce the likelihood of damage by incorrect testing.

We are in the process of compiling a new guidance document addressing electrical safety issues. In the meantime, please do not hesitate to contact us if you require any further information.

D GIBSON, Technical Officer.

THE IMPORTANCE OF A HAZARD ANALYSIS

Clause 4 of most European 'Type 3' product standards is entitled 'List of hazards'. This section of the standard is usually in the format of a table which lists all of the significant hazards relevant to that type of product. The types of hazard listed originate from the basic standard for safety of machinery, EN ISO 12100-1:2003. A hazard, as defined in the above standard, is 'a potential source of harm'.

Undertaking a hazard analysis, or risk assessment, on a new product is a vital part of the design process. Not only does it highlight areas that may involve a risk to personal safety but also identifies whether the product complies with a particular product standard. The hazard

analysis should therefore be undertaken at an early stage in the development process so that any potential risks can be designed out.

The new Machinery Directive 2006/42/EC places greater emphasis on documentation on risk assessment, as stated in Annex VII. This means that the technical file for a particular product must contain some type of analysis that first identifies the hazards relevant to that product and secondly states the measures that have been taken to remove or reduce the risks.

Normally, the 'List of hazards' in a type 3 product standard will cross reference specific clauses within that standard. This provides the user with an idea of how that particular

hazard can be addressed for the type of machinery concerned. A typical hazard analysis for machinery would first list the relevant hazards and then the specific clauses within the product standard. Alongside each individual clause, a description of the protective measures implemented would be inserted by the manufacturer. Often, a simple visual inspection of the product may be sufficient to initially highlight any problem areas that need to be addressed.

During the process it is also important to consider any residual risks that may still remain, and that may only be addressed by way of markings or instructions. The concept of reasonably foreseeable

should also be taken into account - in other words, 'readily predictable human behaviour'

Once complete, it is advisable that the documentation should form a specific section within the product technical file. This should be reviewed whenever changes to the product are made or contemplated.

Should you require any guidance during the process of compiling a hazard analysis, PAC are on hand to assist. Additional information on the process of risk assessment/hazard analysis can also be obtained from the European standard EN ISO 14121-1:2007.

**PETER REED
Technical Officer**

A COMPETITION FOR ENQUIRING MINDS

Some of you will remember the poser we published in Issue 5, December 2009, in respect of the date chosen by the European Commission (Sunday, 29th December, 2009) as the termination date for EC Type Examination Certificates issued to Machinery Directive 98/37/EC as opposed to the end of the year?

Despite the fact that we offered three prizes of scale models of MEWPs, we received no correct answers and set out below the official answer, which we obtained from Her Majesty's Government Department, BIS (Department for Business Innovation and Skills):-

It was published on the fairly arbitrary date of 9 June 2006 in the Official Journal. 9 June was simply when, post rubber stamping at Council of Ministers around April, its publication could be arranged there taking account of printers', proofing deadlines, space etc. The articles provide for it to enter into force 20 days after this date of publication. That date, 29th June 2006, then sets the timetable for everything else to happen as provided for in subsequent paras of that article. So we end up with 24 months for Member State transposition, which is why we were rushing around a year ago last June to finalise SI 2008 No. 1597 and then, 18 months after that, for enforcement bringing us to the date of 29th December, 2009.*

All of this would fail to fit in with the classic requirements of Good Regulatory practice where one aims for things to begin on quarter days. However, EU derived legislation is allowed to deviate from this precisely because its rhythms are determined by the OJ and therefore beyond practically anyone's control. It so happens that this one nearly hits a quarter day quite by accident. However, by just falling short, it ends up in the middle of the strangest working week of the entire year!

THE EC MOVES IN A MYSTERIOUS WAY!

PAUL ADORIAN, Managing Director