26 ELECTROMAGNETIC COMPATIBILITY

26.1 REGULATIONS

26.1.1 General

1 Ensuring electrical components, equipment and systems supplied are safe and does not interfere with the normal operation of other equipment is the basis for Electromagnetic Compatibility regulation.

2 Low Voltage Directive 73/23/EEC; shall apply to electrical equipment designed for use at a rated voltage of 50 to 1000 V for alternating current and 75 to 1500 V for direct current. Rated voltage shall refer to the input or output voltage of the equipment and not voltages which are generated internally.

3 The electrotechnical product shall also meet the requirements of other applicable directives in addition to the Low Voltage Directives. The compliance of individual components with the requirements of appropriate European Norms (EN) does not imply compliance of the end product. End product testing ensures that interconnections as well as manufactured CE marked components are performing to what is formally stated in their declaration of conformity.

26.1.2 EMC: Electromagnetic Compatibility

1 EMC is the ability of different items of electrical equipment to work together without suffering the effects of interference. All equipment shall operate without interfering with broadcast and communications signals and be immune to normal levels of such signals.

2 EMC implies that equipment shall not generate unacceptable levels of interference, which affect the performance of other products designed to operate in the same environment. Also, equipment shall have sufficient immunity to electrical interference, such that the equipment continues to operate in an acceptable manner.

3 The contractor shall submit a certificate issued by the manufacturer that the electrical equipment's supplied against the contract under execution complies with the requirements of the EMC Directive.

26.1.3 The CE Marking

1 All electrical products shall have CE Marking as an EU recognised certification mark that confirms the product has been tested and complies with the European Union Electromagnetic Compatibility Directive and other relevant directives, standards or norms.

26.1.4 EMC Directive and Standards

1 The electrotechnical products shall be designed and constructed that do not cause excessive electromagnetic interference and are not duly affected by electromagnetic interference. Electrical products shall carry a CE mark and manufacturers 'Declaration of Conformity'.

2 There are four generic standards:

(a) EN 50081-1 EMC - Generic emission standard - Part 1. Residential commercial and light industry (IEC 61000-6-3 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments)

(b) EN 50081-2 EMC - Generic emission standard - Part 2. Industrial environment. (IEC 61000-6-4 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments)

(c) EN 50082-1 EMC - Generic immunity standard - Part 1. Residential commercial and light industry. (IEC 61000-6-1 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments)

(d) EN 61000-6-2 EMC - Part 6-2: Generic standards - Immunity for Industrial Environments. (IEC 61000-6-2 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments)

26.1.5 EU Product Directives

1 The EU product directives deal with large families of products or horizontal risks such as those addressed in the Electromagnetic Compatibility Directive. The manufacturer and exporter are responsible for ensuring the product meets the requirements for all applicable directives.

2 The following directives (with the reference between brackets) have been adopted:

(a) low voltage (73/23/EEC)

(b) simple pressure vessels (87/404/EEC)

(c) safety of toys (87/378/EEC)

(d) construction products (89/106/EEC)

(e) electromagnetic compatibility (EMC) (89/336/EEC)

(f) machine safety (89/392/EEC)

(g) personal protection equipment (89/686/EEC)

(h) new hot-water boilers (92/42/EEC)

(i) gas appliances (90/396/EEC)

(j) explosives for civil uses (93/15/EEC)

(k) recreational craft (94/25/EC)

(l) non-automatic weighing machines (90/384/EEC)

(m) active implantable medical devices (90/385/EEC)

(n) equipment for explosive atmospheres (94/9/EEC)

(o) telecommunications terminal equipment (91/263/EEC)

3 Most of the above-mentioned directives are amended by Directive 93/68/EEC, "Rules for the Affixing and Use of the CE Conformity Marking."

26.1.6 Harmonized European Standards

1 EU product directives are limited to essential safety, health or other performance requirements in the general public interest. The technical details of how to meet these requirements are to be certified by the three regional European standards organisations, CEN, CENELEC, ETSI, and government appointed product certification bodies.

2 Products that meet the essential technical standards developed by CEN, CENELEC and ETSI are presumed to conform to the requirements of EU directives

3 For many products, however, a manufacturer can choose not to comply with CEN, CENELEC, ETSI standards, but must then demonstrate that the product meets the essential safety and performance requirements of the directives.

26.1.7 CE Marking Vs ISO 9000

1 Manufacturer having a quality management certificate that demonstrates an efficient organisational confirming low failure rate shall not be acceptable as a substitute to CE marking.

2 The quality system makes no reference to the quality of the product. The quality certificate is only a recommendation for customers that their order will be processed correctly and on time.

3 The CE marking indicates that the product complies with the essential requirements relating to safety, health, environment and consumer protection of the user.

4 Some directives explicitly make use of a quality management system (ISO 9000) as part of the conformity assessment. If a manufacturer wishes to provide the customer with assurance about the functional quality of the product, the manufacturer can then obtain a voluntary quality inspection mark that guarantees the products conform to safety and functional requirements over the long term.

26.2 RECOMMENDATIONS FOR REDUCING INTERFERENCE

1 The contractor shall exercise the manufacturer's recommendation for reducing interference. Following is basic guidelines for ready reference that helps reduce radiated interference by screening of the equipment and cables. The conducted interference can be reduced by filtering of the mains supply.

(a) keep all cables as short as possible

(b) separate power cables and signal cables from each other and from different equipment

(c) shield the mains cable to the welding equipment if any

(d) apply earthing and equipotential bonding to the welding installation

(e) connect the equipment to a separate mains supply spur or using a different phase

(f) physically separate welding equipment from other equipment

(g) weld at times, which cause minimum disruption.

END OF PART