

ACHIEVING COMPLIANCE WITH THE EUROPEAN COMMUNITY DIRECTIVE ON EMC.

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1 Introduction

In order to achieve electromagnetic compatibility between electrical/electronic equipments, it is necessary to control:

- (i) unwanted emissions from equipment;
- (ii) the level of immunity of equipment to externally generated interference.

These objectives are achieved by using standards as guidelines, which may be enforced by regulations.

Most standards are derived from the recommendations published by CISPR (Comite International Special Des Perturbations Radioelectriques or International Special Committee on Radio Interference). CISPR makes recommendations for emission limits, immunity levels and test procedures and is a committee of the IEC (International Electro-technical Commission).

Historically EMC has only been considered when interference prevents a system from functioning as required. Awareness is increasing, which is reflected by the introduction and development of standards. In particular the European Community agreed an all embracing Directive in May 1989, which will be legally binding from 1 January 1992.

2 The European Community Directive on EMC 89/336/EEC

2.1 General

From 1 January 1992, all electrical and electronics equipment "placed on the market" or "taken into service" must comply with the essential protection requirements of the European Community EMC Directive. This applies to both new and existing designs which are being manufactured and marketed after this date.

This Directive is an essential precursor to the establishment of the single European market and is intended to provide an environment for the reliable operation of all electrical/electronic equipment. The objectives defined by the Directive are mandatory, whilst standards are not themselves binding and are only defined as a means of demonstrating that compliance with the objectives has been achieved. These can therefore be adapted to take account of technological progress, ensuring that development is not stifled.

2.2 Objectives of the Directive

Essential protection requirements are:

- i) equipment must be constructed to ensure that any electromagnetic disturbance it generates allows radio and telecommunications equipment and other apparatus to function as intended; and
- ii) equipment must be constructed with an inherent level of immunity to externally generated electromagnetic disturbances.

2.3 Scope of the Directive

All electrical and electronic equipment together with equipment and installations containing electrical/electronic components are, without exception, deemed to be within the scope of the Directive. The existing directives and associated legislation covering domestic equipment and luminaires will be absorbed into it. Likewise, the definitions of electromagnetic disturbances are all embracing, covering: conducted and radiated emissions, conducted and radiated immunity, mains disturbances, electrostatic discharge (ESD) and lightning induced surges.

The Directive excludes equipment covered by other Directives with EMC provisions. This includes vehicle spark ignition systems and non automatic weighing machines. It should be noted that where these separate provisions exist, but cover only certain aspects of EM disturbances (eg immunity to radiated interference), equipment is still required to comply with the EMC Directive in respect of the other aspects (eg radiated emissions).

Also excluded are amateur radio equipment, which is not commercially available and kit-built electronics.

2.4 Compliance with the Protection requirements

A formalised plan of action for companies or organisations manufacturing or importing electrical/electronic products, equipments or systems with which compliance with the EMC Directive will be mandatory is shown by the flowchart in Fig 1.

2.5 Responsibilities of the Member States

Apparatus complying with the objectives of the Directive, that is to say bearing the CE mark, must not be impeded from being placed on the market. However, if an administration finds that apparatus does not comply, then the apparatus must be withdrawn from the market or its free movement restricted. The European Commission is then immediately informed, which in turn, assuming the action is justified, will inform all the national administrations. This effectively will "ban" the equipment throughout Europe. For UK manufacturers and distributors, the implication is that this ban will include the UK even though the complaint originated in another member state.

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2.6 UK Implementation

In the UK, the Wireless Telegraphy Act exists to preserve the quality of radio communications. The EMC provisions of the WT Act are inadequate and new primary legislation will be required. It was intended that a bill be passed through Parliament during the summer of 1991, however the draft legislation has still to be circulated for public comment [October'91]. Enforcement of the WT Act is currently carried out by the DTI's Radio Investigation Service, which is complaint driven. Whilst the DTI expect this to continue it is considered that random checking of equipment will actually be necessary if the spirit of the Directive is to be maintained.

2.7 Relevant Standards

Standards which are described as "relevant" for claiming compliance with EC Directives are designated Euro Norm or EN. For the EMC Directive these are drafted by CENELEC, the European Committee for Electrotechnical Standardisation and derived from CISPR or other IEC publications. It is necessary for the European Community member states to harmonise their own national standards with the appropriate EN. An example of this is BS6527:1988, which is fully harmonised with EN55022. Table 2.0 shows an up to date list of relevant standards, however the process of harmonisation with the appropriate EN is not complete and some ENs are still in draft form.

2.8 Amending Directive and Interpretative Document

In December 1990 the European Commission agreed to draft an amending Directive to allow for a four year transitional period during which manufacturers would have the choice of complying with the Directive and thereby enjoying the benefits of the single market, or of meeting existing national regulations. This amending Directive is currently with the Council of Ministers prior to submission to the European Parliament. The proposed transitional period may well be reduced to three years and formal adoption is likely during the first half of 1992.

The Commission has also produced a draft interpretative document (June 1991), which attempts to clarify issues such as the scope of the Directive, "placed on the market" and "taken into service" and exemptions. It also attempts to explain how compliance for Telecommunications equipment may be demonstrated.

Details of the amending Directive and the interpretative document are contained in a booklet produced by the DTI (yellow cover) issued in August 1991.

3 Conclusions

The aims of the Directive are laudable in attempting to provide an environment for the reliable operation of all electrical/electronic equipment without interference to bona fide spectrum users. It removes any existing EMC regulations within the EC which may be used as a barrier to trade and attempts to define by virtue of standards, levels of emissions and immunity for manufacturers to attain.

The Directive will be effective from the 1st. January, 1992, whether standards exist or not. From then 12 months grace has been allowed, during which time existing national regulations should be observed if a "relevant" standard has not been agreed, it is expected that this will be extended to 3 or 4 years. Of particular concern is:

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- i) the interpretation of standards, particularly the Generic standards;
- ii) the lack of EMC standards relating to physically large systems or installations, such as standby gensets, telephone exchanges or rail traction equipment;
- iii) the lack of product specific standards;
- iv) the uncertainties surrounding the Technical Construction File and "competent body" requirements

Action must be taken now to confer a "reasonable" level of EMC to products. Many uncertainties currently exist regarding standards and the machinery to be established within the Community for policing the EMC Directive, it will nevertheless become legally binding from 1 January, 1992 and contravention will be an offence. The main deterrent, however, to failing to comply will ultimately be loss of market share.

References

1. The Official Journal of the European Communities No L 139/19, Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC)
2. EN 55 022:1987 (BS 6527:1988) Limits and methods of measurement of radio interference characteristics of information technology equipment
3. DTI "Yellow" cover booklet, August 1991, The EC Directive on EMC - an update

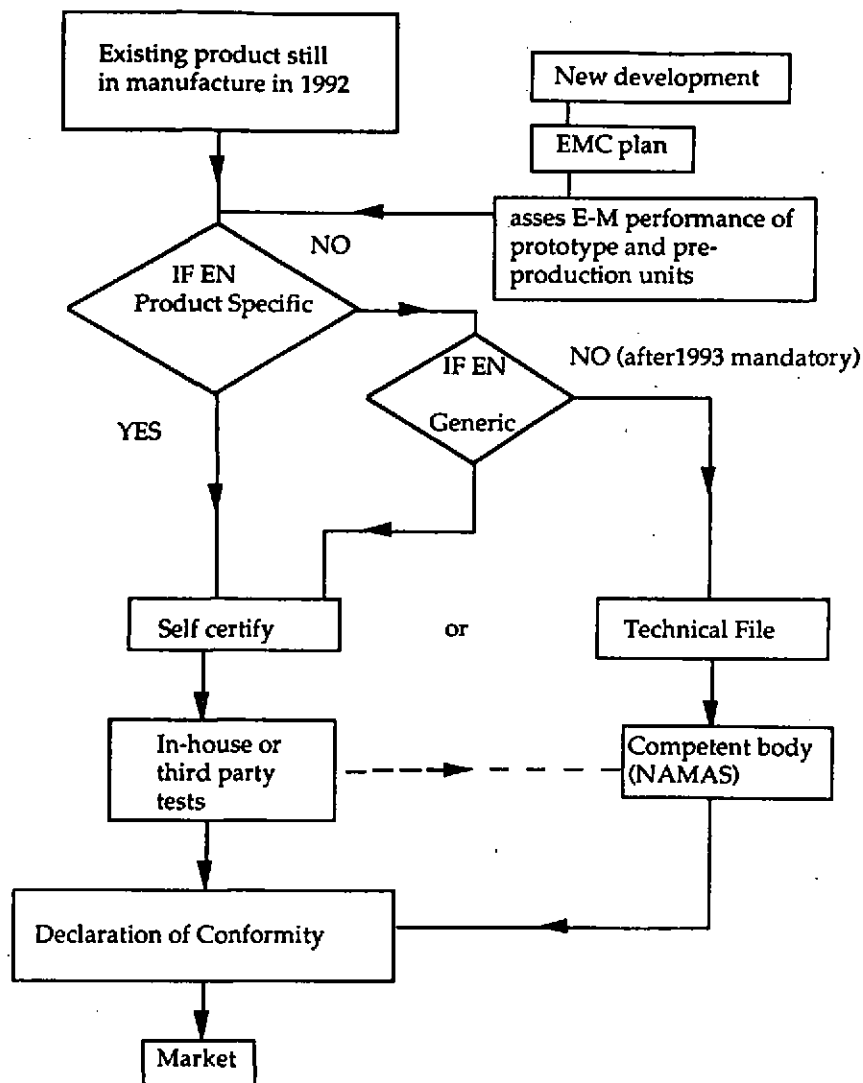


Fig.1 Flowchart summarising the Compliance Action Plan

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Relevant Standards (including drafts) Product Specific Standards

Emissions

EN55011	BS4809	Industrial Scientific and Medical
EN55013	BS905-1	Broadcast Receivers and associated equipment
EN55014	BS800	Household Appliances
EN55015	BS5394	Luminaires
EN55022	BS6527	Information Technology
EN60555	BS5406	Limitation of disturbances in electricity supply networks caused by domestic and similar appliances equipped with electronic devices

Immunity

EN55020	Broadcast Receivers and associated equipment
EN55101-2	ITE ESD
EN55101-3	ITE Radiated Immunity
EN55101-4	ITE Conducted Immunity
HD481	Industrial Process, Measurement and Control equipment (IEC 801):

IEC 801-1)	General
IEC 801-2)	ESD
IEC 801-3)	Radiated Immunity
IEC 801-4	Fast Transient Burst
IEC 801-5	Surges
IEC 801-6	AM Bulk Current Injection

Generic Standards

Emissions

prEN50081-1	Generic Class: Domestic, Commercial and Light Industry
prEN50081-2	Generic Class: Industrial.

Immunity

prEN50082-1	Generic Class: Domestic, Commercial and Light Industry
prEN50082-2	Generic Class: Industrial.

Table 2.0