The technical construction file route to EMC compliance

Before placing a product on the market in the European Community, it must meet the requirements of the EMC Directive. Normally, the manufacturer will test the product to the appropriate European Norm (EN) standards, using either his own facilities, or those of an independent test laboratory.

In certain circumstances, however, testing may be impossible, impracticable, or occasionally unnecessary. In these cases, the manufacturer can use the Technical Construction File (TCF) route to compliance.

A TCF is a document prepared by the manufacturer, describing the product's design and use. The information it contains should demonstrate that the product is compliant with the essential requirements of the Directive.

Once compiled, the TCF must be submitted to a Competent Body, which will assess its contents and issue a technical report stating reasons for acceptance or rejection. If accepted, the manufacturer can use the TCF as a basis for making a Declaration of Conformity. DTI appointed Competent Body can provide manufacturers with a full consultancy service to gain EMC Directive compliance through the TCF approach.

A Competent Body works closely with manufacturers to advise on the suitability of the TCF approach, providing guidance on compiling TCFs, assess completed TCFs, and recommend design modifications if a product fails to meet the required standards.

The involvement of a Competent Body at the earliest stages helps to ensure minimal time-to-market delay.

Why use the TCF route?

There are a number of circumstances when a manufacturer may choose the TCF route. Briefly, these are:
1) Where applicable harmonised standards do not exist.
2) Where the manufacturer has chosen not to apply the standards in part or full.
3) Where the size, physical location or environment of the equipment makes testing impracticable.
4) Where similar products exist, for instance a range of products.
5) Where a manufacturer has already tested the product to EMC standards other than harmonised standards.

The TCF approach is particularly appropriate for large systems or installations which cannot be tested conventionally, and for gaining compliance across a range of similar products.

What does the TCF contain?

The extent of the TCF depends largely on the complexity of the product. That having been said, in all cases the manufacturer should include the most comprehensive information possible to assist the Competent Body in making an accurate assessment of the product's compliance to EMC standards.

Although it may not be practical to carry out full testing especially on a large system or installation, it is usual for the TCF to include results of limited testing such as radiated and conducted emission tests plus immunity tests such as ESD and Fast Transient Burst.

Where a range of similar products is involved, the worst case product from an EMC point of view will need to be formally tested to the harmonised standard. The EMC test report for this product will then serve to support the technical rationale in the TCF for each of the remainder of the variants in the product range. In this way, the TCF approach can provide a time saving and cost efficient method of gaining EMC Directive compliance.

Typical areas which need to be covered in the TCF include:
1. The reasons for applying the TCF approach.
2. A technical description comprising system elements and relationships, operating and service manuals and EMC design criteria.
3. Justification for claiming compliance with the EMC Directive.
4. Technical rationale that contains an explanation of the EMC design criteria and an EMC test report of tests performed in-house, by the manufacturer or by a third party.

Uncertainty estimation in testing

Mr Ridler works under contract to the Division of Electrical Science, NPL, and is based at DRA, Malvern. He is one of the two UK representatives for the Eurofrep TC15. The group is charged with drafting an 'industry-level' document on measurement uncertainty.

An important part of an overall measurement process is the identification of all the contributing errors and, where possible, making the necessary corrections. Where corrections are not possible, the effect these errors have on the measurement result needs to be evaluated. This process is called the uncertainty evaluation for the measurement.

The resulting value for the measurement uncertainty indicates quantitatively the doubt about the accuracy of the measurement. Quite clearly, the effect of a measurement's uncertainty could be critical when assessing the compliance of a Device Under Test (DUT) to a specific test limit.

As a consequence of a workshop in December 1992, the Eurofrep General Assembly decided to create a specific Technical Committee (TC): Uncertainty in Measurement for Testing. The aim of the TC is to produce guidelines on the determination and presentation of uncertainties associated with test results which could be applied to specific fields.

In the United Kingdom, BMTA, incorporating Eurofrep UK, has set up a measurement uncertainty Technical Group. This Group has set itself the following roles:
(i) To provide a nucleus for awareness on measurement uncertainty.
(ii) To be the route for UK input into the Eurofrep TC, and for feedback to interested parties.
(iii) To improve communication between BMTA and Namas on measurement uncertainty and related topics.
(iv) To develop through Eurofrep "industry-level" documents on measurement uncertainty.

Several meetings of the BMTA Technical Group, which provide the UK representatives for the Eurofrep TC, have already taken place this year, making significant progress on the above issues. However, it is recognised that these roles may be altered in the future, in response to changes in emphasis within the Eurofrep TC.

One of the most important tasks will be to instil the concept of uncertainty and its importance, at an early stage, so that it becomes second nature for the testing community to consider the uncertainty in a test at the outset. Standards, detailing how to evaluate uncertainty, will need to be put in place.

It is expected that these will cover specific disciplines, although at least one general guidance document of a descriptive nature is planned as a complement to the technology-specific standards. Training and education will be required and this will need to be directed not only to practitioners and technicians of test laboratories, but also at the standards makers, regulatory authorities and the customers for the tests.

BMTA Update

The BMTA elected a new Chairman at the recent annual general meeting. He is Dr Ken Albutt, Managing Director of AMTAC Laboratories. Ken has been the Vice Chairman of the BMTA Council, one of the two UK representatives on the Eurofrep General Assembly, and a member of its Executive Committee. At the same time, Geoff Matthews, the General Manager and a Director of Assessment Services, was appointed as Chairman and Ian Knott, Deputy Managing Director of Sira Test and Certification, became our new Honorary Secretary.

David Stanger, our retiring Chairman of Council, has been appointed Secretary General of the European Organisation for Testing and Certification (EOTC).