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European Standards and Certification Procedure

1 Introduction

The protection of life and real values is too important to leave it to the free interplay of forces of economy. In a world getting more complex every day the people, authorities, trade and industry and insurers expect a proved and confirmed function and reliability when thinking about useful protection measures against fire, explosion, intrusion, hold-up and other hazards. The introduction of a test and certification scheme for products and services in the field of fire protection and security technology [1] was the consequence of this request in most of the European countries.

The following article will describe this system of testing and certification of products and crosses questions regarding the co-operation of different test houses and certification bodies within Europe which is becoming more and more one unit in some sectors.

2 Importance of testing and certification

One of the characteristics of all security and protection measures against fire, intrusion and hold-up in practical use is the fact that normal users unfortunately are not able to verify the functionality and reliability of such systems. Users also cannot differ between useful systems of high quality and systems which are to the benefit of the salesman only.

Another important aspect is the fact that faulty functions of protection measures may cause losses in another area or at least big trouble with people, neighbours etc. The unintentional flooding of an area which is protected by an automatic sprinkler system is one example, the need for evacuation of an area flooded by mistake with CO₂-gas by an automatic CO₂-extinguishing system another one. But also the faulty function of a

detection system like an automatic fire detection system may cause serious problems if you think about the jeopardising which is caused by the vehicles of the fire brigade which are driving very fast through the night. Additionally the confidence in protection measures giving false alarms is sinking rapidly. Which policeman is reacting to an alarm of an intruder alarm system when he has made the experience that this is typically a false alarm?

It is one of the greatest challenges for the technical development departments in the industry that safety installations on the one hand in the case of an actual hazard have perfectly to work mostly in short times; on the other hand these installations have to survive huge periods in a “stand-by” mode under most different environmental conditions, probably with changing modes for use for the protected premises, other operators etc.

Therefore it is a good and long tradition in Europe that products in the fire protection and security technology market are tested by independent Test Laboratories (Test Labs) and certified by independent Certification Bodies (CB). The initiative for these activities mainly came from the insurers. Already at the end of the 19th century they knew that the assurance in much cases is more reasonable than just to insure. First emphasis was given on products for fire prevention. Later on also the field of protection against intrusion and hold-up was considered. In Germany for example the insurers against losses who gathered in associations founded a department of loss prevention in 1906. Same activities started in countries like France or Great Britain even before this date.

The assessment of products first was made on-side during installation. Later – e. g. in Germany – universities made this assessment on the basis of product samples. There one concentrated first on the key functions of a product, e. g. is the sprinkler system extinguishing fire and then on the options against false function. In the 60ies this activity was no more of interest for the universities because their work is not focused on type-testing. The insurers – in front of the decision to give up the item prevention -

decided to found own laboratories which took over this activity in 1967. In other European organisations the development was similar.

A further aspect should be raised here: the installation of specified and qualified protection measures as e. g. a certified automatic sprinkler system may lead to enormous reductions in insurance rates. So the loss prevention is not only useful but also cost reducing.

Finally the advantage for users when changing to another insurer cannot be denied because everyone knows what measures are existent when standardised and certified products are used and a new assessment of the measures on side is not necessary.

3 Activities of the insurers and other organisations

As mentioned above testing in the past was first concentrated on the key functions of a product, later in addition on the key options against false function of that product. Beginning with the 70ies the idea of "type testing" was initiated; this meant that samples of the products were sent to the laboratories for testing. The insurers' laboratories together with their associations and in co-operation with universities – as an example in Germany the University of Aachen and later Duisburg, developed test schedules for the different products. A lot of these test schedules were the predecessors of national and international standards (example: the insurers' test schedules for heat and smoke detectors are now a part of the European standard EN54) [2].

Products which have passed the testing with success got a “letter of conformity ” with the remark that this product has been approved by the insurance association. Restrictions in function or time limitation of this “approval” were unknown in the first years, neither terms like complete test report nor quality assurance. In the 70ies the test schedules got more complete, also the problems of avoiding faulty function were more and more tackled and solved. What was furthermore found out was the fact that testing on samples of products or even only one specimen handed in by the manufacturer is not sufficient as a sample test for all products.

Given this idea further requirements as the testing of several samples, the visit of the manufacturers' plant, single re-tests of approved products and a kind of product surveillance of the installed systems which also have been assessed by the staff of the insurers' department of loss prevention were described. The rules and standards of the insurers changed in the same way; those, often versions lying in the office tables of the laboratories in the 80ies, became specifications equivalent to "regular" standards.

In the meantime the information on the approval was given not only by letter but the laboratories also issued approval certificates which were limited timely and which constrained both parties to re-check – normally after 4 years – if the characteristics of the product are still actual. Furthermore the tested and approved products were listed accordingly.

The described procedure had a great advantage; solutions for problems which were detected during visits on site – or in struggles with the failure of protection systems – or the bypassing of intrusion prevention measures by more skilled intruders – could directly be introduced in the testing schemes; not in every case to the pleasure of the manufacturers. At the end of the 80ies - at least in Germany - a satisfying level of the tools for loss prevention against fire and intrusion was reached.

The industry was not sleeping that time. Especially those companies who wanted to stand out from the majority and wanted to have confirmed the quality of their products made big efforts towards a standardization of performance and quality characteristics for fire prevention and security technology. First traces of this standardisation can be found e. g. in Germany in the year 1913 [3]. In other countries there were similar developments and in the 70ies and 80ies all major countries in Europe had own national standards in the field of fire prevention and security. This trend was continued by the European standardisation bodies CEN (European Committee for Standardization) and CENELEC (European Committee for Electrotechnical Standardization).

4 Certification and accreditation against European standards EN 45 000 ff.

A decisive turning point in the activities of loss prevention was introduced by the activities of the European Community (EC) regarding a combined European market. These activities started in the middle of the 80ies. The aim of the harmonisation of the European market, anchored in the foundation act of the EEC already in the middle of the 50ies (so-called Treaties of Rome), was blocked at that time by a series of trade restrictions between the member states. These restrictions were mainly given by:

- different interstate legal and administrative regulations
- different or missing technical standards
- different test, certification and surveillance procedures

The commission of the EC decided that all these trade restrictions should be cleared up, and as a consequence the standardisation bodies in Europe should begin to transform national standards and specifications into European standards. The different test, certification and surveillance procedures were to be standardised. Today, in the year 2001, we can notice that we are still far away from reaching this aim, e.g. in the area of intruder alarm systems. It has, however, to be considered that it is not possible to equalise very strong habits which have grown in long decades and even centuries just "by order". The different languages represent further difficulties. Insider only know the difficulties of a group of people discussing about complex items when everyone of them is talking in another language. Also the actual use of standards is different: in some countries standards are used seriously like laws, in others they are more or less advices.

As far as the different test procedures, certification and surveillance procedures are taken into account it was easier to come to an agreement. For testing and certification one has to distinguish between the so-called legally controlled area, e.g. where safety in electrical installations or safety of machines is required (see also clause 7) and the voluntary area to which at the moment all in clause 1 mentioned products count. In order to create the conditions for a trustful co-operation the **European Organisation for Testing and Certification – EOTC** - [4] was founded in April 1990 by the European Commission, the European Free Trade Association (EFTA) and the European Standards bodies. The EOTC was charged with the elaboration of transparent and trustworthy

accreditation and certification models for Europe in order to reach the aim of one-stop-testing.

In order that all institutions like laboratories, certification bodies and institutions for product surveillance are working according to the same rules, a European standard series was elaborated valid for all these institutions [5] [6] [7]. Furthermore accreditation systems in the member states of the EU were established with the aim to check on side if all participating institutions are working according to the same rules. The so-called sectorial committees within the national accreditation bodies elaborated product-by-product specific standards, against which laboratories, certification bodies were assessed.

In this connection also the requirement to give proof of a certified quality management system (QMS) according to the ISO 9000 series of standards came up [8] [9]. These requirements represented also a reaction on the activities of the Japanese in the 80ies regarding a higher quality of products compared with the rest of the world.

The realisation of the requirements of the accreditation bodies was not very easy; a lot of ingrained structures had to be adopted to the requirements of the standards; standards existing only on the paper had to be brought to applied standards and specifications; testing procedures had to be described in detail. Now there is more exactness but in a lot of cases the spontaneity was lost, as e. g. the change of standards regarding requirements which have become outdated.

A major problem was created by the requirement for a certified quality management system for smaller companies – especially in Germany where traditionally personnel enjoys a long-lasting training (e. g. 3 to 4 years for a junior craftsman), before beginning to work without steady observation. This is in contradiction to the philosophy in other countries where staff is employed without training and is then working according to detailed and unambiguous instructions. But it was mentioned already that the European unification is not a very easy task.

Taken all these arguments into consideration the constraint for accreditation of institutions which deal seriously with testing and certification of products in the fields of fire protection and security technology has led to an amelioration of results in many areas [10]. The whole procedure has become more formalised, there are real test reports and real documented certificates now. Also the items testing (that means the measurement of facts) and certification (that means the confirmation of conformity with a technical specification) were divided into two independent procedures to allow a qualified verification and evaluation of the test results which have been ascertained in the laboratories.

Lists of all certified products had to be published regularly, the rules of the insurers became quasi-standards. Also requirements as e. g. certified quality management system, regular product surveillance led to the fact that not only the few tested and certified products (the test samples) were good but - what can be assumed by the additional measures - all certified products which are leaving the factory.

In principle the certification – or approval – now is based on three equal pillars:

- Successful testing of test specimen
- Operation of a certified quality management system according to ISO 9000 by the manufacturer
- Regular product surveillance and – if necessary - re-testing of samples.

But now each member state of the European Union (EU) felt forced to found laboratories and certification bodies for the field of fire protection and security technology - a disadvantage as suddenly for those economically small areas more laboratories and certification bodies than manufacturers were existing. And due to the different mentalities and the legal administrations in Europe the organisations of accreditation bodies had different characteristics. Some of them worked thoroughly and tested each step of the certification bodies and laboratory, others concentrated on formal items. So, for the time being the Europeans cannot be satisfied with what has been reached until now. There is still a lot of work to do.

5 Active certification bodies in Europe

Due to the variety of the languages in Europe it is not easy to get an overview of the nowadays existing test and certification schemes for products and services in the field of fire protection and security technology and their efficiency in the market. According to the knowledge of the author – which may possibly not be complete - the situation for this field of activity in the most important countries of the European Economic Area represents as follows:

Italy: Certification of intruder and automatic fire alarm systems, safes and strongrooms

France: Certification of gas and water extinguishing systems, safes and strongrooms, intruder and automatic fire alarm systems, access control systems

Belgium: Certification of intruder alarm systems and automatic fire detection systems

Germany: Certification of intruder and automatic fire alarm systems, access control systems, gas and water extinguishing systems, safes and strongrooms, physical security equipment and locks, portable fire extinguishers

Great Britain: Certification of intruder and automatic fire alarm systems, gas and water extinguishing systems, safes and strongrooms, physical security equipment, portable fire extinguishers

Denmark: Certification of automatic fire alarm systems

Sweden: Certification of safes and strongrooms, physical security and locks

Switzerland: Certification of intruder and automatic fire alarm systems

Austria: Certification of intruder alarm systems and safes and strongrooms

The meaning of the different certification marks in the market seems to be very different; in some countries there is already no chance to get an allowance to use a building by the authorities without the use of certified products in the area of fire protection, in other countries the insurers are very strict: that means no underwriting in specific risks without sufficient certified protection against intrusion. But certification marks also may only be an item “nice to have” or a marketing instrument of the sales department.

6 Testing and Certification in a united Europe

The great differences of the certification systems and test specifications in Europe are causing series of trade restrictions between the individual states in Europe. This may lead to the fact that a system which is seen positively and in accordance with the standards in one country may not be applied in another country – and in the worst case – has to be changed and re-tested and re-certified. In the legally controlled area these differences will be abandoned by the introduction of the CE-marking (see clause 7). However, the CE-marking represents the smallest common factor for requirements of a product. In case trade restrictions are not based on liabilities as we know it in the legally controlled area but on the free interplay of forces, the governmental authorities cannot take direct nor indirect influence. This situation can be avoided by two measures: on the one hand the technical specifications which are included in the national certification schemes have to be harmonised. On the other hand agreements between the certification bodies should be made in order to ensure the mutual acceptance of test results and the additional requirements like a certified quality management system in accordance with ISO 9000, regular product surveillance, sampling and re-testing of products.

Agreements between certification bodies, however, are only possible if impartial fundamentals for a trustful co-operation between the certification bodies do exist. This ideal situation is not yet completely achieved in the higher sophisticated European unification procedure.

Therefore the „European Fire and Security Group“ (EFSG) was founded in 1991 [11] with the aim to avoid unnecessary duplication of testing, assessment and certification work – but to keep this work on the proven high level. EFSG started with the three members: APSAD (Assemblée Plénière des Sociétés d'Assurances Dommage – today Centre National de Prévention et de Protection (CNPP) in France, Loss Prevention Council (LPC) – today BRE Certification Ltd. in Great Britain, and Verband der Sachversicherer e.V. – today VdS Schadenverhütung (VdS) in Germany. Today EFSG

has 8 members in 6 European countries [12] and some other organisations are waiting to get accepted as members

A former aim of EFSG was the introduction of a harmonised European certification mark (EFS Mark). But it has been abandoned because the mark was not requested from the market nor was it possible to remedy the almost insuperable obstacles caused by the missing of harmonised standards and specifications. Furthermore there were and are reservations of the national certification bodies regarding the loss of their independence. Another important issue is the fact that Certification Bodies carry the full responsibility for the decision of a certification. From the legal point of view the certification body may get great problems in case of damages caused by a product tested and/or certified by another organisation.

In order to come closer to a mutual recognition of test results without jeopardising the autonomy of the certification bodies the basic philosophy of EFSG has been renewed in the year 2000:

Now the testing and certification procedures are left to the relevant national certification bodies or associated laboratories. The certification bodies stay autonomous in future and will not be forced to issue certificates on base of a test result without any further condition. Agreements on a product-by-product basis are made between the single certification bodies on base of which certifications may be performed. These agreements may be bilateral or even multilateral agreements and may cover a complete test and certification scheme for a specific product or parts of it only.

These agreements may be similar to the Memorandum of Understanding (MoU) which exists already between BRE and VdS and works satisfactory since August 1997. Under this MoU test results in the area of automatic fire detection systems have been exchanged between BRE and VdS without problems. Personnel of the laboratories work close together e. g. in standardisation groups and regularly exchange information important for the daily work. An extension of the MoU to other areas is planned.

Members of EFSG – the certification bodies – have to fulfil the requirements specified in the Terms of Reference (a kind of statutes of EFSG), as e. g. the accreditation according to EN 45011, qualified personell, regular training of the staff, round-robin tests. These are some of the requirements for a trustful co-operation between the EFSG members. Some severe requirements are to be fulfilled by the associated laboratories. A Certification Body may nominate one or more laboratories as associated, which then acts as subcontractors to perform the tests necessary for the certification. The fulfilment of these requirements for certification bodies and associated laboratories is checked in form of audits by EFSG.

Finally it must be stated that EFSG now is associated member of the European Fire and Advisory Council (EFSAC) [13], an umbrella organisation of the manufacturers in the field of intrusion and fire protection. Membership within EFSAC brings together European industrial associations, the Confederation of Fire Protection Associations (CFPA) and the European Insurance Committee (CEA) [14].

7 CE-marking versus testing and certification

As already mentioned in clause 6 the commission of the European Union (EU) [15] tries to harmonise the technical specifications and test/certification systems in areas which match health and safety with legal influence to level out trade restrictions between the single states in Europe. Now the main set of products used in the field of fire prevention will become part of the „Construction Product Directive“ (CPD) and are therefore part of the legally controlled area which requires CE-marking in the future.

As soon as the so-called harmonised standards for these products are available – and after a transition period of 1 – 2 years – all these products have to be CE-marked by the manufacturer and in addition show a „Certificate of Conformity“ issued by a „Notified Body“. Notified Bodies have to be listed in Brussels (at EU level) for the field of activities testing, certification and surveillance.

From the point of view of the insurers the oncoming CE-marking does not guarantee in every case the same level of product quality as known today; the CE-mark is more or less not more than a „passport“ allowing products to cross borders and to demonstrate that the products are conform with European laws. Very often „CE“ represents the smallest common factor for requirements of a product. Also a „system“, that means the combined function of different products (e.g. the chain: fire detectors - fire alarm control and indicating equipment – alarm transmission equipment), will not be tested for CE-marking. But the main concern is the fact that Notified Bodies will come into the market which are not active in the field of testing and certification of products in the area of fire protection until today. This may cause great differences in quality of the products marked with „CE“.

The established certification bodies working together in EFSG will continue to work on a level of quality of testing and certification as known today. Therefore the mentioned „Certificate of Conformity“ for CE-marking will be a subset of the certificate which is issued today. The certification marks of today (e.g. CNPP, LPCB, VdS) will continue to guarantee a high level of product quality above the level of the CE-marking.

8 Conclusion

The third party testing and certification of products and services of the fire protection and security technology has been applied in Europe since decades with success. Only the impartial judgement assures that user, insurer and authorities can trust on the functionality and reliability of these services and products.

All certification bodies which are united in the „European Fire and Security Group“ (EFSG) work in order to reduce the expenses for testing, quality assurance and product surveillance on the base of European standards and specifications – but to keep the quality of the certified products on a high level. Also they would like to stay independent certification bodies with their own independent decision and their own certification marks.

Basis of these activities on one hand is a trustful co-operation between the certification bodies on the base of equal conditions – on the other hand the availability of harmonised and comparable requirements and test methods. Here big deficits still exist, especially in the area of security. Automatic fire detection technology is in a slightly better situation.

But the oncoming CE-marking in the field of fire prevention will not supersede marks of qualified certification bodies because of lack of quality in technical specifications and in the confidence of the issuing bodies.

References

[1] Fire protection: e.g. automatic fire alarm systems, water extinguishing systems (sprinkler systems), gas extinguishing systems (CO₂), smoke and heat exhausting and ventilation systems (SHEVS), portable fire extinguishers

Security technology: e.g. intruder alarm systems, hold-up alarm systems, access control systems, safes and strongrooms, high security locks, physical security equipment, locks

[2] EN 54 series of Standards of Fire Detection and Fire Alarm Systems

[3] E. g. German standard DIN 14 675 Feuermelde- und Alarmanlagen (Fire signalling and alarm systems), VDE 0800 Bestimmungen für Fernmeldeanlagen (Regulations for communication systems), first edition published 1913)

[4] EOTC – European Organisation for Conformity Assessment
Rue d’Egmont 15, B-1000 Brussels Web: <http://www.eotc.be>

[5] EN 45 001 General criteria for the operation of testing laboratories

[6] EN 45 011 General requirements for bodies operating product certification systems

[7] EN 45 012 General requirements for certification bodies operating Quality System certification

[8] EN ISO 9001 Quality systems – model for quality assurance in design/development, production, installation and servicing

[9] EN ISO 9002 Quality systems – model for quality assurance in production, installation and servicing

[10] The laboratories and certification bodies of most of the members of EFSG were accredited at beginning of the 90ties; e. g. VdS Schadenverhütung was accredited for testing and certification of products in the area of fire protection and security technology in 1992.

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[14] „European Fire and Security Advisory Council“ (EFSAC) – members January
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- European Federation of Associations of Lock and Builders Hardware Manufacturers
– ARGE , Postbus 190, NL-2700 AD Zoetermer
- Comité Européen des Assurances – CEA
3 Bis, rue de la Chaussée d`Antin, F-75009 Paris
- Confederation of fire protection associations – CFPA
Nüscherstrasse 45, CH-8001 Zürich

- European Association of Manufacturers of Fire and Intruder Alarm Systems – Euralarm
Hofmannstraße 51, D-81379 München
- European Committee of the Manufacturers of Fire Protection Equipment and Fire Fighting Vehicles – Eurofeu
c/o Minimax GmbH, Industriestraße 10 – 12, , D-20840 Bad Oldesloe
- European Committee of Safe Manufacturers Association – Eurosafe
Merwedestraat 48, NL-3300 AB Dordrecht
- European Doors and Shutters Federation – EDSF
c/o Verband Tore-Türen-Zargen, Hochstraße 113, D-58095 Hagen

[15] The „European Union” (EU) is the successor of the „European Community” (EC), which was founded 1957 in Rome as „European Economic Community” (EEC) by France, Italy, Germany, Netherlands, Belgium and Luxemburg in order to push the economical and political integration of Europe.