

# The Product Safety Newsletter



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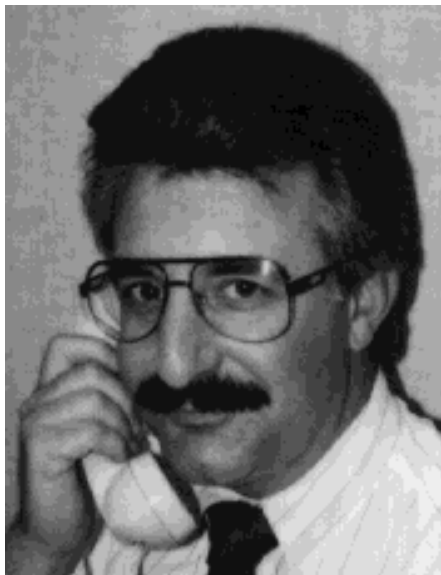
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Volume 3, Number 5

September/October 1990

## Chairman's Message



Rich Pescatore

*Here is an appeal that deserves a wide response from our readers. If Product Safety is to expand as an engineering discipline, then practitioners must participate in all aspects. Present safety standards are beginning to include some of the basic research that should form the foundation of such works, but a tremendous amount of work remains. This is the start of our effort*

*to contribute through the PSTC and the IEEE standards writing process. And now let me turn the column over to Tania Grant, Standards Subcommittee Chairperson.*

### STANDARDS SUBCOMMITTEE TAKES OFF!

All parties interested in proposing, writing, and publishing standards on safety of electrical products are invited to call Tania Grant, Standards Subcommittee Chairperson, at 408-942-2569 (fax: 408-946-1720).

Some subjects being considered for possible standards topics are definition/limits of electrical shock, thermocouple measurement techniques, service definitions and procedures, grounding practices, leakage current limits and measurements, RFI filter performance vs. safety, and dielectric/insulation requirements, to name a few.

Help is needed not only with re-

search and writing of the proposed standard when the Working Group is established, but also in related preliminary and coordinating activities. For example, the IEEE standards generating process has certain requirements and milestones which need a "watchdog". People with safety expertise from different types of equipment - RFI filters, medical equipment, transformers, etc. - or even system or software safety are needed. You need not be a poet laureate or a technical "guru" to join this interesting group and get in on the ground floor - no, the basement floor - of the PSTC Standards Subcommittee.

Participating in a standards generating/writing activity is a fascinating process and a great learning experience. Here is your chance to make your voice heard, first on the choice of topic for our first standards-writing effort, then in the actual formulation of the standard if you are involved with the Working Group. Note that we are planning not to copy presently existing stan-

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# The Product Safety Newsletter

The *Product Safety Newsletter* is published bimonthly by the Product Safety Technical Committee of the IEEE EMC Society. No part of this newsletter may be reproduced without written permission of the authors. All rights to the articles remain with the authors.

Opinions expressed in this newsletter are those of the authors and do not necessarily represent the opinions of the Technical Committee or its members. Indeed, there may be and often are substantial disagreements with some of the opinions expressed by the authors

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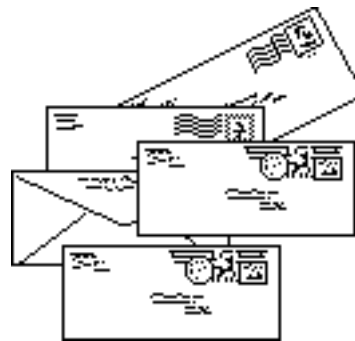
dards but to create new documents that fill unmet needs. Quite a task!

This group is not limited to Santa Clara Valley. We plan to conduct business by phone, fax and mail. We also plan to divide the work into

small, manageable chunks, so that no-one is excessively burdened.

Could you ask for a better chance to make a difference in the world of product safety? Take off with the Standards Subcommittee on our first flight. Please call or write now!

## Letters to the editor



*(The opinions expressed in these letters are those of the authors only and are presented as such. We welcome letters of comment, but reserve the right to edit them. - Ed.)*

### **Circuit Breaker Debate Continues**

We are quite concerned with the exaggerations and gross errors included in the subject article which appeared in a recent edition of the *Product Safety Newsletter*. If taken seriously, this article could mislead your readers with potentially serious consequences.

The main theme of Mr. Franklin's article involves the merits of reducing the instantaneous trip point of

Molded Case Circuit Breakers intended for use on 15 and 20 Amp residential branch circuits. This subject is being studied under the sponsorship and direction of the Electronics Industries Association, National Electrical Manufacturers Association, and Underwriters Laboratories. The study is aimed at establishing the maximum benefit of reduced instantaneous trip levels without incurring the problem of excessive nuisance tripping.

Since Mr. Franklin has been party to those efforts, we are surprised by the sweeping implications included in the first paragraphs of this paper. He leads the reader to believe that reducing the instantaneous trip level to 5 times the circuit breaker rating will guarantee that short-circuit fires will be prevented. Preliminary test data presented by UL to the study group clearly shows that fires can occur with instantaneous trip levels set at 5 times current rating. In addition, it is well known and easily demonstrated that limited arcing faults at or below the ampere rating of the circuit breaker can cause fires.

But our primary concern with this article is not with Mr. Franklin's grossly overstated claims for low instantaneous trip, but rather with his conclusion that branch circuit

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# Telecommunications Terminal Equipment Homologation in the United Kingdom

by Patton & Associates Inc.

## Abstract

A product is considered Homologated when all regulatory testing is successfully completed and the license for approval to sell the product has been granted. This report addresses Homologation of Telecommunications Terminal Equipment for connection to the analog Public Switched Telecommunications Network (PSTN) in the United Kingdom. This article does not address the connection to digital services, as defined under the United Kingdoms General Approvals scheme.

## Defining Homologation of Telecommunications Equipment

Homologation of Telecommunications Terminal Equipment that connects to the PSTN (Public Switched Telecommunications Network) requires that the equipment be tested to, and comply with, the requirements of multiple standards. These documents can be broken down into the following classes:

- Telecommunications Safety
- Product Safety
- Product Radiation
- Product ESD
- Telecommunications Performance

Each country has all or a subset of the above requirements. In some countries, several requirements are combined into one document, as is the case when telecommunications

safety is contained within the telecommunications performance requirements.

In the United States, UL1459 covers both telecommunications safety and product safety from the UL prospective. We also find dielectric test to verify nonincidence of harm to the network within FCC Part-68. FCC Part-15 is used for product radiation, and FCC Part-68 for telecommunications performance. At present ESD is not mandatory in the commercial sector in the United States.

## The United Kingdom Regulatory Process

The British love hierarchy and regulation, and telecommunications equipment homologation is no exception. In the United Kingdom, BABT (British Approvals Board for Telecommunications) is the entry point for all applications. BABT processes your application by first reviewing it for correctness and collecting a £900 application fee.

Once BABT accepts your application, one of several test laboratories may be selected to conduct the test. Testing fees are established, payments collected, and the product is then tested for compliance. After the product has been tested, the test results are submitted to BABT for processing.

If the applicant has obtained an

assessment of his manufacturing facility, paid all necessary fees, set up a legal presence within the United Kingdom, and passed all requirements of the testing process, then BABT will recommend to OFTEL (Office of Telecommunications) that a "License Certificate" be granted. The license holder is the legal representative, and may be the manufacturers United Kingdom office or a sales representative.

## The Application Notes

There are currently 38 application notes available from BABT. The application notes define what standards your product should comply with, depending on its application. The only caution is to verify that you have the correct application note and the most current revision.

## The User Information Checklist

There are currently 28 User Information Checklists available from BABT. The User Information Checklist gives you a list of marking and labeling guides, and user instructions that must be included within your operation and installation manuals, and other checklists. The User Information Checklist is for guidance only and should not be treated as a definitive of all requirements.

## The Standards

The British Standards for telecommunications equipment evolved in an era when British Telecom was still a powerful government entity. As one reads the various documents, it becomes clear that some of these test requirements were based on attempts to protect the current base of British Telecom terminal

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# Managing Tomorrow's Product Safety and Liability: The Engineers' Challenge

by K. L. Pfundstein  
(Part II)

*This is the conclusion of the article begun in the July/August of this newsletter.*

## **What is the Role of Engineers in Dealing With the Safety and Liability Challenge?**

At the start of the paper, we listed several formidable challenges for engineers - a shift toward an information society, competition from Japan and others, and the product liability crunch. Meeting these will require a level of dedication and excellence that causes some observers to be quite alarmed, in the face of the recent study by the US Commission on Excellence in Education. Their report "Nation at Risk" is quite critical of education's quality standards.

The author of Megatrends says we are drowning in information and starving for knowledge. How true. Much personal and corporate discipline will be necessary to avoid the "terminal illness" that results from allowing the sophistication ("snob appeal") and status symbol of computer graphics and analysis capability (CAD-CAM) to obscure the merits of simplicity, efficiency, and integrity in communicating with the Board of Directors and the public.

In facing the product liability crunch, it is quite understandable, yet totally unforgivable, to cave in to its intimidations. The develop-

ment of safety standards, research, the introduction of new products, and other desirable endeavors have been slowed out of fear of probable liability claims. This regrettable situation should only serve to strengthen our determination to confront and overcome the problem by always performing with the excellence necessary to assure that our engineering work is found irreproachable.

This last section of the paper deals with the larger part of that challenge - some guidelines to help designers with day-to-day decision making. It includes principles and procedures with which sound product safety judgments can be achieved efficiently and reliably. Some will be more helpful to the individual engineer's thought process while others involve policies and procedures of the employer that engineers help formulate and implement.

Our dual role means achieving the safest, practical products using input and decision criteria that are defensible in court. The engineers' design goal is, first and last, to eliminate and control all unreasonable risk associated with the product. Because one's success or failure in meeting this goal often seems to be in the hands of the lawyers in some future lawsuit, how does a designer, or his supervisor, know what constitutes acceptable design at the

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outset?

It requires a policy commitment by corporate management that says in effect, "an acceptable design is one which, in our best judgment, does not offer an unreasonable risk of injury. For any potential hazard, the designer should eliminate or reduce the hazard as much as possible without unreasonable impairment of equipment function, or unreasonable cost, relative to the total cost of the equipment and seriousness of the hazard. Any remaining hazard is acceptable only if/when safety instructions (operator's manual and/or safety signs) on how to avoid it can be clearly written, displayed, and practically followed."

With such a goal-oriented corporate policy as a starter, our decision process in defining what is or is not unreasonable can then be as objective before the fact as that of a jury sitting in judgment after the fact. Then, when a designer and his/her employer make safety considerations an integral and priority part of all engineering/design analysis and judgments, we have established intent, motivation, and acceptability criteria that put us on solid ground in dealing with societal expectations, corporate goals, and the courts.

Acquire a good understanding of product safety technology, as made up of societal, technical, economic, and legal issues. Each of these elements of product safety technology connotes proficiency levels that can be learned only through some special effort.

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# News and Notes

by Dave Edmunds



## IEC 950 Second Edition

The second edition is planned for the 4th quarter of 1991. This second edition will be a total new document in the new IEC/ISO format and will contain a new subclause 6 dealing with Telecom equipment.

## New UL Product Category

UL, in a July letter, announced a new product category entitled "Communication Cable Assembly." This category is for factory assembled Listed communication cables fitted on both ends with Listed communication circuit accessory connectors. This new listing will appear under the CCN designation DUHN in the Electrical Construction Material Directory.

## Volunteers Alive and Well!

A national survey published in the "Giving and Volunteers in the United States, 1988," gives some encouraging statistics on volunteers in the U.S. Some highlights are:

- ❖ The most active age group is 25 to 40 with 59% giving regular volunteer time.
- ❖ Most volunteer because they are asked.

- ❖ A majority of volunteers keep the work because they feel useful and want to help others.
- ❖ Volunteers are not dependent upon area of the country.
- ❖ Numbers are similar for men, women and both married and single.

Volunteers are still needed for our society, both IEEE speaking, and worldwide. How about you?

## IEEE Spectrum Special Report

The August, 1990 issue of Spectrum starting on page 22 has a Special report on 60 hertz electromagnetic fields and the human body. Part one discusses biology; part 2, the society and regulations; and part 3, managing the risk.

## ACOS (Advisory Committee on Safety, an IEC subcommittee) reports on ELV

A draft report has prepared by WG-ELV ACOS that gives guidance on voltage levels for conductive parts that may be accessible to touch. It has been circulated to various US Technical Committees. The information and data in this document is based on IEC 479-1 (1984) and IEC 479-2 (1987). The purpose of the draft is to promote harmonization between various IEC publications. Copies should be available from members of the TC 76.

## ACOS Working Group

A new working group will be set up under ACOS. Its purpose will be to a) define the safety related characteristics of systems intended for signal transmission through building wiring (low and ELV), fiber optics, or through the air by means of electromagnetic waves in household and

similar premises, including home electronic systems. Also, b) to investigate the existence of or the need for safety standards used in these systems. For more information, contact the TA for TC 76, or Mr. M.E. Cox at UL Northbrook at (708) 272-8800.

*The following information was published in one of the last three editions (May - Oct) of the M. A. Lamothe & Associates Inc./ Ultratech Engineering Labs Inc. Newsletters. The following is reprinted here by permission. The Editor wishes to thank Mr. Lamothe for his support of the Product Safety Newsletter.*

## Europe 1992

The Standards Council of Canada and Canadian Government, Department of External Affairs is sponsoring a seminar in October of this year covering the approval scene and marketing in Europe.

If you would like more information on this seminar contact:

Standards Council of Canada 350 Sparks Street, Suite 1200 Ottawa, Ontario K1P 6N7

## Flame Tests for Wire and Cable

CSA has introduced a specific flame test category for cable used in the air return plenum. The new category, FT6, is designed to test for flame and smoke spread. This category is identical to the UL CL2P classification. CSA does not have the test equipment required to conduct this test but will accept results of tests conducted by UL in the USA or ULC in Canada.

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# Product Safety Abstracts

by Dave Lorusso



*(Dave Lorusso, our faithful researcher and compiler of Product Safety articles tells us that he can use more of our readers' input on Product Safety articles. Would you take a moment and send him copies of articles you feel would be of interest to the Product Safety Profession? His address appears at the conclusion of this article. -Ed.)*

**“New Emphasis on Product Warnings”**, was published in the August 6, 1990 issue of Design News. The author, Phillip M. Davis, writes about why product warnings are growing in importance, manufacturer's duty warn, and how operators are not responsible for the unknown.

**“Standards and the US Government”**, was published in the August, 1990 issue of Quality. The

author, John J. Kendrick, briefly reviews a recent report from the National Institute of Standards and Technology (NIST), titled “Conduct and Administration of US Participation and Leadership in International Standardization, Testing, and Certification in the Decade of the 1990's”. Kendrick reviews a study commissioned by NIST to study US participation and leadership in international standards, testing and certification. Standards development, impact on US labs and the possible first step of Congress establishing a national commission to study the current system of testing and certification and its role for the federal government, are reviewed.

**“Certifying Quality Management Systems”**, was published in the August, 1990 issue of Quality. The author, John J. Kendrick, discusses three (3) US firms who can now certify companies as having met ISO 9000 standards. Compliance with ISO 9000 and certification requirements are also discussed.

**“Antitrust Liability in Standards Making”**, was published in the August, 1990 issue of Quality. The author, Paul J. Grant, reviews two (2) civil antitrust cases dealing with standards making and provides key elements of an equitable standards making procedure, including: Notice, Openness, Balance, Considerations, Appeals, and Records.

**“Product Safety Compliance - an Overview”**, was published in the 1990 issue of Interference Technology Engineer's Master. The author, Arthur E. Michael, introduces responsible agencies, current stan-

dards for EDP equipment, identifies proven techniques for expediting approvals, and discusses alternatives available to those involved in product safety compliance.

*Please send your Product Safety articles to:*

Dave Lorusso M/S PS-1  
Codex Corporation  
4 Conlyn Avenue  
Franklin, MA 02038

## Area Activity Reports

### Santa Clara Valley

In its first meeting since July, the Santa Clara Valley chapter met September 25th to elect officers and plan meetings for the coming year. It was decided then to hold meetings every other month, in November, January, March and May. The November meeting time, date and place will change to coincide with the EMC meeting, as noted in the calendar of activities (see Calendar section of newsletter). The presentation will be on European Requirements for EMI, ESD and power line surge testing based on IEC 801. Mike Hopkins, VP of Sales with Keytek Instrument Corp. will be giving the presentation. Those interested in more information are asked to contact the chairman, John Reynolds, at 408-970-1329.

### Southern California

The September meeting of the

Southern California chapter was to have featured a presentation by Mr. Konrad Kobel, TÜV America on medical equipment safety, including information about the German medical equipment safety law, "MedGV" and the medical safety standard IEC 601. Unfortunately, the feature presentation became the Orange County Fire Department as an evacuation of the meeting place was required to investigate a natural gas smell. The smell was traced to a neighbor venting chemicals that smelled like natural gas. The presentation was postponed to the October 2nd meeting and was well worth the wait. Mr. Charles Bayhi can be reached at 714-730-2556 for more information about the Southern California chapter activities.

### **San Diego**

A new chapter has been formed in the San Diego area. The first meeting occurred October 16th at Hewlett Packard in Rancho Bernardo. The presentation included a discussion of the chapter's purpose and objectives, future activities, followed by the main program, "Testing by Manufacturer Program and Approvals for EC '92" by officials from the Norwegian Board for Electrical Approvals (NEMKO). Details of the meeting will be available in the next issue of the newsletter. For more information about the San Diego chapter, please contact Scott Bonnet (619) 592-4571, Ray Jimenez (619) 729-9303, or Jim Dykema (619) 573-6295.

### **Northeast**

The most recent meeting of the Northeastern chapter was held on

July 25th and included committee reports on Constitutional Bylaws, Technical presentation, and the legislative committee, followed by liaison reports on UL, CSA, EIA, and CBEMA/NEMA/NFPA, EC 1992, and OSHA. Mr. Carl Lindquist of San-O Corporation, Atabex Research then gave the evenings program entitled "Is it a good fuse?" Carl's presentation covered basic fuse design criteria, and described how simple differences between fuses can result in significant performance discrepancies. Carl also discussed the misnomer of "equivalent" fuses, and the vagaries of fuse approvals by various agencies both here and overseas. Carl's discussion was well received and followed by a lengthy question and answer period.

### **Chicago**

We have no information on the recent September meeting of the Chicago chapter. A report of their activity will be provided in the next newsletter.

### **Northwest**

Rich Nute was the featured speaker at the Northwest chapter's September meeting. Rich reviewed the happenings at the IEEE-EMC symposium held in Washington, DC in August and also gave an overview of a paper he presented at the symposium on grounding impedance. The speaker for the October 16th meeting was Junior Owings who is an Oregon State Electrical Inspector. Junior spoke on how the National Electrical Code relates to OSHA and to the manufacture of safety equipment.

The Northwest chapter is considering nominations for officers for the next year.

Letters to the Editor  
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breakers and fuses are not necessary to protect against overload conditions. These conclusions are based on test results that are grossly in error. Mr. Franklin video-taped an experiment in which 14-gauge copper Romex cable carried 100 amperes for one hour without damage to the insulation or the internal paper wrap. While the experiment is a relatively simple one, it must have been incorrectly conducted, since the results are obviously in error.

No. 14 two-wire Romex carrying 100 amps will generate a power loss of 60 watts per foot. It should be apparent that such power generation would quickly destroy the insulation, which has been demonstrated by many manufacturers who have conducted this test. In fact, with just 60 amps flowing, the insulation on No. 14 Romex will begin to melt in about eight minutes. From his erroneous results, Mr. Franklin concludes that branch circuit overcurrent protection is unnecessary and intimates that a 60 or 100-amps main fuse is sufficient to prevent overcurrent fires.

Mr. Franklin further states that 60 amperes can be carried by 16-gauge power supply cord sandwiched between two layers of carpet. Once again, the correct performance of such a test shows that, in actuality, the insulation will bubble and begin to melt in just one minute.

If the readers of your "Product Safety Newsletter" accept the information provided by Mr. Franklin and permit or encourage substitution of higher ampere rated breakers for 15 or 20-ampere branch circuit protection, they could put themselves and others at serious risk. We urge you to carefully assess the veracity and potential impact of Mr. Franklin's paper and to conspicuously publish appropriate clarifications and retractions.

Sincerely,  
W.J. Heerlein  
Consultant

#### **The author's response**

Nowhere in my article did I state or imply that the handle rating of circuit breakers should be increased. The whole point of my article was that the magnetic trip levels of American circuit breakers should be reduced, to greatly decrease the energy delivered to short circuit arcs. Raising the handle rating of circuit breakers would increase the magnetic trip levels, and this would be counter productive to my thesis.

Nowhere did my article guarantee fire prevention. But it should be obvious that if the energy delivered to an arc is reduced by 20 or 100 times, the probability of a fire will be reduced by a like amount.

Sincerely,  
Frederick F. (Rick) Franklin, P.E.  
President  
Professional Analytical and Consulting Engineers, Inc.  
Cincinnati, Ohio

Telecommunications  
Continued from page3

equipment. Other portions seem to be created to insure that the present equipment base would not be affected by new CPE (Customer Provided Equipment).

The following partial list of British Standards represents the most common documents for PSTN connection.

**BS-6305**, "General Requirements for Apparatus for Connection to the British Telecommunications Public Switched Telephone Network". This document defines the general requirements for Telecommunications Performance that must be met for connecting to the PSTN (Public Switched Telecommunications Network) or to a PABX.

**BS-6301**, "Electrical Safety Requirements for Apparatus for Connection to Telecommunication Networks". This specification defines the Telecommunications Safety and Product Safety requirements that must be met. It covers creepages and clearances and barrier devices that must be qualified for both telecommunications line interfaces and the power supply.

**BS-6789**, "Apparatus With One or More Particular Functions for Connection to the British Telecommunications Public Switched Telephone Network". This specification has 6 parts, and multiple sections within each part. The most important is part 3. Section 3.2 which covers auto answering and section 3.1 covers auto calling of terminal equipment.

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**BS-6320**, "Modems for Connection to the British Telecommunications Public Switched Telephone Network".

This specification defines the requirements for modems, but contains very little information. Most of the performance requirements are covered in a SITS.

**BS-6312**, "Plugs for use with British Telecommunications Line Jack Units".

This specification defines the BT 601A jack used for connection to the PSTN.

**OTR001**, "Technical Requirements for Private Branch Exchanges with Telecommunication Ports".

This document covers all PABX and switching equipment that provides through connections between the PSTN and extension ports.

Thus for a modem that auto answers and auto dials, it would be required to meet all of the above specifications with the exception of OTR001. The problem with the British specifications is that many of the requirements are not clearly identified or not identified at all as in the case of BS-6320 for modems. As for Voice Response or Voice Processing equipment, no standard exist at this level, but if you dig deep enough you will then find a layer of documentation called SITS.

#### **The SITS**

Because of inadequacies in the original British Standards, an additional layer of documents was created to add further requirements for performance and testing. The non standards are called SITS, or "Special Investigation Test Schedules". The



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SITS are not standards, but they are mandatory.

Currently there are over 35 listed SITS. SITS documents can be updated or new ones added without notice. To select the proper SITS usually requires some assistance.

### **The Application**

The application consist of an application form, filling out all necessary TIS (Technical Information Sheets), and submitting all possible documentation about your product in duplicate to the testing laboratory with the original to BABT. There are currently 34 different TIS from which you must select and fill out properly. You should plan on a stack of documentation at least two to three inches thick when making an application for a simple product.

The application, TIS documents and your product information are reviewed by BABT to insure that you have submitted the entire package correctly. If not correct, the applications are returned for additional information to be added. The time lost in rejection and resubmittal can be weeks to months. In come cases, not all if the forms need to be filled out.

### **The Compliance Test**

The chosen test laboratory verifies that the equipment complies with telecommunications safety and telecommunications performance requirements as set forth in the applicable standards and SITS documents. At present, the United Kingdom does not have product radiation, product Safety, or ESD requirements for Telecommunications Terminal Equipment that con-

nects to the analog Public Switched Telecommunications Network (PSTN).

Once the test laboratory has completed the testing, a copy of the results will be forwarded to the manufacturers legal agent and to BABT. If the equipment has not been properly designed and pre-tested for compliance, then additional test cycles will be required.

Each test cycle can be rather expensive and time consuming, as lead times are usually three to four months. The applicant can usually plan on paying £3,500 to £5,000 in test fees for simple terminal equipment, such as a modem or answering machine.

### **The Factory Approval**

A manufacturing Factory Assessment must be carried out by BABT to ensure that the sample product that was tested will be representative of the products manufactured. The Factory Assessment scheme is defined in BABT Document 340 and several appendixes. BABT personnel visit factories much like UL does in the United States. Follow up visits are mandatory.

The lack of factory assessment and approval can delay your product being granted a "License Certificate". It is therefore important to schedule the assessment early on. The initial factory assessment is £500 plus travel expenses. The over seas travel expenses are divided between all factories that are visited on a given trip.

The factory visit will assess quality assurance, manufacturing work-

manship practices, manufacturing process flow, test procedures, material control, change control, test equipment, test equipment calibration.

In addition, the manufacturer must appoint an Approvals Liaison Engineer (ALE). The ALE is responsible for monitoring all software and hardware changes that affect the Telecommunications products performance and safety. All changes that affect the telecommunications functions must be reported to BABT. If warranted by BABT, additional testing may be required to verify compliance.

### **The Requirements for Legal Presence**

As a manufacturer of products that are sold into the United Kingdom, you are required to have a legal presence in country, should any legal action be necessary. The legal presence can be your company's international UK office, an office without personnel that is a registered "Limited" corporation, or a sales representatives corporation. Regardless of which you select, the legal agent must be established before a "License Certificate" will be granted by OFTEL.

### **The License Certificate**

When the applicant has met all of the testing requirements, obtained a factory assessment, established a legal presence in the United Kingdom, and paid all fees, BABT will recommend to OFTEL that a "License Certificate" be granted.

The license is for the life of the product, and no additional continuation compliance testing is required,

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unlike FCC Part-68 in the United States.

The total cost for obtaining a License Certificate is therefore in the range of £4,900 to £6,400 plus travel expenses, provided that your product passes compliance testing and the factory assessment are satisfactory on the first try. Don't forget to multiply that number by the current conversion rate to determine final cost in US Dollars.

### **The Future of Homologation in the UK**

BABT is expected to evoke the ENV41003 Telecommunications Safety and EN60950 Product Safety standards by mid 1991, which would replace BS-6301. By 1992 Pan European Harmonized CISPR-22 specification for radiation is expected to be invoked.

The three inch thick draft prETS 300 001, which is also referred to as candidate NET 4, specifies the general requirements for connection of telecommunications terminal equipment to the PSTN. The current draft is a compilation of general interface requirements for 20 countries, and as such accommodates the historical peculiarities of the PSTN for each country.

Although candidate NET 4 contains inputs from the United Kingdom, it remains to be seen when NET 4, and the many supporting NETs for modems, facsimile, and voice products will be adopted by the United Kingdom. Don't count on 1992 as being the year of total harmonization of telecommunication standards in the European Economic Community

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### **About the Author**

Mr Patton is a consultant in the Homologation of Telecommunications Equipment for North America, Europe, and the Pacific Rim. He can be reached at 602-934-5458 or by facsimile at 602-242-7700.

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Societal trends are important to engineering. A good engineer stays abreast of all public policy issues that relate to his/her field or product interests, including learning to anticipate society's future judgment of one's work. Lest this sound like I'm suggesting the "fortune cookie business", let me clarify. I'm simply suggesting that societal expectations are foreseeable when we maintain a sensitive ear to not only the action of society, but more importantly, why the action occurs - the principle behind the action. With a little practice, we can acquire some proficiency in foreseeability of societal trends and thus in society's future judgments as to the efficacy of our products.

Technical competence is, of course, as basic to good design for safety as for reliability. However, the consequence of any shortcoming can be much more serious in the safety area. Inasmuch as a single shortcoming - a single accident - can, under some circumstances, jeopardize existence of an entire organization, it is usually unwise to expect or allow any one engineer to privately make the complete/final judgment

regarding a major safety question.

Maintaining engineering/design competence in the organization is the responsibility of engineering management. Product safety management should not attempt to manage the engineering competence picture, even though it often involves safety. Product safety management should, on the other hand, make certain that all engineers are required to participate in product safety technology training. An important part of this technical training and competency deals with human factors and human behavior.

Economic considerations are very much a part of product safety technology, even though some lawyers would lead one to believe otherwise. As pointed out in the above policy on "acceptable design", unreasonable interference with product cost can be a valid reason for deciding that a safety feature is not appropriate. Albeit, some disciplined capability is essential in determining what constitutes "unreasonable interference with cost". The economic consequence of litigation, field modification programs, late/unscheduled redesign to control a hazard, etc. are often so large as to command the design engineers' full attention.

The importance of understanding relevant legal issues, both of statutory and litigation origin, has already been adequately addressed.

Participate in the development of and compliance with, special corporate policies and procedures that guide engineering decisions regard-

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ing accident prevention and liability defense.

A successful product safety program serves three basic objectives:

- ★ Provides design engineers with guidelines and confidence in decisions regarding accident prevention and product liability.

- ★ Provides senior management with an early alert of serious safety problems and an audit of product safety performance.

- ★ Provides sound and practical product liability defense posture and arguments.

Engineers play a key role in the development and implementation of policies and procedures to meet these objectives, as follows:

- **Safety signs.**

Given today's ethical and legal duty-to-warn, safety signs become as important to accident prevention and liability defense as the design itself. Detailed criteria are essential to achieve uniform company practice in compliance with standards, sign material for durability, format, colors, signal words, message, and availability. Taken together, the elements of an acceptable safety sign communicate:

1. Hazard identification.
2. Avoidance procedures.
3. Consequence.

Procedures and materials are needed to remind and assist dealers to restore safety signs on resale machines after defacing or painting. Signs should carry a part number, should be applied to the appropriate repair parts according to location on whole goods, and should utilize pictorials for emphasis and multi-

lingual purposes.

- **Voluntary industry safety standards and recommended practices.**

Industry standards represent feasibility studies that strive to optimize technical, economic, and behavior criteria into practical guidelines. Engineers should give strong support to both development work and compliance. Your employer should support both areas, including funds for the ASAE Cooperative Standards Program, for your work in standards committees, and with a policy that tells designers their goal is to comply with or surpass the intent of all applicable industry standards and recommended practices concerning safety.

Compliance with an industry standard cannot assure that a product is not unreasonably dangerous, but failure to comply with an appropriate safety standard will almost certainly add to embarrassment in litigation. Voluntary industry standards are continually gaining credibility, hence evidence of compliance can be expected to become progressively more important in litigation defense.

- **Operator's/owner's manual.**

The manual, like the safety sign, can be as important to accident prevention and liability defense as the design itself. Because manuals, like signs, may be ignored by product users, we must strive to make them more "user friendly", practical, and effective. Professionalism in format and content, uniformity among machines of a single make and within an industry class/category, and availability are all primary objectives. A safety sign on a machine and a big bold front-cover state-

ment for the manual, "Do Not Operate This Machine Before Reading This Manual", can save lives on the farm and dollars in the courtroom. Predelivery safety instructions for the dealer are needed and each machine should have a weatherproof place to store the manual.

- **Accident reporting and investigation.**

Manufacturers should have a policy and system for encouraging dealers and other field personnel to report on all personal injury accidents (with their own machine make) that come to their attention. The information is essential for helping designers understand product shortcomings and the reason(s) for them, to get advanced warning of possible litigation, and to determine if field modification programs are needed or were completed. Employees should also be required to report all product accidents or near misses, both on and off the job. The accident information should promptly reach all of the appropriate people in the organization and a permanent record should be kept of the action taken on each report.

Accidents should be investigated as necessary to obtain enough information to permit reliable analysis by the designer and the product safety committee, to determine cause, and potential correction. Investigation authority and procedure should be arranged by responsible corporate people as it may relate closely to future litigation.

- **Field modification programs.**

Correction of a recurring problem in the field involving injuries can save lives and limbs, can do great

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things for customer loyalty, and can save a lot of litigation money. Lawyers for the manufacturer err badly when they advise that admission of a problem and/or correction of customers' machines should be postponed or avoided because such action could be embarrassing in a pending lawsuit. Such tunnel vision should be overridden by a corporate policy that outlines these objectives:

1. Advising owners as early as practicable of a recognized unreasonably dangerous situation.
2. Recommending useful accident preventing practices to be followed by owners until further notice.
3. Indicating approximately when and how to expect corrective action through the dealer or otherwise.

Because the debits and credits are often so large in field modification situations, manufacturers should have a workable system for tracking candidate products through manufacturing (date-coding of some kind) and by serial number in customers' hands (first owner name and address).

• **Product Safety Committee organization and responsibility.**

The complexity of much product safety decision-making, together with the enormous potential consequences of poor judgment, point strongly to the use of a product safety advisory committee system to secure dependable consensus recommendations for designers and for management, regarding all major safety questions. Depending upon corporate structure, this suggests a plant or a corporate committee or both. The confidence that an objective, experienced, professionally chaired committee can furnish is

critical in making good judgments. And, a strong documented committee consensus is much more difficult to argue against in court. Charles F. Kettering, the late, famous inventor and Vice President of General Motors, once said, "It is amazing what foolish thoughts one gets when he thinks too long alone."

Seeking advice and judgment from one's peers in product safety is a sign of wisdom. The committee role is most effective when it is advisory to the designer - thus preserving line responsibility of the designer for the product. Likewise, the committee should best be advisory to its supervisor - a designated top management position such as the plant manager or division vice president. When so structured, both the individual designer and the Plant manager are still accountable for their final decisions, yet neither is apt to act contrary to a strong committee consensus.

A product safety committee should have broad departmental representation and always include one or more members from product engineering, reliability, and service publications. Lawyers or insurance people should participate only as special circumstances arise and then only as counsel. With exceptions for certain unique corporate structures, the typical committee's responsibility should include the following:

- ★ Eventual consensus recommendation on every item.
- ★ Consider the utility of design compared to other products on the market, and alternative designs.
- ★ Follow up to assure either implementation of its recom-

mendation or return to and review by the committee for an alternate/acceptable recommendation

- ★ Assure appropriate use of a formal hazard review system for safety, including utilization of information from accident reports, engineering tests, field service and reliability reports, insurance reports, etc., to identify potential hazards.
- ★ Process and assure resolution of each accident report.
- ★ Assist with and review all new safety signs and pictorials.
- ★ Assist with and review all field modification programs involving safety.
- ★ Assure continuing product safety training in-house.
- ★ Advise on all major special safety related issues, i.e. manufacturing deviation approval, on-site accident investigation, etc.
- ★ Provide committee meeting minutes that are permanent and informative enough to service business needs, and free of ambiguous/self-incriminating statements.

• **Product review procedures for safety.**

Most hazard analysis techniques have their roots in occupational safety criteria - based mainly on frequency and severity. They are not adequate for product safety analysis where lack of supervision imposes the additional factor of susceptibility - often called "degree of surprise", "assumption-of-risk", or vulnerability. Both statutory and case law in recent years have cited this third element as a necessary part of the process of

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defining unreasonable risk.

A reliable review system must prompt us to articulate our analysis of three separate elements of a hazard: frequency of risk, vulnerability to exposure, and severity of consequence. Additionally, a system should be capable of quantifying the degree of risk such that the relative importance of hazards can be compared.

Consistent use of such an analytical tool also provides a readily understood common language with which to communicate with management on the importance/urgency of action. This is a uniquely valuable asset in the face of the ponderous nature of many of today's product safety judgments. It helps maintain uniformity of decisions over time, it minimizes emotional biases, and builds management confidence in the whole product review process.

• **Product safety communications.**

Effective written communications are an essential part of any successful engineering endeavor and should not be thwarted by the innuendoes of product liability. During litigation it is quite possible for the plaintiffs side to search a manufacturer's files and find a memo or report that appears to indict the manufacturer by admission of a longstanding/unresolved safety hazard. The threat of large legal claims, especially punitive damages, causes some lawyers to advise that all such potentially damaging material in the files should be systematically located and destroyed. This is further bad legal advice. Although perhaps helpful in a specific short-term situation, admission of such a practice is sure

to embarrass the manufacturer in later litigation, is expensive, and is apt to remove documents of value to future conduct of business or in future litigation defense.

In the opinion of the writer, alteration or destruction of file information that relates to any pending legal claim or litigation is totally unethical. By comparison, there should be no objection to asking a writer to redo a memo written in emotional haste or exasperation, and that is not related to any pending legal action. Records/minutes of safety deliberations should be carefully prepared by experienced people who can address a problem, its analysis, and its resolution with the objectivity necessary for understanding but with little opportunity for a plaintiffs lawyer to manipulate the facts. Language that is precise and simple minimizes the risk of misinterpretation. Safety communications should limit or avoid unnecessary adjectives/superlatives and use of absolute words like "safe", and should clearly distinguish between "observation", "opinion" and "fact". Statements that can be interpreted as legal conclusions should be avoided, for example, "product is defective".

As written safety communications are thus modified - toned down - to avoid potentially damaging statements, it is imperative that the resulting loss of urgency be restored by some sort of corporate pronouncement including a requirement for personal follow up of every major safety communication.

• **Product safety training.**

Advancing product safety expecta-

tions by society and management call for perceptive and professional maturity in decision-making. Today's Product safety technology covers a broad range of multidisciplinary areas already described. An important additional training requirement deals with expert witness and trial work - to provide engineers who are confident, convincing, and able to keep cool under pressure.

In addition to participation in outside seminars, every engineer should have opportunities to grow in the kind of perceptiveness that comes mainly through in-house training - to practice PERCEPTIONEERING. An integral part of that training program should be the prerequisite to participate frequently in presentation and deliberation before the product safety committee. Manufacturers should make sure that this training is on-going and that it utilizes resources and precepts that are workable in place of so much that is out-of-date or empirical.

Training should also reach others in the organization who make decisions having implications for safety, such as the advertising and sales promotion departments. Their material should make it obvious to readers/viewers that safety is a high priority and functioning policy of the organization.

• **Product safety performance audit.**

Discovery of a product or decision shortcoming through an in-house audit may carry some embarrassment, but it is part of growth, both personal and corporate. And, the consequence is always less than

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when the same shortcoming is discovered in court. Product engineering management must be responsible for monitoring the engineering/technical competence of its staff. The product safety audit, on the other hand, is totally separate and should deal primarily with the use of the processes, techniques, and procedures that are central to assuring dependable safety judgments - judgments that involve inputs that often compete, sometimes conflict, and nearly always involve complex tradeoffs. In other words, good engineering practice is basic, but it alone cannot prevent unreasonably dangerous products or faulty judgment.

By appraising the performance of the product safety committee against each of the key elements of product safety technology, as described above under "Product Safety Committee organization and responsibility", it is possible to periodically identify and thereby strengthen the weakest aspect of each plant's product safety activity. The ability to conduct such meaningful product safety audits is another of the many merits of a corporate structure that utilizes the committee system. Such an audit of system weaknesses can also provide management with relative merit ratings among various plants.

These ten guideline procedures are basic to a strong product program.

Apply human factors principles in dealing with behavior-related accident cause/avoidance problems. Some just criticism has been leveled at the field of human factors engineering for being so esoteric

and empirical that practical day-to-day design application is sometimes questionable. In spite of these shortcomings, a useful definition/rationale is: The application of behavioral principles and data to optimize human contribution toward the effectiveness of a system while minimizing any negative system impact on the operator.

We know that machine characteristics can influence how an operator performs. They can act as stimuli that contribute to or detract from efficient operation and safety - in other words, help control behavior. The field of engineering psychology has identified some additional human characteristics that are valuable guidelines for design decisions that require optimization and tradeoffs that often involve conflicts. Engineer psychologist Jerry Duncan of Deere & Co. states as follows in a recent presentation at the University of Texas: (15) "Humans have a great ability to store large amounts of information for long periods of time and to remember relevant facts at the appropriate time. This ability is related to the human's superior ability to use judgment and improvise and to respond appropriately to low probability occurrences. The human can be reprogrammed fairly easily and quickly and can vary performance tolerances quickly. He can acquire new methodological know-how simply by reading printed verbal procedural directions. Human flexibility helps avoid complete system breakdown in emergencies. Because of our seemingly limitless memory storage, we can consider possible events that have extremely low probabilities."

These fundamental behavior criteria, when made a part of a task analysis review, get us closer to a realistic definition of "unreasonable risk" for any product use environment. Task analysis identifies and analyzes the machine system events to find where system design changes may be needed - that is, per Mr. Duncan, "changes in product design, methods of use, formal training, or personnel selection criteria - where any change represents an optimum trade-off among the various system criteria, including costs."

His paper also includes two sets of guidelines for helping one integrate design changes and behavior criteria.

"Five Major Categories of Human Error:

1. An error of omission is where a person fails to perform the task.
2. An error of commission is where the person performs the task incorrectly.
3. An extraneous act is when the person introduces some task or step that should not have been performed.
4. A sequential error is when the person performs some task out of sequence.
5. A time error is when a person fails to perform the task within the allotted time, either too early or too late."

"Human Tolerance Limits - human response limits to keep the variability of human behavior within acceptable tolerances, must be used when trying to control the potential of human error. (Listed from most effective to least effective. )

- ★ Barrier limits: physically prevent unacceptable performance, for example, interlocks or shields.
- ★ Fixed limits: clearly established limits such as detents on controls or color coding.
- ★ Empirical limits: an observation or measurement, for example, checking a gauge reading against tolerance.
- ★ Reference limits: output vs. a standard, for example, a “good” or “bad” weld.
- ★ Caution limits: warning signs/messages are low attention getters hence are less effective.
- ★ Conventional limits: instilled by training or custom and have limited effectiveness unless reinforced.”

Farm tractor operation, like many other activities, will always require a variety of modes that include operator judgment to avoid injury. Therefore, the definition of “unreasonable risk”, while focusing first on reasonable design, must also center on how well safe work practice information is provided and followed.

Participate in technical society and trade association safety activities. Much of what is accomplished for safety can best take place through technical societies and trade associations, and there is no substitute for the professional growth opportunities offered. One’s involvement should be focused - targeted on specific objectives, if efforts are to be productive.

Equally important is the discipline of making safety an integral part of every engineering endeavor, espe-

cially in engineering publications. Safety, like honesty, is part of the fabric, not some adjunctive thing that the specialist addresses in a separate bailiwick. In December, 1970, the ASAE Ten-Year Safety Plan was adopted. As part of the Plan, authors of ASAE papers were formally requested to consider the safety implications of their projects/presentations. For a time authors responded well, but in recent years this commitment has waned. I urge you to reinstate it individually, and corporately within ASAE. Without such a constant reminder, it is easy to overlook an interface of our project objective with safety.

Utilize legal counsel often and wisely. The term “legal counsel” has lost much of its original meaning - from “valued consultation” to “quarterback for a fight”. The media reminds us from time to time of instances where business, instead of following its heart, let its lawyers make the decision, only to regret it later. One of the reasons punitive damages are so threatening today is because manufacturers sometimes follow the advice of lawyers or an insurance carrier in not admitting to or correcting a product shortcoming, in spite of in-house feelings to the contrary. Expensive tunnel vision! How should the design engineer handle such a situation?

First of all, it requires sound homework and the courage to defend your position when “right”. Second, it requires a management that listens to all points of view, is not startled when the engineering and legal viewpoints are in conflict, and then is no more reluctant to reject legal counsel than to reject engi-

neering counsel in making the final decision. Translated another way, this means that engineers should typically utilize legal counsel on the basis of asking, “Do you have any suggestions on how my plan/decision might be improved upon, and why?” instead of asking counsel, “How do you think I should handle my problem?” In exploratory situations, lawyers may unwittingly tend to direct attention away from full perception of a problem and toward only those aspects that are of consequence in current or foreseeable litigation.

Preaction vs. reaction in safety and liability matters. A hip-shooter is one who preacts without homework. Preaction always depends on completed homework. Punitive damages are often due to a decision to wait and react instead of taking action promptly. History is full of examples of preventable accidents, expensive recalls, unnecessary litigation losses, unrealistic government regulation, and the like, resulting from that infamous disease known as “better wait and see” - procrastination.

Consider a scenario where the product safety committee, for example, has reviewed two similar injury accidents reported during the first year of sales of a new model tractor, say 2000 units. The information available is inconclusive as to cause. Therefore, the potential for more such accidents is unclear and the decision is made to wait and see what, if anything, shows up in the future. Over the next five years the picture remains the same - an occasional accident report but not enough information to define a pattern of

cause. With 14,000 units now in customers' hands, suddenly a detailed accident report makes it clear that the original suspicion of an inherent deficiency was correct - field modification is now necessary.

The consequence of this wait and see decision now includes additional injuries, the probability of one or more difficult to defend lawsuits, and the cost of finding and fixing 14,000 units. That cost, instead of being seven times what it would have been at year one, will now be many times that amount because after six years, the largest part of the cost will be in tracking down first, second, and perhaps third owners of the product. An investigation of the first or second accident would probably have indicated a need for early correction, and in hindsight, produced large rewards.

I would like to close on a point of confidence and inspiration for all product engineers. Society, your customers, and your management are all growing in their recognition of reward for safety decision-making based on sound engineering perception and a forthright goal of the highest practical level of safety for the greatest number. This often contrasts sharply with the conflicting signals from isolated lawsuits. Our good country has a history of revulsion and then defeat for those notions that would place the favor of a few above the good of many. None of us can predict exactly how or when the overdue correction of product liability abuses will come, but let's work with the assurance that it will because it must.

Product safety work is a high calling. By maintaining a commitment to integrity and excellence in all our product safety endeavors, we leave the world a better place to live at the end of every day.

References 1. Code of Ethics of Engineers, ASAE Bylaws and Rules, 1983-84 Agricultural Engineers Yearbook, pages 701-702. 2. Occupational Safety and Health Act of 1970 (amended September 22, 1972), Federal Register, Vol. 37, No. 202, Wednesday, October 18, 1972. 3. Chief Justice Warren E. Burger, talk at Notre Dame University Law Center, London, England, July 1983. 4. Gallup poll, American Institute of Public Opinion, August 1983. 5. Rock Island (Illinois) Argus Editorial, 16 November 1983, from current AP wire service. 6. The Plugger, Volume 57, Number 1, January 1984, Article references Senator Robert W. Kasten statement on a study of claims. 7. The News-Sun, Sun City, Arizona, February 19-20, 1983. 8. Safety Goals for Nuclear Power Plant Operation, Revision 1 for comment, U.S. Nuclear Regulatory Commission, May 1983. 9. Chauncey Starr, Social Benefit versus Technological Risk, presented at Symposium on Public Safety, National Academy of Engineering, May 1969. 10. Agricultural Tractor Safety on Public Roads and Farms, U.S. Department of Transportation, January 1971. 11. U.S. Office of Management and Budget Circular A-119, "Federal Participation in the Development and Use of Voluntary Standards", January 17, 1980 — Revised October 16, 1982. 12. Chief Justice Warren E. Burger, annual message to American Bar Association, February 1984. 13. The Product Liability Act S.44 by Congressman Robert W. Kasten. 14. Stanley I. Lehrer article in insurance publication INC., September 1983. 15. Jerry R. Duncan, Human Factors Engineering in System Design, presented at Product Safety and Liability Conference, University of Texas, March 1983.

### **CSA Required for DOC Submissions**

Previously, DOC has accepted submissions for CS-03 and other telecommunications approvals with either CSA having been applied for or the option of dielectric strength testing and engineering analysis. The requirements have now been changed so that CSA Certification must have been granted at the time of filing the DOC application.

You can no longer apply for CSA and then submit the application to DOC with the CSA file number. You must wait until the CSA Certification is complete. DOC will no longer accept what is known as Option B (Dielectric Testing).

### **Alternates to CSA for Canada? The Standards Council of Canada has announced that USA Certification Organizations are now eligible for SCC Accreditation.**

*ETL Testing Laboratories, Inc.* of Cortland, New York have requested recognition for the subject areas of 'Electrical Equipment and Appliances' and 'Gas-Fired Equipment and Appliances'.

*Underwriters Laboratories Inc.* of Northbrook, Illinois have requested recognition in a number of areas including 'Burglary Protection Equipment', 'Fire Protection Equipment', 'Hazardous Location Equipment', 'Electrical and Electronic Products, Processes, Systems and Services' and 'Health Care and Health Hazard Technologies'.

The process is in the early stages but there is some indication that ac-



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creditation could be granted before the end of 1990. There are many questions which we will attempt to answer in coming newsletters.

For example, will UL use their own standards or will they have to use CSA standards? Generally, CSA and ULC are accepted without question in their respective fields.

Added to this picture is the fact that CSA is trying to get recognition as a recognized agency under the auspices of OSHA. As we have reported previously, CSA is also actively pursuing the multitude of jurisdictions in the USA to have them recognize CSA as an equivalent to UL and other certification organizations.

*Communication Certification Laboratory (CCL)* in Salt Lake City has also applied to OSHA to become a nationally recognized testing laboratory to provide listing services that will meet the requirements of the NEC.

A problem that will result from this proliferation of Certification Organizations is confusion with the consuming public. Will each mark be readily identified as a safety mark? This will be an important consideration in choosing which laboratory to use for your approvals.

We do not expect to see a drastic reduction in actual approval fees but we should see some improvements in approval times as each organization strives to maintain its place in the market. We have noticed a significant improvement from CSA over the last three years both in terms of cost and the time

taken to get the approvals. UL however has become more procedure oriented and as a consequence approvals are taking longer and the costs have tended to increase.

**XI and X2 Capacitors** - The 950 series of standards (UL 1950, CSA C22.2 No. 950, EN 60 950) have a requirement for across the line capacitors that has slipped by. The requirement is not clearly stated (clause 2.9.1) but the result is that an XI cap (or X2 cap with SEV approval) is required. The standard X2 cap has not had the 2500V surge test applied however the Swiss (SEV) requirement has been for 2500V on X2 caps. One consequence is that many switching power supplies will not meet the new requirement unless their input filter capacitor is changed.

#### **Canadian Electrical Code Seminars**

CSA is conducting seminars covering the new 1990 Canadian Electrical Code. These seminars, scheduled between October and January, at various Canadian cities will cost \$450 Canadian for two days. If you are interested contact CSA (Ross Cotton or Caroline Boyle).

#### **Requirements for Electrical and Electronic Measuring Equipment**

CSA has published standard C22.2 No. 231 Series-M89 which covers the safety requirements for this type of equipment. The effective date is March 31, 1991.

#### **Requirements for Cord Sets for Communication Systems**

CSA has published standard C22.2 No. 233-M89 which covers the safety requirements for this type of

product. The effective date is June 30, 1991 and the application requirements are covered in Cord Sets, Notice 1.

#### **Acceptance of CSA in the USA**

The Canadian Standards Association is working on becoming accepted in the USA. Currently the states of Oregon, Washington and North Carolina accept CSA state-wide. Many other areas also accept CSA but with some 18,000 chief electrical inspectors in the USA, each having jurisdiction in their respective areas, it is a monumental task to get uniform acceptance. Even UL does not have universal acceptance.

#### **Harmonization of the CEC and the USA NEC**

A task force has been established to work on the eventual harmonization of both codes. This should make harmonization of the various product standards easier since many of the current differences are related to the installation code requirements that differ between the two countries.

#### **UL Listed & Recognized Power Supplies**

UL have revised their power supply categories. The master category or umbrella category will be QQAQ for Listed supplies and QQAQ2 for Recognized Component supplies. The subcategories of most interest are:

- QQFU - General Purpose
- QQIJ - Specialty
- QQJE - Telephone Equipment
- QQBK2 - EDP Equipment
- QQFU2 - General Purpose

Continued on Page 21

# Calendar

Location/Contact	October	November	December
<p><b>Austin</b>            Bob Hunter            (512) 250 6878</p>	<p>No Activities</p>	<p>No Activities</p>	<p>No Activities</p>
<p><b>Chicago</b>            Dick Hagadorene            (708) 505 5722</p>	<p>No Activities</p>	<p>No Activities</p>	<p>No Activities</p>
<p><b>Northeast</b>            Sheraton            Routes 111 and 495            Boxborough, MA            Bill Von Achen            (508) 263 2662</p>	<p>Wed., October 24            7 PM            "Ergonomic Requirements for the European Marketplace" by Chris Swanson, TÜV Rheinland.</p>	<p>Wed., November 28            7 PM            Speaker and Subject to be determined</p>	<p>Tues., December 18,            7:30 PM            "Powerline Filters, Safety and EMI Considerations", by Russ Pepe, Schaffner EMC (tentative). Location: PGE Building, 14655 SW Old Scholls Ferry Road, Beaverton, OR</p>
<p><b>Portland</b>            Location to be determined            Fran Pelinka            (503) 641 4141</p>	<p>Date, Time and Speaker to be determined.            Subject: "Fuseology; Spec'ing the right fuse for the job".</p>	<p>Date, Time and Speaker to be determined.            Subject: "Fuseology; Spec'ing the right fuse for the job".</p>	<p>Tues., December 18,            7:30 PM            "Powerline Filters, Safety and EMI Considerations", by Russ Pepe, Schaffner EMC (tentative). Location: PGE Building, 14655 SW Old Scholls Ferry Road, Beaverton, OR</p>

# Calendar

Location/Contact	October	November	December
<p><b>San Diego</b>            HP Cafeteria            16399 West Bernardo            Rd.            Rancho Bernardo, CA            Scott Bonnet            (619) 592 4571            Ray Jimenez            (619) 729 9303            Jim Dykema            (619) 573 6295</p>	<p>Tue., October 16            6 PM            "Testing by Manufac-            turer Program and            Approvals for EC'92" by            NEMKO</p>	<p>No Activities</p>	<p>No Activities</p>
<p><b>Santa Clara Valley</b>            Apple Computer Inc            20705 Valley Green Dr            Cupertino, CA            David McChesney            (408) 985 2400 X2771</p>	<p>No Activities</p>	<p>Tues., November 13            7 PM            "European Requirements            for EMI, ESD and            Power Line Distur-            bance" by Mike            Hopkins, Keytek Instru-            ments Corp.</p>	<p>No Activities</p>
<p><b>Southern California            Orange County</b>            MAI Systems Corp.            14101 Myford Road            Tustin, CA            Charlie Bayhi            (714) 730 2556</p>	<p>No Activities</p>	<p>Tues., November 6            6 PM            "Summary of September            CBEMA Meeting" by            Charlie Bayhi, MAI            Systems</p>	<p>Tues., December 4            6 PM            Subject and Speaker            to be determined</p>

# Institutional Listings

The Product Safety Technical Committee of the IEEE EMC Society is grateful for the assistance given by the firms listed below and invites applications for Institutional Listings from other firms interested in the product safety field. An Institutional Listing recognizes contributions to support the publication of the *Product Safety Newsletter* of the IEEE EMC Society Product Safety Technical Committee. Minimum rates are \$100.00 for listing in one issue or \$400.00 for six consecutive issues. Inquiries, or contributions made payable to the Product Safety Technical Committee of the IEEE EMC Society and instructions on how you would like your Institutional Listing to appear, should be send to: PSTC *Product Safety Newsletter*, C/O John McBain (M/S 42LS), Hewlett-Packard, 19447 Pruneridge Avenue, Cupertino, CA 95014.

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## News and Notes

Continued from page 17

QQGQ2 - Information Technology  
Equipment

QQHX2 - Office & Business Equip-  
ment

QQIJ2 - Specialty

QQJE2 - Telephone Equipment

### Discharge Path Resistors for Au- dio Equipment

UL has issued a new standard for  
Discharge Path Resistors (UL 1676).  
Specifically this resistor is con-  
nected between the antenna shield  
and the neutral conductor of the  
supply circuit in TV, radio and au-  
dio equipment.

These resistors are rated 1/2 Watt or  
greater and 480K to 12Meg resis-  
tance. The test requirements cover  
resistance range, humidity condi-  
tioning, discharge, dielectric, over-  
voltage, strain relief and torque.

UL will require that resistors used  
for this application be UL Recog-  
nized Components or be specifi-  
cally investigated to these require-  
ments.

## ANNOUNCING ELECTIONS!

Here is your chance to make a direct contribution to the  
Product Safety Technical Committee (TC-8) by in-  
vesting your time and effort as an officer. Please call  
John McBain at 408-447-0738 for more details. Here  
is an outline of the procedure for a change of officers  
for TC-8:

1. Per EMC Society bylaws, officers in a TC have a 2  
year term.
2. The present officers are Chairman (Rich Pescatore),  
Vice-Chairman (vacant), and Secretary-Treasurer (John  
McBain).
3. Only members of the IEEE who are also members of  
the EMC Society may be officers of the TC.
4. Officers of the TC are confirmed by the EMC  
Society Board of Directors (BOD) from the names  
submitted.
5. The process of choosing names to submit is as  
follows:
  - a) A call for candidates meeting the requirements (per  
Item 3) is made through the Product Safety Newsletter  
(PSN).
  - b) Information about and a statement by the candidates,  
as well as a ballot form, are distributed through the  
PSN.
  - c) Only members of the IEEE who are also members of  
the EMC Society may vote.
  - d) The name of the candidate for each position with the  
most votes is submitted to the BOD for confirmation.

## READER DIRECTORY

We have prepared an address directory, organized by name and postal code, to help put readers in touch with each other. To order a copy, please send a check for \$15.00 payable to the Product Safety Technical Committee to the address given above.

(Please contact us if you want your address deleted from the directory).

## BACK ISSUES

We have a two year (1988 and 1989) collection of past Product Safety Newsletters, with an article index. To order a set, please send a check for \$20.00 payable to the Product Safety Technical Committee to the address given above.