The IEEE EMC SOCIETY

Product Safety Newsletter

Vol. 5, No. 2 Second Half, 1992

What's Inside

Chairman's Message

LOOKING BACK, LOOKING AHEAD

Many of us have experienced the effects of the recession in 1992, whether directly or through our friends and co-workers. Many companies have restructured or downsized, eliminating jobs or whole departments, generally because the perceived value of the function to the company does not clearly outweigh the cost. Companies have been squeezed out of their markets as the battle is waged for value in customers' eyes. Decisions have had to be made about who to keep and who to let go.

With that reality in mind I'd like to propose a resolution for all of us for 1993 and the years to follow: make the investment in yourselves to increase your value to your employers, clients and coworkers—that is, your customers. Here are three ways to keep this resolution.

Broaden your technical scope

At times considerable effort is made to differentiate product safety practice from other disciplines such as quality engineering, reliability and so on. Don't waste your time trying to make that distinction. Unless you're in some rare niche market where product safety activities justifiably focus solely on obtaining product safety approvals, it is impossible to cleanly separate product safety engineering from other disciplines, especially quality and reliability. The overlap among the disciplines is so great, the need to explore the technologies in these related areas is compelling. Continual education from outside the traditional product safety discipline thus becomes critical.

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The **Product Safety Newsletter**

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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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Letters To The Editor

Subject: PTTs Acceptance of Safety Regulatory Agency Certification to EN41003 standard. I would welcome comments on the following questions regarding the feasibility of possibly expediting product approvals of telecommunications equipment through the various country PTTs overseas.

Question 1. Would developing a partnership with a single Internationally recognized safety agency; using that agency's Certification of these products to EN60950 and / or EN41003 standard be likely to most effectively move the approvals process best through the various PTTs?

Question 2. If this is feasible, has anyone had any success in submitting an agency (e.g. TÜV, VDE or BSI) license for their products which was routinely accepted by most if not all the PTTs overseas?

Question 3. Where someone generally has had some success in the past using a single safety agency license; what country PTTs still require additional safety approvals and or testing?

Question 4. Following up on Question 3 above; what added safety tests or requirements were needed for these added individual country requirements?

Thanks in advance for any responses to the above questions. My e-mail id is smith_pj*corp_st@msm.cdx.mot.com Alternate e-mail id is..... smith_pj%msm.ismail.umc@isunix.cdx.mot.com. Alternately, please respond to the editor, PSN

Best Regards,
Paul J. Smith
(Formerly of Wang Labs). ✺

News and Notes

by Dave Edmunds
News and Notes Editor

LEAKAGE CURRENT LIMIT CHANGES?

Recent mailings from CBEMA indicate that there is an effort by UL and the North American Telephone Industry to reduce the leakage current to ground allowed under UL 1950 and CSA 950 from 3.5 mA to 1 mA for class 1 movable equipment. This subject will be discussed at the next Binational Committee meeting which was set for December 15 to the 17th, 1992. Stay tuned for further details.

UL OFFERS TOTAL CERTIFICATION PROGRAM -

Within the past 6 months, UL has introduced a new avenue for certification called "Total Certification Program" or TCP. According to UL, TCP is a natural evolution from the existing COMPASS program which allowed qualified clients to make minor revisions to products while continuing to use the UL mark. TCP will combine the existing programs to provide qualified manufacturers a way to speed up the product safety certification process while achieving the same level of safety evaluation provided by UL's traditional service. Among the features of the program are faster authorization to use the UL mark, ability to drive the UL product evaluation process, and eliminate the wait for UL to process their paperwork. An interactive relationship with one or more UL TCP contact engineers is key to the program. Further details can be obtained by contacting your local UL office.

The following material was extracted from the "M.A. Lamothe and Associates/UltraTech Engineering Labs" Newsletter, November/ December, 1992 edition:
EUROPEAN COMMUNITY MUTUAL RECOGNITION AGREEMENTS -

Canada and the US have been included amongst the list of countries that the European Community is planning to negotiate Mutual Recognition Agreements with. The purpose of these agreements is to accelerate the acceptance of testing and approvals done in other countries. This should enable a company to have their testing and approvals done by their local approval authority.

This would apply to European manufacturers wishing to sell in North America and to Canadian or USA manufacturers wishing to sell in Europe.

CSA/UL RECOGNITION -

On October 28, 1992, the Standards Council of Canada voted to accept Underwriters Laboratories Inc. as an accredited approval agency in Canada. OSHA has issued a press release saying they are proceeding with investigating the merits of extending recognition to CSA as a NRTL.

In terms of UL acceptance in Canada, you should note that electrical safety is a provincial jurisdiction. In some provinces, the electrical safety code provides for immediate acceptance of any accredited approval agency. However, in Ontario, the electrical safety code must be changed through legislation before UL will be accepted. Ontario is proceeding to amend their

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Harmonic Current Standards

by Richard Nute

[Here is the non-technical(?) side of Rich Nute. Dare we call it "Regulatorily Speaking"? - Ed.]

Here is the status (as of October, 1992) of the IEC standard for controlling harmonic current emissions from plug-and-socket-connected products. The proposed revision to the IEC standard changes the scope from household equipment to ALL equipment, whether ITE, T&M, Analytical, or Medical.

The 74A document was interesting in that it had eliminated Class D, and established one table, the former Table for Class D. After publication, the authors of the 74A document claimed to have found many unacceptable errors, and therefore reverted to the previous documents. The authors did not identify the errors. (The 74A document was accompanied by an engineering rationale which, in essence, said that they only needed one, simple table comprised of both relative and absolute limits. It is interesting that the rationale was subsequently found in error, but without identifying the errors.)

IEC Sub-committee SC 77A and Working Group 1 (WG1) of that sub-committee have a "new" work-

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AN INDEX TO HARMONIC CURRENT STANDARDS
AND DRAFT STANDARDS
October, 1992

PUBLISHED DOCUMENTS

Organization	Standard Type	Document	Status	Date
IEC	Voluntary	IEC 555-2	Effective	1982
		Amendment 1	Out of print	1985
		Amendment 2	Includes Amend. 1	1988
EC	Regulatory	EN60555-2	Effective	1987
		comprised of:		
		1. CENELEC modifications		
		2. IEC 555-2		
		3. IEC 555-2 Amendment 1		
SC77A	Draft	77A(Secretary)36	Superseded	1988
		77A(Secretary)36A	Superseded	1988
		77A(Secretary)48	Superseded	1989
		77A(Secretary)60	Defeated	1990
		77A(Secretary)70	Defeated	1991
		77A(Secretary)74	Superseded	1992
		77A(Secretary)74A	Superseded	1992
		77A(Secretary)82	Draft	1992
ECMA	Draft	CBEMA proposal	Changes requested	1991

Notes: (1) IEC 555-2 scope applies only to household products.
(2) Draft standards scope apply to ALL products.
(3) In 1991, CENELEC delegated its harmonic current work to SC77A.

PSTC Standards Committee Meeting Minutes

Issued date: October 16, 1992

PSTC Standards Committee

Meeting Minutes

The Standards Committee met for the first time on October 8, 1992 at 2:00 P.M. at APEX International Co., Ltd., in Santa Clara, California. The attendees were Mr. Paul McDonald, Mr. Jim To, and Mr. Dan Weinberg.

We discussed: 1) Statement of Intent of the PSTC Standards Development Department, 2) suggested standard development topics, 3) new ideas, 4) strategy to attract volunteers, and 5) presentation of the SSDD to the general PSTC meeting on October 27, 1992.

1. Statement of Intent - The group reviewed and discussed proposed wording of the Statement of Intent. Everyone agreed with the general philosophy and the direction of the SSDD. Jim indicated that he would revise the wording to clarify the position and objectives of the SSDD. The revised Statement is as followed:

"Statement of Intent of the PSTC Standards Development Department

The Safety Standards Development Department (SSDD) is a part of the PSTC — TC-8 —, and will adhere to all rules and policies set forth by the PSTC. It will serve as a coordinating body for standards work initiated or being done by satellite PSTC chapters. It will report its activities to the Chairman of the Central PSTC who will allocate appropriate resources to support the work of the SSDD.

The objectives of the SSDD are:

A. Development of IEEE guides, recommended practices, and standards relating to product safety,

B. Compilation of technical data relating to product safety, and

C. Compilation of acceptable constructional practices and testing methods which comply with national and international standards relating to product safety.

The SSDD will propose guides, recommended practices, and standards to the IEEE. By preparing these documents, the SSDD will:

A. provide the product safety profession with a necessary consolidated set of technical information, and

B. provide the PSTC with additional credibility toward its goal of becoming a full IEEE Society. "

2. IEEE Glossary of Terms - In IEEE Standards parlance, there are three classes of publications:

Standards provide mandatory requirements, **Recommended Practices** provide procedures and positions preferred by IEEE, and **Guides** suggest alternative approaches to good practice, but make no clear-cut recommendations.

3. Product Safety Handbook - We decided that the SSDD should develop a handbook containing product safety information; the individual sections would be published as IEEE guides.

4. Suggested Guides

A. Safety standards from North America, Europe, and Asia

B. Testing Procedures - How one performs a test such as temperature or /Rating current test. What is the correct way to conduct a test?

C. Software testing - Criteria and procedures to test the reliability of software.

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A Proposal for a Product Safety Handbook as an IEEE Guide

PAUL MCDONALD
JIM TO
DAN WEINBERG

The *IEEE Standards Manual* describes three classes of publications:

Standards provide mandatory requirements,

Recommended Practices provide procedures and positions preferred by IEEE,

Guides suggest alternative approaches to good practice, but make no clear-cut recommendations.

The Product Safety Technical Committee (PSTC) should issue this handbook as an IEEE *Guide*. When we gain more experience, we can issue sections of it as *Recommendations or Standards.*

This document is a preliminary outline sample of the proposed **Product Safety Handbook.** Each technical section, issued as an IEEE Guide, deals with a specific product safety topic. Product safety engineers throughout the PSTC should write these sections. We present five sample technical sections. The final document will contain many more. It also contains an appendix with sections dealing with legal, economic, and management aspects of product safety. A key part of this handbook is its *Index,* issued on computer disk to provide a method for rapid location of applicable standards and practices.

The handbook should be issued in loose-leaf format so it can be updated frequently. Users should be able to subscribe to updates.

Introduction

The purpose of this Product Safety Handbook is to collect, in one location, the myriad of information dealing with product safety now buried in notebooks, desk drawers, and file cabinets. Product Safety Engineers wrote the information in this handbook. Information included in the handbook must meet the following criteria:

1.The information must apply to product safety.

2. It must be clearly written.

3. It must pass peer review.

4. It must be compatible with other IEEE standards.

5. All sources must be credited.

6. A list of key words for indexing must be provided.

Technical Section

Note: These technical sections are examples only. They obviously have not been peer reviewed and edited.

Safety Standard Interpretation

What safety standards apply to North America, Europe, and Asia? What products do they cover? What geographical areas do they cover? Do the terms used in them have different meanings? What construction techniques meet the standard? What tests are required to determine compliance?

Testing Procedures

How should temperature be measured? How should leakage current be measured? What measurement procedures issued by other IEEE or ANSI organizations apply to product safety testing? How should test data be collected and analyzed?

Safety Factors and Testing of Computer Controlled Equipment

More and more equipment used in medical procedures is computer controlled. Other computer controlled equipment is used in construction and manufacturing. Failure of this equipment can cause

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The Thinking Building: an intelligent idea for the future

Reprinted from *IEC Bulletin*, Nov/Dec 1991

Home Electronic Systems (HES) Buildings in the future may be much more sophisticated electronically, able to monitor and control lighting, heating, ventilation, energy, security and entertainment - all at the same time. But while performance is the most visible result, safety is a critical aspect. That is where the IEC comes in.

Imagine a security system in your home hooked up to your video cassette deck (to record intruders), smoke or heat detectors integrated with a system that monitors the baby (or an aged parent), individual lighting and temperature controls that can be operated from anywhere within the house (or even by telephone). If you envision this, you may be looking at your own home sometime in the not too distant future.

Thermostats, light dimmers, smoke and heat detectors, etc., are not new, but they are not usually integrated, nor are they hooked to the exterior telecommunications network. Most household appliances, entertainment centres (stereos, videos), and heating and lighting systems are stand-alone devices: they function independently of each other, operated by individual on/off switches.

"The principle is to simultaneously monitor and control all systems, appliances and devices that operate electrically or electronically.. "

Unifying them - that is, integration and outside connection - is the idea behind home electronic systems (HES), now under development in Europe, Japan and North America.

There are three categories of HES systems. The first concerns switching and control devices only. The second includes the first, but adds audio capability. The third includes the first two, but adds moving pictures (like television). Category one is the simplest, and least cost-intensive, and the paragraph that begins this article is a description of category one HES.

Your house is thinking while you're away

Essentially, HES is a communication system between an "intelligence" source and a performance device. Seen in simple, concrete terms for a category one installation, this could look like the following: your home video machine is programmed to tape intruders and alert a security company to their presence while you are away from your house.

Thus, an infrared beam, once broken by intruders, triggers a camera hooked to your video machine, which records the scene. At the same time, the infrared beam also instructs your telephone to dial the security office and play a preprogrammed message, giving your address and relaying the intruder alert.

What is critical in this scenario, in HES terms, is not the terminal equipment: any video camera, any video cassette recorder, any telephone will do. It is the communication system - the wiring and the connectors - that is essential. This is the heart of HES.

The system is a bus, and could be made up of any combination of powerlines, coaxial cables, twisted pairs, optical fibres, infrared or radio, along with the connectors. Some projects, opt for a single bus - a thick cable containing, a twisted pair, a coaxial cable, a fibre, etc. Some experts suggest this poses a serious problem for renovating older buildings, but would work well in new constructions .

Other projects prefer several thin, single cables to perform different

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Safety Standards and HES

Reprinted from *IEC Bulletin*, Nov/Dec 1991

The origins of HES (Home Electronic Systems) are probably impossible to trace. Certainly practical examples of the concept of the House of the Future go back at least to the mid-1970s with Westinghouse, and a lot farther back if you consider some of the designs of the architect Le Corbusier.

In the mid-1980s new developments in microelectronics and non-cable systems, along with greater automation of building services and the growing integration of single systems components into a bus-based integrated building installation system led to the development of HES.

The IEC's involvement began about 1988 in the form of a Draft International Standard prepared jointly by the IEC and ISO. It described the structure of home electronic systems in general. Then, at a CENELEC meeting in 1989, the Danish National Committee suggested the need for safety aspects of HES, and the German National Committee recommended the IEC do the work instead of CENELEC.

The IEC Committee of Action asked the IEC Advisory Committee on Safety (ACOS) to set up a Working Group on Safety of Home Electronic Systems (ACOS/WG 1), with a mandate to define the safety-related characteristics in HES, and to investigate the existence of, or the need for, safety standards for equipment used in such systems .

The latter task includes recommending which IEC Technical Committees should prepare safety standards for Home Electronic Systems (HES). As a basis for work, ACOS/WG 1 uses the ISO/IEC Guide 51 and IEC Guide 104, both of which concern aspects of safety in standards writing.

There are essentially two types of standards to be considered in relation to HES. The first are functional performance standards, which are covered by ISO/lEC Joint Technical Committee 1/Sub-Committee 25/Working Group 1. They concern primarily the manufacturer. The second type deal with safety, which is the concern of ACOS/WG 1, and extend hierarchically throughout the system from manufacturer to installer to consumer.

A hierarchy from the IEC to the user

The hierarchy for HES, in safety terms, looks like the following: standardization committees (who write safety standards) - manufacturers (who make equipment) - systems engineers (who design the information flow for the transmission media in the buildings) - installers (who use safety standards as rules for installing HES,not only electrical safety, but also safety as defined in IEC Guide 51) -consumers.

ACOS/WG 1 is not writing safety standards. It is instead considering parameters, dimensions, and asking itself: Who best to deal with the task? Standards writing would fall to Technical Committees, likely to include those like TC 64 (Electrical installations of buildings), SC 1 7D (Low-voltage switchgear and controlgear assemblies), and TC 79 (Alarm systems). In fact, a close look at the IEC Yearbook reveals there are about 12 Technical Committees and Sub-Committees that could be involved.

The job that would face these committees is for them to think of how their particular domains relate to safety in terms of HES. For example: it is easy to design a system where you can start from your bedroom an electric heater in your living room for cold winter mornings. But what if somebody thoughtlessly lays a blanket on the heater late the

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Standards Committee
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D. *Product Safety Management - Management, Design, and Recall methods in product safety.*

E. *Dielectric Withstand Test voltage criteria and specifications.*

F. *Biological Effects of Electromagnetic Field*

Details on each topic are provided in the accompanying article entitled "A Proposal for a Product Safety Handbook as an IEEE Guide", Pg. 7.

5. Strategy to attract volunteers - We will present the handbook to the general meeting on October 27, 1992, and distribute a questionnaire to the attendees. Further recruitment efforts will be discussed after the committee reviews the survey.

6. Presentation to the general PSTC meeting - The group agreed that Jim will present the overall picture and direction of the SSDD. Dan will present the handbook and the updating method of the book. Paul will present the questionnaire and will compile the answers for further study.

* * * * *

The group will meet again to work on the layout and contents of the handbook and the questionnaire.

* * * * *

List of Attendees

1. Mr. Paul McDonald - Safety Manager, Electro Service Corporation, 2 Davis Drive, Belmont, CA 94002; (415) 592-5111

2. Mr. Jim To - Safety Manager, A-PEX International Co., Ltd, 2900 Lakeside Drive, Suite 101, Santa Clara, CA 95054; (408) 492-9101

3. Mr. Dan Weinberg, Ph D. - Electromagnetic Field Hazards, 1844 Schoodale Drive, San Jose, CA 95124; (408) 723-1486 ✺

Handbook Guide
Continued from page 7

injury and even death. Product safety analysis and testing of this equipment can be very difficult. The *IEEE Computer Society* has issued some standards on software engineering that deal with reliability. Unfortunately, they do not appear to cover the interaction between hardware and software. We should provide information and recommendations on this interaction. For example, we can recommend that where personnel safety is involved,

1. The programming should be *firmware,* that is, in read-only memory, so it is not changed easily.

2. The hardware should provide safety interlocks to prevent dangerous operation even if the program is faulty.

It is difficult to test programs thoroughly because some errors, especially in control programs, show up only when there is a coincidence of random events. If the chance of such a coincidence is 1 in a billion, it might occur every few minutes, or every few years of continuous operation. The PSTC has a real opportunity to provide systems safety guidance.

Dielectric Testing

This section must be coordinated with the *IEEE Dielectrics and Electrical Insulation* and the *Power Engineering* Societies. While these

societies deal primarily with power engineering problems, they probably could help us.

Biological Effects of Electromagnetic Fields

During the past several years, the popular press has told us that small amplitude electromagnetic fields from electronic and electrical equipment are harmful. Unfortunately, it is not easy to refute or substantiate these claims because:

1. It is not possible to prove that something is safe under all possible conditions.

2. The undesirable effects, if any, are small compared to all the other hazards associated with daily living.

3. Some people doing research in this area are under pressure to show "positive" results to continue getting grants.

4. These fields have some biological effects, but studies of hazards have given conflicting results.

5. Many of the studies have shown "windows." That is, the effect is small at a small field, grows larger as the field increases, then decreases as the field increases more, then increases and decreases as the field in increased still more. Thus, if the effect were harmful, increasing the field might be safer than decreasing it.

This section should include reviews and interpretation of the current literature on the subject. It should be coordinated with the *Electromagnetic Compatibility, Engineering in Medicine and Biology,* and *Society on Social Implications of Technology* societies.

Miscellaneous Data

What is the maximum safe temperature at the surface of a device for continuous contact? For casual contact? How does the thermal conductivity of the surface affect the maximum allowable temperature? What is the electrical leakage current threshold of feeling for a sensitive person?

There are many such parameters that the product safety engineer should be able to find quickly.

Appendix

The appendix contains the non-technical information on product safety operations that are important to the engineer and can help in dealings with management. Experts in the fields should write these sections.

1. Product Safety Management.

For example: Product safety should report to top corporate management, not to production management. "Whistle blowers" should be able to be protected while their claims are evaluated. There should be channels for this, both inside their company and via professional organizations - the IEEE.

2. Legal aspects of product safety.

3. Economic aspects of product safety.

Index

The index is the most important part of the handbook. It should be thoroughly cross indexed, both to the contents of the handbook and to other standards. We suggest that it be available on computer disk to speed searching. ✺

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functions. This would make renovation much simpler, and could be easily integrated into new buildings, although would be more complex than a single cable.

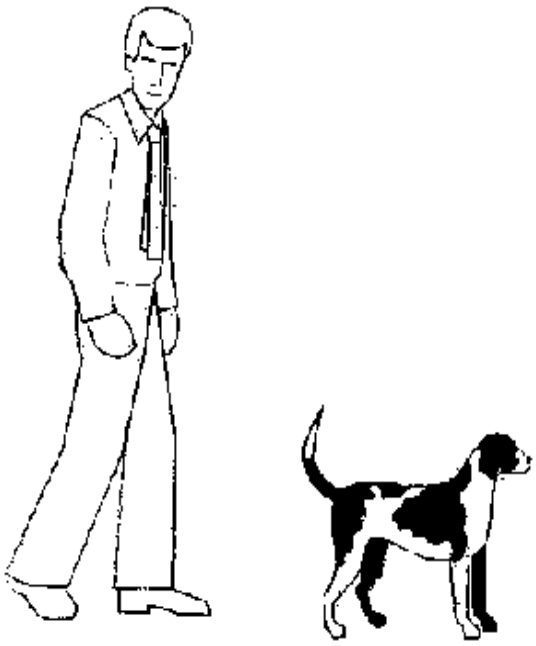
Key criteria

The principle is to simultaneously monitor and control all systems, appliances and devices that operate electrically or electronically: heating, lighting, ventilation, energy, security, entertainment, etc. The key criteria involve user requirements, seen as performance, easy installation and use, safety, reliability and compatibility with existing systems. Once established, these criteria should then lead to detailed specifications of HES.

The name "home electronic systems" is slightly misleading, since HES includes large commercial buildings like offices, schools, hospitals or factories as well as homes.

Companies do not imagine a sudden revolution to HES, but instead an incremental acceptance. People are not likely to have the full range of HES potential installed in their homes, but will add to what they already have, one step at a time. They will probably cluster systems like lighting, security, energy, etc., and then finally link those clusters together into an integral whole. On the other hand, new homes and buildings will probably begin to be fitted with a core network, or even a complete system.

With the Batibus beginning to take hold in Europe and the marketing this year of Smart House in North America, the home of the future is here today, and so some day soon you may be able to go on vacation, assured that lights and lawn sprinklers will turn on and off at preprogrammed times to give the impression that somebody is at home, window shades will be raised and lowered, and the security system would be continuously armed, ready to record any intruders and automatically alert a central security office. And on the day you're due home, you can telephone ahead and instruct the air conditioning to start up so that, hot and dusty, you find a refreshing reception. Still, the neighbour will have to walk your dog. ✺



code for that purpose. Changes to the electrical code normally take about one year to process. It is understood that Quebec has expressed some concern with the ability of UL to offer service in French. This may effect the acceptance of UL in Quebec.

CSA COMPONENT ACCEPTANCE SERVICE -

CSA is starting to offer a component approval service similar to the UL Recognized Component program. The initial approvals will be limited to a narrow range of products (CRT's, power supplies with Non-Class 2 output for use with Electrical and Electronic Equipment, and PTC Thermistors). Further details are available from your local CSA office.

The following material was extracted from "ComputerWorld" dated October 12, 1992:

OHIO STATE TO STUDY KEYBOARD STRESS INJURIES -

Ohio State University's Biodynamics Lab has received a
$ 22,000 grant to study the biomechanics of keyboard work that may provide clues about how to prevent repetitive stress injuries (RSI).

This class of injuries is spreading quickly, according to Federal Government data, and has fast become a major issue not only for those who suffer from it, but also for managers increasingly expected to alleviate or prevent it.

"Little is known about the forces and stresses on the hands and forearms that occur when typing at a computer keyboard," said William Marras, director of the laboratory. "The results will be helpful in understanding the optimum keying techniques, operator postures and the relationship between them and keyboard design."

The study will include field analysis of how computer users type in real job situations, laboratory research and development of a biomedical model of the stress on the hands and wrists.

PLASTICS AND THE ASTM -

The ASTM "D-20" Committee on Plastics recently held their quarterly meeting. The following are the meeting highlights:

- Standards for recycled plastics are becoming increasingly important. One of these standards, "Guide for Identification & Estimation of Non-Volatile Contaminants in Recycled Plastics" is now being developed. This and other standards are aimed at ensuring that recycled plastics are used safely and effectively.

- "Impact Resistance of Rigid Plastic Sheeting or Parts by Means of a Tup (Falling Weight), Rev. D-3029" is now being revised. The Gardner impact portion of the present method has been removed from the proposed version and two new geometries have been added. The Gardner impact method will be balloted as a new method to allow easier harmonization with ISO. ISO does not recognize the Gardner impact method.

- A 1992 version of the "Standard Practice for Generic Marking of Plastic Materials" is now available.

- "Specification for Non-Rigid Vinyl Chloride Plastic Sheeting" is another standard that has been revised.

- Other working subcommittees include:
+ D-20.94.02 on Test Specimens.
+ D-20.94 on Government/Industry Standards.
+ D-20.12.02 on ISO Data and Methods determination for D-4101.
+ D-20.95 on Recycled Plastics.

- The ASTM quarterly "Standards Developing Meetings" of Committees D-1 on Paint & Related Materials, E-12 on Appearance, and G-3 on Durability of Non-Metallic Materials, are scheduled for January 17/21, in conjunction with a symposium on "Accelerated and Outdoor Durability Testing". The Symposium will focus on faster and more realistic methods of evaluating product durability. Sixteen papers will

be presented on the advances in test equipment, characterization of exposure environments, methods used to evaluate changes in exposed materials, results from ASTM round-robin studies and the impact of test variability on interpretation of those results. Symposium fee is $55.00

EMF-CANCER LINK REPORTED -

On 30 September, Sweden's National Board for Industrial and Technical Development, NUTEK, formally announced that from now on it "will act on the assumption that there is a connection between exposure to power frequency magnetic fields and cancer, in particular childhood cancer."

The new policy was prompted by two epidemiological studies, released the same day. This is the first time a national government has linked EMF with cancer.

Jaak Nou, the director of NUTEK's Department of Electrical Safety, said that the new EMF policy will apply primarily to children. "We don't yet consider the link proven for adults — this will have to wait for detailed investigations from around the world."

In the residential study, Anders Ahlbom and Maria Feychting of the Institute of Environmental Medicine at the Karolinska Institute in Stockholm found that childhood leukemia rates rose with increasing magnetic field exposures. Children exposed, on average, to more than 1 milligauss (mG) had twice, those exposed to more than 2 mG had close to three times, and those exposed to more than 3 mG had nearly four times the incidence of leukemia of those exposed to less than 1 mG. Despite a small number of cases, the risk ratios are statistically significant. The link to cancer among adults was weaker than for children.

The occupational study by Birgitta Floderus and coworkers at the Department of Neuromedicine at the National Institute of Occupational Health (NIOH) in Solna, a suburb of Stockholm, showed that men exposed to 2.9 mG or more at work had three times the incidence of chronic lymphocytic leukemia (CLL) of those exposed to less than 1.6 mG. Floderus also found a link between EMF exposures and brain tumors. High magnetic field exposures were found among those working in power stations, airplanes and locomotives, and among those using electric arc welding equipment.

NUTEK (formerly known as the National Energy Administration) will soon begin work on EMF exposure regulations for new homes near power lines and for all new electrical facilities, which Nou predicted would take about six months to complete. He said that the standard might require that average annual exposures be less than 2 mG, noting that peak fields would be less than 4 mG. The average exposure could end up being 3 or 4 mG, Nou said. "We will have to balance the health of the Swedish population with the economic costs of the standard." NUTEK is responsible for electrical safety regulations in Sweden.

"The most difficult problem is what to do about existing homes and power lines," Nou said. "The cost of decreasing these magnetic fields will be enormous."

VDT STUDY: POSITIVE LINK BETWEEN ELF's AND MISCARRIAGES -

In September, at the "Work With Display Units '92" conference in Berlin, Marja-Liisa Lindbohm of the Finnish Institute of Occupational Health presented a paper on VDTs and miscarriages. The study found there was no increased rate of miscarriage in the over-all study group (n = 585). However, they found a threefold increase in miscarriages among women exposed to ELF magnetic fields of 3 milligauss (mG) or more from VDTs. [No mention was made in the news articles on the study regarding possible effects from VLF exposures from the VDTs - ed.]

On 8 September, Lindbohm and Hietanen held a press conference in Helsinki to announce their results formally, which led to articles in

some major U.S. newspapers. USA Today ran an item on 9 September and the Washington Post followed on 15 September. Linkbohm and Hietanen's paper was published in the current edition of the American Journal of Epidemiology. [Readers with access to this publication are encouraged to send a copy to the PSN, attention: Editor.]

VDT STUDY: NEGATIVE LINK -

From an article entitled "Spontaneous Abortion and Work with Visual Display Units" (E. Roman, et al.; Br J Ind Med, 49:507-512 (1992)), we find the following:
Recently a study sponsored by the U.K. Health and Safety Executive found that women who work with VDTs are not at increased risk of spontaneous abortion. The study was specially designed to minimize confounding by non-occupational factors.

The case-control study, reported in the British Journal of Industrial Medicine, was based on a sample of some 450 pregnant women who were interviewed by the researchers. None of the women had given birth before. The group was composed of 150 working women with a clinically diagnosed spontaneous abortion and 297 working women attending for antenatal care.

The study found that women who had a spontaneous abortion were significantly older, were more likely to own their own home, and to have further educational qualifications, although the last two factors were largely a function of their age. There was no difference in reported smoking and alcohol consumption before pregnancy between the women who had a miscarriage and those who had not. However, more women with a clinically diagnosed spontaneous abortion were dissatisfied with their jobs. The study found no increase in risk of spontaneous abortion among VDT users, regardless of how long they spent at the machine, and there was no association with passive exposure (e.g., exposure from their co-workers' VDTs).

COURSE ON HAZARD BASED SAFETY ENGINEERING -

Hewlett Packard of Loveland, Colorado will be offering another section of their Hazard-Based Safety Engineering class. The purpose of the class is to teach product safety design strategies in terms of fundamental engineering concepts. Contents of this two day seminar include an overview of the fundamentals, the nature of injuries, electrically caused fires, product safety testing, and reporting of test results. The course will be offered February 25 and 26, 1993 at the HP Loveland facility. Cost is $ 400.00 which includes the course, student materials and break refreshments. For further information and registration, contact Ray Corson at (303) 679-3816, or Marsha Alsager at (303) 679-3628.

ENVIRONMENTAL PITFALLS OF PACKAGING -

The following material is extracted from "Environmental Information Newsletter", Issue 4. The newsletter reported on an interview with Anthony Casale, president of Environmental Research Associates of Princeton, N.J. Mr. Casale conducted thousands of interviews across the country and found that environmental concerns are deepening. Foremost of those concerns is worry over the environmental impact of packaging. Casale found that the public believes that more trash can be diverted into recycling rather than being sent to landfills. It is believed that if the public's expectations are not met, there might eventually be strict legislation on packaging.

PTT ISSUES: TTE DIRECTIVE SCHEDULE -

The following information was extracted from a recent CBEMA mailing (Telecom TG/92-52) entitled "TTE Directive and Common Technical Regulations CTR's):

"The Telecommunication Terminal Equipment (TTE) Directive came into force in EEC countries on November 6, 1992. By treaty, all EFTA

countries are also obliged to implement the provision of this directive. Implication of this is that all telecommunication terminal equipment products from this date onwards will have to comply with the directive and carry a CE mark. It may be a criminal offense to place non-compliant products in the marketplace in some EEC countries, if not all. Existing products approved under the National Approvals scheme will also have to be withdrawn from the marketplace unless they comply with NETs (Mandatory Telecommunication Standards which were introduced under the first phase TTE Directive: 86/361/EEC).

"A TTE product could be a stand alone terminal, a system, a subsystem, a plug-in card, hardware or software.

"All the above could not take effect unless there is applicable CTR's for the product type in question. In addition, it is expected that each CTR will have a transitional period.

"It is important that product development teams are aware of CTR's under preparation.

"TBR's (Technical Basis for Regulations) are standards developed by ETSI and will form the technical portions of the CTR's. It should be assumed that TBR's will be converted to CTR's by TRAC (Telecommunications Regulations Application Committee) soon after they are approved at ETSI.

"The adopted TBR's and the earlier draft version should be available to us via ETSI. The following is an [abbreviated] list of TBR's under development with the expected target dates:

TBR Calendar by ETSI

CTR 1, TC/TE: X.21 Network Access (NET1) (Attachment requirements for connection to circuit switched public data networks, or digital leased lines): TC Agree: 4/93; ETSI Agree: 5/94

CTR 2, TC/TE: X.25 Network Access (NET 2) (Attachment requirements for connection to packet switched public data networks using CCITT recommendation X.25 interface): TC Agree: 4/93; ETSI Agree: 5/94

CTR 3, TC/TE: ISDN Basic Access (NET 3) (Attachment requirements for connection to Basic rate ISDN):TC Agree: 3/93; ETSI Agree: 9/93

CTR 4, TC/BT: ISDN Primary Rate Access (NET 5) (Attachment requirements for connection to Primary rate ISDN) TC Agree: 3/93; ETSI Agree: 9/93."

A total of 18 CTR's are listed in the above article, each with a scheduled for completion by ETSI, the latest being May of 1994. Further details can be obtained by contacting CBEMA at 1250 Eye St., NW, Suite 200, Washington, DC 20005.

PRODUCT SAFETY ENGINEERING NETWORK -

For those who are interested in forwarding additional e-mail addresses to be included in future distributed regulatory / compliance e-mail directories sent back to those who respond.

Please send e-mail addresses to John Freudenberg at "freudenberg_j*corp_def@msm.cdx.mot.com".
The alternate back-up contact is John Anderson at "anderson_j*corp_ab@msm.cdx.mot.com." Alternately, contact the editor, PSN.

WARNOCK HERSEY CERTIFICATION ACCEPTABLE IN CANADA -

Warnock Hersey is in the process of setting up an agreement with ETL to accept their test results (to CSA standards) and certify (WH) for sale and use in Canada. What the end cost and procedure will be is not yet known.

Warnock Hersey is not known as a safety certifier by anyone in Canada as yet. CSA was OSHA approved as an NRTL December 24 1992. The mark will be CSA/NRTL

Products CSA certified by Category

certification can apply the NRTL mark by making a special report to CSA. Contact CSA in Toronto for details..

OSHA is aware of CSA and UL and ETL.. manufacturer certification systems..while they have not yet changed their regulations to accommodate them, they are allowing work arounds.

****

News items of interest to the Product Safety profession should be sent to the attention of the News and Notes editor, Dave Edmunds, at the PSN. ✺

Safety Standards and HES
Continued from page 9

night before?

Then, perhaps, an HES system should not allow for this remote possibility, or heaters should be built into the wall so that blankets cannot be laid on them, etc. The number of potential safety factors that must be considered is staggering, yet critical.

At the top end of this hierarchy are safety standards, and at the bottom end are devices used by consumers. For example: a washing machine with a built-in information-receiving unit called a " home electronic device" which tells the appliance to operate at off-peak hours to save on electricity consumption .

ACOS and HES

ACOS/WG 1 held its first meeting in March 1991, where it began to work out the dimensions of its task, elaborating the parameters of safety-related aspects of HES. Then, in May 1991 the members met in Cologne, where they developed more precise definitions of terms, and established the parameters .

Accordingly, HES is destined for "any type of building where for the time being wiring accessories are employed." This includes manufacturing sites, office buildings, and private homes. Further, WG 1 defined safety for HES as including "characteristics of systems intended for signal transmission through building wiring carrying low voltage or extra low voltage, through fibre optics, through air or by means of electromagnetic waves, etc. "

This led to two ground rules. The first reads: " If the network of a home electronic system interferes with the function of a device all safety aspects of the product standard of the device must be complied with. Second: "No 'element' of a home electronic system shall rely on unconfirmed safety-critical information coming from outside that element."

The group defined five areas for safety of HES: 1) system aspects; 2) network and network parts; 3) connection of devices to the network; 4) internal safety aspects in devices connected to home electronic systems; and 5) connection of a HES to other systems These five areas can be seen as representing two different aspects regarding safety: those for information flow and those related to hardware.

Decision imminent

ACOS/WG 1 met on 2-3 September this year in Geneva, and submitted its final recommendations. Their report commented on "the urgent need to provide for a systematic set of IEC Publications covering safety aspects of HES."

They recommended that this be achieved, as far as possible, by amending existing IEC standards, as well as by setting up a new Sub-Committee. These recommendations will be reviewed by ACOS in February 1992, where they will decide whether to continue with the project or not. ✺

Continued from page 5

ing document as a result of the SC 77A WG1 meeting in October in Paris.

Harmonic Number	Maximum Absolute Permissible Current	Maximum Relative Permissible Current
	Odd Harmonics	
3	2.30 A	3.4 mA/W
5	1.14	1.9
7	0.78	1.0
9	0.40	0.5
11	0.33	0.35
13 up	per Table 1	3.85/n

Here are the Class D harmonic current limits from 77A(Secre-tariat)82

Class D has been reinstated. (Class D is the input current "special wave shape" characteristic of a full-wave rectifier with energy storage capacitors — whether off-line switcher or 50-60 Hertz linear transformer with rectifiers in the secondary.)

The Class D limits apply to equipment with active input power greater than 50 watts and not exceeding 600 watts. There are no limits for equipment with input power up to 50 watts. Products exceeding 600 watts are defaulted to Class A limits. There are no limits for even harmonics for Class D. The effective date of these limits is now proposed to be January, 1995.

The limits for Class A harmonic currents (from 77A(Secretariat)82 apply to steady-state harmonic currents. Harmonic currents in ITE (Information Technology Equipment) are measured with the equipment configured to its rated current. If necessary, the power supplies shall be loaded (resistive) to simulate rated conditions. Harmonic currents less than 0.6% of the input current, or less than 0.5 mA are disregarded.

Transitory harmonic currents, lasting not more than 10 seconds when the equipment is brought into operation or taken out of operation, either manually or automatically, are disregarded. All other transitory harmonic currents occurring during operation of the equipment shall not exceed 1.5 times the limits for a maximum of 15 seconds of any observation period of 2.5 minutes.

If you have been following this saga, you will see that there have been few fundamental changes from the first to the most recent document. The authors remain adamant that these limits will be imposed on products in the European Community.

As near as I can tell, if this (or any of the previous) documents become an EC standard, full-wave power-supply rectifiers deriving current from the mains (either switcher or linear) as we know them today will not be allowed in any product greater than 50 watts. Instead, we will need to incorporate power factor correction circuits ahead of the rectifier. Yes, in some cases, chokes may allow compliance with the limits, but chokes typically do not attenuate all of the harmonics to the specified limits.

North America uses a multitude of small delta-wye distribution transformers, while Europe uses a few large delta-wye distribution transformers. The delta-wye distribution transformer effectively traps the third harmonic and odd multiples of the third harmonic from being transmitted further back into the power distribution system.

But, on the load side of the distribution transformer with high harmonic currents, one can expect voltage distortion to appear everywhere. If the distribution transformer is large as in Europe, then harmonic currents can cause voltage distortion to many customers even though they do not create any harmonic currents. Hence, their concern for harmonic current generation.

The Euro power generation and distribution authorities believe the trend is for increased voltage distortion. They believe that they currently experience about 2.5% voltage distortion, and that they are rapidly approaching their limit of 5%. They predict that unless they have this standard in place, they will get to 5% at about the year 2000.

(Harmonic currents are generated by a load, and distributed upstream into the power distribution system where they are dissipated as heat. In doing so, harmonic currents cause voltage distortion on that system.)

Harmonic Number	Maximum Absolute Permissible Current
	Odd Harmonics
3	2.30 A
5	1.14
7	0.78
9	0.40
11	0.33
13 up	0.21
15 to 39	0.15 x (15/n)
	Even Harmonics
2	1.08 A
4	0.43
6	0.30
8 to 40	0.23 x (8/n)

Here are the Class A harmonic current limits from 77A(Secretariat)82

In most cases, users are not aware of harmonic voltage distortion. This proposed standard is driven by the European electricity suppliers who want to keep voltage distortion under control so that the users will continue not seeing any effects of voltage distortion. One way to do this is to require products to present linear loads to the system.

This new standard spells the death of full-wave rectification. Equipment users will see equipment prices go up without any apparent benefit. Because users will not see any benefit, there will continue to be much manufacturer objection and foot-dragging. It is doubtful that a majority of IEC countries will vote for this standard if and when it gets to the voting stage — especially those IEC countries such as the USA and Canada where this problem does not exist.

Regardless of the IEC vote, CENELEC is likely to seek an EC vote for adoption of the standard as an EN standard.

This is a "local" EC problem. About half the EC countries appear to be seriously concerned with harmonic current emissions from products. Whether or not a majority will emerge is not yet clear. If you build Euro-specific products, you might consider PFC for them. ✺

Institutional Listings

We are grateful for the assistance given by these firms and invite application 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. Please direct inquiries to: Ervin Gomez at (408) 447 4070 (phone) or (408) 257 5034 (fax).

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Employment Wanted

As a free service to our readers, the Product Safety Newsletter will periodically list Regulatory Compliance professionals who are available for employment. Those with employment opportunities are encouraged to contact the following individuals directly. Those interested in listing their names should contact the Editor.

Please note that the Product Safety Newsletter staff cannot make any recommendations about the individuals listed.

Product Safety/ Regulatory Engineer:
Carlos A. Ortiz, 884 So. Quieto Way, Denver, CO 80223
(303) 922-5091 (home), (303) 850-5127 (work);
(303) 850-5129 (fax)

Increase your product safety depth

Merely complying with public domain product safety standards does not mean a product is safe in the eyes of all whose health and livelihood can be affected by the safety performance of that product. And yet, many of us practice our trade as if standards compliance and certification is all there is.

Safety assessment must consider both the past and the future. The politics and gestation period associated with standards development often prevent them from adequately reflecting all the lessons of the past. To be more comprehensive, one must search further, into the accident and failure experience of our products and those of the industry as a whole, into customer environments and into the experience of others using similar technologies. There are many sources for this information; however, in many cases, systems to retrieve this information have to be developed or improved.

As we develop and modify products and systems, the future must also be taken into account. As a product proceeds from concept to specification to design and so on through installation, use and finally disposal, the costs of dealing with deficiencies increase exponentially. There are proven approaches developed in certain safety disciplines that focus on prediction and risk reduction before a product reaches subsequent stages of its life cycle. These tools and techniques are available to all of us, but we must be willing to learn their use.

Share your professional experience

We can increase our value to our companies and to society as a whole by minimizing both losses arising from product incidents and the costs associated with preventing incidents. I challenge each of you to consider the ways you can improve your effectiveness in these areas.

This Newsletter can be a forum for exploring these concepts. I'd like to hear your thoughts. You can reach me at (408)578-1963 (phone) or (408)578-5035 (fax). ✺

Paul McDonald, ESC
2 Davis Drive, Belmont, CA 94002
Fax (415) 592-6052

Product Safety Technical Committee
OUESTIONNAIRE FOR THE PRODUCT SAFETY HANDBOOK

SAFETY STANDARDS DEVELOPMENT DEPARTMENT

A. So far the following topics will be covered in the Product Safety Handbook. Please circle your interest in each of the following topics.

1. Safety standards from North America, Europe, and Asia

Not interested Somewhat interested Interested Very interested

2. Testing procedures -The correct way to conduct temperature, linkage current, and other product safety tests.

Not interested Somewhat interested Interested Very interested

3. Software testing - Criteria and procedures to test the reliability, of software

Not interested Somewhat interested Interested Very interested

4. Product safety management - Management, design, and recall method in product safety

Not interested Somewhat interested Interested Very interested

5. Dielectric withstand criteria and test voltage specifications

Not interested Somewhat interested Interested Very interested

6. Biological effects electromagnetic field

Not interested Somewhat interested Interested Very interested

B. What topics would you like to add to the Product Safety Handbook-?

_____.

C. What work would you like to see from the Standards Department?

_____.

D. Which topic would you like to help?

_____.

Name: _____Company:_____Phone _____.
Good time to Call:_____Fax_____.

THANK YOU FOR YOUR FEEDBACK!

The Product Safety Newsletter

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