The IEEE EMC SOCIETY

Product Safety Newsletter

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What's Inside

Chairman's Message

ARE WE BECOMING OBSOLETE?

We are living in a world of unprecedented economic, political and technological change. What lies ahead for the practice of product safety disciplines in the electrical/electronic industries? In particular, what might the future hold for those who are primarily involved in assessing products to public domain standards and pursuing third party certifications?

Let's take a look at three statements from a few different perspectives to come up with some clues:

1. STANDARDS HAVE LIMITATIONS. The requirements in the standards normally used (such as IEC 950 and its national deviations) primarily address physical hazards in the product itself, rather than overall effects of hardware and software operating and failure modes on the system or application they support or control. Additionally, the standards address a fairly limited number of hazards (fire, shock, burns, etc.). Where addressed, most attention is given to protection of the operator or innocent bystander (as opposed to the assembler, shipper, installer, servicer or recycler). Finally, the basic requirements have been around in one standard or another for 15 years. It seems most standards activity during this period has been devoted to international harmonization.

QUESTIONS: How do you assess potential product hazards not addressed by the standards? Can a "non-safety" defect or failure in your product's hardware or software result in damage or injury to your customer's operations, plant or personnel? What has been learned from technological advances, basic research and hazard risk reduction in the last 15 years that could suggest significant revisions to standards?

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The **Product Safety Newsletter**

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News and Notes

by Dave Edmunds
News and Notes Editor

Design Automation:
The IEC council has endorsed and established a new technical committee on design automation and the USNC has been allocated the Secretariat responsibility. Major liaison contacts have been established with other committees including IEC TC3, ISO/TC 10, ISO/TC 184/SC 4 and ISO/IEC JTC 1.

Laser Activities: EN 60825 was issued as a European Norm in September, 1991. This EN is based upon IEC 825, entitled "Radiation Safety of Laser Products, Equipment Classification, and Users Guide", Amendment 1. At the plenary meeting of TC 76 in November, 1991, a second amendment to IEC 825 was prepared and will be circulated for a vote. This new amendment brings IEC 825 closer to the US FDA laser requirements and clarifies some problems encountered with the zero measurement in the present 825 document. The fall, 1991 issue of "Journal of Laser Applications" has a section on laser safety which contains articles titled "Comparison of CDRH and IEC laser Standards for laser Products" and "Impact of International Laser Safety Standards on Manufacturers". Copies may be ordered from LIA Editorial Office, Box 8886, Toledo, Ohio 43623. Phone number (419) 885-4803.

Instrumentation: UL hosted a meeting with industry representatives to determine if harmonization is required between IEC 1001 and UL 144 and UL 1262. The IEC document is entitled "Safety Requirements of Electrical Equipment for Measurement, Control and Laboratory Use".

Telecom: A new EEC Directive on Telecommunications has been issued in Europe. It is referred to as 91/262/EEC.

IEC 950: The second edition of IEC 950 is now available. The major addition is the inclusion of requirements relating to the connection of equipment to telecommunication networks. Although UL 1950 and CSA 950 are based on IEC 950, the UL and CSA based documents for telephone equipment (UL 1459 and CSA 225) do not have a common base. A special task force is to be established to address the matters of (a) including telecommunications into UL 1950 and CSA 950; (b) maintaining separate standards for telecommunications or c) provide a choice of standards. The task force will have representatives from UL, CSA, CBEMA, EEMAC, ITAC, and TIA.

IECEE: The IECEE Management Committee has appointed Frank Kitzantides, a member of USNC/IECEE, as convener of a working group for establishing rules for a certification system known as System Number 5.
System Number 5 is based upon testing, with assessment and approval of the manufacturer's quality control arrangements followed by regular surveillance through inspection of factory quality control and audit testing of samples from both the open market and the factory.

ACOS Workshop in 1992: Standards Australia will be hosting the next ACOS *[Advisory Committee On Safety of the IEC]* workshop on electrical safety, scheduled to be held in Melbourne on February 17th and 18th, 1992. Co-sponsor is the

Continued on page 21

Limited Current Circuits

Prepared by: Lal Bahra, P. Eng.
Canadian Standards Association

IEC PUBLICATION 950/CSA STANDARD C22.2 No 950

A limited current circuit is a circuit which is safe to touch by a person who is situated in a dry non-hazardous location. According to subclause 2.4.1 of IEC Publication 950 (CSA Standard C22.2 No 950) Safety of Information Technology Equipment including Electrical Business Equipment, a circuit is considered to be a limited current circuit if current through a non-inductive resistor rated 2000 ohms, connected between an accessible part of the circuit and earth or between an accessible part of the circuit and either pole (line or neutral), does not exceed 0.7mA peak ac or 2mA dc, under normal or single fault conditions.

It has been shown that the human body is more susceptible to AC waveforms than DC and can tolerate a higher DC current (than AC) relative to that required to result in an equivalent physiological reaction (such as "let-go"). Also, higher frequencies are considered less harmful to the human body and for frequencies above 1kHz, the limit of 0.7mA may be increased by multiplying it by the value of frequency in kHz, but shall not exceed 70mA.

The capacitance associated with limited current circuits that are limited so as not to exceed 450V peak or dc shall not exceed 0.1μF. Capacitance of a higher than value 0.1μF can store a greater amount of energy and can therefore cause a shock or energy hazard depending on the size of storage capacitance and the voltage level to which it is charged.

The available stored charge in limited current circuits shall not exceed 45 microcoulombs for voltages not exceeding 15kV peak or dc. The available energy shall not exceed 0.35 Joules, if voltage exceeds 15kV peak or dc.

Once these limited current circuits are achieved, they must be kept segregated from other circuits.

Applications:

1. Small screen black and white monitors have CRT anode voltage of 10 to 15kV dc (with a ripple). See Figure 1. If the current through a 2000 ohm non-inducting resistor, applied as described above, under normal and single fault conditions, complies with the limits defined above, then other circuits in the vicinity of the anode which would be permitted to be touched, need not be isolated in any special manner. Also, clearances and creepage distances from other accessible parts need not be maintained for reason of safety, but only for maintaining performance.

2. Some graphic plotter paper holders hold the paper electrostatically. An autotransformer may be used to generate approximately 450V (See Fig 2). The 400V output is connected to the paper holding plate through two high value resistors so that the normal current is approximately 0.1mA, and under single fault conditions it may be approximately 0.2mA. A small internal capacitance may be present to keep the paper

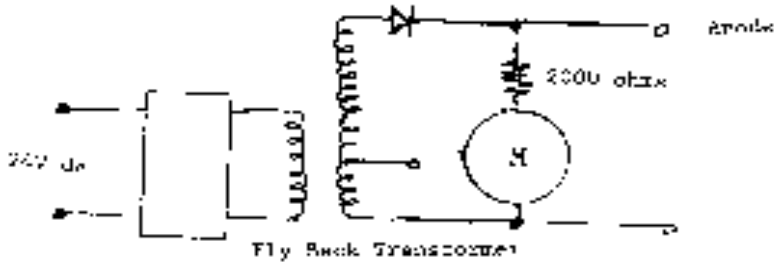
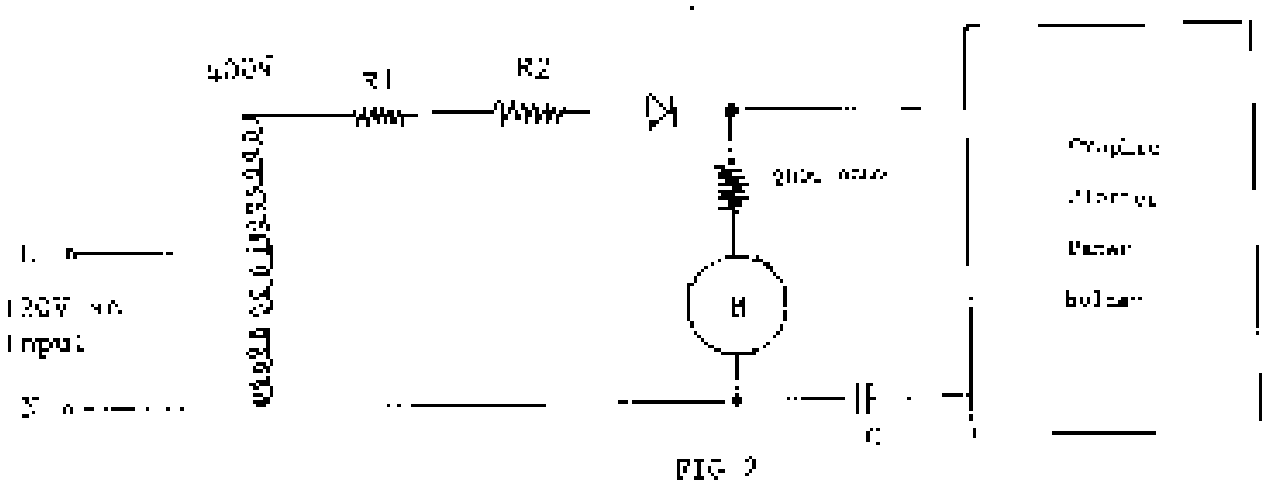


FIG 1



holder plate charged to the required level.

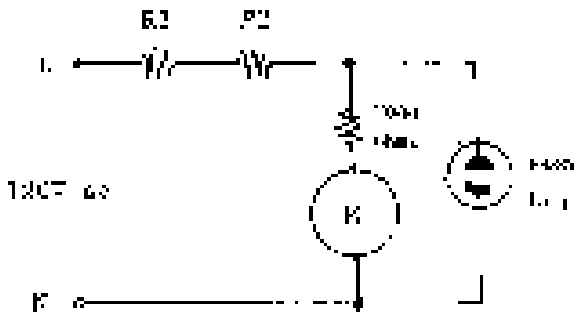
3. Status indicators in computers etc., may use a combination of two high value resistors connected in series (see Figure 3A). One side of the combination is connected to line or high voltage and the other side to a neon indicator. If the current after normal and single fault conditions is within the limits defined above, then such an indicator may be located in the operator accessible area providing the polarity of the input can be maintained.

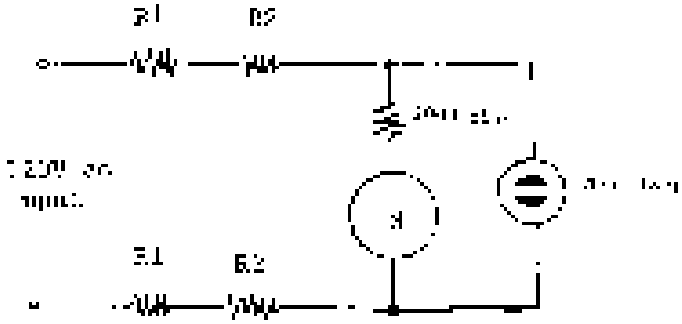
If the polarity of the input cannot be maintained, then a combination of two resistors in series must be located in each side of the supply as shown in Figure 3B.

New Proposal for IEC Publication 950. Presented To TC-74

A central office paper 74(CO) 196 was issued on January 23, 1991 which will make unacceptable, the applications just described. The new proposed clause 2.4.6 stipulates that the limited current circuit shall not be conductively coupled to any primary circuit including neutral. CSA does not agree with this. Conductive contact should be permitted provided that acceptable performance can be established regardless of line polarity.

Acceptance of this central office paper will limit the applications of limited current circuits to non-SELV secondary circuits only. Canada and U.S. decided at the last TAG74 meeting to vote against this. ❀





Timetable for Transition to IEC based Standards

by Ercell Bryant

[The editor wishes to extend a special thanks to Ercell Bryant for his efforts in compiling the following chart. Please pay particular attention to the final date of manufacture of products compliant with the obsolete standards. Are all of your company's products compliant with the latest standards?]

NOTES:

1. Design changes to existing products Certified to CSA 154 must be re-evaluated to CSA 220 or CSA 950.

2. Design changes after 09-30-93 to existing products Certified to CSA 220 must be re-evaluated to CSA 950. Second edition to CSA 220 may extend this date until CSA 220 is withdrawn on 09-30-99.

3. Approvals granted are valid for 10 years.

4. Products certified before 09-05-88, as long as unmodified, can be shipped until 09-01-93.

5. Design changes to existing products certified to IEC 380/435 must be re-evaluated to EN 60 950. "Refurbished" products are treated as new products and must be re-evaluated to EN 60 950.

6. Products purchased for public use must be certified to EN 60 950.

7. As safety standards are not cited in local regulations, IEC 380 and 435 remain valid and only a matter between buyer and seller.

8. Equipment submitted for data communication approval must meet EN 60 950 and EN 41 003.

9. "Refurbished" products do not need to meet the new standard.

10. Design changes to existing products must be re-evaluated to EN 60 950.

11. Presently it is not clear if EN 60 950 (resp. BS 7002:1988) is accepted by BABT or other UK licensing authorities for data communication approvals.

The information presented in this timetable is important so companies can plan for design changes and regulatory agency activities. If you have updated information or information on a country not listed in the timetable please let me know. Telephone (714) 966-3459 or FAX (714) 966-3288. (continued next page)

Timetable For Transition To IEC 950 Based Standards

Product safety standards for EDP equipment are changing world wide. This timetable shows current product safety standards required by each country and date for transition to IEC 950 based product safety standard.

Country	Standard Withdrawal date	Last date to mfg prod to old std	Last date for sale of prod to old std	Date new prod must meet new std
Austria	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-90 EN 60 950
Belgium	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-90 EN 60 950
Canada	Withdrawn CSA 154 09-30-93 CSA 220	09-30-93 CSA 154 09-30-99 CSA 220	09-30-93 CSA 154 09-30-99 CSA 220	09-30-88 CSA 220 Note - 1 09-30-93 CSA 950 Note - 2
Denmark	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	01-01-90 EN 60 950
Finland	12-31-91 IEC380/435	12-01-99 IEC380/435 Note - 3	12-01-99 IEC380/435 Note - 3	01-01-90 EN 60 950
France	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435 Note - 4,5	09-01-90 EN 60 950 Note - 6
Germany	09-01-92 VDE 0806	09-01-92 VDE 0806	09-01-93 VDE 0806	09-01-90 EN 60 950
Greece	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-90 EN 60 950
Ireland	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-90 EN 60 950

Timetable For Transition To IEC 950 Based Standards (continued)

Country	Standard Withdrawal date	Last date to mfg prod to old std	Last date for sale of prod to old std	Date new prod must meet new std
Italy	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-95 EN 60 950 Note - 7
Luxembourg	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-95 EN 60 950
Netherlands	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-95 EN 60 950 Note - 5
Norway	Withdrawn IEC380/435	09-01-00 IEC380/435	09-01-00 IEC380/435	01-01-95 EN 60 950 Note - 3
Portugal	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-95 EN 60 950
Spain	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	09-01-95 EN 60 950
Sweden	Withdrawn IEC380/435	09-01-00 IEC380/435	09-01-00 IEC380/435	09-01-95 EN 60 950 Note - 3
Switzerland	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	01-01-95 EN 60 950 Note - 9,10
United Kingdom	Withdrawn IEC380/435	09-01-92 IEC380/435	09-01-93 IEC380/435	01-01-95 EN 60 950 Note - 7,11
United States	03-15-00 UL 478 4th	03-15-00 UL 478 4th	03-15-00 UL 478 4th	03-15-00 UL 1950

Acceptance Criteria for Abnormal Tests

by Lal Bahra, P. Eng.
Canadian Standards Association

[This is the first of several articles written by Lal Bahra, an Engineering Project Manager for the CSA office in Rexdale. We think you will enjoy this "northern exposure"! - Ed.]

Misunderstandings can occur regarding acceptance criteria (such as the status of a 3 A ground fuse) applied following tests that are performed under abnormal conditions and, in fact, regarding the true intent of such tests.

Acceptance Criteria

Some Canadian Electrical Code Part II Standards require a 3 amp fuse to be connected in series with the equipment ground lead when tests under abnormal conditions are being performed. Opening of this fuse during such a test is viewed as evidence of an unacceptable result. When using 3A fuse in series with the ground lead, the equipment shall be connected to the supply directly and not through an isolating transformer (otherwise the 3A fuse will not open under any abnormal operating condition). Also, the 3A fuse may not open if the neutral conductor shorts to the ground.

Other CEC Part II standards use different criteria. For example, CSA Standard C22.2 No 223, Power Supplies With Extra-Low-Voltage Class 2 Outputs, specifies the usage of a Class A ground fault circuit interrupter (GFCI), to supply the unit under test. In this Standard, tripping of the GFCI during test under abnormal conditions is considered evidence of an unacceptable result.

Another example may be found in IEC Standard 950, which instead of a (ground) fuse or GFCI as an indicator of failure calls for the application of a dielectric voltage withstand test. However, IEC 950 specifies the dielectric voltage withstand test shall be conducted after the equipment under test has reached room temperature. The conditions from the time of the abnormal test to the time when equipment reaches room temperature might change significantly. For example the insulation which might have been damaged during the test under abnormal conditions might recover when the equipment cools down to room temperature, but excessive leakage current might flow during the test and cause a shock hazard.

Purpose

The general purpose of testing under abnormal conditions of operation is to determine the suitability of a product when considered in the context of foreseeable operating conditions outside the "normal" usage of the product. Normal operation must be considered to be that defined by the manufacturer of the product or, under unusual circumstances, a usage that is so commonplace that it is proven to continuously exist in spite of the intent stated by the manufacturer.

Typical tests under abnormal conditions include:

(a) electrical fault modeling (opening or shorting or other condition representative of actual component degradation), in which the modeled test condition directly affects the component under consideration or other components connected in the same circuit ;

(b) mechanical failure (such as loss of cooling air to a part of a product, even though the fan motor itself may be protected against a stalled rotor condition or located in an entirely separate circuit);

(c) functional failure.

Testing under abnormal conditions of operation is a complicated undertaking, as more than one hazard must be considered for any one test condition. This testing, for the most part prescribed by CEC Part II Stan-

dards, is mainly concerned with the risk of electric shock and fire hazard. Individual Standards must address other hazards peculiar to specific products within their scope, but the common theme throughout the CEC Part II system of standards is the prevention of electric shock and fire hazard.

For purposes of this presentation only shock hazard is considered.

Insulation

In all electrical equipment, insulation in some form or another is used for the prevention of electric shock. In "Class I" (grounded) equipment, basic insulation is provided between parts considered to be a source of electric shock and exposed non-current-carrying metal parts.

One means used to prevent electric shock for equipment of this type consists of bonding the exposed metal parts to the equipment grounding terminal as a "back-up" means to reduce the risk of shock hazard in the event of basic insulation failure. The bonding requirement is considered prudent, and has been generally considered as an acceptable means of protection by dealing with the eventuality that over the life of the product, basic insulation can become degraded or defeated by some unforeseen mechanism, at the time of product manufacture or during the life of the product. Bonding of exposed metal parts to the equipment grounding terminal is a means used by industry to protect the product user from the "foreseeable" hazard resulting from the "unforeseeable" fault. Grounding path integrity is assured by performing limited short circuit and bond impedance tests according to CSA Standard C22.2 No 0.4 Bonding and Grounding of Electrical Equipment. This ensures that under a direct short circuit of basic insulation, the overcurrent protective device in the ungrounded conductor will open. If the fault is not a direct short but has a certain impedance, then the overcurrent protection in the ungrounded conductor may not open.

Tests under abnormal conditions prescribed by individual CEC Part II Standards are tailored to address the unique features of the specific product covered by the scope of the Standard, and are chosen to be representative of the "foreseeable" conditions that are likely to occur. Conditions of acceptability such as a 3 A ground fuse remaining intact, no tripping of a Class A GFCI or no breakdown of insulation during a dielectric voltage withstand test at the conclusion of an abnormal test are all intended to ensure that (basic) insulation has not been damaged as a result of an abnormal operating condition that is considered "foreseeable".

In IEC Publication 950, Paragraph 6 of the section entitled "Principles of Safety" correctly observes:
"It is normal to provide two levels of protection for operators to prevent electric shock caused by a fault. Thus a single fault and its resulting faults will not create a hazard. However, provision of additional protective measures, such as protective earthing or supplementary insulation, is not considered a substitute for, or a relief from, properly designed basic insulation".

The key in this quotation is the statement that protective earthing is not to be used as a justification for improperly designed basic insulation - at least not under foreseeable conditions such as component failure, which can occur as a result of influences internal to the product to which the components themselves may be susceptible.

When a barrier providing basic insulation fails, the failure may not be a direct short circuit that will cause the overcurrent protection for the power supply or branch circuit to open. The failure may introduce certain impedance and even the 3 amp ground fuse may not open. The currents generated, however, may be large enough to cause a shock hazard, depending upon the location of the fault in a circuit (neutral to ground fault may not cause any current to flow through the fault).

Test Conditions

Abnormal test conditions must be carefully chosen to yield the maximum stress (thermal, electrical, mechanical, etc.) that can be applied to the insulation under consideration, by means that are either developed entirely within the prod-

uct itself (such as component failure) or by an external means deemed likely to occur (such as the blockage of ventilation openings by improper product positioning or by user error).

Abnormal tests are performed to stress double insulation as well. In this case the criteria of acceptance will seldom involve the opening of a 3 A ground fuse, as the grounding path may not be present in the equipment in which the insulation is being evaluated ("Class I" (grounded) equipment is equipped with a protective earth conductor; "Class II (double insulated) equipment is not). Adaption of a ground fuse to double insulated equipment is possible (by connecting all exposed metal parts and accessible secondary circuits to ground by means of a 3 A fuse in the test circuit), but to date this method has not been popular. Many Subcommittees developing CEC Part II Standards have prescribed dielectric voltage withstand testing as the method of choice for the evaluation of double insulation systems.

Integrity of Ground Path

There has also been confusion over the applicability of the 3 A ground fuse test criteria when performing a test consisting of shorting a line-to-ground ("Y") capacitor. Abnormal tests performed to determine the suitability of an (basic) insulation system must not in themselves directly bypass the insulation being evaluated. The only condition under which "Y" capacitors are to be shorted is to determine the suitability of the bonding path to safely conduct fault current that will flow in the event of this "foreseeable" fault. This has in some instances been performed as a substitute for a formal "Limited Short Circuit" test as prescribed in CSA Standard C22.2 No 0.4 entitled "Bonding and Grounding of Electrical Equipment". In this case, opening of a 3 A ground fuse should not be used as a condition of acceptability; and in fact, the fuse must not be used at all. Test data should be examined carefully to ensure that the opening of a fuse is not due to a fault which really is introduced for assuring the integrity of the ground path.

Absence of Ground

Many of the older U.S. and Canadian built homes have grounding type receptacles, or utilize grounding type receptacles such as ones having configuration 5-15R which do not have the grounding terminal bonded to ground. This is another reason that the basic insulation shall not be permitted to fail, during tests under abnormal conditions.

Conclusion

Tests under abnormal conditions are conducted to ensure that there will be no shock hazard created (and to ensure no fire hazard). Faults which short the (basic) insulation itself shall not be conducted as tests under abnormal conditions but to ensure the integrity of the ground path. ❀

ANSI - Your Source for European Standardization Information

from the *ANSI Reporter*, September 1991

[How does one get plugged into the global standards network? In the U.S.. one good source is the American National Standards Institute. - Ed.]

ANSI provides U.S. industry with the information necessary to effectively compete in Europe. In its role as the official U.S. representative to the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), via its United States National Committee (USNC), ANSI has been recognized as the primary U.S. liaison of the regional European standards bodies of CEN and CENELEC — respectively the European Committee for Standardization and the European Committee for Electrotechnical Standardization. In this capacity, ANSI makes available a great deal of European standards information including CEN/CENELEC catalogs of approved standards and mementos for each organization describing their organizational structure.

In addition, some of the relevant ANSI and CEN/CENELEC documents available through the Institute are:

*** U.S. Voluntary Standardization System - Meeting the Global Challenge:** Provides an overview of the role and participation of the U.S. in the global standardization arena.

*** ANSI Global Standardization Report:** Provides U.S. industry with detailed information on the latest developments relating to European standards, testing and certification. Consists of five volumes.

*** CEN/CENELEC Monthly Review:** Lists European documents from new work proposals through published European standards, and contains other information and publications available from CEN/CENELEC.

*** The CEN Technical Programme - Standards for Europe:** Updates U.S. industry on the latest technical standardization developments taking place in Europe and provides a detailed examination of the CEN program.

*** CEN N525 - National Implementation of Approved Documents:** Lists the European standards, harmonization documents, European pre-standards and reports which have been adopted and published by CEN together with the reference of the national standards implementing these documents at the national level.

*** CEN/CENELEC Internal Regulations, Part 2, Common Rules for Standards:** Details the internal operating procedures of CEN/CENELEC.

*** CEN General Technical Report for 1991:** Lists standards projects and stages of items in progress by committee.

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Letters To The Editor

Letters from China:
I am very glad to continue to correspond with you and to introduce our work situations and to raise the product safety requirements on the information technology equipment including business equipment and telecommunication equipment or other opinion or suggestion in China in the future.

Here, I would like to talk about some situations and suggestions now:

1. China, in fact, has carried out the GB4943-85 "Safety of data processing equipment" (approximately equaled to IEC435) from 1985. Now, we have just translated IEC950 (first edition, 1986) into Chinese and as a national standard equaled to use, from October 1991 in China. For the most of other electronic/electrical equipments, they have mostly equaled to use international standards or advanced regional standards more or less.

2. In 1984, we set up the subcommittee on the Safety of Data Processing Equipment that is part of the Chinese Computer and Information Processing Standardisation Technical Committee. I am responsible for this subcommittee and make an attempt to establish and to keep in contact with international organization, regional organizations and other national organization, and put forward standards for ourselves.

3. For the problem of readability of IEC950, a new Product Safety Designer's Guide has been prepared by Mrs. N. Araway (Data General) - June 1991, see the document ECMA/TC12/91/46. I hope your newsletter will be able to give publicity to our colleagues or will be published and provided for safety design engineers and safety test engineers on a global scale.

4. At present, it is important problem that is test procedure for the certification according to IEC950, UL1950, EN60950, CSA950, or ECMA-129 and so on. I hope your Newsletter will be able to introduce a unified procedure for the compliance verification report in testing houses or laboratories, so that all of the safety engineers in the whole world have a consensus of understand.

5. Other aspects will come one after another.

With best regards,
Yan Yumin

[Although everyone seems to be using IEC950 these days, Yan Yumin has pointed out areas that need more harmonization. A common report format would help understanding, but even more important, clearly established test procedures would allow better comparison and acceptance of test results. Perhaps the PSTC Standards Subcommittee will be working on that this year? - Ed.]

Thank you very much for your Newsletters on the product safety. Now, brief on the situation.

Here, I am mailing you a copy which is Chinese national standard on product safety of information technology equipment and which is equivalent with IEC950 (first edition, 1986)

for the keeping it as a souvenir and for the understanding situation on the computer and peripheral and so on in China.

At present, we are going to acquire a better understanding the IEC950 (=GB4943-90), UL1950, ECMA-129 and according to their requirements to make corresponding inspection or testing, in addition, how to carry out and put these requirements into product design, field installation and testing houses that we are considering. So I am very glad that your Newsletters will take very good effect.

Besides, in order to exchange experience, we will hold a seminar (annual meeting) on the safety in electronic products this year or next year in Beijing, and it will be introduced for your Newsletter when the time comes.

With best regards,
Yan Yumin

[Thank you for your news. We are glad to be able to hear and to pass along to our readers how other countries are dealing with product safety. - Ed.]

Open Letter from CENELEC:

[This open letter is to Morris Brooke, author of the article "US Manufacturers and EC '92" in the IEEE Standard Bearer, Vol. 5, No. 2, October 1991. It addresses the issue of adopting international standards as regional or national standards. - Ed.]

Over recent years, we have tried at every opportunity to explain to people in industrial circles, to Congress and to governmental representatives in the USA that it is a general principle for our work in CENELEC to make the widest possible use of the results of international standardization. "International" in this context means the International Standards established by the International Electrotechnical Commission (IEC) as the only competent body for world-wide cooperation in the area of electrotechnical and electronic engineering. The fact is that, of the total set of European Standards (EN), nearly 90% are IEC implementations. Only 10% are newly "created" and they concern subjects not yet covered by IEC results.

We therefore regard it as misleading to say that "the EC is continuing to create new standards applicable to products sold in the European market" and that "many manufacturers in the US are understandably concerned ... of excluding their products from the European market". This certainly does not apply to those manufacturers that use IEC standards for their products.

Also we do not share your view that "the US is ahead of every other country in the development of consensus standards". Standardization in our member countries, as well as in IEC, is fully based on the consensus principle and "reflects the needs and wants of the marketplace". The essential difference, however, lies in the fact that you are primarily considering how "standards will serve as the best possible vehicles for the export of US products to Europe and elsewhere". We do not consider trade between countries as a "one-way-street", so we concentrate our efforts on world-wide harmonization.

Accordingly, we support all measures to strengthen and to accelerate the work of the IEC, leading to timely results of such a quality that they can replace existing national standards. In our eyes, approving an IEC standard means normally that not only do we recognize it for export purposes, but also that we make it valid as the only standard for the home market. This does not mean that the standard becomes compulsory (unless this arises from legislative or administrative measures in specific cases). But it does mean that every buyer or seller requesting or claiming compliance with standards refers to a uniform standard for every place of sale or use within the countries following this policy. This is the right way to facilitate trade and to serve the marketplace.

We are now going even one step further. So far, we followed a two-step procedure, by considering in CENELEC implementation of an IEC standard only after its interna-

IEEE EMC Symposium 1992 Update

by Mark Montrose

[Mark Montrose provides this abstract of the Product Safety session at the International EMC Symposium 1992, which will be held in August in Southern California. More details will appear in future issues of the PSN. - Ed.]

Products in today's marketplace require both product safety and emc compliance. Some companies have separate engineers to design, test, and certify products for safety and emc. Other companies have the same person performing both functions. Several technical areas overlap both engineering disciplines. EMC engineers must not only concern themselves with emc compliance, but often must have a basic understanding of product safety.

This workshop is designed to present to emc engineers an overview of various issues that product safety engineers face, without discussing specific details of how to achieve compliance with various safety standards. Harmonization of these safety standards facilitates compliance approval. Subtle, but significant, differences still exist between North America, Europe and the rest of the world.

One speaker at this workshop covers liability issues for the manufacturer should the user of a product become injured or killed. Others examine basic safety design requirements that design engineers may overlook in an attempt to meet emc criteria. The current state of affairs in Europe is examined, focusing on changes in harmonized Europe 1992. The final topic deals with proper component selection relating to both product safety and emc compliance.

Handouts will be provided for all material presented. Question and answer sessions complete the program. ❀

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tional approval. At a time of rapid technological changes the resulting delays are no longer tolerable. Therefore, the new procedures (applied since a few months ago) mean a simultaneous decision on the approval of a draft in IEC and CENELEC, resulting in its automatic recognition in all CENELEC member countries (replacing existing standards for the same subject).

We suggest that you invite your readers to consider a similar action in the USA in order to serve really the needs and wants of "purchasers, specifiers, regulators and other potential users".

R. Winckler,
Immediate Past President
G. Gaddes, President
E. Comellini, President Elect ❀

IEC 950 Questions & Answers

by TC74 Chairman's Advisory Group (formerly Interpretation Panel)

[For your information here are questions and answers for use with IEC Standard 950. Included are the most recent questions acted on by the Group through December 1991. - Ed.]

The following notes should read in conjunction with opinions of the Panel.

1. The Panel consists of active members of TC74, but its opinions are those of the Panel and are not voted decisions of the IEC.

2. Where it is felt that a query arose due to lack of clarity in a standard, the matter will be brought to the attention of the appropriate group on TC74.

3. Panel opinions are restricted to interpretation of the words of the standard in question, as the members of the Panel recollect the original intentions of TC74. The Panel cannot be concerned with the application of the standard by test agencies and approval authorities.

4. The use made of Panel opinions by the originators of requests for interpretation, and others, is their own responsibility, and no guarantee can be given that a subsequent amendment to the standard will support their opinion. To assist in assessing the reliability of their opinion, the Panel will state whether it is unanimous or otherwise.

Question 17 (ref. Paragraph 2.9.2 Table 5):
Which of the following are true:

1. Transformer isolation is the only means permitted for transition from Installation Category II to Installation Category I until further provisions are made in IEC 95O.

2. Other elements such as overvoltage protection devices used within their ratings may be used to justify the transition to Installation Category I (IEC 950 Table IV).

3. Other elements such as overvoltage protection devices, along with adequate test data in the application, may be used to justify the transition to Installation Category I (IEC 95O Table IV).

Opinion of the Panel:
The use of a transformer in a earthed environment (Class I equipment) is the only reliable measure to ensure that Installation Category I exists in a secondary circuit when Installation Category II exists in the primary circuit. Earthing may be provided either by a shield between the primary and secondary windings of the transformer, or by directly earthing the secondary circuit, as is common practice in SELV circuits of Information Technology equipment.

See condition 5 to table 5 in the second edition of IEC 950 (Table IV of the first edition, amendment 2) .

Action:
WG-6 is following the work of SC28A and will consider additional methods of achieving Category I levels in secondary circuits.

Question 18 (ref. Paragraph 5.3.2 Table 18):
How is the working voltage to be used in Table 18 determined where a combined a.c. and d.c. voltage is present?

Opinion of the Panel:
The working voltage is determined by summing the values of the d.c. component and the peak of the a.c. component and dividing the sum by the square root of 2. This is stated in the second paragraph of 5.3.2, second edition of IEC 950.

Action:
None

Question 19 (ref. Paragraphs 2.9.6, 2.9.7):
For the transformer used in a pollution degree 2 application, which has been vacuum impregnated with varnish in order to exclude dust and moisture, can the spacings therein be considered to be in a pollution degree 1 environment? In accordance with Subclause 2.9.4, this varnish would not be relied on for insulation, but for pollution protection of the other insulation.

Opinion of the Panel:
The standard as written today does not accept that transformer varnish impregnant creates pollution degree 1. The correct meaning is that if the quality of the varnish meets the thermal and humidity cycling tests followed by an electrical strength test, the interior of such transformers can be considered as providing pollution degree 1.

Action:
WG-6 is developing proposals to define fully the conditions by which transformer impregnation can be used to create pollution degree 1. ❀

Chairmans Message
Continued from page 1

2. TECHNOLOGICAL ADVANCES ARE REDUCING MANY HAZARDS. Many of the requirement in safety standards are related to the effects of high voltages, excessive currents, heat, moving and stationary mass, etc. The fast-changing world of technology, marketplace expectations and other factors is constantly attacking and reducing these effects to improve efficiency and performance. For example, the energy and physical overhead (and accompanying hazard potentials) required to support a given level of computer processing power has diminished tremendously. The state-of-the-art laptop computer would have been a room full of mainframes 15 years ago.

QUESTIONS: Did product safety help drive these improvements? Are we technically prepared to help "lead the charge" to accelerate further improvements? Are we treating product safety as an engineering and technological discipline requiring constant improvement? Is the body of safety knowledge advancing as aggressively as in other technology areas? How many quantitative safety requirements can readily be integrated into automated design processes? What is the focus of the training we deliver to design engineers and other technology functions?

3. MANUFACTURERS ARE RESPONSIBLE FOR SAFETY. The continuing emergence of strict liability in key global markets is affecting the basic legal definition of safety. The basis for defining what's safe places emphasis on the producer's responsibility to foresee user environments, interaction and expectations, rather than on industry standards. Even standards-based product certification programs are migrating to manufacturer's determination of conformance, with the certifiers' focus redirected to process quality assurance.

QUESTIONS: Do you know how your products might fail and potentially create an unsafe condition for your customers? Are you responsible for assessing and assuring control of potential hazards? If not, who is your management relying upon to perform this role?

Are we becoming more valuable or are we becoming obsolete? What do you think? I'd like to hear from as many of you as are interested. Please fax me at (408) 285-2553 with your comments.

Brain Claes
Chairman ❀

Product Safety Abstracts

by Dave Lorusso

You may notice that this issue's Product Safety Abstracts is short on abstracts. This is due to a couple of things. 1) Since I left Codex to join Sequoia Systems, the approximately twenty (20) periodicals I subscribe to haven't made the transition; and 2) I need contributions from you.

While I'm waiting for my periodicals, I thought I would share with you what's involved in preparing Product Safety Abstracts. As each periodical comes in, I quickly glance at the table of contents looking for articles with Product Safety information. I then read these articles and write an abstract. I'll usually browse through the periodical out of curiosity even if there is no indication of Product Safety content.

The periodicals I subscribe to cost my company and me nothing - they are free to qualified subscribers. You can be a qualified subscriber by filling out their subscription cards.

Some of the more interesting periodicals having product safety content are:

Appliance, 5615 W. Cermack Road, Cicero, IL 60650-9961

Compliance Engineering, 629 Massachusetts Avenue, Boxborough, MA 01719-9973

EDN, P. O. Box 5262, Denver, CO 80217-9865

EMC Technology Circulation Department, 5615 West Cermack Road, Cicero, IL 60650-2290

EMC Test and Design, 6300 S. Syracuse, Suite 650, Englewood, CO 80111-9912

Evaluation Engineering, 2504 North Tamiami Trail, Nokomis, FL 34275-9987

Interference Technology Engineers' Master (ITEM), R & B Enterprises, 20 Clipper Road, West Conshohocken, PA 19428-9990

Quality Attention: Reader Information Department, P. O. Box 3002, Wheaton, IL 60189-9929

Test and Measurement World, P. O. Box 5341, Denver, CO 80217-9703

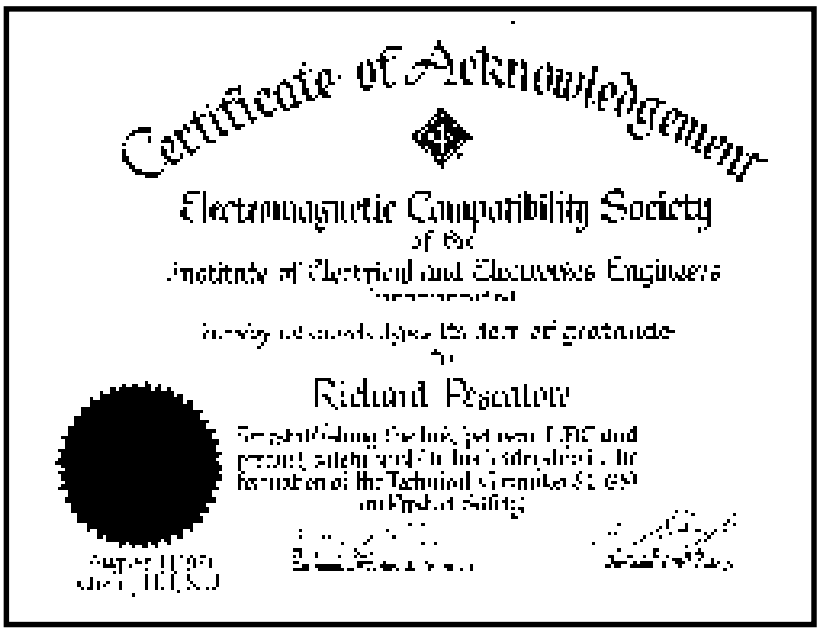
Please write to these periodicals to ask for a subscription card and subscribe - it's free.

Another benefit of receiving these periodicals is all the technical information and samples available by request. Just for the asking you can get stuff like: line filters, connectors, product literature, and design guides. I recently got a display of twelve appliance couplers with built-in fuseholders, on/off switches, and voltage select switches - FREE.

When you come across that occasional article with Product Safety information in it, please fax me a copy (508-481-2418) or call me (508-480-0800, X1633) and tell me about it, it's really appreciated. ❀

Bonus Page

This certificate represents the success of the efforts of all participants in the PSTC to encourage the growth of product safety as a discipline within the EMC Society and the IEEE.


Certificate of Achievement

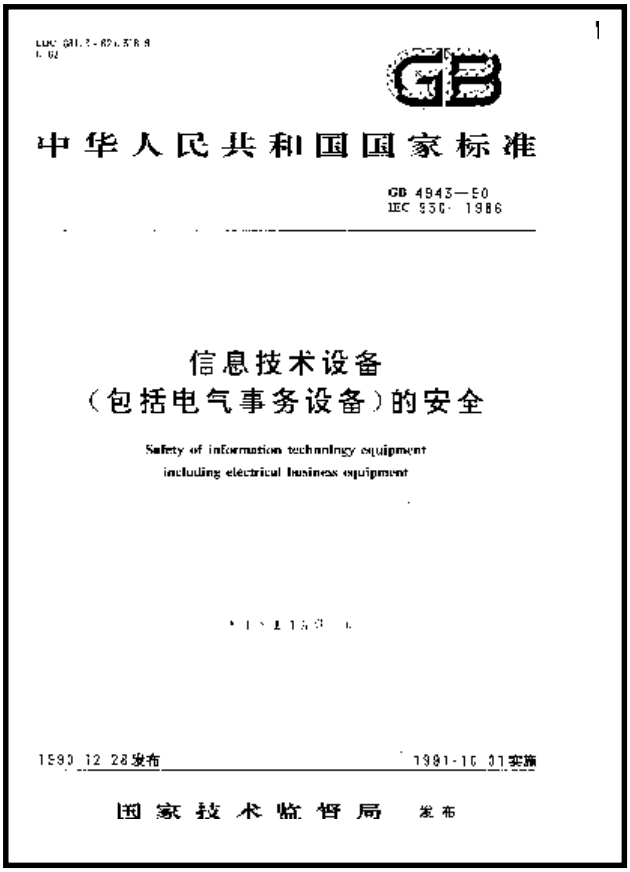
Electromagnetic Compatibility Society

of the

Institute of Electrical and Electronics Engineers

Richard Pegalis

China has used GB4943-85 (aproximately equal to IEC 435) since 1985. Now , IEC 950 (first edition, 1986) has been translated into Chinese and is being used from October 1991. Most Chinese electronic/ electrical standards are based on internaltional standards or advanced regional standards. See "Letters", page 13.


GB

中华人民共和国国家标准

GB 4943—90
IEC 950: 1986

信息技术设备
（包括电气事务设备）的安全

Safety of information technology equipment
including electrical business equipment

1990 12 28发布　　1991-10-01实施

国家技术监督局　发布

Area Activity Reports

Santa Clara Valley Chapter Activity Report

The November 26th meeting was a presentation by Dr. David Thompson of Portola Associates on the subject of Cumulative and Repetitive Motion Trauma and Keyboard Design.

Dr. Thompson presented interesting data on keyboarding and destroyed a few myths about this subject such as:

1. *Keyboarding is the same as typing.* It is not. Using a computer is not the same as using a typewriter.

2. *Keyboarding does not take much effort.* Wrong again. It takes a lot of work when considered over a long period of time.

Also there were some photos of various new keyboards that solved some of the problems of long duration keyboarding.

For more information, contact:

Dr. David Thompson
2600 El Camino Real
Suite 414
Palo Alto, CA 94306

The December meeting was a joint meeting with the EMC Society. The January 1992 meeting will be a presentation about writing IEEE Standards.

For more information on the activities of the Santa Clara Valley chapter, please contact David McChesney at 408-985-2400, ext. 2771, or Mike Campi at 408-988-0111.

Portland - The featured speaker for Tuesday, January 21, will be Bob Hoover of Underwriters Laboratories' Portland office. He will be explaining the various phases of the UL inspection process and paperwork requirements and will cover some of the appeal possibilities. In addition, he will provide an update on the new facilities Underwriters Labs is building in Camas.

Bob has been working for Underwriters Labs for 24 years in various locations and positions but has been in Portland since 1984. He is a Field Supervisor directing the activities of 6 inspectors. He made a point of the fact that he is a "hands on" supervisor. In other words he is out in the field doing inspections in addition to the supervisory activities.

In addition to Bob's presentation, we will be having a short brainstorming session to try to develop topics for future programs. We want to provide programs that are of interest to our members.

If you are not going to be able to be at the meeting and have some ideas for speakers or programs please call Jim Pierce at 626-6694.

Come and visit informally with the speaker at a no-host dinner at the Cattle Company Restaurant in Beaverton at 5:30 p.m.. Everyone (including spouses) is welcome to join us. The regular meetings are usually on the third Tuesday of each month at the Portland General Electric Co. in Beaverton at 7:30 p.m.. For more information call Art Henderson at 777-8111.

San Diego - The emphasis was on power supplies for the November meeting when Mr. Lal Bahra of the Canadian Standards Association (CSA) discussed the power supply requirements of Bulletin 1402C vs. CSA Standard C22.2 No. 234.

Mr. Bill Schieler from the American Society of Safety Engineering described that organization at the December meeting, which was held the first Wednesday of the month instead of the second.

The international standard IEC 555-

2 was featured on Wednesday, January 8, when the topic of Harmonics - Measurements and Options was presented by Tom Radley of Hewlett-Packard ... and by A.N. Other, an expert Power Supply Engineer!?

The usual meeting place is at Hewlett-Packard Co. in Rancho Bernardo starting at 6:00 p.m. the second Wednesday of each month. For more information call Gene Biggs at (619) 592-8236 or Tom Radley at (619) 592-8104.

Orange County - The December 3 meeting centered on an in-depth discussion of the Boston CBEMA meeting. The discussion was led by Ercell Bryant and Charlie Bayhi, who were attendees of the CBEMA meeting. A summary of the meeting and copies of the handouts are available from Ercell.

The recent UL IAC meeting for UL 1262, UL 1244, and UL 1092 was also discussed, briefly. The IAC members voted to adopt IEC 1010-1 to eventually replace UL 1262 (Laboratory Equipment), UL 1244 (Testing and Measurement Equipment) and UL 1092 (Process Control Equipment). A discussion of this topic (including the proposed U.S. National Deviations to IEC 1010-1) is planned for the next meeting on Tuesday, January 7, 1992.

We are also looking for suggestions for future speakers and meeting topics. Please bring your suggestions to the next meeting, or send them to the attention of Bill Carpenter, fax no. (714) 754-0731.

Meetings are held at FileNet Corp. in Costa Mesa, generally the first Tuesday of each month starting at 6:00 p.m.. Please call Ercell Bryant at (714) 966-3459 for more information. ❀

News and Notes
Continued from page 3

Institution of Engineers Australia. The theme of the Workshop is "Electrical Safety - an integrated approach through IEC standards". The first day calls for four separate sessions: IEC and safety standards, electric shock, protection against electric shock, and other safety issues. Day 2 will cover general equipment requirements, specific equipment applications, application of IEC safety standards, and a summary and conclusions.

Six Technical Committee and Sub-Committee meetings have also been scheduled to take place during February 1992 in Melbourne. They include SC 59H, TC 61, SC 61D, SC 61E, SC 61H and three Working Groups of TC 74.

Switzerland - Alert! Per the SEV Bulletin of August 7, 1991, starting from September 1, 1991, it is only allowed to distribute EDP equipment in Switzerland if the product meets EN 60555. This new law references the "Ordinance on Electrical Low Voltage Equipment" dated June 24, 1987, of the Swiss Confederate High Voltage Inspection Institute (Schweizer Eidgenossisches Starkstrominspektorat). Per this law the importer of EDP equipment has to prove evidence of compliance by having available a test report of one of the European test houses (such as SEV, VDE, TÜV, SEMKO, etc.). - from H. Landeck, R&L Ing. Cons. GmbH, 8/16/91 ❀

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) 2573-5034 (fax)

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.

The Product Safety Newsletter

c/o Tandem Computers Incorporated
10300 North Tantau Avenue, Loc 55-53
Cupertino, CA 95014
Attn: Roger Volgstadt