The Product Safety Newsletter

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What's Inside

Chairman's Message

I want to devote this first message to sharing both a look back and a look forward with you. In looking back, I want to recognize and thank all those who have contributed to the success of the Product Safety Technical Committee (PSTC) through their commitment, energy and creativity. Special thanks go to Roger Volgstadt, Ken Warwick and the Newsletter crew, Rich Pescatore, John McBain and the rest of the central committee, and to the leaders in each local chapter.

Looking forward, I want to share the highlights of the PSTC's five-year plan which was presented at Cherry Hill in August. This plan establishes high-level year-by-year goals for the following key activities:

- Active participation in each annual EMC symposium through presentation of special sessions, workshops and tutorials,
- Expansion of Standards activities,
- On-going monitoring of product safety issues and activities,
- Continuing development of the PSTC Newsletter, increasing its circulation and visibility, and eventually dividing it into two separate publications: one a magazine and the other remaining a newsletter,
- Elevation of the PSTC to Technical Council status within the IEEE, focusing on the safety of electrical products. A key advantage of this is the broadening of outlook that will occur through exposure to other disciplines that deal with safety issues, frequently from different perspectives, including reliability, quality and systems safety.

Finally, I want to share two concerns. Of immediate importance is the need for more members to get involved and share the load. As frequently happens in volunteer organizations, the tendency is for a few people to carry a disproportionate share of the load, frequently resulting in unacceptable overload. When this goes on for an extended period, the organization either grows by increasing the number of individuals helping out, resulting in reduced workload for all (good!), or, failing that, it declines, suffering the effects of burn-out (not good!). Elsewhere in this issue *[page 17 - Ed.]* are descriptions of specific roles in both the Newsletter staff and standards activities that await member response.

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The Product Safety Newsletter

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Letters to the Editor

Editors, Take Heed!
Technical articles are most interesting. They would be most useful if it was clear they had been reviewed for accuracy by a peer review committee - and edited for clarity. I liked this (Mar/Apr, 1991) issue's article on NRTL Marking by Dave Adams because he outlined the issue clearly and listed references or sources.

In contrast, the article on Hazard Markings by Perkins did not seem to communicate. [For example] in the first paragraph "One of the major objections..." and "We believe..." - who is objecting and who are "we"? Is he part of the Z535.4 Committee? Where is he coming from? There is no historical background - no mention of the ASAE S441 standard and SAE J115 standard on Safety Signs (which were developed in the 1970's and have been adopted since 1983 (ASAE)).

I also looked for a mention of "pictorials" in safety signs - but I realize after checking the title that may be outside the scope of an article on "signal word and color perceptions".

Regardless of the above comments, the Perkins article is of interest and useful. If I need to know more, I'll track him down and ask some questions. Was this article published elsewhere before appearing in the PSN?

Robert Diedrichs
Cedar Falls, Iowa

[We (meaning the PSN editorial staff) certainly agree with your plea for greater clarity. We will try to do better with the resources available and to recruit more people to work on the newsletter. Any volunteers???
The author responds that he is not a member of the Z535.4 Committee; "we" refers to informal discussions he has had with a number of colleagues. He would be interested to hear more about the ASAE standards, and this article has been published only in the PSN. - Ed.]

Sticking with Warning Labels:
I would like to comment on the use of the proposed ANSI Z535.4 standard (Product Safety Signs and Labels, 1980 draft) as opposed to the scheme contained in the Westinghouse Product Safety Label Handbook (1981).

We have opted to use the latter, as warning labels created according to that standard have two additional elements which the proposed ANSI standard does not.

While the ANSI-constructed labels contain three components (Signal Word Panel, Message Panel, and Pictorial Panel), the Westinghouse standard specifically requires the Message Panel component to contain three individual elements:

- Identification of the hazard,
- Result of ignoring the warning, and
- How to avoid the hazard.

I believe this tack is much more appropriate than simply stating what the hazard is, as not everyone encountering such a statement is going to know what to do directly thereafter; thus they could engage in inappropriate action that may result in injury or death.

Mr. Perkins stated that "Our reactions in situations requiring quick decisions and actions is based on our lifetime experience and training".

Westinghouse's five-element scheme provides for a higher probability that one will live in order to apply such experience (or have the fingers, etc., with which to perform

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Technically Speaking

TESTING PURPOSES
Every product is subjected to a suite of tests. What are the purposes of these tests?

Often, we just perform the tests as prescribed in a standard, and with whatever conditions are specified by the certification house we are currently dealing with.

I have found that it is worth while to consider not what the standard or certification house requests, but rather what is the "thing" that is being tested, and what is its relevance to the safety of the product.

Let's look at a few of the popular and universal tests that are commonly applied to products.

INPUT TEST:
This test is to measure the input current and input power as a function of input voltage. The product is adjusted or stimulated to consume maximum current or power.

Note that the test has no pass/fail criteria as do most of the other tests. The input current and input power for specified input voltages are recorded.

What do we use the test data for?

Some standards imply the purpose of the test is related to proper sizing and loading of the supply to which the product is connected. Indeed, this is true for permanently connected equipment where the building wiring is specifically installed for the equipment. For plug-and-socket connected equipment, the building wiring is already installed; the issue is whether the building wiring has sufficient capacity to carry the additional load imposed by the product.

However, what is the safety issue? Whether permanently installed or plug-and-socket connected, the building wiring up to the point of product connection, is required by building codes to be adequately protected by circuit breakers or fuses. No matter what load is connected to building permanent wiring for either permanently connected products or plug-and-socket connected products, the installation remains safe.

The usual use of the test data is to evaluate the product rating markings. However, such data is not related to the safety of the product. If the rating markings are incorrect, there is no safety issue. The worst that can happen is nuisance tripping of building overcurrent devices. This, in itself is not a hazard, although remedies to nuisance tripping may result in hazardous situations.

The major safety issue for which we use input test data is to determine the adequacy of the current rating of the various primary circuit components. To prevent overheating, the current ratings of various primary components must be equal to or greater than the primary current. Components that must be considered include the power plug current rating, the power cord wire ampacity rating, the appliance coupler current rating, the fuseholder current rating, the power switch current rating, internal wire ampacity rating, internal connector rating, etc.

Another safety issue related to the input test is the temperature of various insulating materials within the product and the temperature of heated accessible parts on the product. As a general rule, maximum heating occurs when the product consumes maximum power. Thus, the "normal temperature" test should be conducted at the input voltage for maximum power.

However, the power difference as a function of input voltage is usually a low percentage of total power. Unless internal temperatures are

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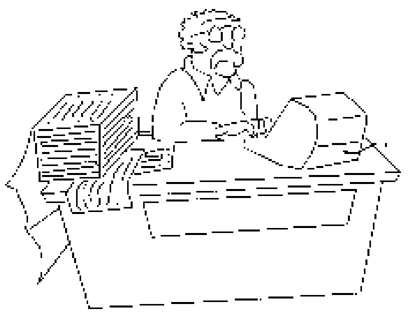
News and Notes



Laser Safety

A plenary session of IEC 825 is planned for November 11 through the 16th in Kobe, Japan. Please refer to Brady Turner's article entitled "Laser Requirements; Harmonization Meeting" in the March/April issue of the *Product Safety Newsletter* for a list of the issues that may be on the meeting's agenda.

UL Data Service

UL Data Service (ULDS) is available by requesting information from Melville by phone, fax, MCI mail, or Compuserve. A computer search will be conducted upon receipt of your request and a written report will be issued. For more information, contact Jeri Cavagnara at Underwriters Laboratories, Melville, phone (716) 271-6200, ext. 897.

Program Proposed for Twisted-Pair Cables

UL's development of a test program for the data transmission performance levels of twisted-pair cable is nearing completion. UL recently distributed the proposed "Program for Qualifying Cables of 100-ohm Twisted-Pairs for Data Transmission Performance Level Marking" to communication and power limited circuit cable manufacturers, data-processing equipment manufacturers and data processing systems specifiers. UL is seeking input on the proposal before complying with formal revision and adoption procedures.

In a level program, values for various characteristics - such as impedance, attenuation and crosstalk - are specified so that the suitability of the cable for use in specific data transmission applications can be easily determined.

For more information on the proposed level program, contact Shari Duzac in Santa Clara, Calif., at (408) 295-2400, ext. 2550.

IEC 950 Publication

The second edition of IEC 950, Safety of Information Technology Equipment Including Business Machines, has been published. Copies will be available from ANSI. This is a complete publication and includes amendments 1 and 2 and 68 Central Office documents. Four new appendices that are considered informative have been added.

Opto Isolators

VDE has withdrawn the safety standard DIN VDE 0883/06.80 and replaced it with DIN VDE 0884/08.87. For licenses of end-use products using 0883 optical isolators, there is no expiration date. However there is an expiration date for the production and selling of opto isolators themselves. It may be possible for manufacturers of opto isolators to obtain special permission to produce opto couplers under 0883 until December, 1991 and sell until the end of 1992. A copy of the license will be required to determine if photocouplers which are approved to 0884 are acceptable for use in SELV circuits for equipment approved to IEC 950.

NITS Publications

The National Institute of Standards and Technology (NITS) has a publication entitled "*1991 Annual Directory of Accredited Labs (SP 810)*". This publication is available by sending a request and mailing label to NVLAP, A214, Bldg. 411, NIST, Gaithersburg, MD 20899. This publication contains more than 1000 laboratories accredited by NITS National Voluntary Accreditation Program. Many are not related to manufacturers of electrical/electronic equipment. Categories of equipment include Acoustics, carpets, paints, sealants, plastics, and computer applications.

CSA an Accredited NCB

At the IECEE Management Committee meeting in Paris, France in mid-July, Canadian Standards Association (CSA) was accepted as a National Certification Body (NCB), making them the only North American certification and testing organization recognized under the IEC

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Circuit Board Spacings For Process Control Equipment

by Richard C. Masek, P.E.

The subject of spacings between electrical circuits is complex. In the past, spacings were based on field experience and rules of thumb.

Now, considerable work has been done to relate spacings to specific variables such as working voltage, transients, frequency of condensation, and insulation type.

INFORMATION REQUIRED TO DETERMINE SPACINGS

- The maximum working voltage between the two conductive parts,
- If the circuits are secondaries, primaries, or field I/O related,
- If the product will be used in a dry, controlled temperature environment,
- If the spacing of concern will have a protective coating,
- If the product will be submitted for a Division 2 hazardous location rating,
- If either conductive part is related to an intrinsically safe circuit.

WORKING VOLTAGE

The working voltage is the maximum ac(rms) or dc voltage normally between the two conductive parts of concern.

TRANSIENTS

Transients are related to the working voltage (i.e. higher transients are expected with higher working voltages. Transients are also related to whether circuits are internal or are associated with primary or field input/output circuits. In general, secondary circuits are expected to have very low transients, primary circuits (120/240 Vac) are expected to have intermediate transients, and field input/output lines are expected to have the highest transients.

The spacings can be reduced if transient protectors limit the transient voltage. A transient protector on a circuit board will normally provide protection for the associated traces both upstream and downstream from the protector. However, a transient protector on one printed circuit board may not protect traces on other circuit boards. This is because of the inductive impedance that is possible on the interconnecting wiring.

PROTECTIVE COATING

Many standards specify performance tests, thickness, or number of coatings. In addition, many circuit boards will require that the coating not be applied in certain areas such as at connectors and switches. Where the spacing is acceptable only if there is a coating, steps must be taken to ensure that the coating will be applied at that location.

FIELD INPUT/OUTPUT CIRCUITS

Field wiring may pick up sizable transients from nearby lightning strikes or from operation of large motors and switching gear. Additionally, even very low voltage circuits with a high common mode voltage may have very large transients, e.g. a thermocouple connected to a motor winding. Therefore, the working voltage of the field input circuit must be based on the sum of the maximum rated input and the common mode voltage rating.

POLLUTION DEGREE

The frequency of condensation is referred to as the pollution degree. For dry indoor environments with controlled temperature changes, the pollution degree is 1. Where condensation may occur, but would be infrequent, the pollution degree is 2. Equipment designed for outdoor applications must have spacings for pollution degree 2, even if enclosed in a NEMA 4 enclosure (See ANSI/NEMA 250 for the NEMA rating system). This article does not include the higher spacings needed where frequent condensation would occur.

CIRCUIT BOARD MATERIAL

The insulation type is only relevant for equipment used in pollution degree 2 designs. The critical parameter is called the comparative tracking index (CTI). Epoxy based printed circuit boards vary considerably in their CTI value. The spacings in this article are based upon a CTI > 250.

ORDINARY LOCATIONS

The following three ordinary location safety standards are normally applicable to process control equipment.

CSA C22.2 No. 142 - Safety Standard for Process Control Equipment.
IEC 1010 - Safety requirements for Electrical Equipment for Measurement and Control.
ANSI/ISA S82.01 - Safety Standard for Electrical and Electronic Measuring and Controlling Equipment.

The spacings in ISA S82.01 are based upon older spacing concepts that are generally larger than required. Approval organizations will normally accept the spacings in either IEC 1010 or CSA C22.2 No. 142. The spacings tables show the larger of the spacings from these latter two ordinary location standards.

The spacings for ordinary locations are shown both for pollution degree 2 and for pollution degree 1.

DIVISION 2 HAZARDOUS LOCATIONS

Equipment used in Division 2 locations should be designed for compliance with IEC 79-15 standard. These spacings usually are larger than the ordinary location spacings. However, they only apply where the current is not limited to specific levels. Where meeting the spacings is a problem, current limitation could be investigated.

INTRINSICALLY SAFE CIRCUITS

Equipment containing circuits that provide energy limiting for intrinsically safe circuits must have spacings based upon ANSI/UL913, Intrinsically Safe Apparatus and Associated Apparatus. The spacing values shown in the column listed "I.S." are considered "infallible". This means that spacings exceeding the shown value cannot be shorted during the intrinsic safety analysis. An intrinsic safety analysis permits up to two faults to be inserted in the circuit such as by shorting components or shorting inadequate spacings. Therefore, it is pointless to use the larger infallible spacings if the same spacing can be defeated by faulting a component. In these cases, the spacing may be reduced to 1/3 of the value shown.

One of the faults allowed during an intrinsic safety analysis is to impose 250 V anywhere in the circuit. The use of specially qualified components can be used to limit the fault voltage. However, in general, even if the normal working voltage of the circuit is only 5 volts, if the circuit is to be evaluated for intrinsic safety, the 250 Vac spacings may have to be used.

IDENTIFICATION OF SPACINGS ON THE SCHEMATIC

In order to control future design changes, it is usually preferable that the schematic drawing be marked with the spacings that are maintained on the various circuits in the product. Most manufacturers use some minimum spacing to ensure that there will not be frequent shorts because of manufacturing problems. In general, using 0.15 mm (0.006") as a minimum, will be adequate for all extra low voltage circuits for products used in ordinary locations. If larger spacings are required on specific circuits such as primary circuits, field I/O circuits and internal higher voltage secondary circuits, then these need to be identified on the schematic with clear references to the circuits that require the larger spacings and the reason why.

One method of identifying specific circuits is by placing a symbol (such as a triangle, square, or circle) directly on the specific lines on the schematic. Other methods include identifying the specific line with a number or letter within a parenthesis.

A note should then be placed on the schematic to identify the spacing associated with that symbol (or letter or number) and the reason for the larger spacing.

EXAMPLE: " Note: Traces designated with (A) are to be spaced a minimum of 2.8 mm (uncoated) or 1.7 mm (coated) from other conductive parts to comply with Division 2 spacings for 240 Vac circuits. All other traces are to be spaced a minimum of 0.15 mm from other conductive parts".

(Tables 1 to 6 follow)

Table 1 Primary circuit spacings without transient protection (millimeters)

Working Volts ac	Uncoated Circuit Boards: Ordinary Locations Polute 2	Uncoated Circuit Boards: Ordinary Locations Polute 1	Uncoated Circuit Boards: Div.2 instal'	Uncoated Circuit Boards: I.S.(1) instal'	Coated Circuit Boards: Ordinary Location	Coated Circuit Boards: Div.2 instal'	Coated Circuit Boards: I.S.(1) instal'
125	1.05	1.05	1.70	8.00	0.50	1.00	2.67
130	1.10	1.10	1.70	8.00	0.50	1.00	2.67
150	1.10	1.10	2.80	8.00	0.50	1.70	2.67
160	1.50	1.50	2.80	8.00	1.50	1.70	2.67
190	1.50	1.50	2.80	8.00	1.50	1.70	2.67
200	1.50	1.50	2.80	10.00	1.50	1.70	3.33
250	1.80	1.80	2.80	10.00	1.50	1.70	3.33
300	1.80	1.80	4.30	10.00	1.50	2.60	3.33

Table 2 Primary circuit spacings with transient protection (millimeters)

Working Volts ac	Uncoated Circuit Boards: Ordinary Locations Polute 2	Uncoated Circuit Boards: Ordinary Locations Polute 1	Uncoated Circuit Boards: Div.2 instal'	Uncoated Circuit Boards: I.S.(1) instal'	Coated Circuit Boards: Ordinary Location	Coated Circuit Boards: Div.2 instal'	Coated Circuit Boards: I.S.(1) instal'
125	0.35	0.25	1.70	8.00	0.22	1.00	2.67
130	0.40	0.40	1.70	8.00	0.25	1.00	2.67
150	0.40	0.40	2.80	8.00	0.25	1.70	2.67
160	1.40	0.70	2.80	8.00	0.70	1.70	2.67
190	1.40	0.70	2.80	8.00	0.70	1.70	2.67
200	1.40	0.70	2.80	10.00	0.70	1.70	3.33
250	1.40	1.00	2.80	10.00	0.70	1.70	3.33
300	1.60	1.60	4.30	10.00	0.75	2.60	3.33

(1) intrinsic safety analysis usually assumes 250 V faulted to circuit.

Chairman's Message
Continued from page 1

The final concern is for the future of our discipline and the need for continuous professional development. Most of us who are associated with the information technology industries are certainly feeling the effects of monumental change. I don't think the safety disciplines in these or other industries are immune from these effects, and it is essential that we increase the value of our contributions through broadening and strengthening our skills.

Brian Claes
PSTC Chairman

Table 3 Field I/O circuit spacings without transient protection (millimeters)

Working Volts[2]	Uncoated Circuit Boards: Ordinary Locations Polute 2	Uncoated: Ordinary Locations Polute 1	Uncoated: Div.2 infal'	Uncoated: I.S.[1] infal'	Coated Circuit Boards: Ordinary Location	Coated: Div.2 infal'	Coated: I.S.[1] infal'
30	0.85	0.85	1.00	2.00	0.18	0.30	0.70
50	0.85	0.85	1.30	3.00	0.18	0.43	1.00
60	1.00	1.00	1.30	3.00	0.50	less	1.00
90	1.00	1.00	1.70	4.00	0.50	1.00	1.33
100	1.00	1.00	1.70	8.00	0.50	1.00	2.67
125	1.50	1.50	1.70	8.00	1.50	less	2.67
130	1.50	1.50	1.70	8.00	1.50	less	2.67
150	1.50	1.50	2.80	8.00	1.50	1.70	2.67
160	3.00	3.00	less	8.00	3.00	less	less
190	3.00	3.00	less	8.00	3.00	less	less
200	3.00	3.00	less	10.00	3.00	less	3.33
250	3.00	3.00	less	10.00	3.00	less	3.33
300	3.00	3.00	4.30	10.00	3.00	less	3.33

Table 4 Field I/O circuit spacings with transient protection (millimeters)

Working Volts[2]	Uncoated Circuit Boards: Ordinary Locations Polute 2	Uncoated: Ordinary Locations Polute 1	Uncoated: Div.2 infal'	Uncoated: I.S.[1] infal'	Coated Circuit Boards: Ordinary Location	Coated: Div.2 infal'	Coated: I.S.[1] infal'
30	0.20	0.10	1.00	2.00	0.10	0.30	0.70
50	0.20	0.10	1.30	3.00	0.10	0.43	1.00
60	0.20	0.16	1.30	3.00	0.10	0.43	1.00
90	0.20	0.16	1.70	4.00	0.10	1.00	1.33
100	0.20	0.16	1.70	8.00	0.10	1.00	2.67
125	0.35	0.25	1.70	8.00	0.22	1.00	2.67
130	0.40	0.40	1.70	8.00	0.25	1.00	2.67
150	0.40	0.40	2.80	8.00	0.25	1.70	2.67
160	1.40	0.70	2.80	8.00	0.70	1.70	2.67
190	1.40	0.70	2.80	8.00	0.70	1.70	2.67
200	1.40	0.70	2.80	10.00	0.70	1.70	3.33
250	1.40	1.00	2.80	10.00	0.70	1.70	3.33
300	1.60	1.60	4.30	10.00	0.75	2.60	3.33

(1) - intrinsic safety analysis usually assumes 250 V faulted to circuit.
(2) - The working voltage is ac or dc

Table 5 DC Secondary circuit spacings (millimeters)

Working Volts dc	Uncoated Circuit Boards				Coated Circuit Boards		
	Ordinary Locations Pollute 2	Ordinary Locations Pollute 3	Div.2 infal'	I.S.(1) infal'	Ordinary Location	Div.2 infal'	I.S.(1) infal'
10	0.10	0.10	1.00	1.50	0.10	0.30	0.50
15	0.10	0.10	1.00	2.00	0.10	0.30	0.70
30	0.10	0.10	1.00	2.00	0.10	0.30	0.70
36	0.10	0.10	1.00	3.00	0.10	0.30	0.70
50	0.10	0.10	1.30	3.00	0.10	0.43	1.00
60	0.16	0.16	1.30	3.00	0.10	0.43	1.00
75	0.16	0.16	1.30	4.00	0.10	0.43	1.33
90	0.16	0.16	1.70	4.00	0.10	1.00	1.33
100	0.16	0.16	1.70	8.00	0.10	1.00	2.67
125	0.25	0.25	1.70	8.00	0.22	1.00	2.67
150	0.40	0.40	1.70	8.00	0.25	1.00	2.67
160	0.70	0.70	1.70	8.00	0.70	1.00	2.67
190	0.70	0.70	2.80	8.00	0.70	1.70	2.67
200	0.70	0.70	2.80	10.00	0.70	1.70	3.33
250	1.00	1.00	2.80	10.00	0.70	1.70	3.33
300	1.60	1.60	2.80	10.00	0.75	1.70	3.33
320	1.70	1.70	4.30	10.00	1.70	2.60	3.33
375	2.00	2.00	4.30	10.00	1.70	2.60	3.33
400	2.00	2.00	4.30	15.00	1.70	2.60	5.00
500	2.50	2.50	4.30	15.00	1.70	2.60	5.00
550	3.20	3.20	5.10	15.00	1.80	3.00	5.00
600	3.20	3.20	5.10	18.00	1.80	3.00	6.00
630	3.20	3.20	7.50	18.00	3.20	4.40	6.00
750	4.00	4.00	7.50	18.00	3.20	4.40	6.00
800	4.00	4.00	7.50	25.00	3.20	4.40	8.30
900	5.00	5.00	7.50	25.00	3.20	4.40	8.30
1000	5.00	5.00	10.00	25.00	3.20	5.80	8.30

(1) - Intrinsic safety analysis usually assumes 250 V faulted to circuit.

N/A - spacing table in the standard does not extend to this voltage.

Table 6 AC Secondary circuit spacings (millimeters)

Working Volts ac	Uncoated Circuit Boards: Ordinary Locations Pollute 2	Ordinary Locations Pollute 1	Div.2 infal'	I.S.[1] infal'	Coated Circuit Boards: Ordinary Location	Div.2 infal'	I.S.[1] infal'
10	0.10	0.10	1.00	1.50	0.10	0.30	0.50
12	0.10	0.10	1.00	2.00	0.10	0.30	0.70
30	0.10	0.10	1.00	2.00	0.10	0.30	0.70
50	0.10	0.10	1.30	3.00	0.10	0.40	1.00
60	0.16	0.16	1.30	3.00	0.10	0.40	1.00
90	0.16	0.16	1.70	4.00	0.10	1.00	1.33
100	0.16	0.16	1.70	8.00	0.10	1.00	2.67
125	0.25	0.25	1.70	8.00	0.22	1.00	2.67
130	0.40	0.40	1.70	8.00	0.25	1.00	2.67
150	0.40	0.40	2.80	8.00	0.25	1.70	2.67
160	0.70	0.70	2.80	8.00	0.70	1.70	2.67
190	0.70	0.70	2.80	8.00	0.70	1.70	2.67
200	0.70	0.70	2.80	10.00	0.70	1.70	3.33
250	1.00	1.00	2.80	10.00	0.70	1.70	3.33
300	1.60	1.60	4.30	10.00	0.75	2.60	3.33
320	1.70	1.70	4.30	10.00	1.70	2.60	3.33
375	2.00	2.00	4.30	10.00	1.70	2.60	3.33
380	2.00	2.00	4.30	15.00	1.70	2.60	5.00
400	2.00	2.00	5.10	15.00	1.70	3.00	5.00
500	2.50	2.50	5.10	15.00	1.70	3.00	5.00
550	3.20	3.20	7.50	15.00	1.80	4.40	5.00
600	3.20	3.20	7.50	18.00	1.80	4.40	6.00
630	3.20	3.20	7.50	18.00	3.20	4.40	6.00
660	4.00	4.00	7.50	18.00	3.20	4.40	6.00
750	4.00	4.00	10.00	25.00	3.20	5.80	6.00
800	4.00	4.00	10.00	25.00	3.20	5.80	8.30
1000	5.00	5.00	10.00	25.00	3.20	5.80	8.30

(1) - intrinsic safety analysis usually assumes 250 V faulted to circuit.

N/A - spacing table in the standard does not extend to this voltage.

Who Is The "Authority Having Jurisdiction"?

by Glen Dash
Dash, Straus & Goodhue, Inc.

Federal Court Says OSHA has Sole and Exclusive Control Over the Workplace; Cities and States Cannot Apply Their Electrical Codes to Determine What Must be Listed And by Whom

Product safety professionals know that the listing of electrical equipment is an important step in assuring quality product. However, at times corporate management wants to know if listings are truly necessary - are they required by law? If so, which law applies — federal, state or local? Up until now there have been few court opinions on the subject.

Determining who is the "authority having jurisdiction" was a murky undertaking. Now, because of a Federal court opinion, this situation has been clarified, at least for the nation's workplaces. The opinion was issued in the case of Dash, Straus & Goodhue, Inc. (DS&G) v. The City of Chicago. DS&G has been accredited by the Occupational Safety and Health Administration (OSHA) for listing products to standards UL478 and 1950 (EDP), UL 1459 (Telecom), , UL 544 (Medical and Dental) and UL 1262 (Lab Equipment), , among others.

Listing organizations like DS&G, however, face certain intractable difficulties. For example, what if a city sets conflicting requirements for the listing of electrical equipment from that of the Federal government. Does a laboratory such as DS&G follow the local requirements or the Federal ones? What if the requirements are completely incompatible?While it was able to resolve conflicts with nearly all jurisdictions, problems with the City of Chicago could not be resolved. DS&G therefore felt it had no choice but to engage the City in litigation in Federal court. The issue was important for the courts to resolve because of the broad jurisdiction of an organization such as OSHA.

DS&G argued that OSHA, pursuant to the Occupational and Safety Act of 1970, had sole and exclusive control of the nation's workplaces. Since OSHA set standards for which equipment should be listed and by whom, cities, like the City of Chicago, could not set additional regulations for the Federally regulated workplace. The Federally regulated workplace means practically any premise in which there is an employer/employee relationship. The exceptions are quite narrow, covering state and city municipal buildings for example. Even farms are considered to be Federally regulated workplaces. The City argued that the intent of the Occupational Safety and Health Act of 1970 was not to exclude local control of the workplace.

The court based its decision on an earlier circuit court case: National Solid Waste Management Association v. Killian. That case held that any state or local authority which wished to regulate the workplace first had to file a State Plan for the regulation with OSHA, which OSHA then had to approve. Since neither the City of Chicago nor the State of Illinois had filed such a State Plan, the City could not specify which kinds of equipment had to be listed for use in the workplace or by whom.

The court concluded "[DS&G] is an OSHA approved electrical testing laboratory. The City therefore may not prohibit electrical products listed by [DS&G] from being sold, offered for sale, given away gratis, installed, altered, repaired or used in OSHA regulated Chicago workplaces." The court enjoined the City of Chicago from enforcing its listing requirements in the Federally regulated workplace.

What does this holding mean for product safety professionals? It means that when it comes to workplaces under OSHA's jurisdiction, which is practically any workplace in the Country, it is OSHA that sets uniform national Federal requirements. OSHA determines which equipment must be listed and by whom. No state or local inspector can red tag equipment if it is used in the workplace if that equipment has been found acceptable with OSHA. To do so would be an unconstitutional exercise of power on the part of the state or local inspector. In order to determine which products used in the workplace must be listed, and by whom, product safety professionals need only consult OSHA; state and local authorities are not the authorities having jurisdiction over such workplaces.

The text of the court's opinion, as it applies to this issue, is available from the author or Editor. Please send a stamped, self-addressed envelope if you would like a copy.

Technically Speaking
Continued from page 4

very close to their ratings, the actual input voltage at which the temperature test is conducted is not usually significant.

(Some certification houses assert that maximum temperature of some devices within products is not related to maximum input power; in such cases, only the certification house can specify the input voltage at which temperatures should be determined.)

(Other certification houses specify the input voltage at which the temperature test is to be conducted regardless of power.)

The purposes of the input test are:

1. Determine whether the rating markings are acceptable.
2. Determine whether the primary components are suitably rated.
3. Determine the input voltage at which the temperature test should be conducted.

LEAKAGE CURRENT TEST:
For grounded products, this test is to measure the current in the protective grounding conductor. For two-wire products, the test is to measure the current between accessible conductive parts and ground.

In some cases, leakage current is measured following humidity treatment. Why should humidity affect leakage current?

This test has pass/fail criteria which are specified in the standard to which the product is evaluated. The measured value is recorded and compared with the standard.

Often, the purpose of the test is purported to be that of determining whether an electric shock is possible in the event of an open ground, or from accessible conductive parts of a two-wire product.

To identify the purpose of this test, let's look at what one would do to address a problem of excessive leakage current. Or, putting the question another way, what does one do in the design of a product to control or minimize leakage current (ignoring EMI suppression capacitors)?

To control leakage current, we must first know the source of the leakage current. Since there are no electrical components connected to the ground circuit (or to accessible conductive parts), where does the current come from? The current comes from the stray capacitance between the primary circuit and the ground circuit (or to accessible conductive parts). The dielectric of this stray capacitance is the insulation between the primary circuit and the ground circuit (or accessible conductive parts).

Therefore, to control leakage current, one must minimize the stray capacitance of the primary circuit. This is done by increasing the distance between the two plates of the capacitor (increasing the distance between the primary circuit conductors and grounded or accessible parts).

Some insulations may be hygroscopic (i.e., may absorb moisture). The presence of moisture within an insulator will alter the overall dielectric constant, thus increasing the value of capacitance. If the value of capacitance increases, so will the value of leakage current. Therefore, some standards specify humidity treatment prior to the measurement of leakage current.

The purpose of the leakage current test is:

1. Determine whether the insulation from the primary circuit to grounded or accessible parts is adequate to prevent electric shock.

DIELECTRIC WITHSTAND (HI-POT) TEST:
This test applies a relatively high voltage between the primary circuits and the protective grounding conductor. For two-wire products, the high voltage is applied between the primary circuits and accessible conductive parts (or foil wrapped around accessible non-conductive parts).

In some cases, the test follows humidity treatment. Why should humidity affect this test?

This test has pass/fail criteria which are specified in the standard to which the product is evaluated. Note that this is not a measurement in that no value of any parameter is recorded.

What is the safety purpose of this test?

To answer this question, we need to identify what part fails when the product fails the test and we need to identify the consequences of that part failure.

Since we are applying a voltage between the primary circuits and the grounding circuit (or accessible conductive parts), the part we are testing is insulation. The insulation between any point of the primary circuit and the grounding circuit is either solid or air, or both solid and air in series.

In the event of a hi-pot failure, there is a failure of either the solid insulation or the air insulation. If the failure is solid insulation, then a conducting path is impressed upon the surface or through the solid insulation, and the insulation is destroyed catastrophically, becoming a resistor of indeterminate value. The resistance may be sufficiently low value to allow an electric shock to occur.

If the failure is air insulation, then a conducting path exists for the duration of the test. When the high voltage is turned off, the system returns to normal because air is a renewable insulation. A shock could exist for the duration of a primary circuit overvoltage.

So, the failure of the primary-circuit-to-ground insulation could result in an electric shock.

But, why test with a voltage often more than 10 times the rated input voltage?

Inductors have the property of storing energy in magnetic fields. Usually, energy in magnetic fields is converted to some other energy form such as the kinetic energy of a rotating shaft (of an electric motor). Occasionally, magnetic energy is released as a high-voltage impulse into the power distribution system. Such releases are normal (e.g. - during the starting process of an electric motor).

Because high-voltage impulses are impressed upon the power line, all insulations on a power distribution system (including product internal insulations) must have sufficient electric strength to withstand not only the normal system operating voltage, but also the normal system overvoltages. Consequently, product mains-to-ground insulations must be tested with a high voltage to confirm that the insulations will not break down when subjected to high-voltage impulses, which normally occur on power distribution systems.

For type-testing, there is merit in converting this test from a pass/fail test to a measurement of the breakdown voltage of the weakest insulation in the product. This is done by increasing the voltage until breakdown occurs, recording the voltage, and examining the unit to identify the failed insulation. This tells you the margin between the required electric strength and the actual electric strength. It also tells you what the weakest insulation is. This is valuable information in the event of a failure of the production line hi-pot test.

Some authorities now advocate that the weakest insulation should be a specific air insulation especially installed in the product, where the breakdown voltage of that air insulation is less than that of the weakest solid insulation. This construction has the advantage of protecting the solid insulation from catastrophic breakdown in the event of ANY overvoltage. The breakdown voltage of the air insulation can be set at any convenient value.

However, safety standards authorities and certification house authorities commonly do not permit breakdown of either air or solid insulation at any value less than that specified in the standards.

The purposes of the dielectric withstand (hi-pot) test are:

1. Determine whether the insulation from the primary circuit to grounded or accessible parts has sufficient electric strength to withstand the worst-case overvoltage which could occur in service.
2. Determine the insulation with the least value of electric strength.

TEMPERATURE TEST:
This test is to measure the normal operating temperatures of various components and materials. (For the moment, we will ignore the fact that some standards specify measure-

ment of temperatures under fault conditions.)

The measured temperatures are compared with maximum temperatures specified in the standard.

Why do we measure temperatures? What is the safety consequence of a component or material exceeding the temperature specified in the standard? How do we choose what components and materials to measure? Why does the standard specify some components and materials and not other components and materials?

Probably the most obvious reason to measure temperatures is to prove that accessible parts are not hot enough to cause a burn injury.

But what is the purpose of measuring internal product temperatures?

All components and materials will fail as a function of temperature. Products commonly use metals for conductors and for structure. For metals, the temperature for failure of either the conductor function or the structural function is sufficiently high that it can be ignored.

However, products also commonly use thermoplastic for insulation and for structure. For thermoplastics, the temperature for softening can be of the same order as the normal temperature for power dissipating components such as power resistors and power semiconductors. If the structural function of a thermoplastic is weakened, so, too, may be its insulating function. Failure of an insulator may result in electric shock or electrically caused fire.

Therefore, we need to measure temperatures of thermoplastic insulations and thermoplastic structural parts (assuming the failure of the structural parts will result in a hazard — which usually will be the case).

Examples of thermoplastic insulations are wire insulations, connector bodies, transformer bobbins (including EMI filter coil forms), and sheet insulations.

Other materials may exhibit chemical change as a function of temperature. If such materials are used as insulators, then we must ascertain that the material operating temperature is less than that at which the chemical change occurs. (The chemical change may also alter the material's insulating characteristics.)

An example of a material which incurs a chemical change as a result of being subject to a high temperature is the epoxy of a glass-epoxy circuit board.

Some components, when heated, can evolve a gas. If the component is sealed, the pressure due to the evolved gas can cause a catastrophic rupture of the container. Some containers will release such pressure in the form of an explosion, while others will release the pressure gradually. An explosion could result in an injury.

Examples of sealed components which can evolve a gas when heated include electrolytic capacitors and sealed batteries. Today, most electrolytic capacitors incorporate pressure relief mechanism which prevent explosion. Nevertheless, we still measure and control the temperatures of electrolytic capacitors and batteries.

Often, rather than measure the temperature of the material, we measure the temperature of the heating device, such as a transistor or diode. In this case, we get a worst-case measurement, where the insulation associated with that component can never achieve the temperature of the heating device.

Such a measurement accounts for misrouting of wires in case they should bear against the heating device.

The purpose of the temperature test is:

1. Determine whether materials are subject to a temperature at which they are likely to fail, where such failure would result in a hazardous condition.

CONCLUSION:

Obviously, we could continue this discussion to cover a large number of tests. But, I believe these four tests are sufficient to illustrate the point.

Too often, we just test the product, and record the data.

I believe it is useful, for each test, to consider the consequences of failure of that test, and what one would do to the equipment to make it pass the test. This exercise forces one to consider what is being tested, and how it fits into the "big picture," the overall set of components that make the product safe. ❁

An Extract from the PSTC Workshop Proposal

by - Mark I. Montrose

[The following is not yet officially approved, but we hope it will be part of the program at the 1992 EMC Symposium in Anaheim, California. This Workshop Proposal is completely separate from any technical papers on product safety which may have been submitted to the Symposium Committee. - Ed.]

The Product Safety Technical Committee (TC-8) of the IEEE EMC Society presents the following format for a workshop to be held at the 1992 Symposium. Topics have been chosen and speakers identified. At this early date, speakers may change, however, a commitment to appear has been promised by all parties.

Part A

1. Liability issues - Mr. Lewis Bass, Lawyer
2. Areas frequently overlooked during product safety certification - Telecommunication Equipment: Mr. Peter Tarver, UL ITE Equipment: confirmed speaker, CSA
3. Proscribed and regulated materials in electrical products – Mr. John Hawley, UL
4. Open panel discussion, question and answers

Part B

5. The current state of affairs in Europe - product safety, EMC compliance, telecommunication and the CE mark - Dr. Klaus Spiegel, TÜV Rheinland
6. Quality control (ISO 9000) in product safety and EMC - Mr. Harvey Berman, UL
7. Components selection for safety and EMC compliance - Mr. Mark Montrose, MIPS Computers
8. Open panel discussion, question and answers

As requested by the TC-8 committee, I will participate as Workshop chairman in addition to presenting a session on “Components Selection for Safety and EMC Compliance”. ❁

News

Continued from page 5

system. With this accreditation, CSA can now process applications for the testing of Information Processing Equipment to IEC 950, and for Electromedical Equipment to IEC 601. For further information, contact Michael Lewis, Communications Director, CSA, 178 Rexdale Blvd, Rexdale, Ontario, N9W 1R3. Phone (416) 747-2253.

CSA Revisions

CSA has decided not to proceed with the proposed amendments to CSA 950. They will first develop a draft of changes to CSA 950 which will incorporate the requirements from the second edition of IEC 950 together with additional proposed revisions. For more information, contact John Davis, P. Eng., Project Manager, Standards Division, CSA, Rexdale.

CBEMA Liaison

John Adams has been appointed as the Northeast Product Safety Society’s liaison to CBEMA.

IEC 990 (Methods of Measurement of Leakage Current)

An error has been discovered in Figure 4, the mesuring network for touch current weighted for perception/reaction. The output capacitor is shown as 0.22uf - it should be 0.022nf. The effect of using the wrong capacitor value would be to accept a construction which should be rejected. A second printing of IEC 990 will correct this error. (From the TC74 Secretary Report, April 1991) ❁

TC-8 (Product Safety) Activities 1990-91

ANNUAL REPORT

The Product Safety Technical Committee continued and expanded its activities during the last year. The six main categories of activities were Symposia, Standards, PS Newsletter, Local Groups, Technical Council and Other.

Symposium support included organizing the annual TC-8 meeting as well as reporting to the TAC. One paper was received for review for the 1991 EMC Symposium, but unfortunately was not reviewed in time, because of a late start and confusion over correct review procedures There was no special session this year at the EMC Symposium in New Jersey; however, a product safety session was sponsored at the Santa Clara Valley local EMC Colloquium.

A Standards subcommittee, chaired by Tania Grant, began investigating topics for an initial Standard proposal. Don Heirman met with Tania and TC-8 officers in Cupertino to describe the Standards generating process and provide IEEE material to guide this effort. Tania has asked that a replacement be appointed for her for 1991/92.

The Product Safety Newsletter (PSN) was the most visible activity and the largest expense. Encouragingly, the $1500 allocated by the EMC Society Board of Directors last year has not yet been touched because of an increase in Institutional Listings. Issues have been published every two months, each about 24 pages, and the PSN has a present circulation of almost a thousand. More articles are being submitted by readers, including some from Canada, Germany and other overseas countries. Visual quality is improving because of the efforts of Ken Warwick, the new production manager.

Local product safety groups continued to sponsor regular technical meetings. TC-8 supported these activities by reporting them in the PSN, updating local mailing lists, suggesting topics and speakers, and encouraging the start-up of new local groups, such as the one in San Diego. IEEE and EMC Society publications, procedures and membership applications were also provided upon request.

Working towards forming a Technical Council for Product Safety has proceeded slowly after being approved by the EMC Society BOD last year. Investigating IEEE procedures and obtaining information about who to contact in other IEEE Societies has begun, but other efforts, such as Standards and Newsletter, have taken most of the time.

Other activities of TC-8 include contributing to the EMC Society Newsletter, monitoring electrical product safety issues and preparing a 5-year plan. A change of officers saw Rich Pescatore step down as Chairman to become Vice-Chairman and Brian Claes move in as Chairman. John McBain remained Secretary/Treasurer

Respectfully Submitted,
John McBain (Sec/Treas)
8/13/91

PSTC Help Wanted

Standards Chair - This person will co-ordinate PSTC efforts to determine what sort of product safety standard we should write and to organize a Working Group to write it. Call Brian Claes (408-285-4768) to discuss this position.

Newsletter Subscriptions Manager - This person will update and expand the PSN subscriptions database and provide current copies of it for each mailing. Call John McBain (408-447-0738) to discuss this position.

the task — again)!

Rich Yount
Sussex, Wisconsin

[Does anyone else have a favorite marking scheme, not yet mentioned, they would care to share with our readers? - Ed.]

A Note from "Down Under":
I am just completing an assignment in Australia on behalf of my company, BULL HN, and have been a recipient of the PSN since its inception. I will be returning to the States in early July and would like to remain on the mailing list for your very excellent newsletter.

As soon as I have settled down in the States I would be willing to provide an article on the "Australian View" of Product Safety for Information Technology and Telecommunication products.

Not too long ago Al Brazauski and I spent some time over a few schooners of Foster here in Sydney solving all of the world's problems. Not including IEC950/EN60950!

Thank you for your consideration in this matter and I look forward to your future newsletters.

John Matteson
Sydney, Australia

[We are always happy to keep on our mailing list someone who says nice things about the PSN — and especially someone who promises to write an article sometime soon! - Ed.]

EMC and Product Safety at the Crossroads:
I would like to be added to the mailing list for the Product Safety Newsletter. As the Manager of the Electromagnetic Compatibility department at Computer Crossroads of America, Inc. (CCA), I am involved in the EMC and safety fields. I had been involved in the EMC field for many years at Southwest Research Institute, and now at CCA am needing to learn more about safety design, standards and regulations. I am a member of the IEEE EMC Society and actively involved on the local level (past chairman of the Central Texas chapter).

Mark E. Bushnell
Richardson, Texas

[Another case of responsibility for both EMC and Product Safety ending up in the same hands, even if technical aspects may differ. - Ed.]

Limited Current - A Response:
The question of your reader Mr. Don Clayton *[Letters, March/April 1991 issue of PSN - Ed.]* can be answered as follows:

If a circuit is not SELV, it may though be safe to touch, that is if it complies with current limit requirements.

The example of the 5V DC interface circuit is covered by the SELV requirements, voltage less than 60V DC and 42.2V AC.

Now consider an appliance with high-voltage circuits, a laser printer for example, where 5kV are accessible when the machine is opened to remove jammed paper. This circuit does not comply with SELV, however if it complies with all limits given in clause 2.4 while a <u>single fault condition</u> exists (2.4.5) it is regarded as safe.

May I add from a practical viewpoint that the measurement with a 2kohm test resistor does not reflect the most hazardous condition, because most such high-voltage supplies oscillate abnormally at such load. To catch the most severe condition I disable the internal limiting circuit (applying 2.4.5); a fault which can exist in the circuit for any length of time because it is not detectable by malfunction. Then I approach the part with a well isolated electrode grounded through the mA-meter and determine the highest current the circuit can supply while sparking. Alternatively, a sufficiently large variable resistor of a few Mohms will help to locate the maximum steady-state current of that supply.

B. Nürnberger
Tokyo, Japan

[Mr. Nürnberger is with TÜV Rheinland Japan, Ltd. - Ed.]

Limited Current - Another Response:
With reference to your letter of April 17, 1991, I will inform you that I would be quite happy to help you and to become a contributor of the Product Safety Newsletter from Germany.

Any time I run across any news in Germany or Europe which I think may become of interest to your readers I will inform you accordingly.

In order to speed up mailings may I kindly ask you whether you have a telefax machine available for communication.

Following I will comment to the inquiry of the subject "Limited Current Info Needed" from Don Clayton, your page 4 of the Product Safety Newsletter volume 4, number 2:

Per IEC 950, paragraph 2.1.1, subclause 1 is clearly mentioned that the user can have access to bare parts at SELV or to bare parts in circuits which have current limitation.

The test per clause 2.4.1 is not applicable for voltages up to 42.4VAC or 60VDC, and is also not applicable, if in single fault consideration the voltage goes up to 65V peak for a time no longer than 0.2 seconds (amendment 1 to IEC 950 mentions 71VAC or 120VDC).

A practical example where paragraph 2.4.1 does apply would be a product which has a plasma display built in which operates with e.g. 100VDC (e.g. a laptop). A short circuit (single fault consideration) between 5V and 100V circuit would be performed, and on the I/O connector would be checked whether the conditions of paragraph 2.4.1 are still maintained.

H. Landeck
Raunheim, Germany

[Mr. Landeck is with R & L Ingenieur Consulting GmbH. The April letter he mentions was sent to all our international subscribers to ask if they could provide Product Safety news from their countries to the PSN. Our thanks for his offer to contribute. PSN fax numbers are shown on page 2 of the PSN. - Ed.]

Limited Current - and Much More!:

I just read the March/April issue (for which, thanks) and was inspired to write on a few separate matters.

1. Limited current circuits. This is a brief response to Don Clayton. I can provide more, but Pete Perkins or Rich Nute will probably get in before me. A limited current circuit is a circuit of any voltage. It is allowed to be freely accessible, even though it is not an SELV circuit. I know of two ways it can be used: as a CRT anode supply circuit, to save having to enclose the parts in reinforced insulation rated for 35kV or more; and for touch controls as in elevators and on hi-fi.

Designers would be wise to use smaller capacitors than the 100 nF allowed in IEC 950 up to 450V: this can give a nasty kick. I am at the moment proposing a change to IEC 950 to reduce this value.

2. Reference is made in the Newsletter to 74(Central Office)198, which is about supply voltages in Europe. Although you may have read that there are moves to make all European countries use 230 V (400 V three phase), this will not happen in UK which will keep 240 V (415 V). UK is not going to throw away 4% of the distribution capacity of all that copper up there by lowering the supply voltage. Central office 198 ignores this fact and may therefore fail. It also ignores Australia and other countries which are 240 V and are not part of Europe.

3. As convenor of the TC74 Chairman's Advisory Panel, I am interested to see that you have published some of our results. You ask readers "Did you know that this Panel existed?". A good question, I don't think we have enough publicity.

Readers should note that the proper procedure for a question to the Panel is through their National Committee of the IEC. In U.S.A. your contact is Ray Daniels. But if you want to short-circuit the system, please copy me direct (see below) so we can start thinking about it.

4. The address at Unisys is true until the end of June, when I retire. I hope to continue to represent Unisys part time on a consultancy basis but this is not yet certain. Anyone wishing to contact me please call home, which is:
3 Dormywood
(Tel.: +44 895 635 628)
Ruislip Middlesex HA4 7UW
U.K.

5. Regarding writing an article: you tell me what you want written about, bearing in mind my involvement with TC74 and all its works, and with the European telecom safety requirements.

I hesitate to respond gung-ho to your letter [of April 17, 1991] about national correspondents. I can only usefully do that if I get enough work to stay in touch with thing, but meanwhile I can contribute odd facts like paragraph 2 above.

Robert S. Ferguson

London, U.K.

[Some very interesting comments from the U.K., and a pledge to send more. Certainly the sort of letter we like to get! - Ed.]

China Connection

Thank you very much for your letter [of April 17, 1991] and a Product Safety Newsletter (Vol. 4, Num. 2, March/April 1991) from Mr. John McBain.

I was very glad to read both above and I would agree and support that you will set up the International Professional Association for Electrical Product Safety that is a good idea. I will do that dedicated for the international product safety in the Product Safety Newsletters, if I shall become a correspondent or your member.

In order to understand your jobs before that, if possible, please send me some others of Product Safety Newsletters before the Vol. 4, Num. 2, March/April 1991 or other informations.

Again many thanks, and look forward to hearing from you soon.

Yan Yumin
Beijing, China

[Mr. Yan Yumin, in a second letter, inquires further about product safety, the IEEE EMC Society, newsletters and more. We are glad to send him information and to welcome his participation. Perhaps we will be hearing about the state of electrical product safety in the People's Republic of China. - Ed.]

Employment Wanted

As a 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 adding their name to the following list may contact the editor of this newsletter.

Please note that the Product Safety Newsletter staff can not make any recommendations about the individuals listed below.

George Man Tat Lee
San Jose, California (408) 578-3918

Dave Olson
San Jose, California (408) 738-4378

Marty Matthews
San Jose, California (408) 723-2847

A Standard Inquiry

The National Institute of Standards and Technology's (NIST) National Center for Standards and Certification Information (NCSCI) is the principal U.S. source of information on domestic, foreign, and international standards, standards organizations and certification programs. As such, NCSCI is responsible for responding to requests for information on a particular country's standardization, certification, and related activities. Your newsletter appears to have information which would be useful in responding to such requests, and we would appreciate being put on the mailing list for free subscription.

The enclosed brochure describes NCSCI services and address. I have also enclosed a list of publications available from our office, and I would be happy to send you any documents which are of interest to you or your organization.

We appreciate your assistance and cooperation in this matter.

Sincerely,
Maureen Breitenberg
Standards Code and Information
National Institute of Standard Technology
Administration Building,
Room A629
Gaithersburg, MD

Area Activity Reports

Orange County -
The September meeting featured an excellent presentation by Mr. Konrad Kobel of TUV America on ISO 9000 Registration. Konrad was a last minute stand-in for Mr. Manfred Popp, who was unable to attend due to an emergency.

Konrad's presentation was extremely informative and helpful. Thanks Konrad! If you could not attend the meeting, and desire a copy of something, please contact Charlie Bayhi.

The November meeting (on November 12 because of Election Day) features Lal Bahra of CSA discussing Agency Issues. The December program will be a discussion of the latest CBEMA meeting. See you there!

Santa Clara Valley -
For September we followed the lead of the local EMC Society Chapter by providing refreshments to attendees at a social get-together instead of a technical presentation. Lots of fun having a chance to meet and chat with other product safety people!

October's presentation by Bruce Paton of Hewlett Packard was a view of trends in product regulations from the environmental product safety standpoint. His talk, "Product Stewardship, or Reacting to Regulations Before They Exist", focused on anticipated changes such as the recycling of the packing materials (required now) and the entire product (proposed law) and how to encourage one's company to be ready before the changes occur. Shades of 1992!

November is expected to be a discussion of ground fault interruption at the branch circuit level (break out your NEC!) and December will be a joint meeting with the EMC Society on the second Tuesday of the month on some aspect of IEC 801-3 (immunity).

Portland / Seattle -
Pete Perkins, Corporate Product Safety and Regulatory Affairs Manager at Tektronix, spoke on "Safety Awareness - High Points of the Tektronix Annual Safety Seminar". November brings Ruth McKnight, John Fluke Legal Council, and December features Ed Spooner of TUV. Altogether a great series to finish 1991!

San Diego -
The speakers and topics scheduled for September and October were, respectively, Dr. Thomas Radley of the University of Wokkingham on the Pond on "Compliant Magnetics Design" and Manfred Popp, Executive Vice President of TUV America, on "ISO 9000 and EC '92". San Diego continues to be very active - call Gene Biggs at 619-592-8236 for more details. ❁

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. Inquiries should be send to: PSTC *Product Safety Newsletter*, C/O John McBain (M/S 42LS), Hewlett-Packard, 19447 Pruneridge Avenue, Cupertino, CA 95014.

Articles Needed For Product Safety Abstracts

If you see articles related to product safety, please take a moment to drop a copy to:

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