The “6 Hazards” of Product Safety

Welcome ASSE Members

CertifiGroup is a Product Test & Certification Laboratory
We Specialize in Product Safety

ASSE & Safety
Facility Safety
Loss Control
Employee Safety
Product Safety??

Product Safety
Even if your company does not make a product, you need to know Product Safety
Personal/ Family Health
Who wants to use an unsafe product?

Workplace Safety
Who wants to injure or kill an employee?

Product Safety Laws that impact Workplace Safety
OSHA Law

All products used in the workplace must be “Listed”

CPSC Laws

Hazardous Products & Toys

State & Local Laws

All products must be “Listed”

NC, FL, OR, WA,
City of LA, City of Chicago
United States Product Safety

Products are “Listed” by an OSHA Accredited “NRTL”

United States Product Safety

Products are “Listed” to UL Standards by OSHA NRTL’s

United States OSHA NRTL’s

- Underwriters Laboratories
- MET Laboratories
- Intertek (ETL)
- CSA
- TUV
- A few others
United States Product Safety

Products must comply with the appropriate UL standard for safety

2 Certification Options:

• Field Labeling or,
• Listing

“Listings” = Manufacturer
“Field Labeling” = On-Site for non-UL products
United States Product Safety

Over 600 UL Standards by product type

United States Product Safety

All Standards attempt to protect the user from the same set of potential hazards

Product Safety Standards

The 6 Hazards of Product Safety
6 Basic Safety Hazards

Applies to ALL safety standards

IEC  EN  UL  CSA

Overall Intent

Protecting the User and Service Personnel from 6 potential hazards

6 Basic Safety Hazards

- Risk of Shock
- Risk of Energy
- Risk of Fire
- Risk of Injury
- Radiation Hazards
- Chemical Hazards
**The 6 Hazards of Product Safety**

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**Differences Between Standards**

The degree of concern towards each hazard depends on the type of product.

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**Differences Between Standards**

- **Different Hazard Weighting**
  - Power Tools > Risk of Injury
  - Microwaves > Radiation Hazards
  - Heating Appliance > Risk of Fire

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**The Specific Hazards**
Risk of Shock

- Prevent access to Hazardous Voltages:
  - H.V. > 30 Vrms, 42.4 Vpk, or 60 Vdc
  (Medical = H.V. > 25 VRMS)

Risk of Shock

- Access is defined as a circuit that can be contacted with the probes:

Accessibility Probes

Many other probes = standard specific
Risk of Shock

- Circuits that can be "accessed" require **2 levels of protection** from H.V. = protection under a single fault condition
- Insulation System Dependent
  - Operational, Basic, Supplementary
  - Double, Reinforced Insulation Systems
  - Double Insulation provides 2 levels of protection

Risk of Energy

- Prevent **access** to circuits capable of delivery 240 VA or more
  - "Capable" is key word = not what the circuit draws but what it is capable of delivering = into any load including short circuit

Risk of Energy

- High energy can melt watches, bracelets, rings
- Not all standards reference = VERY GOOD idea regardless
Risk of Fire

- Limit flammability of combustible materials (limit “fuel to the fire”)
- Limit temperatures on flammable materials (limit the “likelihood of ignition”)
- Containment of Fire (even if there is a fire, keep it from getting out of the product)

Risk of Fire

- No such thing as limiting access to fire = probes are not relevant for this hazard

Risk of Fire

- IEC/EN standards used to try and prove no potential for fire
- UL focus has been on fire containment
- NOW = combined approach
Risk of Fire

- Flame rated materials (5V, V-0, V-1, V-2, HB)
- Temperature test confirms limits not exceeded (using thermocouples)

Risk of Fire

- Abnormal & fault testing confirms fire containment
  - Tissue paper & cheesecloth are fire indicators

Risk of Fire

- Fire Containment = fire that you can see inside the enclosure is NOT a fire hazard.
Risk of Injury

- Limit access to hazardous moving parts, sharp edges, pinch points, etc.
  - Barriers required up to the point where they prevent operation of the device

Risk of Injury

- Sharp Edge access = when in doubt, test it with a sharp edge tester

Risk of Injury

- Prevent implosions/explosions
  - Certified CRT’s with implosion protection,
  - Pressure vessels = pressure relief
The 6 Hazards of Product Safety

Risk of Injury
- Prevent tip-over of equipment
  - 10° Tilt & Pushover Tests

Radiation Hazards
- Limit exposure to radiation
- Lasers
  - 21CFR CDRH verification
  - IEC60825-1 and particulars
- Microwave Ovens
  - Microwave Radiation limits

Chemical Hazards
- Limit exposure to chemical hazards
  - Ozone
  - Tip-over test with liquids
The “6 Hazards”

Conclusion

- Risk of Shock
- Risk of Energy
- Risk of Fire
- Risk of Injury
- Radiation Hazards
- Chemical Hazards

The 6 Hazards of Product Safety

Continuing Education - Product Safety

FREE

“The Weekly Whitepaper”

www.CertifiGroup.com

Presented by
Bill Bisenius – President, NCE/NCT
billb@CertifiGroup.com
CertifiGroup, Inc.
www.CertifiGroup.com

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