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## Standards Update

### Wireless Communications by Bill Stumpf

The use of wireless communications is becoming an ever-increasing part of our daily lives. Some of the more prevalent technologies are detailed here, with their corresponding regulations.

**IEEE 802.11** Family of Wireless Local Area Networks - Wireless Lan/WLAN Standards are developed by Working Group 11 of the IEEE LAN/MAN Standards Committee. The 802.11b & 802.11g standards use the 2.4 (GHz) band in the USA, and the 802.11a standard uses the 5 GHz band. These technologies are subject to Certification (FCC Part 2 Subpart J & IC RSP-100) and are tested under Part 15.247 of the FCC Rules for the U.S., and RSS-210 & RSS-GEN for Canada.

**Zigbee Devices** operate under the 802.15.4 protocol and operate in the 2.4GHz and 868/915 MHz bands. General characteristics of Zigbee radio include data rates of 250 kbps @ 2.4 GHz, 40 kbps @ 915 MHz, and 20 kbps @868 MHz. Zigbee is optimized for low duty-cycle applications (<0.1%) and offers the possibility of battery life from months to possibly years. Zigbee devices are subject to Certification (FCC Part 2 Subpart J & IC RSP-100) and are tested under Part 15.247

or Part 15.249 of the FCC Rules for the U.S., and RSS-210 & RSS-GEN for Canada.

**RF Identification (RFID)** requirements are based on operation frequency and modulation type, and are subject to FCC Part 15 and RSS-210 Certification. Some RFID products operate at 13.56 MHz and are therefore subject to FCC Part 15.225. One thing to consider when operating in this frequency band is that the transmitter is subject to testing for frequency stability ( $\pm 0.01\%$ ) testing over a range of temperature and supply voltage. Other RFID devices may operate at 902 to 928 MHz Spread Spectrum wireless technology, which must meet the requirements of FCC Part 15.247. Industry Canada requirements for both frequency bands is RSS-210. All RFID transmitters are subject to certification for both FCC and Industry Canada. In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device. Since active transponders always have their own power source, they are subject to certification. Because inactive transponders rely on received signal from the associated transmitter for activation, they are subject to verification only.

EU Requirements for these technologies vary by frequency, modulation type, power output, etc. Most can be tested under existing Harmonized Standards. Even if Harmonized Standards can be used to show compliance, be sure to check the Member State frequency allocation tables for restrictions on operation.



## New approach to EMC knowledge

*EMC Practical Applications  
Seminar Workshop  
October 19-20 and 23-24, 2006  
Northbrook, Illinois*

### What makes this seminar different from all others?

Class begins with three days of learning (or reviewing) the basic EMC fundamentals. The fourth day is spent applying EMC theory to a real-life product,

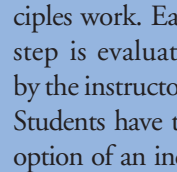


using a proprietary computer program designed by the instructors, Donald L. Sweeney and Roger Swanberg.

During this day-long workshop, students get a hands-on view of how the EMC principles affect a product. They become highly involved in their own learning, finding out for themselves how EMC principles work. Each step is evaluated by the instructors. Students have the option of an individual 45-minute review with an instructor or his associate for a product of their choice, thereby once again learning to apply their newly acquired skills.



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**To register call Carol at  
847-537-6400 or email her at  
cgorowski@dlsemc.com  
For more information:  
www.dlsemc.com/class301.htm**

**\$300 discount  
if you register by  
September 19th!**

**For more information, call  
Bill Stumpf at 262-279-0210.**

## Why we have so many NVLAP accreditations

NVLAP is one of the two accreditors used by United States Testing Laboratories today. D.L.S. has been a NVLAP accredited lab since the very first accreditation in 1986. At that time NVLAP accreditations were for only two FCC test procedures - radiated and conducted. In 1988, the military joined NVLAP through an extensive program formed by NAVAIR. In the 1990's Europe followed; then it was on and on. And now we have 10 pages of NVLAP accreditations for close to 100 test procedures. To you, our customers, these accreditations mean you can be confident of our knowledge and expertise.



Because we are NVLAP accredited for European testing, NIST under the U.S. Department of Commerce has also appointed D.L.S. a CAB (Competent and Notified Body for Europe) for EMC and R&TTE.

This year during our annual NVLAP audit, we had an auditor who had been at D.L.S. during that first military audit and had brought along his previous exit evaluation. He wanted to confirm that we had indeed corrected a minor item he had reported in 1988. Of course we had! He then reminded us that when we had called him regarding the correction we had made, we had admitted to finding two other minor items, which we had already corrected. His comment was, "Anyone who was willing to tell the auditor they had found an item he had missed, was a lab he did NOT need to worry about!"

## News from the Lab

### Did you know...Shielding effectiveness testing is being done in our new chamber

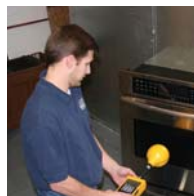
D.L.S. has added an entirely new chamber specifically designed to perform shielding effectiveness testing. Years ago when shielding effectiveness testing was being done in small boxes, Don was asked, "How would you perform it if you could do it your way?" He had always dreamed of doing this kind of testing with full-size antennas, in full-size rooms. As a result, we modified one of our rooms specifically for this work. It was always hard to keep the isolation between the two rooms but it was a vast improvement over the way many were testing it at the time.

And now we have installed a new state-of-the-art chamber designed specifically to our specifications that has isolation from one room to the next of 120 dB up to 10 GHz. We will be testing material up to 40 inches square.

If you have a need for shielding effectiveness testing give us a call. We will do it for you the way it should be done!

### The new RoHS Directive went into effect July 1, 2006 for products being sold in the EU

Many of you have been working feverishly to meet the RoHS Directive and have had to make changes to your products. Remember changes affecting your EMC and Safety compliance require a review and quite possibly testing and updating of your reports and files. See our March 2006 newsletter or [www.dlsemc.com/newsletter](http://www.dlsemc.com/newsletter) for a copy of the previous article on RoHS and how it affects compliance.



EMC testing due to RoHS changes



Safety testing due to RoHS changes

### D.L.S. can help you with your environmental testing

If you require Mil Std 810, RTCA Sec. 4 - 14 or the many environmental requirements, contact Jack Black, Steve or Brian at 847-537-6400 to arrange for your environmental testing.



Halt Chamber



Temperature Chambers

### D.L.S. EDE Program

*Investing a small amount of time up-front during the design stage will save you time, money and frustration in the long run.*

D.L.S. Electronic Systems offers up front design evaluations through their EDE, Early Design Evaluation Program. This



program incorporates an early stage design review and evaluation addressing the EMC and product safety requirements of electric and electronic devices, performed by experienced senior level engineers from the D.L.S. technical staff.

The review identifies the applicable directives and standards, and provides for an analysis of potential design related anomalies that can lead to extended testing time and higher overall costs for the end product if not addressed prior to final testing.

This program covers world-wide EMC and Safety directives, including but not limited to, MIL-STD, RTCA, FCC, CE, UL, CSA, ACA, FDA, FAA, IEC, NEBS, ISO and other government and regulatory agencies. This process greatly reduces the time to market by eliminating design flaws and identifying applicable standards for end products.

## Free EMC and Safety Literature

D.L.S. staff has published the following papers. Copies are available to you by visiting [www.dlsemc.com](http://www.dlsemc.com). Click on Training, then on Literature, select the articles you want, fill in the contact form, and they will be mailed to you. A short description of each article can also be found on the web site.

*Know your limits: Class A Versus Class B Requirements for CE Marking*

by Donald L. Sweeney, updated 2006

*Field Strength/Intensity Measurements*

by Donald L. and Marilyn Sweeney, updated 2006

*Standards Updates on Lightning Effects* by Jack Black, 2006

*Measuring Magnetic Fields* by Jack Black, 2006

*Options for North American Product Compliance*

by Jack Black, 2006

*New EMC Requirements with the Updated Medical Devices Directive*

by Jack Black, 2004

*UWB's Promises Hold Industry-Wide Appeal* by William Stumpf, 2004

*Introductions to Mil Std 461E EMC requirements for COTS applications*

by Jack Black, 2003

*Ensuring a Successful Visit to the EMC Test Lab* by William Stumpf, 2003

*EU Medical Device Directive Update*

by Stephen Grimes, Tom Brenner and Jack Black, 2002

*R&TTE Directive Route to Compliance* by William Stumpf, 2002

*Early Design Evaluation Allows 'Speed to Market'*

by Jack Black, William Stumpf & Tom Brenner, 2002

*Case Histories - Testing Uncovers Design Problems*

by James Burgard, Jr. and Jack Black, 2002

*MRA, CABs, and the EMC Directive today* by Donald L. Sweeney, 2001

*Harmonic standard EN61000-3-2...It's official and here to stay*

by Stephen Grimes, 2001

*A History of D.L.S.'s EMI Testing* by Marilyn Sweeney, 2000

*Telecommunication Certification Bodies - Questions and Answers*

by Donald L. Sweeney, 2000

*EMC Rules to Follow for Selling in Europe* by Donald L. and Marilyn Sweeney

*Mitigating Excessive Emissions* by Donald L. and Marilyn Sweeney

## Steve Grimes is now coordinator of our safety organization



Most of you know Steve Grimes who in 1987 started his D.L.S. career at our Wisconsin site

before transferring to our Glenview/Wheeling facility. He is in charge of EMC scheduling and has done a fantastic job over the years. Whenever Don describes him to someone, Don explains how Steve knows all the test standards, all of our labs, our equipment, all of our engineers, our customers and their needs. He is able to put all of this knowledge together to schedule your testing in a timely, efficient and cost effective manner. Along with his EMC duties, Steve is now the coordinator of our safety organization, scheduling and working out bottlenecks. So call Steve for your product safety needs as well as your EMC needs.

## D.L.S. Co-Hosted a June Wireless Workshop

Last month D.L.S. co-hosted a 2-day workshop on wireless technologies. Attendees were treated to sessions on new and existing wireless technologies; applicable standards for U.S., Canada, and EU markets; and procedures and paperwork needed for filing for FCC/IC certification. Also covered was the status of Mutual Recognition Agreements between the U.S. and various worldwide countries. The workshop featured presentations by Art Wall who recently retired from the FCC, Bill Stumpf from D.L.S. Electronic Systems, Dennis Ward from American TCB, and Jason Lauer from D.L.S. Electronic Systems. Please let us know if you are interested in attending similar workshops in the future.

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### Who do you call if your product fails in the field?

Recently we had one of our very first customers bring in his supplier, who was manufacturing a product that was failing in the field. It had never been tested to immunity since it was “only sold in the U.S.” This customer told his supplier he was certain that D.L.S. could duplicate the problem within an hour. (It actually took us 70 minutes.) Once we duplicated the problem, we then found a solution.

We rarely see this kind of problem today since most manufacturers test products to the EU standards, which require immunity testing. My recommendation is that even if you are shipping only to the U.S., you do the complete series of immunity tests including ESD, radiated E-field, fast electrical transient, lightning surge, conducted RF, radiated magnetic, and sag/surge/drop-out. One field failure will often cost more than the testing and a failure certainly does not give good customer satisfaction. If, however, you choose not to follow this recommendation, or if your product does fail, give us a call and we will solve the problem for you.

*Don*

Donald L. Sweeney  
President



### Let us know your needs

Recently a customer exclaimed upon entering our facility, “Wow, I didn’t know you had all this.” Our concern is that our advertising is not getting across to you our complete range of services and our extensive facilities. So we are enclosing a flyer listing our services. We also want you to know our Wisconsin facility has 3 OATS (open area test sites) and our Wheeling facility has 13 EMC labs (including a shielding effectiveness lab), a Safety Lab, a 3-member report & filings department, and an engineering applications department. We also have 16 NARTE certified engineers and 34 employees. We have it all and are ready to serve you. Let us know your needs and we will do our best to meet them.