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# DLS News & Views

To help keep you better informed

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something else?  
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## New 3-day seminar

### Updated and Consolidated

In response to many requests, we now have a new three-day format for our EMC by Your Design Seminar/Workshop. We will be keeping the same important concepts and material, including controlling signal return currents of PCB's, how EMC and signal integrity are interrelated and the expanded section on filter design, but we will present them in a more comprehensive format.

#### The class still includes:

- ♦ Lecture, discussion and hands-on workshop
- ♦ 2 textbooks and a large workbook of slides used in class
- ♦ Take-home proprietary EMC design software
- ♦ Free optional design evaluation of your product
- ♦ Instructors with over 75 years combined engineering experience

#### The seminar/workshop applies to:

- ♦ Military
- ♦ Medical
- ♦ Industrial
- ♦ Radio
- ♦ Avionics
- ♦ Appliance
- ♦ ITE
- ♦ Wireless
- ♦ Other

#### Seminar Schedule

Days 1-3: EMC Design Class, Lecture & Discussion

Day 3: Workshop using computer programs designed by instructors

#### Day 1

1. Introduction to EMC
  - a. Why you need to consider EMC in your design
  - b. The Real World & EMC Test Standards
    - (1) FCC & Canadian EMC requirements
    - (2) European EMC Directive
    - (3) Mil 461& RTCA EMC requirements
    - (4) Other World EMC regulations
    - (5) Real world measurements and levels

2. Interference overview
  - a. Typical noise path
  - b. Wavelengths, bandwidths and dB's
  - c. Overview of radiated interference
3. Grounding
4. Cabling - principles from crosstalk to how shielding works
5. Passive components
6. Electric and magnetic fields from simple circuits
7. Fields radiated by non-sinusoidal sources
8. General strategy for low emission product design

5:00-6:30 pm Laboratory Tour

Optional tour of a modern EMC test facility

#### Day 2

1. Controlling radiated emissions at the device
2. Digital circuit noise and layout
3. Control signal return currents on PCB's
4. Learn how EMC and signal integrity are interrelated
5. Filtering - how filters work and ways they can be used in your design
6. Emission control in motherboards & back-planes
7. Hands-on calculations made throughout the day
8. Controlling radiated & conducted emissions from switch mode power supplies
9. Reducing emissions from cables and packaging.
10. Calculating emissions from a digital circuit
11. Shielding
12. Calculation of emissions from enclosures

#### Day 3

1. Troubleshooting radiated & conducted emissions
2. Electrostatic discharge (ESD)
3. Case study and validation of results
4. **The Workshop**  
Using an example of a real life product and following typical design principles,

(Continued on next page)

**When you leave this seminar/workshop, you should be ready to lead a design team with a high degree of confidence that your products will meet their EMC requirements.**

## D.L.S. EMC and Aerospace

Aerospace equipment and systems are required to meet electromagnetic compatibility requirements to ensure proper operation and minimize risk to space programs. A standard has been established for electromagnetic compatibility for space related equipment and systems, SMC Standard SMC-S-008. The purpose of the standard is to minimize the risk to space programs with respect to electromagnetic phenomena and compatibility. A series of specific tests have been identified to confirm compliance.

NASA defines equipment as a generic term referring to various levels of hardware (with associated software) assemblies. For the general use, equipment usually refers to all units, subsystems and payloads which are to be integrated into a vehicle or ground support segment.

The application of electromagnetic compatibility standards is presented in a broad manner, with requirements having been established for ground support equipment, ground transportation equipment, and communications equipment, as well as launch and space vehicles, equipment, and systems. Let D.L.S. help with the determination and application of the stringent testing requirements for emissions and susceptibility.

## regulatory requirements **UPDATE**

### Safety Updates

#### Audio Video Equipment

The new amendment EN 60065:2002/A11:2008 covering audio and video equipment became effective on July 1, 2010.



Testing of Audio Video Equipment for European Compliance

the Machinery Directive 2006/42/EC for European Compliance requires manufacturers to have a designated legal representative in the member states that they do business in. The directive makes several references to "manufacturers and their representatives." Any product placed on the market must comply with the directive. D.L.S. can provide this as part of a comprehensive Machinery Directive compliance-testing program.

### Intentional Radiators

#### Testing Program

D.L.S.'s new streamlined program for FCC listings eliminates wait time. We do the research, make the recommendations, perform the testing, submit the filings and follow up with each project through completion to ensure a smooth and timely route to product certification. A true value-added program that enables speed to market with economics in mind.

#### ITE Equipment

The new EN 60950-1:2006 standard for ITE equipment becomes effective on December 1, 2010.

#### Medical Standard

The European Union has reversed a previous decision and voted to delay requiring the new 3rd edition of the medical standard EN 60601-1 to June 1, 2012. The previous effective date was Sept 12, 2009. This is only for products covered by the Part 1 standard.



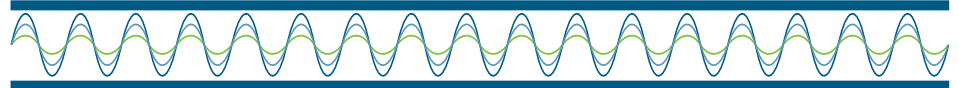
Testing of an intentional radiator

#### Machinery Directive Update

A new interpretation of the recent update for

## New Japan Requirements

Beginning April 1, 2010 telecom port emissions are required for VCCI compliance per VCCI V3/2009.04. Beginning Oct 1, 2010 emissions above 1 GHz will be required. Products already filed with VCCI and distributed in the market before the enforcement date will not be subject to these new requirements. These requirements will need to be applied to new VCCI applications and to products distributed after these dates. D.L.S. is currently providing this data for our clients in their VCCI reports.



*(New 3-day format cont'd)*

we will:

- a. Develop a block diagram
- b. Determine the product's EMC parameters
- c. Using our proprietary computer programs (a copy of which you will take home), calculate the probable emissions of:
  - (1) circuit boards
  - (2) power supply
  - (3) enclosure

While meeting the North American and European EMC regulations, students will design/analyze a unit consisting of:

- a. A motherboard with microprocessor, clocks, digital inputs and outputs
- b. A power supply
- c. Cables with and without shielding for the digital and analog inputs and outputs
- d. An enclosure
- e. An external keyboard
- f. An interface to a video monitor

Students will go through the product's requirements and calculate its estimated emissions, providing rationale for various decisions.

## regulatory requirements **UPDATE** (cont'd)

### D.L.S.'s CCC Compliance Program Update -

The Chinese government started the China Compulsory Certification (CCC) system at the end of 2001. This system is the statutory compulsory safety certification system for electrical and electronic products (EMC compliance is also required). The basic approach is to safeguard the consumers' rights and interests and protect personal safety and their property. CCC system came into force since May 1, 2002 by State General Administration for Quality Supervision and Inspection and Quarantine of the People's Republic of China (AQSIQ) and the Certification and Accreditation Administration of the People's Republic of China (CNCA).

D.L.S. has established a comprehensive CCC compliance program that takes the guesswork out of this specific market. Many companies today need to formally apply for the approval to market products in China, and in doing so receive



approval to display the CCC mark on their products. The CCC Mark program covers 163 products divided into 22 categories, including household appliances, motor vehicles, toys, medical devices, and information technology equipment.

In addition to the CCC Mark, some categories require additional certifications. Examples are certain medical devices, which also require an approval from the China State Drug Administration, somewhat similar to FDA requirements in the U.S. Additionally the China Ministry of Information Industry regulates telecom and internet equipment. In some cases for specific equipment, a Network Access

License and Network Access Identifier Mark must be obtained.

D.L.S. can help your company determine what categories your products fall under, and determine which mandatory standards will be used for certification. Many times, the intended use of a product will determine the product category used for the formal certification process. Often companies have experienced serious delays in getting products to market based on an inaccurate application reference, Harmonized Tariff code or HS codes.

As a condition of the CCC Mark, the certification body will send an

inspector to factory locations where the products are produced and perform an ISO style initial factory inspection if the factory never had factory inspection for that particular product category before. This can be a lengthy process, as the need to obtain a visa by the Chinese inspector can take time. In the event a new factory location is added, or a contract manufacturer is to be used, these facilities must also be audited under the same conditions and approved before products produced at these locations can be legally marked with the CCC logo.

D.L.S. can arrange for all testing and coordinate the total certification process including formal applications and the associated paperwork, along with a factory evaluation by representatives of the official governing agency.

Check with D.L.S. regarding your China compliance projects and find out the D.L.S. difference with respect to CCC compliance.



Jack Black at Yuyuan Gardens on recent trip to Shanghai

**Check with DLS regarding your China compliance projects and find out the DLS difference with respect to CCC compliance.**

## A little bird says...

D.L.S. is now on Twitter!



### Why follow us?

You'll have instant access to the various posts we make on our page! Every Monday, we post a new sample iNARTE question to help you prepare for the iNARTE engineering test or just understand EMC better. Other days, you might find some information about new testing we can perform for you, updates to standards, registration for our bi-annual classes, upcoming promotions, trade shows where you can find us, or even interesting industry-related news.

### What is Twitter?

Twitter is a microblogging site used by over 100 million people worldwide. Its users send out 140-character "tweets" about anything and everything. Although it began as a social networking site, many businesses have jumped into the Twitter world to get relevant information out to their customers.

### How to follow us!

If you haven't signed up for Twitter yet, you can do so here: <http://twitter.com>. Once you have an account, simply visit our page at <http://twitter.com/dlsemc> and click the "Follow" button. Then whenever you log on Twitter, our tweets will appear on your home page. Or if you prefer RSS feeds, feel free to click the RSS feed button on the bottom right of our page and you can receive our tweets directly to your browser or your email.

Happy tweeting!

Need additional help? Call Jessica at: (847)-537-6400

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## NEW 3-Day Seminar Format

For a PDF copy of this newsletter, go to [www.dlsemc.com/newsletter](http://www.dlsemc.com/newsletter)

### In response to your many requests New 3-Day Format

*Keeping the same important concepts and material  
presented in a more condensed format*



## EMC by Your Design

An EMC Practical Applications Seminar and Workshop  
with a free 45 min. individual product design evaluation on Oct. 29,  
take home proprietary computer program,  
expanded chapter on filter design, signal integrity,  
signal return currents on PCB's  
and a second textbook at no extra charge

Tues. Oct. 26 - Thurs. Oct. 28, 2010  
Hilton Hotel, Northbrook, IL



**We are offering a special  
\$300 discount if you register by October 5, 2010**

Classes fill quickly so register early

email [cgorowski@dlsemc.com](mailto:cgorowski@dlsemc.com) or call 847-537-6400  
[www.dlsemc.com/1001](http://www.dlsemc.com/1001)