



The Future of EMC Engineering

by Mark I. Montrose, Montrose Compliance Services, Inc.

Emissions versus Immunity – The Real Concern

What is presented herein is controversial and you may not agree with me. In this series of articles, I examine where the future of EMC engineering may be heading. Five or ten years from now, what will be a greater concern, emissions or immunity? Should we be more concerned with component level compliance or only system level use? What about the operational environment products that are to be used within, and should we even care about emissions and/or immunity in the future?

We live in a wireless world. Almost everyone has a hand phone with Bluetooth, uses wireless Internet worldwide, telecommunication networks, commercial broadcast, computing resources, and everything else that uses electrical power. The primary concern related to regulatory compliance is to ensure narrowband signals do not cause harmful disruption, yet we are being exposed to hundreds, if not thousands of RF signals at the same time no matter where we are in the world. If we look at ambient RF noise throughout the frequency spectrum, what we see is generally broadband RF. Narrowband signals are usually masked out. Under this situation, should we worry about having a radiated emissions event in the future, especially if systems of today must be designed with a high level of immunity?

Conversely, all systems must have a certain level of immunity protection. High transient surge currents or strong RF fields can cause harmful disruption, generally from systems that create intentional RF and whose field strengths are high. For these types of products, we must minimize RF field propagation. However, do computing devices such as laptops

or hand phones really cause an RF event or harm to other electrical systems already designed with immunity in a broadband wireless world?

What we need to worry about in the future is ensuring products have a high level of immunity, such as medical and military products, automotive or transportation systems, communication networks, and other specialized areas not identified in this list. We must therefore be more concerned about having immunity levels high, and to a lesser extent not how much RF they generate. An exception is automotive electronics where systems must be compatible related to both EMI and immunity at very low levels. As EMC engineers in the future, should we concentrate more on EMI or immunity? The answer is dependent on the type of products we are working with and their intended environment of use, in a broadband world.

Mark I. Montrose is an EMC consultant with Montrose Compliance Services, Inc. having 30 years of applied EMC experience. He currently sits on the Board of Directors of the IEEE (Division VI Director) and is a long term past member of the IEEE EMC Society Board of Directors as well as Champion and first President of the IEEE Product Safety Engineering Society. He provides professional consulting and training seminars worldwide and can be reached at mark@montrosecompliance.com