

## Achieving E3 compliance: Simulation Vs. Measurement

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### Abstract

Wireless communication systems are increasingly used in the military environment. Like any other communication system, there is always a demand for improvement and delivering more voice/data over a wider frequency band and radiated at higher output power levels. However, these improvements will result in a more complex electromagnetic environment and raise concerns about Electromagnetic Environment Effect (E3). E3 is defined as the impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines such as EMC/EMI, RadHaz, and EMP. Successful E3 compliance and control program depends on appropriate and sufficiently detailed planning. Actual measurement was traditional the first choice to investigate E3 issues, both at system and component levels. However, Computational Electromagnetic Methods (CEM) along with powerful computer hardware available these days, enabled engineers to also consider simulation as an alternative to costly time-consuming measurements.

In this paper, an introduction will be provided on the E3 and its significance. Pros and cons of simulation in comparison with measurement will be discussed next. A couple of simulation cases will be presented to demonstrate the type of problems that can be handled using simulation and challenges one may face when using simulation for E3 studies.