As humans endeavor to build large-scale complex systems, it will necessitate the integration of engineering practices and techniques to allocate many of the design aspects and responsibility across traditional boundaries. Many of today’s large-scale complex systems, like commercial aircraft, satellite systems, and even automobiles use parts from all over the world. A recently completed airframe, largest commercial aircraft in the world, took nearly 30 years to build, required over 400 different suppliers from 20 different countries. These kinds of projects dictate a method for derivation and synthesis of electromagnetic environmental effects (E3) requirement limits for achieving system level electromagnetic compatibility (EMC).

If a system level EMC design is an assemblage of compliant subsystems, then the subsystems should be an assemblage of compliant module and component designs. This requires tailoring the system level requirements through to module or component level designs. The method discussed is applicable to a variety of designs across varying levels of complexity and importantly implementable early in the design process. The method provides rationale for derivation of limits while maintaining traceability to system level requirements.

Specific examples using the four common divisions of EMC requirements, conducted emissions, radiated emissions, conducted susceptibility, and radiated susceptibility are included. An overall system engineering approach and formal methodology is included. Detailed comparison examples using commercial and military EMC requirements are also included. Lastly, a discussion is included on comparison and margin analysis of input filtering for verifying compliance to requirements at the system level.

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The public is welcome to attend.