Aircraft Power Network Development with Model-Based Design

The race to develop more electric aircraft is forcing design changes at the system level and increasing the need for simulation.  Balancing the tradeoff of model fidelity and simulation speed is key to effective simulation.  Models that include only the necessary effects and use the appropriate simulation mode (continuous, discrete, phasor) make your development process more efficient, ensuring that you can test your design under a wide range of conditions.  Using Model-Based Design, you can optimize system-level performance and be confident that your system will meet all requirements.

* Integrate requirements into your development process
* Refine requirements using abstract component models
* Model networks containing generators, AC loads, DC loads, and TRU
* Analyze power quality at various points in different flight cycles
* Accelerate development by running simulations in parallel

Modeling Aircraft Systems

Modeling and simulation can support efforts across the acquisition life-cycle, ranging from early component design and development of system concepts, all the way to system-of-systems simulations based on a shared coherent modeling architecture. This example will review:

* [Physical Modeling](http://www.mathworks.com/solutions/physical-modeling/)
  + Balancing model fidelity and simulation speed
* [Modeling Electronics](http://www.mathworks.com/products/simelectronics/) / [Power Systems](http://www.mathworks.com/products/simpower/)
  + Generators, AC , TRU , DC and batteries
* [Testing and Requirements](http://www.mathworks.com/solutions/verification-validation/)
  + Scripting tests and verifying performance against requirements

[Model-Based Design](http://www.mathworks.com/model-based-design/) is transforming the way engineers and scientists work by moving design tasks from the lab and field to the desktop.

When software and hardware implementation requirements are included, such as fixed-point and timing behavior, you can [automatically generate code](http://www.mathworks.com/solutions/embedded-code-generation/) for embedded deployment and create test benches for [system verification](http://www.mathworks.com/solutions/verification-validation/), saving time and avoiding the introduction of manually coded errors.

Use Model-Based Design with [MATLAB®](http://www.mathworks.com/products/matlab/) and [Simulink®](http://www.mathworks.com/products/simulink/) to improve product quality and reduce development time by 50% or more.

### With Model-Based Design, you can:

* Use a common design environment
* Link designs directly to requirements
* Integrate testing with design
* Refine algorithms through multidomain simulation
* Automatically generate embedded software code and documentation
* Develop and reuse test suites