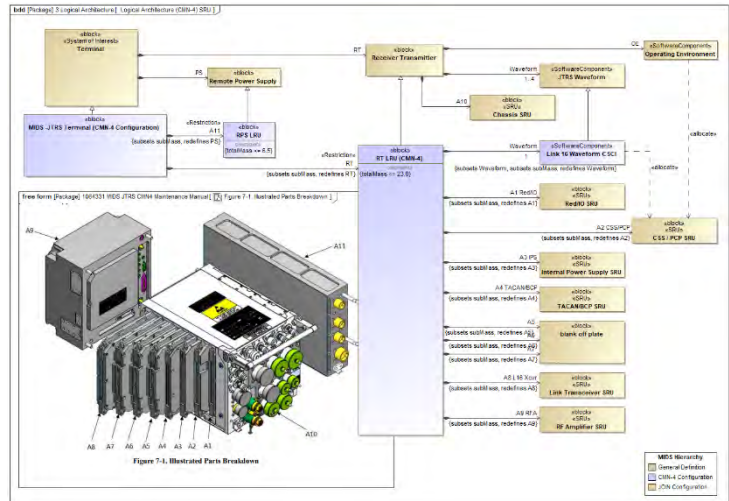


Model Based Systems Engineering (MBSE) for Tactical Data Link Systems



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SYSCOM: Naval Information Warfare Systems Command (NAVWAR)

Program Sponsor: MIDS APEO-E NAVWAR 5.0, PMA/PMW-101

Other Potential Programs: Free Space Optical Communication Phase III Development

Current TRL: TRL not applicable
Projected TRL: TRL not applicable

Keywords: SysML, MBSE, Systems Modeling, Digital Engineering, Digital Twin

THE CHALLENGE

CFD’s challenge was to create a Digital Systems Model for an existing system, the MIDS Terminal, using legacy documentation and specifications. This digital model is a graphical depiction of text specifications and this model is executable, providing a better understanding of the Hardware and Software behavior in the system. Additionally, a digital model facilitates the analysis of the integration of the MIDS Terminal within the larger ‘System-of-Systems’.

THE INNOVATION

CFD models the structure of the hardware and assemblies to the pin level and the behavior to the SRA (Shop Replaceable Assembly) Level, then executes simulation to visualize the terminal in action. Software elements are shown exchanging data over hardware interfaces. This level of simulation in the System Design phase ensures the developed components, both software and hardware, will interoperate correctly in the Test and Integration phase, greatly reducing schedule and cost risk.

THE NAVY BENEFIT

The weapons platforms in use today will continue to be enhanced and upgraded. MBSE and the Digital Engineering Strategy of the Office of the Secretary of Defense (OSD) are new acquisition approaches to be employed in the systems to be fielded. Creating a Digital Twin of an existing system ensures enhancements are integrated efficiently.

THE FUTURE

Digital Systems Models are the framework that enables the OSD’s Digital Engineering Strategy. Future weapons systems will be designed, developed, and integrated by a thread of digital processes that start and end at the Systems Model but include the hardware, software, and manufacturing to reduce integration effort and increase our Nation’s defense capabilities.

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