

PEO Missiles and Space Systems Engineering Methods

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By

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- Joint Attack Munition System (JAMS) Project Office is part of the Missile and Space PEO.
- Portfolio includes HELLFIRE, Joint Air to Ground Missile (JAGM), Hydra70 Rockets, HELLFIRE missile launcher, rocket pods, associated test sets, and training missiles.
- The HELLFIRE, JAGM, and Hydra70 munitions have evolved over the years and are used on more than fourteen platforms₁ across Army, Navy, Marines, Air Force, and Foreign Military Sales cases.

¹ Excerpt from JAMS Commanders Brief 17 Oct 2017

- Investigate strategies for adapting legacy weapons to new joint service platforms for increased missions capabilities.
- Develop systems engineering methods that take advantage of previous qualification testing to minimize cost for airworthiness and/or materiel release for new integration of legacy weapons onto new platforms.
- Investigate new methods for adapting current performance based specifications to new missions, where system modifications are required to accommodate new constraints such as weight limits or new launcher orientations.

- Investigate methods of extending platform specific performance needs, such as vibration, launch constraints, launch transients, and transfer alignment.
- Investigate potential cost and schedule savings through legacy model reuse. Models of interest include solid models, finite element models, and multibody dynamics models.
- Researcher shall apply new methods to investigate challenges with integrating legacy weapons onto the Future Vertical Lift (FVL) platform.

- The success of the HELLFIRE system has led to many non-standard integrations.
 - Unique launcher configurations electrically and mechanically.
 - Low quantities precluded business case for contract modifications resulting in non-production hardware and software.
 - Cost of qualification of each non-standard integration includes analysis and test to support air/sea worthiness.
- Windchill for model and process management.
 - Solid Models, Gerber files, analytical models and results files, and test data.
- MagicDraw to create new specifications from production performance based specification (PBS).

- First installation of Magic Draw.
- First implementation of Windchill.
- Investigation into model based physical configuration audits (PCA).
- Goal of model based technical data packages in accordance with MIL-STD-31000 for launchers entering development.
- Analysis working group to eventually include stake holders and prime contract analyst. Currently consists of JAMS and Lockheed Martin Missiles and Fire Control, Orlando.
- Joined INCOSE-NAFEMS Systems Modeling and Simulation Working Group (SMSWG)
 - My interest is in reusing analytical models, not creating new models based on Functional Mockup Interface (FMI)

- Expand the framework established through tool selection
 - Load M299 launcher model into Windchill and create the non-standard configurations, link “build from parts” to production engineering change proposals (ECP).
 - Create SysML models in MagicDraw to facilitate the new requirements that lead to non-standard launchers.
 - Load requirements documents into Windchill to establish traceability.
- Apply lessons learned toward development of Future Attack Reconnaissance Aircraft (FARA) Competitive Prototype (CP) launcher and the Integrated Munitions Launcher (IML) using these methods, processes, and techniques.

