

Virtual & Constructive Representations on Live Avionics Displays (VCR-LAD)



EXHIBIT FACT SHEET

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The melding of Training & Readiness (T&R) requirements for aircrews on fourth- and fifth-generation aircraft is not easily accomplished using existing training ranges and aircraft assets. These requirements increase the size and complexity of mission training scenarios, making training events more difficult and costly per training hour than in previous generations. This training capability gap is addressed by Virtual & Constructive Representation on Live Avionics Displays (VCR-LAD) through augmentation of live aircraft displays with entities generated by virtual and constructive simulations.

What it is

- ◆ VCR-LAD adds a critical element of LVC simulation to the training spectrum through a fully integrated representation of the LVC battlespace on live platforms
- ◆ VCR-LAD augments the information received from the aircraft avionics with synthetically generated information to present unified, consistent symbology across all cockpit displays
- ◆ VCR-LAD provides a set of symbology guidelines for safe, effective integration, and a set of communications requirements for maintaining consistency across the LVC environment

How it works

- ◆ Initial design considerations are based on Safety-of-Flight and T&R criteria
- ◆ Through iterative phases of more complex design, experimentation and hypothesis testing, the program creates traceable, substantiated



engineering requirements

- ◆ VCR-LAD targets platform integration via necessary OFP modifications to actual avionics
- ◆ VCR-LAD data products will drive training range and cockpit upgrades

What it will achieve

- ◆ Quantify safety and efficacy of augmented cockpit displays for T&R
- ◆ Increase T&R spectrum of capabilities on existing ranges with limited air assets
- ◆ Reduce overall training life-cycle costs by accomplishing more activities per training event
- ◆ Provide training effectiveness force multiplier for existing virtual and constructive simulations

Although the technical aspects of integrating live equipment, including aircraft, into large-scale Live, Virtual & Constructive (LVC) events have received significant attention, impacts on aircrews have not been studied in

detail. The VCR-LAD project builds the Science and Technology (S&T) foundation for LVC integration into live aircraft avionics to enhance T&R. This project includes research spirals that investigate VCR-LAD added workload, possible confusion with LVC entities, and data link-induced Safety-of-Flight artifacts.

Recent successes in assessing aircrew cognitive workload and performance provide an experimental basis for quantifying the impact on safety. By designing traceable and testable cognitive requirements for meeting T&R objectives, this program will characterize and document the impact of VCR-LAD on training effectiveness and safety.

Each year, during demonstrations of experimental capabilities, this program will demonstrate practical methods for integrating V-C entities onto displays in cockpit simulators and live flying aircraft. By FY15, impact assessment and guideline documents will be completed for developing display symbology and range communications. As part of FY16 transition activities to F/A-18 and Training Range PMA, VCR-LAD will be integrated onto aircraft displays, using prototype advanced range communications.