

Virtual and Constructive Representations on Live Avionics Displays



EXHIBIT FACT SHEET

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Training & Readiness (T&R) requirements for aircrews on fourth- and fifth-generation aircraft 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.

Although the technical aspects of integrating live equipment, including aircraft, into large-scale Live, Virtual & Constructive (LVC) events have received significant attention, impact on aircrew, in terms of safety and training effectiveness, has not been studied in detail. The VCR-LAD project builds the needed Science and Technology (S&T) foundation for LVC integration into live aircraft avionics. The research relates current training events to LVC augmented capabilities to investigate added workload, possible confusion about LVC entities, and data link-induced safety-of-flight artifacts. Knowledge products being developed by this program include safety recommendations for platform/training range, avionics/simulator guidelines, and data link/networking guidelines for LVC-enabled training systems.

By FY15, the project will have developed guidelines for integration of LVC-enabled capabilities into aircraft avionics and simulators, and LVC-enabled range communications into training ranges, interoperable with the Navy Continuous Training Environment (NCTE), sufficient for demonstrating an integrated LVC-enabled training system. As part of FY16 transition activities to F/A-18 and Training Range PMA, VCR-LAD will be integrated onto aircrafts, using prototype advanced range communications.



The cost to operate our present and future platforms - combined with advanced capabilities that are rapidly exceeding the capabilities of our current training ranges - demands that within Naval Aviation we become much more innovative in combining live, virtual, and constructive training. – VADM David Buss

What It Does

- ◆ 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
- ◆ VCR-LAD provides a set of guidelines and recommendations for safe, effective avionics and simulation integration, and a set of communications guidelines for maintaining consistency across the LVC environment

How It Works

- ◆ Initial considerations are based on Safety-of-Flight and T&R criteria
- ◆ Through prototyping, experimentation and hypothesis testing, the program creates traceable, substantiated design guidance
- ◆ VCR-LAD limits platform specific modifications leveraging existing LVC standards and aircraft interfaces such as Next Generation Threat System (NGTS), and NCTE
- ◆ 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