



## OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE SYSTEMS ENGINEERING

### System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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### Integration of an In-Vehicle Network Utilizing VICTORY Standards on a USMC M-ATV MRAP

*Presenter: Mr. Ernest Sanchez, Marine Corps Systems Command*

#### Abstract

The U.S. Marine Corps (USMC) Mine Resistant Ambush Protected (MRAP) Program Office conducted a prototype development and demonstration project for the integration of an In-Vehicle Network (IVN) using Vehicular Integration for C4ISR/EW (Command, Control, Communication, Computers, Intelligence, Surveillance, Reconnaissance/Electronic Warfare) Interoperability (VICTORY) standards to interface components on an MRAP All-Terrain Vehicle (M-ATV). The M-ATV was equipped with C4ISR/EW equipment consistent with currently fielded USMC MRAP vehicles. The demo showed the feasibility of integrating an IVN and components compliant with VICTORY standards to enhance interoperability of C4ISR/EW and automotive systems.

VICTORY is a set of open standards developed by a government-industry standards body. The VICTORY standards define requirements for network messaging interfaces that enable interoperability among C4ISR/EW, automotive, and network systems within the vehicle. VICTORY defines component types, which are collections of interface specifications. These component types and interfaces enable controlling, monitoring, and interoperating the systems within the vehicle. An IVN with VICTORY-compliant interfaces enables interoperability across C4ISR/EW and platform systems and reduces the size, weight, power, and cost (SWaP-C) required to add new capabilities versus the historic “Bolt-On” approach to integrating mission equipment.

#### Biography

Mr. Sanchez is an engineer with Marine Corps Systems Command (MCSC) and PEO Land Systems (PEO LS). Since 2007 he has worked within the MRAP Program Office. The MRAP program is credited with saving thousands of lives by urgently fielding armored vehicles capable of withstanding mine, small arms fire, and improvised explosive device (IED) attacks. On MRAP, Mr. Sanchez led the effort to use VICTORY standards to implement an automotive and communications network onto the M-ATV. Mr. Sanchez was the lead engineer for the Buffalo, the MRAP category III vehicle. He was responsible for engineering related to implementing more than 50 engineering changes to improve safety, survivability, and performance of the

Buffalo system. Before his experience with MRAP, Mr. Sanchez spent time as an engineer for the USMC PM Consequence Management, working Chemical, Biological, Radiological & Nuclear (CBRN) defense programs. Mr. Sanchez is a graduate of Virginia Tech with a B.S. in Mechanical Engineering. He is currently working on testing related to all program platforms within PM Medium and Heavy Tactical Vehicles, which includes the MTVR, LVSR, M-ATV, Cougar MRAP, Buffalo MRAP, P-19R, several trailers, and other USMC systems.