



## NAWCWD engineer leads weapon control to new level

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The Navy performs a free-flight test of the Joint Standoff Weapon (JSOW) C-1 variant at NAWCWD's Point Mugu Sea Range in 2011. The JSOW is an air-to-ground, medium-range precision guided, glide weapon that employs a GPS/inertial navigation system and an infrared seeker for terminal guidance. The JSOW C-1 variant adds a Link 16 weapon data link for in-flight target updates and upgraded seeker software to autonomously target and strike a specific aim point on a moving ship. The JSOW C-1 will be the first Network Enabled Weapon in the military's inventory and the first weapon with the capability to precisely strike moving maritime targets. (U.S. Navy photo)

CHINA LAKE, Calif. -- NATO recently approved a change to the tactical data exchange specifications that will give warfighters more control of weapons on the battlefield by expanding communication between multiple controllers and various weapons after launch.

In February, NATO approved a network enabled weapons interface change proposal (NEW ICP) to Link 16, which created a single message standard that redefined how joint and allied warfighters control multiple NEWs through existing tactical data links.

"The warfighters are our customers and we have to give them what they need to fight effectively," said Scott Millett, Naval Air Warfare Center Weapons Division's weapon interoperability lead, and the Navy lead and the joint service co-lead for the NEW ICP. "We now have the foundation for one message set to support a scenario where any



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warfighter, whether he's strapping into an ejection seat or carrying an M-16, can talk to any weapon, whether it's going after a tank, ship or a bridge, or whether it was launched from a ship or a plane."

The 1,400-page NEW ICP was developed during the last 10 years through the coordinated efforts of about 100 uniformed and civilian subject matter experts across the U.S. Navy and Air Force, weapon, fighter, bomber, radio and surveillance communities.

"This is a huge milestone," said Scott O'Neil, NAWCWD executive director. "It was a major undertaking by a lot of people from various disciplines, and is a textbook example of how integration and interoperability should work."

Millett said the team began looking at how to provide data to weapons after they had been launched in order to update the target's location, switch to a different target during flight, or abort the mission.

DOD provided funding through the Air Force in 2004 to develop this technology. Recognizing the need to get the Navy involved, the Air Force contacted NAVAIR's Precision Strike Weapons Program Office (PMA-201). Millett had been working with PMA-201 as the weapon interoperability lead since 1999 and was asked to share lead responsibilities with counterpart Jim Heigle of the U.S. Air Force's Electronic Systems Command.

A successful demonstration of the technology was conducted in 2005 and involved Air Force and Navy weapons programs, radio programs, the fighter community, and network experts. The first formal draft of the message set was released for review by the DoD Link-16 community in June 2008. A more mature set went to NATO in June 2010 and was approved in February.

The result is a standard set of messages that can travel to weapons, from weapons, and back and forth between controllers. This allows for coordinated attacks during which multiple warfighters can be involved in controlling a weapon during a mission.

"The interoperable nature of this makes it special," Millett said. "Before, each weapon's data link was unique. This new message set can be used with any weapon as long as it is attacking something on the sea or on the ground, and each weapon and control platform only needs one set of software and one user interface no matter who it's talking with."

The message set is enhanced by a set of rules that allows control to be given but not taken, which means there is a traceable chain of custody for a lethal weapon.

"There's a great deal of satisfaction knowing that the effort we spent and the challenges we overcame resulted in the



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horizontal integration of all of the different programs involved,” said Millett, who counts this as his top contribution to the Navy so far in his 29-year career.

Millett said the first weapon with this capability could be in the fleet by the end of 2013. The NEW message set is expected to support the needs of most weapons and land/surface attack missions for the foreseeable future.

“We’ve tried to design for the future so when the next generation of weapons and aircraft comes along, we’ll be able to adapt and integrate into those,” Millett said. “We’ve left room for future growth.”