Naval Reservists Shape the Future Fleet Aboard Dahlgren Laboratory's Virtual DD(X)... Next Generation Network-Centric, Multi-Mission Destroyer

By JO1(AW) John J. Joyce, USNR

Navy Reservist, IS1 Sally Jo Sasser, saw the fleet's future on a two-week annual training exercise that took her to Northern Virginia where Civil War battlefields dot the historic landscape. She helped shape the future every day she stepped aboard the virtual (v) DD(X), the next generation destroyer Combat Information Center (CIC) during the recent Naval Fleet Battle Experiment Kilo (FBE-K).

Navy reservists staff a CIC complex at Dahlgren during training. Photo by NSWC Dahlgren.

The imagery analyst, aboard a U.S. Navy ship yet to be built, prosecuted, nominated and sent the geo-coordinates of several simulated enemy targets to shipmates. Suddenly, the Land Attack Warfare Officer (LAWO), Lt. Cmdr. Jennifer Wright's, words: *"Greyhound away. Gulf, x-ray, one, zero, zero, one. Time on target, 29 seconds,"* boomed throughout the vDD(X) node manned by warfighters at Commanding Officer (CO), Tactical Action Officer (TAO), Officer of the Deck (OOD) and Intelligence Group CIC positions. Smoke appeared at the point of impact on a big screen that displayed the total operational picture.

It is vDD(X) shock and awe on the banks of the Potomac River — at a Naval Base named after Civil War Rear Adm. John Dahlgren, the "Father of Naval Ordnance" and the Dahlgren Gun. Two hours of free-play simulation ensued, as the CIC crew tested the mock surface combatant's sea-based precision-strike and volume-fires capability. *"The determination to shoot the time sensitive target (TST) with a Tactical Tomahawk Land Attack Missile (TTLAM) was based on intelligence analysis of a film feed simulating an unmanned aerial vehicle (UAV) on a reconnaissance patrol,"* explained Sasser. *"We nominated the target by identifying the platform — a SCUD launcher. After confirming the geo-coordinates, I snapped a picture off this imagery, and sent it over to the TAO and LAWO. Their decision was decisive and effective."*

Such free-play combat scenarios, as well as DD(X)'s engagement of high-value targets in support of the Marines ashore, enabled Sasser, Wright and a team of officers from Naval Reserve Program Executive Office for Ships, NR PEO(S) HQ 306, to help shape the future of the Navy's first truly network-centric surface combatant. *"We're here on the cutting edge of technology bringing to bear our civilian expertise in land attack warfare, communications and maintenance,"* said Capt. William Sposato, the reserve unit's commanding officer. *"... We are influencing the design of a multi-mission ship and the integration of combat suites."*

With advanced multimission ship and combat systems optimized for littoral environments, the DD(X) design will exploit enemy vulnerabilities on, above, and below the sea while offering long-range precision firepower in support of networked Naval and joint forces ashore — all with a smaller CIC crew. Sposato's team also tested their interface with DD(X) combat systems and the Joint Fires Network (JFN) to simultaneously plan, target and execute multiple fires missions during a myriad of FBE-K scenarios. JFN, a network-centric warfare family of sea, air, land and space-based intelligence gathering systems, will eventually allow all U.S. military commanders and those of certain allied nations to share a common battlespace view.

The main objectives of FBE-K emphasized the Global Concept of Operations and the testing of virtual systems that support the fundamental concepts of the Chief of Naval Operations' (CNO) Sea Power 21 vision: Sea Strike (projecting offense), Sea Shield (projecting defense) and Sea Basing (projecting sovereignty) — all networked through the integration of warriors, sensors, weapons, networks and platforms, referred to as FORCEnet. *"DD(X) and its associated transformational technologies will be at the core of U.S. Navy capabilities and missions for the 21st century,"* CNO Adm. Vern Clark recently said. *"These great ships and other members of the family of surface combatants will transform the Navy fleet, multiply our combat effectiveness, and play a crucial role in dominating the future battlespace."*

"We're on the cusp of shaping the future of DD(X) when it comes to the warfighter and how the ship is going to fight," said Wright, who, as the Navy Warfare Development Command (NWDC) Liaison Naval Officer (LNO) at the vDD(X) node, reported directly to FBE-K's fires initiative lead aboard the Seventh Fleet command and control ship, USS Blue Ridge (LCC-19), on station in the Pacific. *"We are working out concepts, practicing doctrine and protocol. Future crews will be smaller than we're used to. The CIC will have only a few people running highly technical systems. We are learning how that will work out operationally. In addition to the human systems integration (HSI) picture, we're helping to determine how it's all going to flow."*

The design agent team, led by Northrop Grumman and Raytheon, interacted with reservists and studied HSI in the FBE-K network node they helped to establish aboard vDD(X). *"Since the systems are so complex, it was extremely important for us to sit right next to the warfighters and observe, interact and listen,"* said Raytheon Technical Director, Roy Johnson. *"The warfighters tested several simulations during the fleet battle experiment that we intend to build. Their tests gave us the advantage of receiving feedback on what works and what doesn't work, what we had right, and what we had to improve. To work with experienced and knowledgeable reservists who could spend time with us was a great learning opportunity."*

"The reservists in Dahlgren had a direct impact on FBE-K and Sea

Power 21," exclaimed PEO Ships project manager, Lt. Cmdr. Ivan Pierce. *"Without their ability to man and operate the systems, we can't get the data we need to proceed with our design. On their drill weekends at PEO Ships, reservists receive training as each type of sea strike system is introduced. We also have to test the systems which gives the reservists a chance to interoperate with the DD(X) node's Sea Strike capabilities prior to the FBE."*

DD(X) was not the only virtual platform testing systems and participating in the three-week joint warfighting experiment. The ship was part of an expanded Amphibious Group that included a virtual next generation E2-C Hawkeye, a virtual submarine, an unmanned underwater vehicle (UUV) from Naval Undersea Warfare Center in Newport, R.I., and a simulated Royal Australian Navy destroyer (virtual or vANZAC) in Canberra, Australia. The simulations networked live video feeds from a Predator vUAV to ships operating in the Pacific Fleet where shipboard systems were stimulated with actual radar, acoustic and electronic data as if actual platforms were participating in the event.

Dennis Warne of Naval Surface Warfare Center Dahlgren Division (NSWCDD) Theater Warfare Systems Department, who led a team of technical experts who configured the DD(X) node said, *"It was a challenge to network with NWDC (Naval Warfare Development Center) in Rhode Island and the fleet 14 time zones away. We developed artificial tactical systems and made them operate with real networks such as the Naval Fires Control System (NFCS) in the experiment. Our team of technicians — a majority are former military — understood the experiment's environment and worked behind the scenes to make sure the node's warfighters were connected with ADOCS/LAWS (Automated Deep Operations Coordination System/ Land Attack Warfare System), JSAF (Joint Semi-Automated Forces) Simulation, AFATDS (Advanced Field Artillery Tactical Data System), ANGuSS (Advanced Naval Gun Simulation System), NFCS and JFN."*

"*This is an evolution of fleet battle experiments that we started as a reserve unit last year,"* said Capt. Sposato. *"We're working this in conjunction with mobilization readiness. It supports our gaining command, the Program Executive Office for Ships, who oversees the acquisition of the DD(X)."*

As their technical expertise helps to transform the fleet, the PEO Ship reserve unit is expected to undergo a transformation themselves from the Navy's DD(X) testing team to the Navy's DD(X) training team focusing on Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) systems.

Sasser's work with the PEO(S) HQ 306 reserve unit and the design agent during fleet battle experiments will help introduce combat and C4ISR systems integration, precision strike and volume fires capabilities aboard the DD(X). Making the fleet's future a reality by helping to build ships is a Sasser family tradition started by her great grandfather a century ago. "*In the late 1800s and early 1900s, his family business built diesel engines for the Navy,"* said Sasser, a Raytheon mission planner from Aurora, Colo. *"Now, here I am, in the Naval Reserve on assignment in this historic part of the country where George Washington was born, helping the design agent build DD(X) and preparing to train our active duty counterparts to become proficient on the Joint Fires Network."*

For more information go to www.nwdc.navy.mil/Products/FBE/FBEKilo.

Coalition Interoperability Tested at Dahlgren During JWID 2003

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A Spanish soldier sent U.S. Army Staff Sgt. Timothy Knoblach an Artillery Systems Cooperation Activity (ASCA) message from Madrid via a global wide-area network that called for fire on a specific target out of reach. Instantaneously, a dozen military and civilian visitors on tour at Joint Warrior Interoperability Demonstration (JWID) 2003 in Dahlgren, Va., witnessed a demonstration of coalition interoperability action — if they didn't blink an eye.

The U.S. Army fire support sergeant used the Advanced Field Artillery Tactical Data System (AFATDS) to respond decisively to the request by coordinating artillery support with a U.S. Navy warship through the Naval Fires Control System (NFCS).

"Spain is proving they have interoperability with our systems," said Knoblach. *"In the past, we had to run back and forth to use a radio. This new digital exchange of information gives us complete control, overcomes language barriers and does not allow us to fire on friendly troops ... it forces prior coordination before conducting fire missions in a friendly area."*

"*ASCA enables the Spanish field artillery tactical system to become interoperable with the U.S. Army and U.S. Marine Corps tactical fire support system,"* said JWID 2003 Dahlgren Site Manager Dennis Warne. *"... We have to correctly and quickly provide data to a multitude of users — to various nations and cultures that act and think in a different context."*

Information sharing across multiple domains — a critical capability in the Global War on Terrorism is the main concern in coalition interoperability. At the Dahlgren site, many new information technologies and methodologies were tested to determine their usability in a myriad of combat situations that depend on fast, accurate and secure coalition interoperability. JWID, an annual exercise between the U.S. Joint Chiefs of Staff and the international community focuses on Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). This exercise provides an opportunity for government, private industry and coalition partners to demonstrate new and effective joint warfighting technologies globally.

"*This area of interoperability is vital to our warfighting success,"* said Barry Dillon, head of NAVSEA's Theater Warfare Systems Department. *"We have got to improve and stay ahead of our adversaries who have equal access to hardware technologies."*

With a focus on JWID 2003's theme, "Coalition Interoperability, the 21st Century Warfighter's Environment," JWID's 42 Coalition Interoperability Trials (CIT) assessed at various sites offered a full spectrum of solutions to improve combatant commanders near-term coalition interoperability. Each CIT, conducted in a simulated operational environment to provide context for warfighter