



NAVAIR's Hairy Buffalo Provides Network for Sea Strike



By Amy Behrman

NAVAIR Network Centric Warfare Office

The Hairy Buffalo, NAVAIR's Time Critical Targeting test bed, demonstrated the power of forward-based decision-making during a recent Navy experiment in the Bahamas. Sponsored by NAVSEA, Commander, Naval Submarine Forces, OPNAV N61F (FORCEnet requirements office) and NAVAIR's Network Centric Warfare Office, the Giant Shadow experiment assessed emerging NCW tactics and technology requirements in the areas of networks, data fusion, command & control, situational awareness tools, and platform/sensor architectures.

The "Giant Shadow" Limited Objective Experiment was the first in a series of SSGN transformational payloads and sensors experiments, as well as the first FORCEnet LOE under the CNO's Sea Trial initiative.

"The Hairy Buffalo demonstrated significant capabilities in linking warfighters to enable a massing of effects rather than a massing of forces," said CDR Ron Carvalho, Hairy Buffalo project manager. According to Carvalho, the aircraft served as a persistent ISR platform, conducting initial preparation of battlefield data, and providing "eyes in the sky"



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and airborne command and control for embarked Navy SEALs. "The Buffalo provided common communications interfaces that allowed ground, surface, and undersea elements to operate together, seamlessly in sea strike operations," added Carvalho.

The Giant Shadow Experiment was designed to explore how a network of forces consisting of a stealthy platform (SSGN), Special Operations Forces, Unmanned Vehicles (UUVs & UAVs) and sensors (underwater, overhead, and ground) could be used to clarify ambiguous intelligence and provide persistent ISR, and then develop, recommend, and execute appropriate courses of action within the guidance of the Joint Commander, including time-critical strike.

Supporting objectives included demonstrating time-critical cueing and fusion of manned, unmanned, and unattended sensor information; determining whether an orbiting UAV with a COTS communications network repeater could reduce reliance on overburdened satellite channels; and testing how this network of forces might enable SOF/SSGN to transition from reactive to preemptive operations. Final results of Giant Shadow are currently being evaluated.

According to CDR Carvalho, the Hairy Buffalo successfully demonstrated three different "networkable" battlefield data links during the experiment, including Free Wave, VRC-99, and the TCDL (tactical common data link). TCDL is currently in use operationally, and will be migrated to the Predator UAV. The VRC-99, a networking radio used by the Marine Corps, hosted multi-party Joint Fires Network computers aboard surface, subsurface, and airborne platforms during the exercise. The heightened shared awareness achieved by this robust network of forces resulted in the successful detection and destruction of a simulated weapons-of-mass-destruction facility.

Assessing the Impacts of Technology on Joint Tactical Doctrine

Currently hosted on a modified NP-3C aircraft, the Hairy Buffalo architecture enables the warfighting fusion to deliver effects based operations – a key element of Sea Power 21. The end goal is to lock out enemy options through increased reach, persistence, precision and speed. The Buffalo's ability to distribute intelligence products to various elements of a networked force enables forward-based decision-making and decentralized execution of Command and Control -- enabling a more rapid response to emerging threats, and limiting the exposure of ground personnel to hostile enemy action.

According to Carvalho, Hairy Buffalo has more capability for Time Critical Targeting than any other Naval Aircraft, and has demonstrated a clear reduction in the kill chain by conducting targeting onboard the platform and transmitting information directly to strikers. Improvements have been demonstrated by increasing automation and the amount of knowledge made available to the executives/decision makers.



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Hairy Buffalo is equipped with radar, electro optic, and electronic surveillance system sensors developed by industry and government research labs. Some of these sensors are now in the Fleet, while others are being evaluated for future use. The aircraft is manned by approximately 15 flight crewmembers including pilots, flight officers, engineers, and systems operators. Approximately six individuals man the C4I ground-processing node, which is a mirror of the airborne node, minus the sensors. The Hairy Buffalo architecture could be repackaged to fit a standard military shelter onboard a ship, or be airborne on a C-130. Plans for footprint reduction are currently underway.

Recognizing that NCW is fundamentally joint, the Hairy Buffalo supports the development of Joint NCW doctrine by enabling networked, Joint Force Communications (including F/A-18, F-15, F-14, platforms participating in the Link 16 net, and Army and Marine Corps ground forces through Advanced Field Artillery Tactical Data System [AFATDS]). The Hairy Buffalo is also the first naval aircraft to demonstrate the Joint Fires Network (JFN) triad of Tactical Exploitation System (TES), Global Command and Control System - Maritime (GCCS-M), and Precision Targeting Workstation (PTW) directly onboard the platform.

"The Hairy Buffalo is a cost effective enabler for determining the impact of technology on tactical doctrine," said Carvalho. "It allows us to conduct systems-of-systems engineering – integrating the latest sensors, processors and communications systems and then evaluating associated changes in doctrine and tactics – rapidly, affordably, and at reduced risk for our programs."

New capabilities and tactics developed via Hairy Buffalo experimentation will ultimately be transferred to the Navy's P-3 Aircraft Improvement Program (AIP), Maritime Strike Targeting (MST) and Multi-Mission Maritime Aircraft (MMA) programs.

"The Giant Shadow experiment confirmed that Hairy Buffalo is a superb vehicle for demonstrating the art of the possible," said Capt. Alan Easterling, Special Programs Director, NAVAIR Network Centric Warfare office. "Hairy Buffalo is an essential apparatus in the Navy's transformation laboratory."

Additional military units taking part in GIANT SHADOW included the USS FLORIDA; elements of Naval Special Warfare Group Four; Naval Meteorology and Oceanography Command's USNS Mary Sears (T-AGS-65); and Naval Oceanographic Office's UUV, the "Sea Horse." The experiment was conducted at the Atlantic Undersea Test and Evaluation Center (AUTEC) in the Bahamas.

The Hairy Buffalo is a Time Critical Targeting, Network Centric Warfare test bed aircraft, which was designed, built, tested and operated by NAVAIR personnel in less than six months. The project was designed to evaluate new



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technologies and advanced operational capabilities and tactics, quickly and at reduced risk for naval aviation programs.

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