Joint Non-Lethal Weapons Program Newsletter

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JNLWP

First Quarter
Fiscal Year 2010

JNLWP Participates in Non-Lethal Weapons Executive Seminar 2009

U.S. Marines and Australian soldiers perform a riot control demonstration during the Non-Lethal Weapons Executive Seminar 2009.
U.S. Marine Corps photo by Lance Cpl. Paul D. Zellner II

Again this year, the Non-Lethal Weapons Executive Seminar (NOLES) educated U.S. allied and partner nations in the Pacific Command (PACOM) area of responsibility about non-lethal weapons (NLWs). Representatives from the Joint Non-Lethal Weapons Program (JNLWP) attended NOLES 2009, an annual, bilateral demonstration and seminar, Sept. 14-24 in Townsville, Queensland, Australia.

NOLES educates attendees about how to employ the minimum amount of force necessary in a variety of escalation-of-force situations. Attendees learn non-lethal techniques to minimize casualties and damage to infrastructure, maintain peace and handle unrest.

U.S. Marine Forces Pacific (MarForPac) leads NOLES annually as a joint-service event. The Australian military hosted NOLES 2009. Activities included NLW training, an escalation-of-force demonstration and a seminar.

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JNLWP Participates in Non-Lethal Weapons Executive Seminar 2009

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Special Operations Training Group, III Marine Expeditionary Force, based in Okinawa, Japan, conducted the 10-day NLW training portion of NOLES. The Australian Army's 3rd Brigade hosted the training event. Through practical demonstrations, the Marines taught more than 80 Australian junior-level soldiers how to use a variety of non-lethal capabilities currently fielded in Iraq and Afghanistan. These included fin-stabilized rubber bullets, 40mm non-lethal munitions, non-lethal rubber sting-ball grenades, marking rounds fired from an FN-303 Less-Lethal Launcher, the TASER® X-26 human electro-muscular incapacitation device, riot batons and shields, an acoustic hailing device and the Vehicle Lightweight Arresting Device.

The Australian soldiers also shared some of their insight and processes with the Marines. "There was a good balance of tactics, techniques and procedures sharing between the U.S. Marines and the Australian soldiers," said PACOM NLW Combatant Command Liaison Officer Larry Brown, who organized the seminar portion of NOLES 2009.

Lieutenant Colonel Paul Scholl, Capabilities and Requirements Division Chief for the Joint Non-Lethal Weapons Directorate (JNLWD), attended NOLES 2009 and agreed. "The Marines took away as much from the Aussies as the Aussies did from the Marines," said Lt. Col. Scholl.

After the NLW familiarization, the Marines and Australian service members performed escalation-of-force demonstrations, including a vehicle-stopping demonstration and a crowd-control demonstration. The demonstrations illustrated the non-lethal skills and tactics the service members learned during the training.

After the demonstration, NOLES attendees visited static displays featuring the non-lethal weapons, munitions and devices demonstrated earlier, received hands-on NLW familiarization and employed a variety of the non-lethal munitions and devices from the demonstration.

Participating Countries

Australia, Bangladesh, Cambodia, Indonesia, Malaysia, Maldives, Mongolia, Nepal, Papua New Guinea, Philippines, Singapore, Thailand, Tonga, United States, Vanuatu, Vietnam

Approximately 80 senior-level military officers from Australia, the United States and 14 other Pacific-region countries attended the escalation-of-force demonstrations, followed by a two-and-a-half-day seminar. The seminar included briefs and multilateral, multinational forums with discussion of non-lethal tactics, techniques and procedures, equipment, lessons learned, rules of engagement, laws of armed conflict and planning methods. JNLWP representatives also presented a program overview brief.

During the seminar, some of the participating countries discussed their experiences with their military's use of NLWs, according to Lieutenant Commander Lance Lantier, Education Officer for the JNLWD, who also attended NOLES 2009. "Their candidness led to open discussion about why non-lethal weapons are important," said Lt. Cmdr. Lantier.

Australian officials plan to continue internal discussions and promote the use of NLWs for future applicable operations, according to Brown. The JNLWP plans to support NOLES 2010, tentatively scheduled for next summer in Mongolia.

—BY JENNIFER BOWEN

Technology

Researchers Test Laser Windshield Obscuration Technology

The Joint Non-Lethal Weapons Program (JNLWP) is working to meet warfighter needs by developing technologies to fill identified capability gaps. One of the biggest challenges U.S. operating forces face today is dealing with suspicious vehicles at checkpoints and entry control points and determining drivers' intent. As a result, non-lethally stopping or disabling vehicles are top-priority capability gaps that call for new non-lethal escalation-of-force options to help diffuse these dangerous situations and minimize casualties.

The JNLWP is funding several efforts to address these capability gaps. One such effort is the laser windshield obscuration project, which is exploring the use of directed-energy technology to non-lethally stop or disable vehicles. The Directed Energy Warfare Office at the Naval Surface Warfare Center Dahlgren Division, Va., is performing the research for the project.

"Determining whether an approaching vehicle is carrying friendly or hostile passengers is a daily challenge for U.S. operating forces overseas," said Colonel Tracy Tafolla, Director of the Joint Non-Lethal Weapons Directorate (JNLWD). "The JNLWP is sponsoring efforts to develop new technologies that enable our troops to engage potential threats at extended ranges while minimizing casualties and collateral damage."

The laser windshield obscuration project is investigating the use of laser technology to physically obscure vehicle windshields, blocking the driver's view and compelling him to slow or stop the vehicle. While currently fielded laser distracters can cause temporary optical incapacitation, they are most effective at night. The laser windshield obscuration effort is working to produce the same obscuration effects regardless of ambient light conditions.

Initial research attempted to identify the best laser parameters to either crack or blacken a windshield so that the driver could not see through it. Researchers successfully discovered the laser parameters that could crack a windshield without harming the vehicle occupants. In the process, they found that the same parameters produced a bright white flash on the windshield regardless of lighting conditions, which may cause temporary optical incapacitation to the driver, according to Scott Griffiths, systems engineer at the JNLWD. The project is planning to conduct human effects and behavioral research to verify that the white light flashes can temporarily incapacitate a driver's vision and compel him to halt his vehicle.

Researchers have now begun testing the technology at realistic ranges over real road surfaces with a configuration built using commercial-off-the-shelf parts. The outdoor testing began in August to study how atmospheric conditions will affect the laser beam over a road surface.

This series of video images from laser windshield obscuration testing shows the bright white flash caused by the laser and the ensuing damage to the windshield glass. Researchers are now working on creating the same flash while minimizing damage to the windshield.

Official Department of Defense Images

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Researchers Test Laser Windshield Obscuration Technology *(continued from page 3)*

Researchers tested the configuration along a real roadway against static vehicle windshields hundreds of meters away. During this testing, the laser windshield obscuration system demonstrated the ability to produce the windshield effects identified in the laboratory at tactical ranges of hundreds of meters, according to Griffiths. Researchers will now use the information to refine the technical objectives for the prototype laser and optical subsystem.

In addition, researchers have discovered a new windshield effect using a pulsed laser. By creating a plasma on the surface of the windshield, the new pulsed laser causes a flash of light and a loud bang, an effect similar to the explosion of a large firecracker. Researchers will now work to determine the optimum laser parameters for this new effect, which may have additional counter-personnel applications for warning, hailing or suppressing individuals.

Fiscal year 2010 plans for the laser windshield obscuration project include conducting dynamic testing against moving vehicles to provide information to refine the specifications for the prototype laser. As this technology advances, the JNLWP will continue to support efforts to develop new non-lethal technologies to address the Services' identified capability gaps.

—BY NANCY KOREEN

JNLWD Builds Industry Relationships at BELCOAST '09

The Joint Non-Lethal Weapons Directorate (JNLWD) recently participated in BELCOAST '09, a NATO exercise aimed at informing NATO member nations and the international defense acquisition community about infrastructure protection and port and harbor defense. The exercise, held Oct. 5-15 at Koksijde Air Base along the Belgian coast, included technology demonstrations, static displays and industry exhibits, some of which featured non-lethal weapons and technologies.

Lieutenant Commander Pete Simonds, the JNLWD's U.S. Coast Guard liaison officer, represented the JNLWD at NATO's Research and Technology Organisation static display to share information and answer questions about non-lethal weapons. The static displays gave attendees the opportunity to learn about current and future technologies and capabilities from industry representatives. Visitors included high-ranking senior acquisition officials, including the U.S. Under Secretary of Defense for Acquisition, Technology and Logistics and his counterparts from other NATO nations, along with their staff members, flag and general officers, and other JNLWD representatives.

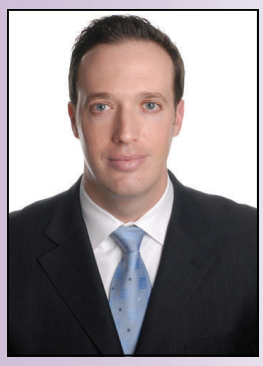
Colonel Tracy Tafolla, Director of the JNLWD, commented that industry involvement is key to developing new non-lethal weapons and technologies. "By attending events like BELCOAST, we build industry relationships and interest in developing non-lethal weapons that could fill critical non-lethal capability gaps," said Col. Tafolla.

The JNLWD plans to continue to work with NATO and industry representatives to develop non-lethal capabilities that will meet the needs of U.S. and allied operating forces.

—BY JENNIFER BOWEN

CLO in Action: Anthony Lewis at U.S. Africa Command (AFRICOM)

The Non-Lethal Weapons (NLW) Combatant Command (COCOM) Liaison Officers (CLOs) are the Joint Non-Lethal Weapons Program's representatives in the field. CLOs work to raise awareness and visibility of NLWs in their respective COCOMs. They also help identify specific needs for NLWs in the COCOM and establish procedures for integrating NLWs into operational planning.



AFRICOM CLO
Anthony Lewis
Photo by
Amy Mullarkey

Q: When did you begin working as AFRICOM CLO?
A: February 2009

Q: What is your hometown?
A: Birmingham, Ala.

Q: What is your area of responsibility (AoR)?
A: AFRICOM is responsible for U.S. military relations with 53 African countries, including the Islands of Cape Verde, Equatorial Guinea, and Sao Tome and Principe, as well as the Indian Ocean islands of Comoros, Madagascar, Mauritius and Seychelles. AFRICOM also coordinates with Egypt on issues relating to Africa security.

Q: What role do NLWs play in AFRICOM?
A: In the AFRICOM AoR, NLWs offer commanders the ability to enhance force protection while minimizing negative perceptions; support operations and exercises; assist in the development of African Union standby brigades; and build partner capacity.

Q: What was your latest travel as CLO?
A: In October 2009, I was part of an NLW educational contact team that supported peacekeeping operations training for Exercise Natural Fire in Kitgum, Uganda. We provided NLW education and familiarization to service members from the United States, Uganda, Rwanda, Tanzania, Burundi and Kenya.

Q: What is your next big event as CLO?
A: In May 2010, we will provide NLW support to exercise AFRICAN LION in Tifnit, Morocco. AFRICAN LION is an annual U.S.-Moroccan exercise that includes various types of military training, including peacekeeping operations.

CLOs around the Globe

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Chris Csanadi Deckard Wins Award for Non-Lethal Work

Chris Csanadi Deckard (right) receives the SSC Pacific 2009 Technical Director's Award from Carmela Keeney, SSC Pacific Technical Director.
U.S. Navy photo by Alan Antczak

A senior scientist and program manager who supports the Joint Non-Lethal Weapons Program (JNLWP) recently won an award for her work, which includes non-lethal efforts. Chris Csanadi Deckard recently received the Space and Naval Warfare Systems Center Pacific (SSC Pacific) 2009 Technical Director's Award for her work in laser intelligence and laser sensor technology. Deckard's efforts have included a variety of projects for multiple programs, including the JNLWP.

Deckard, who has worked for the Navy at SSC Pacific for the past 26 years, began working with the JNLWP in 2005 as a subject matter expert on non-lethal laser, acoustic and vehicle-stopping systems. Deckard was part of an SSC Pacific team that developed a prediction model for non-lethal acoustic hailing and warning devices. The model aided in the military's decision to use acoustic means for non-lethal hailing and warning.

Today, Deckard continues to work with the JNLWP on projects such as non-lethal acoustic hail and warn technologies. She also oversees certain non-lethal laser technologies and vehicle-stopping systems as a project manager for SSC Pacific's Non-Lethal Technologies Program, which the JNLWP sponsors.

"Working with the Joint Non-Lethal Weapons Program is exciting and fast-paced," said Deckard. "Most of the efforts are on a rapid development and deployment schedule to get these technologies to our Service members."

Dave Law, Technology Division Chief for the Joint Non-Lethal Weapons Directorate, has worked with Deckard for many years. "It's great to see her get this recognition for her hard work and dedication," said Law. "Her work on laser and acoustic technologies has had a noteworthy impact on getting non-lethal hailing and warning capabilities to the warfighter."

Deckard received the award Aug. 7 during an SSC Pacific Strategic Planning Meeting. Carmela Keeney, SSC Pacific Technical Director, presented the award.

"Ms. Deckard's efforts and expertise in a variety of areas, including laser sensor technologies, and her leadership in technical education outreach made her the top candidate to receive the 2009 Technical Director's Award," said Keeney.

"I am honored to be a recipient of the award," said Deckard. "I am privileged to have worked on many diverse projects during my career. Working with the Joint Non-Lethal Weapons Directorate and finding solutions to military problems that are aimed at non-lethal and less-than-lethal methods has added to my satisfaction with the research and development that I am able to perform."

—BY JENNIFER BOWEN

Brooks City-Base, Texas

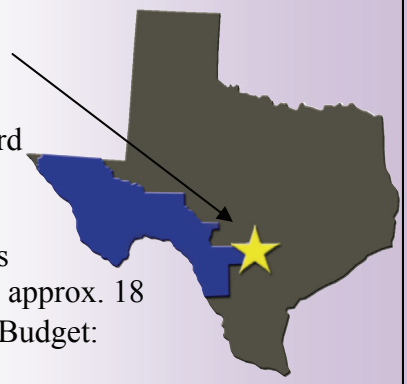
Since its founding in 1918, Brooks Field, which later became Brooks Air Force Base and then Brooks City-Base, has been a hub of military research and innovation. Now occupying 1,246 acres of western Texas, Brooks City-Base in San Antonio houses a host of military and non-military bioscience, academic, environmental and technical research organizations. Among these, the U.S. Air Force and the U.S. Navy conduct human effects research at Brooks on behalf of the Joint Non-Lethal Weapons Program (JNLWP), contributing to the study and understanding of the human effects and effectiveness of non-lethal weapons systems.

Human effects research is essential to the development of any new non-lethal weapon. Through experimentation and modeling, human effects research aims to determine the desired and unintended effects of a weapon system across its operating envelope.

The human effects research at Brooks is critical to providing warfighters with non-lethal escalation-of-force options. "We conduct research on the forefront of science, which helps the United States monitor directed-energy weapon development worldwide," said Dr. Gordon Hengst, Integration Manager at the Air Force Research Laboratory (AFRL) Directed Energy Bio-effects Division at Brooks. "Our insight helps reduce the risk of technological uncertainty so our fighting forces won't be surprised with unintentional effects of a new weapon as they enter into a conflict."

The JNLWP sponsors a variety of human effects research efforts at Brooks related to the bio-effects of directed-energy technologies, with an estimated JNLWP-sponsored fiscal year 2010 budget of $2.2 million. Within the AFRL Directed Energy Bio-effects Division, the Radio-Frequency Radiation Branch researches the bio-effects associated with the Active Denial System and other radio-frequency sources. The Optical Radiation Branch studies the bio-effects associated with lasers, including non-lethal optical distracters. Finally, the Human Effects Center of Excellence (HECOE), within the Bio-behavioral Systems Branch, oversees and analyzes human effects and risk characterization research for non-lethal weapons systems. HECOE also supports the development of tools to predict responses based on non-lethal weapon doses and maintains a non-lethal weapons human effects knowledge base.

Brooks City-Base



Quick Facts:

- Congressional District: 23rd
- District Population: approx. 650,000
- Total Employees at Brooks Working on NLW Efforts: approx. 18
- JNLWP-Sponsored FY10 Budget: est. $2.2 million
- Research at Brooks: Tang, which astronauts drank in space during the Gemini missions, was tested at Brooks.

In addition, the Naval Medical Research Unit–San Antonio (NAMRU-SA) supports the JNLWP by conducting human electro-muscular incapacitation (HEMI) bio-effects research. NAMRU-SA has supported the JNLWP's HEMI bio-effects program for the past five years by researching the biological effects of HEMI devices to better understand the risks associated with electro-muscular incapacitation, according to Randal LeBlanc, director of research support at NAMRU-SA.

With JNLWP support, the Air Force and Navy scientists and researchers at Brooks City-Base will continue to provide human effects data to aid in the development of non-lethal weapons that give warfighters crucial escalation-of-force options. —BY NANCY KOREEN

Air Force and Coast Guard Hold Integrated Concept Team Meetings

As part of individual Service efforts to incorporate non-lethal capabilities into their operations, each Service, as well as U.S. Special Operations Command and the U.S. Coast Guard, holds annual or semi-annual non-lethal weapons (NLW) Integrated Concept Team (ICT) meetings. At these meetings, representatives from different organizations within that Service discuss NLW programs and technologies, identify NLW requirements and share their experiences using the weapons. Over the past several months, the U.S. Air Force and U.S. Coast Guard have held NLW ICT meetings.

Air Force ICT Meeting

The U.S. Air Force held an NLW ICT meeting September 23-24 at Lackland Air Force Base in San Antonio, Texas. At the meeting, Air Force major command (MAJCOM) representatives defined their requirements for non-lethal vehicle stopping, and Headquarters Air Education and Training Command defined its requirements for non-lethal vessel stopping. The MAJCOMs also discussed the results of the Air Force Functional Solution Analysis. The Air Force will use the results to develop its non-lethal weapons/capabilities roadmap, which will highlight solutions to meet future NLW requirements. The team also discussed the initial draft of the Air Force Concept of Operations. In addition, the meeting included NLW simulation demonstrations with non-lethal platforms and munitions. The MAJCOMs also provided their initial comments on the proposed Air Force escalation-of-force kits. For more information, contact Sal Hernandez, the Air Force's NLW Central Action Officer, at salvador.hernandez@lackland.af.mil. —REPORTED BY ANNIE WHEATON

Coast Guard ICT Meeting

At the U.S. Coast Guard ICT meeting on September 22-24 at the Coast Guard Research and Development Center in New London, Conn., Coast Guard District and Station representatives identified their non-lethal counter-personnel (ashore and afloat) capability gaps. The Coast Guard will use this information to identify and develop the best approaches or combination of approaches in doctrine, organization, training, materiel, leadership and education, personnel, and facilities to resolve or mitigate these capability gaps. The Coast Guard's next ICT meeting, scheduled for March 2010 at the Coast Guard Research and Development Center in New London, will focus on counter-vessel requirements. The Coast Guard will then use this information to develop potential solutions to its identified non-lethal counter-vessel capability gaps. For more information, contact Sue Muerdler, the Coast Guard's NLW Program Support Officer, at melinda.s.muerdler@uscg.mil. —REPORTED BY SUE MUERDLER

Upcoming Events

19-22 January: SHOT Show
Las Vegas, Nev. Visit www.shotshow.org.

1-10 February: COBRA GOLD
Chiang Mai, Thailand. Contact Larry Brown, larry.m.brown.ctr@usmc.mil.

9-11 February: NDIA Special Operations/Low Intensity Conflict Symposium and Exhibition
Washington, D.C. Visit www.ndia.org/meetings/0880/Pages/default.aspx.

10-11 February: U.S. Special Operations Command NLW Integrated Concept Team Meeting
St. Petersburg, Fla. Contact Robin Burdick, robin.burdick@usog.jacobs.com.

Improved Flash-Bang Grenade Team Wins Air Force Science Award

As part of the Department of Defense effort to outfit warfighters with non-lethal escalation-of-force capabilities, a U.S. Air Force team has been studying the human effects of the Improved Flash-Bang Grenade (IFBG). In recognition of its work, the Air Force team recently won the Air Force 2009 Science, Technology, Engineering and Mathematics (STEM) Award for Outstanding Scientist Team. The Air Force chose the IFBG team for its efforts that led to the development of a safer and more effective flash-bang grenade.

The IFBG creates a loud bang and a large, bright, long-duration flash to temporarily incapacitate targeted individuals. The IFBG incorporates improved safety to the user and noncombatants in the target area, as well as reduced environmental impacts and a longer-duration incapacitation than previous flash-bang grenades. The IFBG is currently in the engineering and manufacturing development phase of the acquisition process. IFBG capabilities will enable U.S. forces to more effectively support missions such as hostage rescue, room clearing and other operations in complex urban areas.

According to the award citation, the team determined the human effects necessary to increase mission effectiveness by analyzing flash-bang grenade injury data, writing software to analyze flash effects and determining sound exposure limits. The team's research resulted in critical design and performance specifications for IFBG prototypes that meet U.S. military needs.

The 12-member IFBG team includes military, government and contractor personnel from the Air Force Research Laboratory (AFRL), 711th Human Performance Wing, Human Effectiveness Directorate, Directed Energy Bioeffects Division and the Human Effects Center of Excellence. The Joint Non-Lethal Weapons Program sponsors the IFBG program.

"The analysis effort for the IFBG program was one of the most rewarding yet challenging efforts I have been part of in nearly 14 years of Air Force service," said award recipient 1st Lieutenant David Wooddell, IFBG modeling lead and mathematician at AFRL's Optical Radiation Branch. "It was great to be directly involved with and to impact a program that is helping put a safer tool in the hands of those who need it most in future military operations."

During a ceremony at the U.S. Air Force Academy in Colorado Springs, Colo., on Sept. 23, General Carrol H. Chandler, Vice Chief of Staff of the U.S. Air Force; Lieutenant General Mark D. Shackelford, Military Deputy for the Assistant Secretary of the Air Force for Acquisition; and Dr. Werner J.A. Dahm, U.S. Air Force Chief Scientist, presented the award to four IFBG team members who accepted it on behalf of the entire team.

(Left to right) 1st Lt. Allan Nagy, 1st Lt. Katharine Sheldon, Gen. Carrol H. Chandler, Lt. Gen. Mark D. Shackelford, Dr. Robert Thomas, Dr. Werner J.A. Dahm and 1st Lt. David Wooddell during the presentation of the Air Force 2009 STEM Award for Outstanding Scientist Team.
U.S. Air Force photo by Mike Kaplan

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IFBG Team Wins Air Force Science Award *(continued from page 9)*

This latest honor comes on the heels of two other awards the IFBG team recently won. In January, the team received the Air Force Research Laboratory's top technology transition award for 2008. In May, the team received the Air Force Materiel Command 2009 Science, Engineering and Technical Management Award for Best Scientist Team.

Through its human effects research, the IFBG team has led the way for improved grenade safety for targeted individuals and operators, increasing warfighters' capabilities to conduct the full spectrum of military operations. —BY JENNIFER BOWEN

JNLWP Sponsors Combined Light and Sound Experiments

The Joint Non-Lethal Weapons Program (JNLWP) recently sponsored combined non-lethal light and sound human effects and military utility experiments. The Directed Energy Warfare Office at the Naval Surface Warfare Center Dahlgren Division, Va., performed the research using the Distributed Sound and Light Array (DSLA). The goal of the experiments was to determine the effects of combined non-lethal light and sound stimuli on vehicle and vessel drivers. The results will aid in determining the effects' potential military utility for both checkpoint operations and naval vessel exclusion areas, according to Randy Woods, the technical lead for the DSLA experiments at Dahlgren.

The DSLA, shown here mounted on a Humvee, uses combined light and sound stimuli to non-lethally hail and warn a vehicle during the experiments.
Official JNLWP photo by Vincent A. DePrenger

Some of the highest-priority capability gaps the JNLWP and the Services have identified include the ability for operating forces to non-lethally stop suspicious vehicles and vessels at safe distances. The combined non-lethal light and sound experiments will help determine whether the DSLA technology has non-lethal vehicle or vessel stopping applications.

The DSLA produces distant alert and warning effects using a combination of distributed high-output acoustical warnings and high-output non-coherent and coherent light sources. The DSLA provides a non-lethal capability to hail, warn, inform, distract, deter and dissuade targeted individuals at significant stand-off distances.

The first set of experiments, conducted in August and September, involved stationary testing to gather baseline data. The second round of experiments, conducted in October and November, involved testing the DSLA's technology against drivers in vehicles and vessels.

According to Rick Scott, project engineer at the Joint Non-Lethal Weapons Directorate, preliminary results indicate that non-lethal sound and light at moderate intensities are effective at producing measured effects in targeted individuals. Researchers anticipate that final reports will confirm that the DSLA's sound and light components working together will be more effective than either stimulation employed alone.

Future plans call for DSLA demonstrations for Service and Combatant Command representatives to show how this developing escalation-of-force technology can provide important non-lethal hail and warn capabilities to U.S. operating forces. —BY JENNIFER BOWEN

JNLWP Welcomes Lieutenant General Waldhauser

On Sept. 25, Lieutenant General Thomas D. Waldhauser replaced Lieutenant General Joseph F. Dunford, Jr., as Deputy Commandant of Plans, Policies and Operations (DC PP&O) at Headquarters Marine Corps. As DC PP&O, Lt. Gen. Waldhauser also serves as the Chairman of the Joint Non-Lethal Weapons Program (JNLWP) Integrated Product Team, providing guidance and direction to the JNLWP.

Lt. Gen. Waldhauser's previous assignment was Commander of the First Marine Division. His long and distinguished career also includes serving as Chief of Staff for U.S. Special Operations Command; commanding the 15th Marine Expeditionary Unit (Special Operations Capable) during combat operations in Southern Afghanistan for Operation Enduring Freedom and in Iraq for Operation Iraqi Freedom; and serving as Commanding General of the Marine Corps Warfighting Laboratory. Lt. Gen. Waldhauser has a Master's degree in National Security Strategies from the National War College.

Lieutenant General Thomas D. Waldhauser
Photo by Combat Camera, Headquarters Battalion, Headquarters Marine Corps

Hail & Farewell

Hail to:

BGen Paul W. Brier, USMC
Non-Lethal Weapons Executive Agent
U.S. European Command/
U.S. Africa Command

RADM (Sel) Kevin Scott, USN
Joint Integrated Product Team
U.S. Navy Voting Principal

RADM Thomas F. Atkin, USCG
Joint Integrated Product Team
U.S. Coast Guard Voting Principal

Irina Clements
Acquisition Analyst
Joint Non-Lethal Weapons Directorate

Cheryl Avent
Logistics Manager
Joint Non-Lethal Weapons Directorate

Robert Celeste
Contracting Officer
Joint Non-Lethal Weapons Directorate

Donna Reedal
Non-Lethal Maritime Officer of
Primary Responsibility
Joint Non-Lethal Weapons Directorate

Farewell to:

MajGen (Sel) Tracy L. Garrett, USMC
Non-Lethal Weapons Executive Agent
U.S. European Command/
U.S. Africa Command

BG Joseph Martz, USA
Joint Integrated Product Team
U.S. Army Voting Principal

RADM Sinclair Harris, USN
Joint Integrated Product Team
U.S. Navy Voting Principal

RADM Paul Zukunft, USCG
Joint Integrated Product Team
U.S. Coast Guard Voting Principal

Valerie Tolan
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Anthony Pais
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Joint Non-Lethal Weapons Directorate