DEFENSE LOGISTICS AGENCY

MAY – JUNE 2016

LOGLINES

RESEARCH AND DEVELOPMENT




FROM THE

DIRECTOR

Lt. Gen. Andy Busch, USAF
Director, Defense Logistics Agency

One thing that makes me proud to be part of DLA is our ability to anticipate customer needs and innovate to meet our warfighter requirements no matter how often they change. Through the Research and Development Program, DLA continuously innovates to keep our systems at the forefront of technology.

Our R&D team identifies and prioritizes innovative programs based on customer requirements. Research and investment in emerging technologies means we have a greater capability to meet the warfighter's needs. Our early exploration and investment in these technologies will provide our customers the opportunity to capitalize on our work and potentially save time and money.

One example is the additive manufacturing process. Like 3D printing, it uses layers of material to create functional parts and products instead of the more wasteful subtractive process, in which machines shape material. This is a critical development in making items that are hard to source and providing parts that require long lead times.

In this issue, you'll find the latest on how DLA R&D is working to recoup taxpayer money by exploring new ways to dispose of demilitarized vehicles. You can see how a DLA product testing center makes sure the materials used in military uniforms conform to specifications. You can also read about several ongoing R&D projects, involving everything from batteries, to casting and forging, to how we feed our personnel.

Some projects are still in early stages but hold great promise for logistics operations and allow us to understand the potential of disruptive technologies. These innovations will remove the barriers to using commercial technology, reduce response times and ensure investments directly benefit the warfighter and our other customers.

Our ever-present goal at DLA is to efficiently turn logistics R&D investments into operational solutions. Through our collaborations with industry, we can eliminate unproductive processes and encourage evolving ones that boost capabilities, cut costs and deliver logistics excellence now and in the future. ✪

LOGLINES

Official Flagship Publication
of the Defense Logistics Agency

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Loglines is the authorized publication for the Defense Logistics Agency's workforce of federal civilians, active-duty military and Joint Reserve Force augmentees at agency activities worldwide and industry customers of DLA. Contents of this publication are not necessarily the official views of, or endorsed by, the U.S. government, the Department of Defense or the Defense Logistics Agency.

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Loglines is prepared electronically, using desktop publishing applications; no commercial typesetting costs are involved. Photos not credited are courtesy of agency sources. Submissions and correspondence may be sent to the address below:

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DLA RESEARCH AND DEVELOPMENT

A STRATEGIC ACTIVITY THAT LIVES IN AN OPERATIONAL ENVIRONMENT

Story by Kelly Morris, Chief, DLA Research and Development

Imagine people being transported across country by land in just minutes, at speeds over 700 miles per hour. Now think of how this game-changing innovation might be applied to logistics.

Elon Musk's Hyperloop is an "elevated tube that runs for hundreds of miles between cities, propelling passengers at near supersonic speeds," wrote Shervin Pishevar, co-founder and chairman of Hyperloop Technologies, in "Hyperloop Is Real: Meet The Startups Selling Supersonic Travel" (*Forbes*, Feb 15, 2015). It is creative, innovative and definitely a game-changer — a futuristic idea residing in basic research.

Research and development at the Defense Logistics Agency is applied research, enabling supply-chain innovation that directly supports the warfighter. It is a strategic activity that lives in an operational environment. Each day, program managers in the DLA Logistics Operations' R&D Division seek to harness new manufacturing or logistics processes and leverage emerging technologies that will empower the warfighter to be more efficient and effective.

They work with DLA stakeholders and industry to understand gaps in technologies, problem areas and disruptive technologies, and then employ sound, economic solutions to integrate into the end-to-end supply chain. R&D's manufacturing technology — ManTech — and logistics technology — LogTech — programs are well suited for the job. R&D has employed a sound approach over the past few years and become even more strategically focused, identifying and assessing disruptive technologies appropriate for a logistics operational environment, and aligning investments to DLA priorities that support the warfighter.

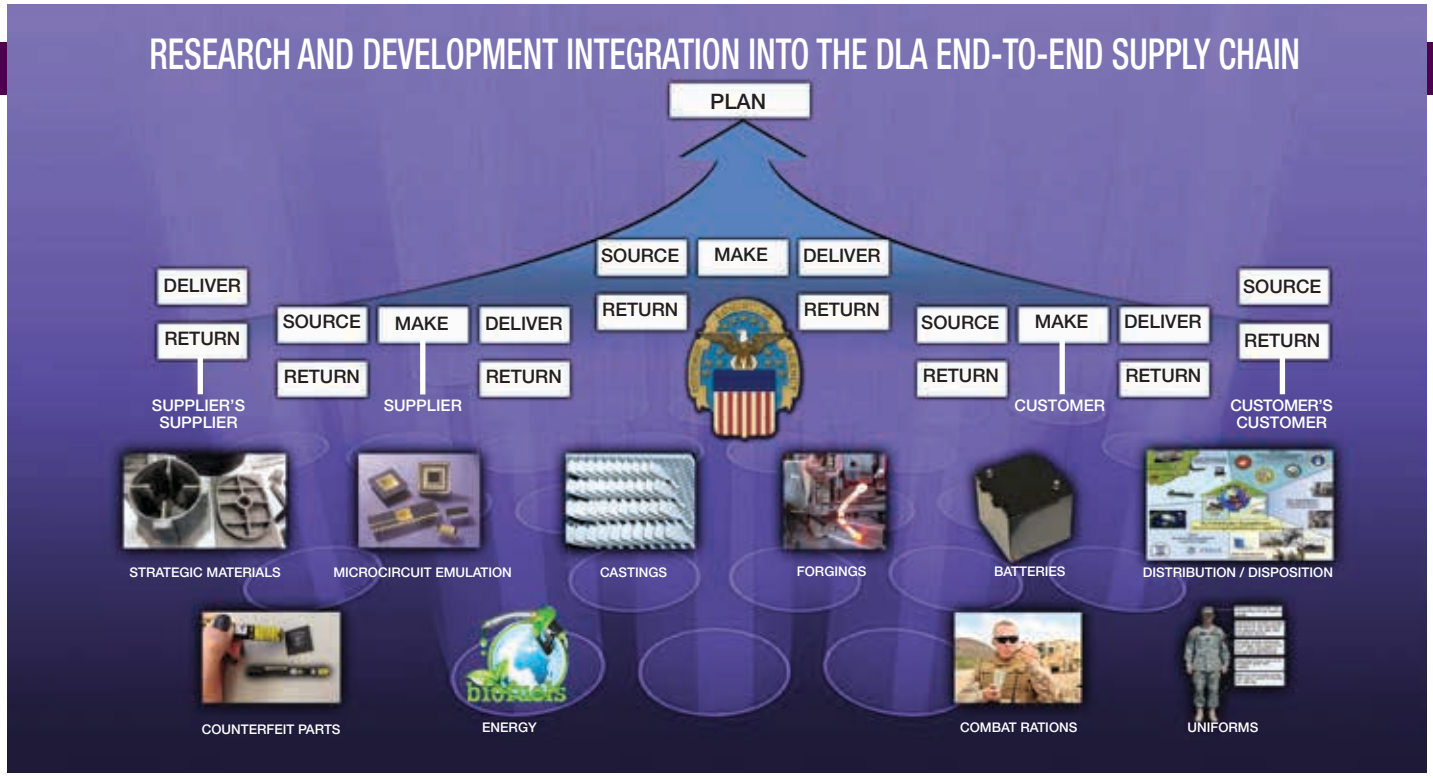
Courtesy Photo

New technologies such as this automated forklift could soon be available to DLA employees.

R&D in the End-to-End Supply Chain

DLA R&D efforts are aligned by budget activities and program elements that support the development of a responsive, world-class manufacturing capability to meet warfighter needs throughout a defense system's lifecycle. R&D efforts also pioneer advanced logistics concepts and business processes that provide the leanest logistics footprint, adopt best commercial practices, and develop technical solutions with risks that are acceptable in light of their potential rewards — including lower costs.

R&D spurs innovation in the operational end-to-end supply chain. From the supplier's supplier to the customer's customer, R&D programs at DLA support the warfighter by developing new technologies and processes to improve efficiency and effectiveness. Supply chain processes are reflected in



The DLA supply chain comprises many different types of items.

the Supply Chain Operation's Reference Model, which is the world's leading supply chain framework, linking business processes, performance metrics, practices and people skills into a unified structure. The model keys in on five main process areas: Plan, Source, Make, Deliver, and Return. DLA R&D makes a difference in every aspect.

Planning is a key process, and R&D program managers work with DLA stakeholders to identify key challenges and problems where R&D solutions may be viable. Sourcing is next, and R&D has projects in strategic materials, anti-counterfeiting, and microcircuit emulation. These programs support manufacturing processes and technologies that help ensure spare parts for hundreds of weapon systems will be secure and available when needed. The Energy Readiness Program looks to improve fuel quality and supports innovations that develop alternative fuels.

Although DLA is not a manufacturer, R&D programs support critical manufacturing industries, such as casting and forging, to improve quality, lower costs and reduce production lead times for spare parts. The additive manufacturing program in R&D provides potential solutions for urgent requirements for hard-to-source parts that are obsolete, back-ordered, have long lead times, or are otherwise difficult to obtain.

R&D also has a robust batteries program that innovates to reduce lifecycle costs and logistics requirements by reducing the size and weight of personal and vehicle batteries and extending run time. This program is also working on new battery designs to reduce environmental hazards. At the ground floor of many manufacturing innovations are the Small Business Innovation Research and Small Business Technology Transfer Programs, which spark manufacturing capabilities that lead to prototypes in DLA ManTech programs.

Delivering capabilities to DLA's customers is critically important. R&D efforts in this area include innovations in subsistence, clothing and textiles, and medical logistics, as well as distribution operations. Weapons systems sustainment supports innovations within DLA process areas, such as planning, tech/quality and procurement, reducing costs, developing new processes and technologies and increasing DLA's efficiency and effectiveness.

Information supports every aspect of the supply chain. DLA needs to ensure accurate, real-time and integrated information. The Defense Logistics Information Research program promotes innovations to connect data across the supply chain from connecting the quality of specifications, to developing digital frameworks.

Strategic Alignment

Although R&D is ever-present in an operational supply chain environment, over the last few years, DLA R&D has taken a strategic perspective, focusing on game-changing, high-impact results. Investments must be strategic and support the DLA Strategic Plan. The division has developed strategic focus areas, aligned to the budget activities and program elements that support industrial preparedness. Objectives are to improving industrial base manufacturing processes, maintain viable supply sources, improve technical and logistics information and take advantage of emergent manufacturing technologies. For logistics R&D demonstrations, objectives are to enhance analysis, modeling and decision support; improve logistics processes; and capture emergent logistics R&D requirements.

Developing the Strategic Focus areas was the first step in becoming more strategically aligned to respond to the

warfighter needs of today and tomorrow. In 2015, DLA R&D started to conduct annual assessments and environmental scans of disruptive technologies and game-changers that might drive an improved logistics solution for the enterprise. The team looked at new innovations on the horizon in the R&D program areas, then linked disruptive technologies to the McKinsey Global Institute's report on "Disruptive Technologies: Advances that will Transform Life, Business and the Global Economy." DLA senior leaders prioritized the most important technologies for DLA and focused on linking R&D investments to strategic outcomes in the DLA Strategic Plan.

In May 2015, the DLA Strategic Plan made Warfighter First its No. 1 goal, with an objective of "Leveraging DLA's Research and Development program to infuse innovation into our solutions." The strategic intent was now in place for R&D to work on technologies and automation in distribution operations, and 3D printing of hard-to-source and long-lead-time parts to "enhance logistics support capabilities and produce more reliable, cost-effective solutions." The strategic assessments were a starting point, and now this approach has been integrated into the strategic culture of R&D to enable DLA senior leaders to identify and prioritize game-changing innovations linked to investments to make a difference in warfighter outcomes.

The second critical step was to listen to DLA's partners in industry and the military services to understand challenges and issues that might require R&D solutions. Senior leader forums like Navy/DLA Day and U.S. Special Operations Command/DLA Day provided opportunities to discuss potential R&D efforts that truly support the warfighter. R&D leaders and program managers also have an open, running dialog with industry to view potential innovative solutions that support the supply chains.

Industry and the military services are also trying to crack the code on innovations such as additive manufacturing. Navy Rear Adm. Vincent Griffith, director of DLA Logistics Operations said, "We're partnering with the military services and industry to use additive manufacturing to obtain obsolete and hard-to-source parts for the more than 2,400 weapons systems we support."

Tom Faulkner, RDECOM Public Affairs

3D modeling artist Ryan Gilley displays some of the products he designed and printed using advanced manufacturing techniques at the Edgewood Chemical Biological Center, Aberdeen Proving Ground, Maryland.

R&D Going Forward

R&D will continue to work on the legacy ManTech and LogTech programs that support the supply chain. Additive manufacturing will continue to be a strategic priority, and DLA R&D has been moving the needle forward in both areas. Mike Scott, DLA Logistics Operations' deputy director, said automation will help DLA improve its support.

"With the state-of-the-art technology and capabilities available in the marketplace, now is the time we need to look hard at getting DLA's infrastructure improved to world class," he said.

DLA Distribution could reap rewards from R&D insights at its warehouses.

"Ensuring the right technology is in our warehouses has the potential to increase DLA Distribution's effectiveness and deliver efficiencies at the same time," said Twila Gonzales, DLA Distribution's deputy commander. "It's a huge priority for us to focus on."

Another top priority is to fund R&D efforts in anti-counterfeiting. Griffith explained, "We have undertaken some impressive efforts already to establish an in-house DNA marking capability for all microcircuits at our Electronics Product Test Center in Ohio, but we are also pursuing additional R&D efforts for marking capabilities of high-risk items."

Another priority is to ensure a secure supply chain. This includes anti-counterfeiting technologies as well as processes to support new technologies. R&D efforts will help to better understand vulnerabilities and risks in the supply chain. Then, they can build solutions that support procurement, quality and cyber risks.

Most of the R&D budget supports traditional programs. However, strategic priorities also require an investment. For some of the priorities, R&D can use its existing budget. For other investments, like additive manufacturing, the team works with DLA Finance to align strategic priorities with funding.

The R&D shop in DLA Logistics Operations straddles both sides of the operational and strategic world. Its ManTech and LogTech programs are robust and well-suited to support the warfighter by developing new processes and technologies that support the operational end-to-end supply chain. R&D has become even more strategically focused, identifying and assessing disruptive technologies that are appropriate for a logistics operational environment, and then engaging senior leaders to identify priorities and align investments that support solutions to put the "Warfighter First."

POWER TO THE WARFIGHTERS

Story by Chris Erbe

Just as civilians have learned to rely on batteries to power multiple devices, so too has the warfighter — and then some. Over the last 15 years, the military has added more and more energy-consuming gear to the soldier's load, including radios, GPS, computers, smartphones, night-vision goggles, infrared sights and counter-IED equipment.

The ability of these devices to improve mission effectiveness and survivability is significant, but the downside is that the warfighter has to carry added weight, especially from batteries. In response, DoD research and development has focused on ways to provide more power while reducing the load. DoD researchers are engineering batteries that are lighter, smaller, longer-lasting and more powerful.

While it is the researcher's job to provide a solution to a problem, it is the manufacturer's job to produce enough of the resulting product to support DoD's mission. It is at this point that the Defense Logistics Agency Battery R&D Network Program steps in to encourage technology implementation projects, striving to lower costs, enhance manufacturing and advance technology for DLA's battery supply chain.

"We work closely with outside industries," said Matt Hutchens, industrial engineer at DLA Logistics Operations and head of DLA's BATTNET program. "For a good portion of our R&D, we collaborate with suppliers, and they propose a specific manufacturing plan that will achieve the objectives we're looking for."

The BATTNET Program recently supported a project to ramp up manufacture of an improved lithium carbon monofluoride battery that powers radios and other small electronics used by soldiers in the field.

Two civilian technology companies, Ultralife Inc. and EaglePicher Technologies, partnering with the U.S. Army Communications-Electronics Research, Development and Engineering Center at Aberdeen Proving Ground in Maryland, developed a smaller, lighter military battery that offered a lot of advantages. The improved battery delivered a 110-percent increase in energy capacity; a 31- to 50-percent decrease in weight (depending on battery size); and an increased shelf life from 5 to 15 years. Once the research team validated the chemistry and tested the samples, the focus shifted to manufacturing.

"Our task was to find a way to move from producing a few prototypes to producing hundreds of units in a fully functioning manufacturing line," Hutchens said.

DLA encouraged the two technology companies to scale up production by assisting with funding for the cost of engineering, materials and testing.

The Army recently finished successful testing of several hundred batteries in various sizes at the Aberdeen Proving Ground and is ordering larger quantities for troops in the field.

"This project made a quick, positive impact by providing a battery with higher

Air Force Staff Sgt. Jeff Nevison

Air Force Staff Sgt. Jeremy Easterwood, with the 455th Expeditionary Logistics Readiness Squadron, places a battery in a Mine Resistant Ambush Protected vehicle at Bagram Air Field, Afghanistan.

The BATTNET Program recently supported a project to ramp up manufacture of an improved lithium battery that powers radios and other small electronics used by soldiers in the field.

energy capabilities for the warfighter," Hutchens said. "BATTNET's role was to develop manufacturing capability, and now it has transitioned to bringing the resulting product into the logistics chain."

For establishing production of the lithium carbon monofluoride battery and making it available to the military, Hutchens and the other DoD R&D team members and partners were awarded the Defense Manufacturing Technology Achievement Award in 2014.

DLA's BATTNET program also looks for ways to promote better manufacturing processes to the battery industry in order to drive down overall costs. One recent project developed a new procedure in the manufacture of battery electrodes.

Most electrode manufacturers use a wet process that involves taking a roll of aluminum through a slurry coat of hazardous materials and solvents before sending it through a dryer. The air used for drying is so toxic that it has to be captured and removed safely from circulation. The process is expensive, and the capital investment needed to set up and maintain such an operation is a barrier to many small businesses.

Through a DLA broad agency announcement, Hutchens became aware of Eskra Technical Products, a small company that developed a dry, electrostatic process to coat electrodes. The dry method eliminated the need for hazardous solvents and a lot of the equipment costs associated with the wet-coating process. Using the dry coating method, new capitalization costs can drop by 50 percent and production costs decrease by 30 percent.

"The process was much more flexible in that you could switch out materials without having to totally clean the equipment like you would with a wet process," Hutchens added. "It even provided quality improvements — the coating is very uniform."

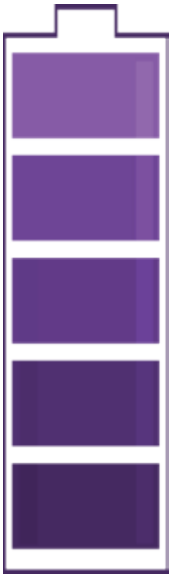
With DLA's encouragement and technical assistance, Eskra Technical Products has been working with B&W Megtec, a maker of battery manufacturing equipment, to design low-cost dry-coating production machines. Hutchens expects the dry-coating process to open the door for smaller-scale manufacturers to produce electrodes effectively at much lower cost.

"This project attempts to go deep into the production process to make an innovative cost reduction that, long term, we hope will have an impact on battery costs," said Hutchens. "As this capability gets integrated into the battery suppliers, we expect the competitive market to influence prices."

In another initiative, the DLA BATTNET Program teamed with the U.S.

DLA Research and Development's Other Battery Initiatives

But wait … there's more! DLA R&D's Small Business Innovation Research program funds phase-one projects from small companies — those with contracts of $100,000 or less. In 2014 and 2015, SBIR posted an "Advanced Battery Manufacturing Technology" topic in its annual solicitation. In response, DLA awarded nine contracts to eight small businesses working on advances that aim to reduce costs and lead times, eliminate hazardous production solvents or improve the performance of military batteries.



Physical Sciences Inc., of Andover, Massachusetts, is combining two innovations that result in higher power but safer lithium-ion batteries, and working on an environmental friendly way to manufacture battery cathodes by using less harmful solvents.

CAMX Power, LLC, of Lexington, Massachusetts, is working on two projects: batteries that can be made inactive for safer transport and storage and automated test software to detect manufacturing defects in a battery cell during the final manufacturing step.

Xerion Advanced Battery Corp., of Westminster, Colorado, is developing a rechargeable battery using a new manufacturing method called electroplating. This new process will produce safer batteries at a lower cost.

ADA Technologies, of Littleton, Colorado, is developing a laser system to cut battery electrodes which will reduce manufacturing defects caused by die cutters.

K2 Energy Solutions, of Henderson, Nevada, is working on making rechargeable batteries using a "greener" manufacturing process by eliminating environmentally harmful solvents.

American Energy Technologies, of Arlington Heights, Illinois, is working on an alternative process to make CFx material used in some non-rechargeable batteries that will increase the industrial base and reduce cost.

Big Delta Systems, of Houston, Texas, is developing production capabilities in an additive deposition process for lithium-ion electrodes, which will result in lower cost, lightweight rechargeable batteries carried by the warfighter,

OnTo Technology, of Bend, Oregon, is making new rechargeable batteries from recycled battery materials. Using recycled material has the potential to save DoD money and is good for the environment.

"As you can see from the above projects, big ideas come from small businesses," said Traci Myers, SBIR project manager and engineer at DLA Land & Maritime. "The exciting thing about the SBIR program is energizing small businesses to bring ideas to the table that solve a problem."

— Chris Erbe

Army Sgt. Daniel Hoffman, a fire support noncommissioned officer with Delta Company, 1st Battalion, 12th Infantry Regiment, 4th Inf. Brigade Combat Team, 4th Inf. Division, looks through a battery-powered long-distance laser rangefinder to get measurements for an upcoming artillery shoot south of Kandahar Airfield, Afghanistan.

— Photo by Army Staff Sgt. Whitney Houston

Army Aviation and Missile Command in September 2015 to design and manufacture a replacement battery used for the missile guidance system of the TOW2 anti-tank missile. AMCOM's goal was to replace a two-piece nickel-cadmium battery and charger system with a lithium-ion battery that has its own integrated charging capability.

Besides having a detached charging system, the NiCad battery's problems include poor performance, high maintenance costs and a disappearing supply chain. The charging unit was so obsolete it was no longer being manufactured.

AMCOM is now designing, developing, and testing a replacement lithium-ion battery, and DLA BATTNET will be providing a technical data package to transition the battery to manufacturing.

"The new battery will reduce the system weight, get more firings, reduce logistics and life cycle costs — and we'll be resolving the supply chain problem," Hutchens said.

DLA is also partnering with the Naval Air Systems Command to increase the manufacturing readiness of a lithium-ion battery used in the MH-60 helicopter. Like the battery for the TOW missile guidance system, the NiCad battery currently being used for the aircraft suffers from performance issues and growing maintenance costs.

NAVAIR has tested prototypes of a replacement lithium-ion battery with a company called Quallion. In December 2015, the DLA BATTNET Program stepped in to develop a manufacturing plan.

"In about a year, NAVAIR wants to buy about 100 batteries and run them through a complete flight-test qualification," Hutchens said. "The current design needs to be reduced in complexity and there needs to be some risk reduction testing as it relates to the manufacturing. Our goal is to have the best battery at the lowest cost come out of our contract."

What's the next battery innovation? Lithium-ion technology has come a long way, but there is still a lot of room for improvement, Hutchens said. Emerging technology in the lithium family of batteries has to do with testing different types of anodes, as well as improving cathode materials and electrolytes. Companies like Panasonic are experimenting with batteries with silicon-based anodes, and there are more exotic solutions on the horizon, such as battery power built into warfighters' clothing.

But what good are innovations if there is no reasonable access? As DoD and industry researchers push the envelope to keep up with warfighters' demand to make batteries lighter, longer lasting and with higher energy, DLA's BATTNET Program works with producers to bridge the gap from development to full-scale production.

As long as there is a need, DoD will continue to find innovative ways to improve battery technology through its many R&D programs, activities and partnerships. At the same time, the DLA's BATTNET Program will be finding innovative ways to bring those advantages to its most important customer.

Air Force Master Sgt. Chance Babin

Air Force Senior Airman Anthony Woodruff, 380th Expeditionary Aircraft Maintenance Squadron, removes a battery cell from a U-2 battery. This process is used to saturate the pads inside the cell.

Bill Addison

Ardra Farally, a chemist and shade evaluator at the DLA Product Test Center in Philadelphia, discusses the shade evaluation process for military uniforms to Army Sgt. Maj. Rodger Mansker of the Army's operations and logistics readiness directorate.

ON SPEC

Story by Beth Reece

Hunter, olive, mint: The shades of green are many, but the Army has strict standards for which ones make up the service's camouflage pattern. Before a soldier dons a new combat uniform, its fabric has been checked to verify that it conforms to the military's strict color standards.

Service members' uniforms, protective gear and even footwear undergo rigorous testing for everything from colorfastness to wear resistance and safety at the Defense Logistics Agency Analytical Product Testing Center in Philadelphia. A new research and development initiative headed by DLA Logistics Operations' Julie Tsao aims to consolidate technical data that outlines performance requirements and testing for clothing and textile items in a digital environment assessable to the services, DLA and industry.

"The military continually redesigns uniforms and individual equipment, and that's a challenge for industry because technical data is difficult to acquire," Tsao said. "It's DLA's responsibility to pass item specifications to the industrial base, but they're stored in PDF documents, a format that usually isn't compatible with commercial databases."

Military specifications are also lengthy, accounting for such characteristics as durability and fabric content. It takes thousands of pages to outline specifications associated with the fabric, content, wear and color for the Army's combat uniform trousers, for example. But lack of access to these specs increases the risk that vendors' fabric and patterns will be rejected. "By the time testers reject a lot of fabric, the printer already has millions of dollars on the line," Tsao said.

Getting uniforms through production into the hands of service members is further complicated by conflicting use of shade-evaluation methods, which

Ardra Farally (left) and Jamie Hieber analyze a fabric sample against Coast Guard uniform standards and tolerances. Color science testing is conducted on every piece of fabric the military buys through DLA Troop Support's clothing and textiles supply chain.

— Photo by Mikia Muhammad

Michael Tuttle

DLA Troop Support commander Army Brig. Gen. Charles Hamilton hands a pair of combat boots to an Air Force recruit receiving her initial clothing issue at Lackland Air Force Base. Hamilton saw technology implemented by the clothing and textiles supply chain that helped cut the clothing issue time in half.

can be done via the human eye or with a color-measuring device. Industry and DoD agree the latter are not adequate for multi-colored fabric, such as camouflage, but industry has become more reliant on devices to evaluate shades for solid-colored fabrics.

Color scientists at DoD test labs prefer visual testing. They're among a small group of individuals who can see up to 10 million colors, and their ability to evaluate fabric shading is tested every six months with a specialized color-acuity test. Industry, however, relies more on instrumental readings to assess color shades.

"When the test lab gives a rejection, the reason can be as simple as too green or too red. So even when fabric is rejected, there's no instrumental reading provided to the printer so they can make adjustments accordingly," Tsao said.

Tsao's program sponsored a study in collaboration with the Textile Materials Evaluation Teamat the Natick Soldier Research, Development and Engineering Center, Massachusetts, the DLA Product Test Center, and industry which found a correlation between instrumental readings and human shade testing for a number of solid-shade military fabrics. The challenge, Tsao said, is that users must know how to properly calibrate the instrument and there must be a disciplined reading process that's standard among the services, manufacturers and fabric testers. As a result, DLA has begun to provide instrumental readings on the color standard for use by industry in its instrumental shade evaluations.

DLA's product testers are gradually providing instrumental readings to industry, and current R&D efforts will help automate the test reporting process.

Partnering with industry on these and similar projects is critical because the clothing and textile manufacturing base is fragile, Tsao added. The Berry Amendment requires the Defense Department to buy only U.S.-made products, but it's become increasingly difficult to find raw components, such as thread and buttons, that aren't from foreign sources. It's also a small industry of primarily small businesses whose only customer is the U.S. military.

Tsao's work has already shown that emerging technology can lead to major improvements despite the challenges inherent to clothing and textiles. In early 2010, she led a project to incorporate the use of radio-frequency identification technology during the clothing-issue process at recruit training centers. Collecting initial clothing items was then a three-hour process during which troops collected gear, visually inspected it and recorded the quantities and sizes they received with pen and paper.

Attaching RFID tags to the items and having troops walk through an RFID reader reduced the process to about 45 minutes. The information is automatically transmitted to DLA Troop Support, where clothing and textile items are managed, so it can be used for inventory and readiness planning.

"RFID technology gives us traceability of the entire supply chain, because we can trace items back to the manufacturer and the commercial warehouse all the way to the customer warehouse and point of issue," Tsao said. "It also lowered our inventory levels and gave us more accurate visibility of that inventory."

Unlike research and development for other DLA-managed commodities, projects relating to clothing and textiles are usually long term.

"Every five to seven years, we have a major accomplishment, then transition to another area," Tsao said. "The goal is always to connect the various pieces of the supply chain and improve customer support."

> DLA has begun to provide instrumental readings on the color standard for use by industry in its instrumental shade evaluations.

DOMO ARIGATO, MR. ROBOTO

THE FUTURE OF DISTRIBUTION AT DLA

Story by John R. Bell

Packing inventory. Loading and moving pallets. Scheduling freight deliveries.

In the commercial world, employees manage these processes with the help the latest technologies. Companies like FedEx, UPS, and Amazon use robotic systems and real-time communications to increase speed, save time, cut costs and help reduce employee fatigue. Yet for years, government distribution has relied heavily on doing things by hand and using decades-old automation.

That's about to change — at least at DLA.

DLA's Strategic Distribution and Disposition Research and Development Program is conducting research in advanced technologies that range from warehouse mobile tablets that provide real-time inventory data to forklifts that drive themselves, with a little help from their friends.

DLA established the Warehouse Automation and Robotics Exploration Project to develop new technologies for DLA Distribution warehouse operations. "We're excited to see how these cutting-edge robotic technologies can reduce the cost of operating large distribution operations and autonomously perform

manual tasks efficiently and accurately," said Navy Cdr. Michael Jefferson, DLA R&D's deputy chief. Jefferson oversees the project, along with Manny Vengua, program manager for the R&D Strategic Distribution and Disposition unit.

"These are truly emerging technologies which would elevate DLA to a leadership position in applying robotics to distribution operations," Jefferson said. "Although most of these projects are still in their initial research phase — and full funding is a long way off — the likelihood is that each of these technologies will be in use at some DLA facilities in the next five to 10 years," he noted.

"These emerging technologies are going to make DLA employees' lives safer and easier," Vengua added. "The common denominator is that these technologies reduce the potential for fatigue and injury for the human operator. This frees him or her to focus on accuracy and problem solving, perfecting the process to better serve the warfighter, and — best of all — not having to endure the physical strain of driving, standing, or lifting heavy items for hours at a time."

Courtesy Photo

Autonomous guided vehicles can be small and used for maneuvering in tight spaces.

PUT A FORK IN IT

DLA warehouse employees may soon benefit from the arrival of the autonomous forklift, which can lift, transport, and deposit items without an operator on the vehicle. "Autonomous forklifts can perform many of the most basic tasks without a human operator," Jefferson explained. "They can also save time and improve efficiency, because operators can quickly take control of the vehicle for manual use when needed, to manage more complex or unusual tasks. This eliminates the need to have two different forklifts available."

> Autonomous forklifts still require people to operate them when a task requires the greater dexterity and judgment of a human operator, but they can free personnel to focus on tasks such as quality control and accuracy in the warehouse operation.

Early research was done by the Army Logistics Innovation Agency, which partnered with the Massachusetts Institute of Technology. They developed a forklift that can respond to voice commands or instructions through a wireless network and operate without wires or magnetic floor stripes. That same technology has been adopted by a major forklift manufacturer of forklift for commercial use. Should these be implemented at DLA, improved productivity and reduced costs would help the program reach a return on investment in two years or less, once the program is mature, said Jefferson.

Autonomous forklifts still require people to operate them when a task requires the greater dexterity and judgment of a human operator—but they can free personnel to focus on tasks such as quality control and accuracy in the warehouse operation.

And they can help improve safety, according to the WAREP analysis. A significant portion of the forklift operational cost is due to accidents and injury. Driving forklifts is an inherently dangerous task. OSHA statistics indicate that there were 85 fatalities and 34,900 serious injuries resulting from forklift operation in 2013. The most common cause of serious injuries was the driver being thrown off the forklift. One out of every six workplace deaths is forklift related. Autonomous forklifts could help reduce the exposure of DLA workers to forklift accidents.

THE GOLDEN RETRIEVER

The WAREP team envisions autonomous forklifts and two-armed robots picking and stowing pallets, totes and cartons on and off warehouse racks, but that material still has to be transported to and from waiting human workers for receiving or preparation for shipping, in some instances even from one warehouse building to another.

For that, the team envisions autonomous guided vehicles, otherwise known as AGVs, moving material from receiving to storage and from storage to shipping. "Promising new navigation technologies allow AGVs to maneuver independently through a warehouse to retrieve and deliver material," said Jefferson. "These systems can fill a variety of roles and can reroute themselves to avoid

Air Force Airman 1st Class Grovert Fuentes-Contreras

An automated guided vehicle parks in its charging location according to an operator's command during a showcase of new equipment at Ramstein Air Base, Germany.

obstacles. More importantly, these systems can operate alongside people, safely."

AGVs in various configurations will be tested to fill the many different requirements for moving material in a DLA warehouse operation. "Ruggedized AGVs with rough-ground capability will be evaluated for moving material between co-located warehouse buildings," said Vengua. "More compact AGVs will be better suited for maneuvering between racks and transporting material within a warehouse. … The concept is not very different from Google Cars, which are driving themselves on California highways today," said Vengua. "Instead of a busy highway, these AGVs will drive in and between warehouses located together on a base."

ARMS AND THE MAN OR WOMAN

Another technology considered for testing is the use of lightweight robotic arms mounted on an AGV base to create a versatile mobile robot to manage totes and cartons in the warehouse. The robot is envisioned to move independently to pick and stow totes and cartons, moving vertically on a pole mounted on the AGV base to reach material stored on the upper shelves of standard warehouse racks. The robot would then place the material on a transport AGV or a conveyor system to transport it to a human worker comfortably waiting at an ergonomic picking station. "Lightweight but powerful robotic arms have been developed that can function safely around humans," Jefferson noted. "This same technology has been used to help paraplegics feed themselves, so they are highly dexterous and very safe."

Return on investment is crucial to any decision to implement new technologies and industry figures indicate that investments in robotic technology can result in a positive ROI in three years or less depending upon the application. Savings can result from accuracy, greater labor productivity, and a reduction in workplace accidents and injuries.

In addition, the tote and carton manipulating robots will reduce the reaching for and lifting of heavy items by humans, a potential source of injury. "One of the drivers of robotic technology for commercial distribution operations is worker safety," Vengua said. "Industry pays a high price for medical and workers compensation benefits due to injuries incurred in performing strenuous warehouse tasks." "One of our primary goals in this project has been to identify technologies which not only work safely with humans but also have the potential to enhance the safety of DLA's most valuable resource, our employees," said Vengua.

THE EYES HAVE IT

Wearable technology is a growing trend in the consumer market as well as in industrial applications. Smart glasses are another technology the WAREP project is considering, to enhance worker productivity, accuracy and safety. Smart glasses typically consist of eyeglass frames or a headset with an optical projection device using a small glass prism extending from one side, to serve as a display screen in the corner of the user's eye.

The glasses would guide employees to the material storage location and display the item to be retrieved, how many items are at the location being viewed, and other information that normally would require the employee to look away from the task to a computer screen or hand-held scanner. Boeing, for example, has tested the glasses for employees building wiring

Wearable "smart" glasses could help DLA warehouse workers increase efficiency.

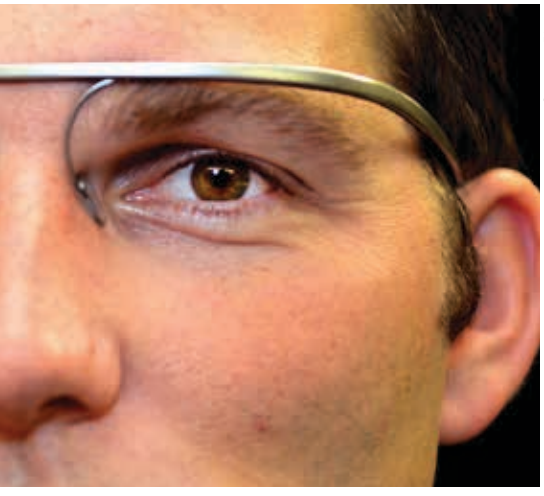
harnesses, replacing stacks of paper wiring instructions with a visual display from the smart glasses, reducing the error rate from 6 percent to practically nothing.

"The applications for smart glasses are limited only by imagination,"said Vengua. "They can be used to reduce the training time for new employees because the glasses can be programmed to provide step by step guidance to perform a task."

FLY THE FRIENDLY SKIES

The armed services have for some time used unmanned aerial vehicles, better known as drones, for some intelligence gathering, reconnaissance and strikes against enemy forces. More recently, commercial sale of UAVs has expanded to the recreational and commercial sector. Some ecommerce companies are even exploring making product deliveries via UAVs.

One application the WAREP team is exploring for UAVs is inventory accountability. UAVs configured with scanners that read bar codes or passive radio frequency identification have shown they can take accurate inventory counts in outdoor storage yards. The technology is being developed for UAVs to count inventory indoors as well. UAVs can autonomously fly a designated flight pattern indoors over bulk storage and in between racking to scan and count inventory.



Courtesy Photo

"One key to customer service is maintaining an accurate count of the inventory," Vengua noted. "Commercial retailers may lose as much as $450 billion from out-of-stock items, empty shelves, and misplaced product. They also incur high costs in the form of time spent conducting inventories."

UAVs are not able to count every type of inventory — especially small, loose items, such as washers and screws. However, UAVs can count bulk items and even cartons in racks, allowing people to focus their efforts on the small items.

CONTAINMENT POLICY

Another promising development on the horizon will help DLA move its freight to customers more efficiently, according to Ria Blackwell, a lead traffic management specialist at the Transportation Office of DLA Distribution, in New Cumberland, Pennsylvania.

One of the things her group does is books ocean shipments of DLA items, using direct vendor delivery. DVD shipment sends the freight directly from the vendor's facility to the customer, instead of through a distribution depot.

In the current process, a DLA Transportation specialist receives information a vendor provides on a form and manually enters it into a booking system, the Vendor Shipment Module. The DLA transportation specialist must then enter that same information a second time into the Integrated Booking System, used by Military Surface Deployment and Distribution Center, known as SDDC—because VSM and IBS don't communicate.

This redundant manual entry consumes a great deal of time, Blackwell said — and it keeps her team from focusing as much as they could on the things that matter.

— Photo Courtesy U.S. Coast Guard District 7

Booking ships to transport ocean containers to DoD locations around the world used to be a process with many redundant steps.

"Because there's no communication between the systems, we can't decide which booking is the best value," — meaning cost and speed of delivery, Blackwell said. "We know our vendors, where they're physically located, their limitations, their history with the carriers and their ability to pick up at those locations. So we can make best-value decisions better than others."

Her team's Distribution Transportation Office Automation project would automate the information-sharing portion of the booking process between the Transportation Office and SDDC. This would free Blackwell and her team to focus on which routes are fastest, which carriers most reliable, and which ports best-suited to given shipments, she said.

In addition, the advancement would "significantly reduce the number of clerical errors and allow customers' freight to move more efficiently," Blackwell noted.

The team initiated the project about a year ago. The business case analysis is almost complete, and the team is now awaiting permission to gather requirements.

RATIONS:
BETTER SEAL, LONGER SHELF LIFE

Story by Beth Reece

Research and development projects chartered by the Defense Logistics Agency are improving the shelf life of combat rations and ensuring the availability of packaging for condiments like hot sauce and mustard.

The goal of both projects is to harness new and improved technologies to provide better products and services to warfighters, said Gloria Edwards, who manages DLA Logistics Operations' research and development for items such as combat rations, field feeding equipment, garrison feeding, and bread and dairy products.

"There's always been an effort to improve combat rations, and that work is now spreading to other parts of the subsistence supply chain. Improving processes and fixing problems is our role as much as it is a role of the individual services," she said.

Recent accomplishments resulting from research and development include a 35-percent reduction in volume and weight of the primary packaging for meals, ready to eat. The effort has helped lower the cost of shipping for the more than 30 million MREs ordered annually.

Now, researchers are focusing on the storage of unitized group rations. UGRs are heat-and-serve meals that can feed up to 50 troops in a field environment. Customers can chose from seven breakfast menus and 14 lunch and dinner menus. Individual items for each menu are stored separately by DLA Distribution in San Joaquin, California, where they're picked off shelves and packaged in an assembly area just before delivery.

URGs can be stored for three years at 80 degrees Fahrenheit or six months at 100 degrees Fahrenheit, but dry heat and a lack of air conditioning at the San Joaquin depot shortened the shelf life. Officials also had no way of monitoring the temperature of food items located on high-rise storage racks.

"It was discovered that, at the highest level, temperatures were reaching 90 degrees and above in the summertime," Edwards said.

Depot officials attempted to lower the temperature by installing 12 evaporative coolers, replacing roof vents with skylights for better ventilation, upgrading insulation and even turning off light fixtures. But without a monitoring capability, there was no way to track conditions.

Current research and development efforts by DLA are expected to identify alternate materials for pouches used to store high-acid condiments such as hot sauce and mustard that are included in.

Air Force Staff Sgt. Mary Thach

Members of the 155th Sustainment Services Flight prepare unitized group rations for the 155th Small Air Terminal, who traveled to Dobbins Air Reserve Base, Georgia. UGR components are stored by DLA Distribution in San Joaquin, California.

Annette Silva

DLA partnered with Rutgers University in 2015 to install 28 data monitors at a DLA Distribution storage facility in San Joaquin, California, where unitized group rations are stored. The effort helped lower the temperature of items stored on high-rise storage racks, thereby increasing shelf life of UGR components.

"Knowing what temperature the food is at all times is critical. This stuff costs money, and if it's improperly stored, it has to be thrown away before it can be consumed," Edwards added.

In May 2015, DLA partnered with depot managers and Rutgers University to install 28 data monitors in the UGR storage area. Since then, the devices have recorded temperatures approximately 9 degrees lower than those recorded before facility improvements were made. The project is now in phase two, which focuses on ration traceability.

"Rations are taken from storage to the assembly area for packing, but the entire pallet isn't always used," Edwards said. "We're looking at the warehouse management system to see when these items are going back into storage and how their shelf life is tracked."

Another project will identify alternate materials for pouches used to store high-acid condiments such as hot sauce. The company that produces the laminate currently used is shutting down its production, so the ration industry must find another laminate with an acid-resistant sealant layer. Without the acid-resistant layer, the acid attacks the adhesives between the laminate structures.

"That can cause gas formation and off-flavors during the three-year shelf life," Edwards added. "We don't want to go back to using glass for these items, because it adds extra weight when the goal has always been to make things as light as possible so Soldiers can carry more."

Primary and alternate laminate suppliers, as well as four potential laminates, have already been identified. In the next phase, researchers at the Army's Natick Soldier Research, Development and Engineering Center will convert each laminate into condiment pouches and test its chemical resistance with pepper sauce, buffalo sauce and ketchup.

Edwards is also overseeing projects to review the duplication of tests and inspections for combat rations, as well as the ability of Microwave Assisted Thermal Sterilization to sterilize group-sized entrees and their components.

"Currently, group-sized rations are produced using a labor and energy intensive stream retort process," she said. "With MATS, the process is completed in minutes versus hours and results in better taste and texture, as well as higher nutrient retention. That ultimately means greater consumptions of rations and less food waste."

NEW TECHNOLOGY, ANCIENT INDUSTRY

Story by Chris Erbe
Photos Courtesy DLA Logistics Operations

Research and development programs are normally considered incubators for the newest cutting-edge technology. But the Defense Logistics Agency manages two R&D programs devoted to advances in manufacturing technologies that are truly ancient.

Metal forging and casting have been around thousands of years. The world's oldest known casting dates from 3200 B.C., and forging may be even older. The Romans worshipped Vulcan — the Greeks, Hephaestus — both gods of fire and the forge and mythical inventors of smithing and metalworking. Through the ages, man has used casting and forging to advance the human condition and to produce weapons of war.

Today's warfighters still depend on metal for almost everything — from enormous ships to the smallest engine parts. To help meet this need, DLA's casting and forging R&D programs invest where industry can't or won't invest in new technology to help industry create the parts that the military requires. The programs are part of the DoD's Manufacturing Technology Program, or ManTech, designed to improve the quality, productivity, technology and business practices of industries providing goods and services to the DoD.

A large hammer forge at SIFCO Industries in Cleveland uses tons of pressure to form metal into high-strength military parts.

Consider DLA's challenges. Many items the military requires are so specialized, they are not suitable for mass production and thus are not attractive for industry to manufacture. Also, DLA needs domestic manufacturers to produce military parts in an era when much of the industry is overseas. Added to that, the military often needs a small number of very critical parts for legacy aircraft and ships — parts that manufacturers have long since stopped producing.

"If we don't have people to make the parts we need, we're in trouble," said Dean Hutchins, manager of DLA R&D's casting and forging programs. "It's a competitive industry with a lot of pressure from overseas. We have a mandate to make certain things in the United States, but it's difficult to get domestic manufacturers to start projects because of the heavy capital investment needed."

DLA's forging and casting R&D programs work with industry to help them produce the parts that the military needs. Part of the program's purpose is to help industry fund startup projects. The programs also acts as a bridge, bringing together established manufacturers with military and university R&D programs to develop new technologies and processes that will help improve the production of military parts.

"We're looking to improve the process to make it less costly and more efficient," Hutchins said. "To work new ideas, we create consortiums that bring together industry associations and research universities like the University of Iowa, Case Western Reserve and the Colorado School of Mines. Foundries and forge shops help us experiment with whatever is being developed."

Casting and forging are equally vital to the military because of the advantages that are inherent to each process.

Casting and forging are equally vital to the military because of the advantages that are inherent to each process.

Forging involves heating metal so that it is malleable, then pounding it with high pressure into the required shape sometimes using a metal form, called a die, to shape the metal. Think of the iconic blacksmith using a hammer to pound hot metal against an anvil. The advantages of forging are strength and durability.

"If you have a piece of metal the size of a loaf of bread and want to make it stronger, you would use forging techniques to compress it down to the size of a metal tube," Hutchins said. "You're closing gaps between molecules, creating grain flow and giving that metal a lot of strength and durability."

To say the military needs high-strength metal parts would be an understatement. Bulkheads, hinges, engine mounts, brackets, beams, shafts, landing gear, wheels, brake discs and arresting hooks are examples of forged items on which the military depends. A heavy tank contains more than 550 separate forgings while an armored personnel carrier employs more than 250.

Casting, which pours molten metal into a pre-shaped mold, is a good way to make complex parts. Motor parts are cast

Workers at Danko Arlington, Inc., a casting facility in Baltimore, Maryland, pour molten metal into a sand casting mold. Once cooled, the part will be removed and the sand recycled for use in another project.

An old-fashioned casting pattern made of wood. Once a pattern is used to make a part, it is stored in a warehouse in case the foundry gets an order for the same part in the future.

because of the curved internal passages.

"One casting method, die casting, starts with a metal mold from which we make a wax pattern," Hutchins said. "The wax pattern is dipped into a ceramic slurry, so the ceramic can surround that wax. The reason we do this is because ceramic can hold and withstand the heat of molten metal. The wax is then melted out of the mold. When metal is poured in, wherever the wax was, the metal will takes its place and create a part."

A short list of examples of military parts created from casting include cross bleed valves for the F-5 Jet Fighter; the transmission case for the Advanced Amphibious Assault Vehicle; ice cleats on the M1 Abrams tank; and hydraulic accumulator cylinders for Navy submarines.

Manufacturers choose casting as the most appropriate forming method for certain parts because no other method can meet the complexity, shape and tolerance requirements as efficiently and cost-effectively as casting. Creating the molds, called tooling, is the most expensive part of the casting process.

"Once you make the tooling, which could cost very little or as much as $1 million for a large item, you can pump the parts out quickly," Hutchins said. "Casting is most cost-effective when you make parts in large quantities."

With many weapon systems being extended and used decades beyond their initial expected life, the Department of Defense faces a big challenge in finding new cast or forged parts to keep this older equipment in use. It's possible that the military can go for decades before needing to order certain parts, by which time the manufacturers have stopped producing them and possibly even gone out of business

"When procuring a part for a legacy aircraft when we haven't bought one in 10 or 20 years, now we have to go back and either recreate the tooling or try to find it," Hutchins said. "When that happens, we have a challenge on our hands filling that order. We have consistently found that cast and forged items make up a disproportionate share of the oldest back orders."

A 2013 study showed that 13 percent of backorders and 20 percent of the oldest backorders are items that contain a casting or a forging.

To help meet the challenge, one of the casting program's early projects was to create the Metalcasting Procurement Solutions Network, an online database of manufacturers that have the materials, tools and processes to make needed parts for DLA. The result was an increased number of bids from capable suppliers and a reduction in lead time and cost to the DoD.

In a current project, casting program participants are working to reduce or eliminate the need for lubricants during production of aluminum die-cast parts, which could result in reduced cost and environmental impact for the die casting industry.

Normally, die casters use a liquid lubricant to coat the die so that the metal part will slip out easily. The lubricant

Molten metal cools inside the sand casting mold after being poured. Once the metal has cooled, workers break the mold and remove the part for inspection and further processing.

Workers at Danko Arlington, Inc., inspect a newly finished part for the Navy's Aegis Combat System recently removed from its mold.

is messy and can be hazardous to the manufacturing environment. The project involves developing a coating for the die surface that will allow metal to separate from the die without sticking — much like Teflon is used in a frying pan to keep food from sticking.

"We've just completed successful trials in January," Hutchins said. "The Colorado School of Mines is doing the research, and Mercury Marine, a manufacturer of marine propulsion systems with their own aluminum-die-casting foundry based in Wisconsin, is testing the technology."

The forging program is also seeking to improve its process through experiments like intensive quenching. Once hot metal is formed into the required shape, it is then "quenched," or cooled quickly, which freezes the properties in its current state. Depending on how a part is cooled can influence the properties that the part exhibits, Hutchins said.

"It's like the blacksmith heating up a sword red hot, beating it with a hammer and then putting it in cold water," he said. "That's quenching. It's used to obtain specific mechanical properties. For some things you want the part to be ductile — to bend a little bit without breaking. Other things you want to be very strong and inflexible. Quenching at the right time can keep the properties of the metal in a desired state."

DLA's forging and casting R&D programs have several other projects under way.

Currently, casting R&D program participants are working on a project to make improvements in casting modeling software that will identify and predict potential problems areas in mold designs; developing and testing high-fluidity aluminum and magnesium alloys that can be used in die-cast molds; and developing improved heat treatment procedures of cast high-strength steel that improve the mechanical properties of the welded areas (a project that received the 2015 Defense ManTech Achievement Award); and more.

> With many weapon systems being extended and used decades beyond their initial expected life, the Department of Defense faces a big challenge in finding new cast or forged parts to keep this older equipment in use.

Forging R&D program projects include cutting down forging processes by using parts that are cast nearly to the final shape, then finished through forging; using simulation software to identify the optimum design and forging process for the manufacture of a part; developing new welding technology for repairing and upgrading forging dies; and others.

Will new technology like additive manufacturing ever take the place of casting or forging? According to Hutchins, 3D printing has a lot of work to be done before it can replace these ancient metalworking processes. For now, each method occupies a unique niche that makes it the manufacturing choice for certain parts.

In the meantime, DLA's Forging and Casting R&D Program continues to develop new ways to cut costs, increase efficiency, improve manufacturing processes and promote innovations so that our nation's warfighters will have the parts they need to complete their most critical mission.

PARTS ON DEMAND

Story by Beth Reece

Hershey's uses 3D printing to make chocolate kisses. A Minnesota man built a concrete castle using 3D printing, and prosthetics companies are using it to build custom arms and legs. Now, Defense Logistics Agency officials are looking into whether 3D printing could help lower the cost of some military repair parts and fill in gaps where material and manufacturing are sparse.

3D printing, also known as additive manufacturing, could change the way DLA provides parts in the future, said Kelly Morris, chief of research and development for DLA Logistics Operations.

"Imagine if we had an additive manufacturing machine and everything that goes with it at the Air Force's logistics center in Oklahoma. We could send them the 3D technical data package for a particular part, and they could make it right there on site," she said.

> Additive manufacturing technology could reduce the time it takes customers to get parts and in most cases minimize or eliminate the need for transportation and storage fees.

This emerging technology could dramatically reduce the time it takes customers to get parts and in most cases minimize or eliminate the need for transportation and storage fees, Morris added.

The possibilities are years away, but DLA's research and development team is already working with the military services to identify 10 parts for possible 3D modeling and manufacturing. Items were selected based on such criteria as backorder status, how long they take to produce, whether manufacturers have the machines and skills to produce them, and whether material to create them by additive manufacturing is available.

The top two candidates have been described by the Naval Air Systems Command as critical and hard to source. The first is a leading-edge extension for the AV-8B Harrier II jet, designed to improve airflow at high angles of attack and low airspeeds. The second is a ball fitting that mounts the engine exhaust duct to the airframe of the CH-53E Sea Stallion helicopter.

Unlike traditional methods of manufacturing that follow a subtractive process and require machines like drills and mills to cut and shape material, additive manufacturing uses a laser-powered 3D printer to lay down successive layers of material, such as plastic or metal, to create functional parts and products.

"If you're forging something, you're taking a piece of metal and heating it up, then hammering or smashing it into the design you want. There's almost always excess material that needs to be trimmed away," Morris said, adding that additive manufacturing leaves much less waste

Inside a massive 3D printer, a delicate head moves at lightning speed to precisely deposit heated plastic layer-by-layer to create a hardened part.

— Photo by David McNally, RDECOM

Luefras Robinson

A Navy instrumentation engineer demonstrates how the 3D ScanArm scans objects and creates digital models for printing. The reality of 3D printing is expanding across the Navy's science and engineering community.

although some machining or milling may be needed to complete the product.

The process starts with a 3D technical data package, or digital blueprint, that depicts all of an item's specifications. For the initial parts DLA intends to have additively manufactured, the agency will do a limited test of contractors' additive manufacturing capabilities. Those contractors will use 3D data specifically approved for additive manufacturing and produce parts for testing.

After the parts are produced, DLA will work with the military services' engineering support activities to evaluate feasibility of testing, evaluation and acceptance of parts, also known as first-article testing, into the supply system.

The introduction of 3D parts into DLA's inventory will require additional focus on data integrity as the agency meets the challenges of storing and accessing 3D drawings, added Tony Delgado, DLA's 3D program manager.

"There's a cyber security component here. When data is transferred between manufacturers and DLA, we need to ensure it's done in a secure environment so there's no interference and no one is changing the specifications," he said.

That will also lead to the need for training quality assurance specialists to certify that manufacturers are producing 3D parts that comply with technical requirements. While the military's engineering support activities are responsible for testing and certifying that additively manufactured parts meet structural standards, DLA maintains the role of quality assurance.

"Even industry is struggling with training and certification. Pennsylvania State University and the University of North Carolina have academic programs specifically for additive manufacturing, so they are developing the workforce curriculum for that," Delgado said. "DLA might have to bring those skills into the quality assurance arena so we understand the designs and material qualifications when inspecting vendors."

Defense Department officials have become more interested in additive manufacturing as the department works to increase innovation and embrace new technologies. DLA is helping to shape DoD's additive manufacturing program by creating a repeatable process to identify suitable parts for additive manufacturing.

And just because a part can be produced additively and meet military standards doesn't mean DLA or the military services should forgo traditional manufacturing, Morris said. Evaluation factors will include the cost of generating 3D data, additive manufacturing costs, demand patterns and whether a part made additively has the same lifecycle as one produced with traditional methods, she added.

Tony Medici

Mikael Mead, an engineering technician for Tobyhanna Army Depot, Pensylvania, removes a small production run of finished lens covers from the printing tray of a PolyJet 3D printer. Three-dimensional printers produce parts out of plastic and other durable materials.

A Conversation with . . .

Navy Rear Adm. Vincent L. Griffith

DLA's Director of Logistics Operations talks about DLA's support to deployed warfighters, humanitarian relief, the nuclear enterprise and more.

You've served with the agency in a variety of positions over the years, first as aide to former DLA Director Navy Vice Adm. Edward Straw, then as commander of DLA Aviation, and now as the Director of DLA Logistics Operations. What changes have you seen over this time?

DLA is a constantly evolving organization, and I've seen much of that change. When I was here initially working for Vice Adm. Straw, DLA Headquarters was still at Cameron Station, and we were primarily centered on parts and consumables. We had just moved into the distribution business, which was the second evolution of missions coming to DLA from the services.

When I commanded DLA Aviation, I witnessed a DLA positioned much closer to our warfighters. Business Systems Modernization also led to significant reorganization; we were more focused on customer-facing efforts. And there was also the name change from Defense Supply Center Richmond to DLA Aviation.

Now as the J3, our warfighter support has expanded and improved even further. DLA has matured into a valued partner for whole of government because of the speed of our response across a full spectrum of operations. There's a much more robust engagement with combatant commanders than we had before.

My duties within DLA have changed, but my belief that DLA is a great partner to warfighters remains unchanged.

How is Logistics Operations supporting the DLA Strategic Plan?

J3 is fully energized implementing the agency's strategic

Navy Petty Officer 2nd Class John Benson

Rear Admiral Vincent L. Griffith visits with DLA personnel at Naval Support Activity Bahrain during a recent visit to the Middle East.

> "While we're always happy to provide support where it makes sense, we never forget that Warfighter Support is our No. 1 priority."

plan. Not only are we the lead for its No. 1 goal — Warfighter First — but we're directly involved in initiatives that support every goal in the plan.

Under Financial Stewardship, we're working with DLA Finance to lead quarterly Cost Summits with our customers, opening up DLA's books to increase transparency. Our team is also leading the effort to improve collaboration with U.S. Transportation Command; we wrapped up a joint continuity of operations exercise with them in February that tested our organizations' ability to fulfill warfighter needs in the event of denial of service attack.

In the Strategic Engagement area, J3 has a team dedicated to looking at performance-based logistics as a way forward for DLA supporting DoD's Better Buying 3.0 Initiative, as well. These are just a few examples.

One of the big shifts within the agency is a renewed emphasis on support to the nuclear enterprise, including the standup of the Nuclear Enterprise Support Office last year. How is this office making a difference in the readiness of this strategic national priority?

Our NESO team aligns resources across DLA, synchroniz-ing our support, engaging with our customers and partners, maintaining situational awareness of their issues, and resolving support gaps and shortfalls. We're tied in tightly with the Navy, Air Force, U.S. Strategic Command and other stakeholders to maintain and improve support to the submarines; aircraft; ground-based missiles; other weapon systems; and command, control and communications systems that define the nuclear enterprise. We're also aggressively pursuing improved materiel availability for all nuclear enterprise weapon systems.

As part of its whole-of-government approach, DLA plays a large role supporting FEMA when disasters like hurricanes, earthquakes and wildfires strike the continental U.S. How does the agency stay ready to support these efforts, which can happen with little notice?

Where it makes sense for both DLA and other federal agencies, we extend our logistics expertise to other elements of government. Currently, we support more than 40 federal agencies. Our most established relationship is with FEMA for day-to-day operations and disaster response. We have developed pre-scripted mission assignments), which are essentially statements of work that DLA has indicated can support FEMA during disasters. Those PSMAs are approved and vetted through the enterprise and the Office of the Secretary of Defense, and they drastically reduce response times to our customers and the survivors of a disaster. They outline in detail what DLA needs to bring to an event rapidly and cost effectively. We also hold regular joint exercises with FEMA where we plan, prepare and practice it all. Last year, we took on support to the U.S. Forest Service's firefighting role. While we're always happy to provide support where it makes sense, we never forget that Warfighter Support is our No. 1 priority.

DLA is supporting USAID in its humanitarian efforts to lessen the suffering of refugees in Syria and Iraq. What were some of the challenges that came along with that operation?

In August, the State Department asked the Defense Department to use funds expiring at the end of September to help USAID obtain humanitarian assistance for refugees: lumber, plastic sheets, wash basins, dignity kits and more. It was a tight timeline, but by working closely with our partners, we got it done. Another challenge was getting the goods to non-government organizations that actually provided the goods to refugees. We set up intermediate staging bases in Kuwait, Jordan and Turkey where goods were received and accounted for, and then they

went to NGOs like UNICEF, the International Medical Corps and the Danish Refugee Council, who distributed them to refugees. Our efforts supporting USAID were a great example of finding ways to accomplish a very tough mission.

How is J3's Research and Development team working with DLA Aviation and the military services on additive manufacturing?

Additive manufacturing is a fairly new concept, but we're thinking big. Our vision is to use additive manufacturing to obtain obsolete and hard-to-source parts for DLA inventory. We're partnering with Naval Air Systems Command and the other military services to enable prompt testing, evaluation and acceptance of these parts for use in the supply system. Ultimately we want to expand our additive manufacturing parts catalog for integration into the supply system; produce approved critical safety item parts; establish and maintain a parts-on-demand capability; and have a library of Technical Data Packages with 3D models to enable faster production.

DLA's customers count on the agency to hold enough inventory to take care of their known and unknown needs, which requires a lot of forecasting and planning. How are we improving in those areas?

One big initiative under the DLA Strategic Plan is restructuring the agency's demand and supply planning. With the Center of Planning Excellence, we're moving inventory forecasting to an enterprise level. Using data pulled from the Enterprise Business System, we'll be able to perform deep statistical analysis to better align supply and demand. The demand and supply planners at the primary level field activities are being merged into materiel planners, each responsible for the overall "health" of an item. These two groups will work together to make sure we have enough in stock to satisfy our customers' needs while ensuring we keep costs down. Huge in all of this is staying in lockstep with our customers, understanding their needs and working with them to get in on the ground floor of the weapons systems life cycle.

> Equally as important is listening and caring about their wellbeing, something we're emphasizing with DLA's new Resiliency Program.

What are customers saying about DLA support to their organizations?

I engage with our customers all the time: on trips to various areas of responsibility, in forums with senior leaders and during direct communication. What I keep hearing is that our customers really like what we do. As budgets get tighter, they're looking to DLA to find ways to maximize their buying power, and we'll continue partnering with them to do that.

What are three things you think every leader should focus on?

First, it's leading by example. Leading is about identifying an objective, task or goal you want to accomplish and having your whole team come together to achieve the desired outcome. When you pick a course, you have to communicate to your folks through voice and action so the whole team owns that path. Equally as important is listening and caring about their wellbeing, something we're emphasizing with DLA's new Resiliency Program. Third, make sure your folks know you have their best interests in mind and provide them with the tools to be successful. When you pull all of that together, you get results. Nothing is more fulfilling for a leader than witnessing mission success and knowing that everyone on the team contributed their best to achieve it.

Is there anything else you'd like to share?

It's a great honor to serve at DLA again, deeply involved in supporting amazing missions around the world. None of this is possible without the people who make up this great organization, from those working in depots in far off places to personnel standing watch 24/7 in our Operations Centers. Everyone has an important role to play in keeping DLA on the path to success. Thanks for all you do.

Courtesy Photos

DEFENSE LOGISTICS AGENCY'S

PROCESS PROBLEM SOLVERS

Story by Chris Erbe

As the Defense Logistics Agency goes about supporting more than 2,430 weapon systems, processing 100,000 daily requisitions and managing nearly 5.3 million items over nine supply chains, a few problems are bound to occur.

When those problems have to do with acquiring weapon system repair parts, DLA calls on the Weapon System Sustainment R&D Program to find solutions.

The WSSP spans multiple weapon systems and supply chains to improve internal DLA processes, provide new tools and methods, reduce costs and lead times and ultimately improve warfighter support. WSSP participants work closely with process owners to spot problems and, through research and development, develop solutions.

"The purpose of WSSP is to make sure the customer has parts available when they need them and that they meet certain quality standards," said Leo Plonsky, Weapon System Sustainment R&D Program manager. "We do that through a series of projects aimed at that objective."

Program participants recently tackled the problem of how DLA can set correct inventory levels for items with unpredictable demand.

The project, called Peak/NextGen, addresses two problems that have challenged DLA's planning functional area: forecasting inventory levels for infrequently purchased items that have sporadic demand; and forecasting inventory levels for frequently purchased items that have sporadic demand.

"Quite often, there needs to be some safety stock level so that the services will have parts available, but you can't really forecast when they will need it," Plonsky said. "Using Peak/NextGen, we've been able to improve materiel availability, which is a key metric in DLA, while making inventory planning more accurate."

Peak/NextGen works by bringing together algorithms that help to balance the risks of being either under or overstocked. The process moves the focus from forecasting to metrics and allows managers to make a single, integrated decision across those metrics on the minimum and maximum inventory level for every item.

DLA began using Peak/NextGen in January 2013 to set levels for about 550,000 items. Benefits included an increase in materiel availability, less procurement workload, fewer unfilled orders, fewer orders that were later canceled and more efficient investment of capital. For this project, DLA's contractor, LMI, was chosen as a finalist for the 2015 Franz Edelman Award from the Institute for Operations Research and the Mathematical Sciences. The award recognizes operations research and analytics work that improves organizations and benefits the people it serves.

"These planning techniques help us improve customer service while maintaining leaner inventory levels," Plonsky said. "We're not stocking what we don't need."

> The Weapon System Sustainment Research and Development Program spans multiple weapon systems and supply chains to improve internal DLA processes, provide new tools and methods and ultimately improve warfighter support.

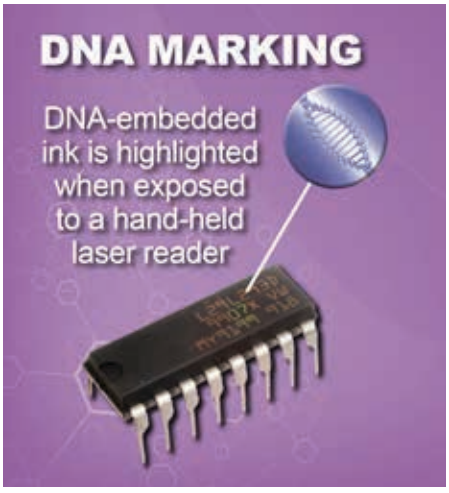
Program participants also work on projects that benefit the Technical/Quality functional area.

DLA has had a serious problem with counterfeiting, especially of microchips. The WSSP, partnering with Applied DNA Sciences, Inc., came up with a solution to authenticate the source of microchips through a technique called DNA marking. The manufacturer marks the microchip with a tiny spot of DNA — a special epoxy-acrylate ink that is impervious to tampering — to identify parts as authentic.

DLA's Product Test Center in Columbus, Ohio, has already implemented the procedures to ensure the integrity of the microchips DLA buys.

"You can't replicate it," Plonsky said. "The DNA mark can potentially protect the entire logistical chain."

The WSSP also works to protect the taxpayer from overpaying for military items. Recently, the WSSP partnered with 2Is (two-eye-s), Inc., to provide a Web-based Price Research Decision Support Tool, which helps DLA employees determine whether proposed prices are reasonable for Class IX supply items (repair parts). Determining a fair and reasonable price is difficult in some circumstances, and this new tool will help keep DLA from paying too much for needed items. DLA awarded 2Is a $7 million contract in November 2015 to implement the technology developed under the R&D contract.



DNA marking consists of applying a DNA identifier to the surface of a microcircuit. A unique code, which can't be replicated, re-engineered or digitally copied, is incorporated into the ink of the DNA mark.

WSSP also assists with the end of the logistics chain — disposition.

Program participants are currently working out a technique in the disposition area where DLA sells excess stock to industry, recouping some income. When there is a demand for that item, DLA buys the needed materiel back at a much lower cost than a new acquisition.

"We have found over time that we have materiel that sits on shelves, and we have pressure to get rid of it as excess inventory, so we do," Plonsky said. "Then when a customer wants it, we have to turn around and pay a contractor to manufacture new materiel."

The concept of the disposition project is to buy the materiel back from the companies that bought the excess inventory from DLA, which is cheaper and quicker than to have it manufactured new.

Like other DLA R&D programs, the WSSP has been working with additive manufacturing projects, also known as 3D printing. The projects are not so much about development of the technology, but are more about introducing 3D printed parts into the supply chain.

Project participants are creating an automated tool that identifies hard-to-procure parts that could be created through additive manufacturing. A second project seeks to address sourcing hard-to-procure parts and obtaining engineering approval for 3D printed parts from the services' Engineering Support Activities.

"The key impediments to additive manufacturing are not necessarily the production of the parts but the qualification process," Plonsky said. "Our goal is to get the right technical data packages so that the 3D printed parts will be qualified against the standards of a traditionally produced part. If all goes well, we'll have new sources to produce hard-to-procure parts."

In another project, WSSP strives to reduce problem procurements. Long acquisition lead time can result when DLA solicits bids and gets no quotes. These problem procurements can occur when, over time, a vendor changes ownership, goes out of business or undergoes some other change.

"We've found that a good way to avoid problem procurements is to focus on "time since last buy," or the last time DLA bought the part," Plonsky said. "We establish a five-year cutoff. If the part has not been bought in five years, a review process kicks in."

During the review process, product specialists in the technical/quality area update technical data, ascertain that there are suppliers who can provide the part and ensure the whole data package is complete. Participants hope that, by taking these steps ahead of time, DLA can virtually eliminate these types of problem procurements.

Tackling problems, improving processes, saving time and money — these are what the Weapon System Sustainment R&D Program team does every day as process-problem solvers for DLA. As long as there are better ways to accomplish DLA's objectives, the WSSP will continue to develop solutions that will improve warfighter support and reduce the financial burden on the taxpayer.

Tackling problems, improving processes, saving time and money — these are what the Weapon System Sustainment Research and Development Program team does every day as process-problem solvers for DLA.

GOOD EATS: MILITARY FOOD RESEARCH AND DEVELOPMENT

Story by Chrissie Reilly, DLA Historian

"The Army marches on its stomach" is a phrase credited to Napoleon, but the need to feed a military on the move is a timeless concern.

The Defense Logistics Agency helps supply high-quality, nutritious food in military dining facilities worldwide. On U.S.-based installations, at sea, and in theater, DLA has systems to ensure provisions reach their destinations on time and in good condition — primarily through DLA Troop Support. Its Subsistence division ensures customers worldwide get meals regardless of the operational or geographic challenges. Through more than a dozen varieties of MREs to fully functioning dining facilities, Subsistence works to provide a worldwide customer base with nutritious food in all climates.

In addition, the DoD Combat Feeding Research and Engineering Program, with representatives from the four military services and DLA, maintains the technological and intellectual base for this multifaceted initiative. Nutrition science, menu and recipe planning, sanitation, tactical food service equipment and training all take place at the U.S. Army Natick Soldier Research, Development & Engineering Center in Natick, Massachusetts.

Food writer and journalist Anastacia Marx de Salcedo used visits to the Natick lab as the basis for her book "Combat-Ready Kitchen: How the U.S. Military Shapes the Way You Eat," about the science and technology of military meals. The U.S. military's prime food objectives are shelf life, durability, taste and cost, Salcedo wrote. "A combat ration, by Congressional mandate, must be able to last for three years at 80 degrees Fahrenheit," she noted.

A great turning point in military culinary history began with Napoleon. He offered a 12,000-franc award to anyone who could create a method to keep food preserved for an army on the move. At the time, the average daily wage in Paris was less than 10 francs. Confectioner and chef Niccolas Appert devised a method to keep food fresh in airtight bottles for several months. He was awarded the 12,000-franc prize in 1810 by Napoleon himself. Later that year, British merchant Peter Durand was granted a patent for preserving food in airtight tins. It was only a few years before this technology crossed the Atlantic.

Eating During the American Revolution

Even before the United States declared independence, the Continental Congress in 1775 made provisions for the enlisted men in the Continental Army. They received peas, beans, vegetables, milk, meat and bread as part of their food allowance. Simple but portable and shelf-stable fare, it was designed to keep troops healthy and on the move.

The Civil War

In 1861, John Ordronaux, in "Hints on the Preservation of Health in Armies," published the first guidelines for an effective military diet. However, eating in the armed forces was not much different during the Civil War from how it had been during the Revolutionary War.

The invention of canning meant foods could be preserved for long durations. The technique worked, but mass production of canned foods was not available in the 19th Century. By the 1860s, canned foods were no longer new, but they were still not widespread. So canning did not dramatically change military fare by the time of the Civil War.

Mealtime during the Civil War.

World War I

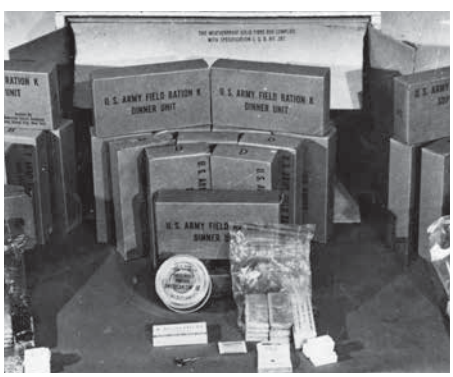
The Combat Feeding Research and Engineering Program is a modern institution, but it has a philosophical predecessor that dates back nearly a century. The first formal institution for U.S. military nutrition research was created when the Surgeon General's office established a Food Division for "safeguarding the nutritional interests of the Army" in 1917.

Maj. H.B. Monroe, the Mess Specialists Division director at Fort Monmouth, New Jersey, in 1942 recalled his own experiences with food during his time in the First World War. He said: "Plenty of times I sat down to a meal of cold coffee, baked beans, and goldfish [canned salmon] in the war."

Military rations during the Vietnam War.

World War II

Before 1940, there was no unified procurement or distribution of food, and each military service was responsible for itself. In 1941, the Army Quartermaster Corps centralized perishable food management into one organization known as the Market Center System. This system used experts such as supermarket executives to supplement Army personnel. According to Col. Karl Detzer in "The Mightiest Army," the Quartermaster Corps fed the soldier, clothed him, furnished his tents and canteens, knives, forks and spoons, his blankets and the packs to carry them in, and the belts to which to hook the packs and canteens."



K rations available in 1943.

Korea and Vietnam

Despite advances in wartime nutrition and food production, troops during the Korean War were mostly stuck with leftover C rations from World War II, supplemented with canned fruit and cakes. A C ration dinner included hard bread; a canned main course; crackers; chocolate or hard candy; cigarettes; chewing gum; and coffee. Unlike today's variety, the C ration entrées were simple, like canned spaghetti and meatballs, beef stew or franks and beans.

In 1953, the initiative to centrally procure semi-perishable subsistence and operational rations began. The Defense Subsistence Supply Center, a DLA Troop Support predecessor, was established in Chicago to perform these centralized procurement functions, with eight decentralized regional headquarters left to manage the perishable subsistence items. When the Defense Supply Agency, now DLA, in 1961 began to further centralize the management of common items for the military, this included Subsistence. In 1965, the Defense Subsistence Supply Center, the Defense Clothing and Textile Supply Center, and the Defense Medical Supply Center were consolidated to form the Defense Personnel Support Center in Philadelphia.

Even with the modernization of ration acquisitions in the 1950s, in 1966 thousands of portable, walk-in, refrigerated storage boxes filled with perishable beef, eggs, fresh fruits and vegetables began arriving in Vietnam — a logistics miracle.

Army historian Glen C. Morris wrote in the "Quartermaster Professional Bulletin" that few changes occurred in Army service between WWII and the Korean War, but "the war in Vietnam was unique because it presented no clearly defined battle lines." Similar to recent conflicts, ground transportation was difficult, and the battlefield was fast-moving.

One of the challenges of feeding troops during the Vietnam War was the absence of a permanently established fighting front. A solution to this was mobile kitchen trailers, known as MKTs, which carried food along with troops but usually had no means of refrigeration. C rations in Vietnam were only slightly different from their Korean War versions. (And cigarettes were still included, despite the 1964 surgeon general's report showing their harm and the 1965 law banning tobacco advertising on TV.)

The Persian Gulf War

In response to the needs of a military on the move, the Meals, Ready to Eat, or MRE, and the Tray Ration, or T ration, were developed in the 1980s. T rations were hot meals for use when cooks were unavailable. MREs were designed to provide a day's worth of sustenance in a convenient package. Designed to sustain the service member on the front lines, early MREs were not especially well-liked. Textures, flavors, and meal choices were lacking, earning MREs nicknames like "Meals Refused by the Enemy," "Meals Rejected by Everyone," and "Materials Resembling Edibles."

Improvements began in the early 1990s, with brand-name snacks and innovations such as the heat-resistant Hershey's Desert Bar. Brand-name foods and spices, like Taster's Choice instant coffee and Tabasco hot sauce, became part of the prepackaged meals. In 1993, the Flameless Ration Heater debuted, allowing a service member to heat a meal by simply adding water to a pouch.

Meals, Ready to Eat were developed in the 1980s.

No longer canned spam and candy bars, contemporary MREs are being infused with caffeine, omega-3 fatty acids and the anti-inflammatory curcumin.

Afghanistan, Iraq and Beyond

Troops now have dozens of MRE menus, with options such as kosher and vegetarian. Professional tasters evaluate mouth feel and "nasal pungency."

When asked about preferences for specific MREs, Army veteran Joseph Parker recalled, "I'm not a vegetarian, but the ones that were actually the best were the meatless ones. My favorite was the cheese ravioli." However, all was not lost even if one wound up with a less-than-adored MRE, as the MREs with the grossest entrees always had the best accompaniments, like M&Ms or Skittles."

Parker said that one of his fondest memories regarding military eating was soldiers' ability to come up with even better offerings by combining multiple MREs. "You'd find one MRE with a Dreamsicle cookie, and then another MRE with milkshake powder, which you would add a small amount of water to, and then use that as icing on the cookie," he explained. "Cookies and milkshakes didn't come together so you had to trade for them. ... That was the best: the frosted milkshake cookie."

DLA employee and Army veteran Mason Lowery, who served during the wars in Iraq and Afghanistan, explained, "It is a soldier's right to complain about MREs, but I loved them." From the coffee packs to the jalapeño cheese spread, Lowery raved about the rations he ate. One of the best items he ever had from an MRE came from the Meal, Cold Weather ration. "The eggs were fluffy and delicious, and with the hot sauce that came with it, I think they were the best eggs I've ever eaten."

The Meal, Cold Weather will not freeze and supplies extra drink mixes for countering dehydration. In addition, each meal contains around 200-300 more calories over the standard MRE to maintain energy in extreme cold.

The future of military cuisine is unwritten. But whatever tomorrow's warfighters are eating, DLA will have played a key role in creating, refining, manufacturing, packaging, and delivering it — at home or overseas.

The DLA History Office provides historical support to all of the agency's activities. It assists field activities with historical projects; compiles and publishes annual histories; conducts oral history interviews; collects historical documents and organizes them in archives; and conducts leader development activities such as senior leader staff rides.

For more information, contact Chrissie Reilly at 703-767-6428 or christine.reilly@dla.mil

DLA NEWSWIRE

DLA TROOP SUPPORT EMPLOYEES VISIT SUPPLIER, IMPROVE UNDERSTANDING OF INDUSTRY

Twelve employees from Defense Logistics Agency Troop Support's clothing and textiles directorate gained a better understanding of the supply chain during a recent tour of DeRossi & Sons, which has been making uniforms for the U.S. military since World War II.

Ken Drexinger, a demand planner, said the visit gave him a newfound respect for the manufacturing process and the people who work in factories.

"The work happens so fast that it requires a high level of focus and attention to detail," he said.

The visit was a result of employees' desire to know how their roles contribute to the overall supply chain.

"I think if everyone understands that bigger picture, their job becomes more meaningful," Drexinger added.

Similar visits are being planned for employees who work with suppliers to meet customers.

– Jason Kaneshiro

More online: go.usa.gov/ceJEC

DLA JOINS AIR FORCE, ARMY TO TEST SKILLS IN EXPEDITIONARY LOGISTICS

Defense Logistics Agency personnel joined soldiers and airmen in March for Turbo Distribution, a joint exercise that tests mobility operations and expeditionary combat support by providing a dynamic venue with scenarios to challenge participants on complex operations in a deployed environment.

The exercise uses U.S. Transportation Command's Joint Task Force-Port Opening mission set, combining the Air Force's swift airbase opening capability and the Army's cargo movement and tracking and distribution capabilities.

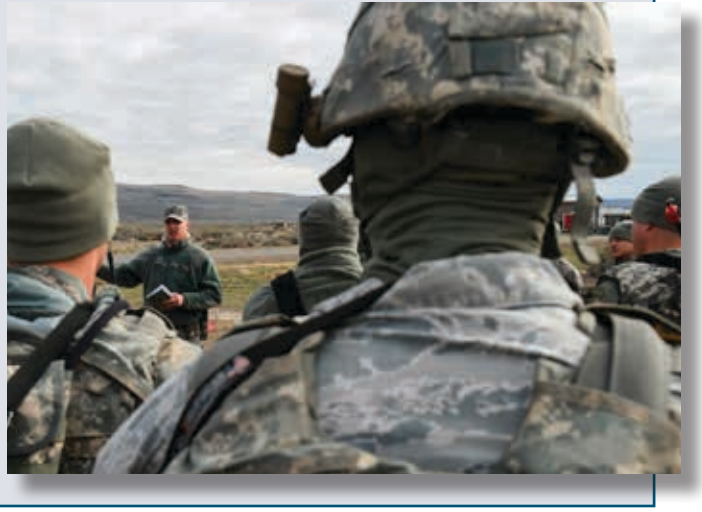
DLA partners with the services in three JTF-PO exercises each year, but participants regard Turbo Distribution as one of the most important.

"This is by far the most realistic training we go through, and it gives us the opportunity to integrate and coordinate points of difficulties with our counterparts, making it easier to complete the mission when we are called upon," said Air Force Staff Sgt. Chavis Wright of the 821st Contingency Response Support Squadron.

The JTF-PO specializes in rapidly establishing hubs for cargo distribution operations worldwide, to include remote or damaged locations, on short notice. Previous deployments include humanitarian assistance missions to Haiti, Pakistan and Japan, and contingency deployments in support of military operations in Eastern Europe, the Middle East and South America.

– Air Force Staff Sgt. Robert Hicks

More online: go.usa.gov/ceJpk



Compiled by Beth Reece

WORKFORCE RESILIENCY WEBSITE LAUNCHES

A new workforce resiliency webpage is now available for DLA employees and their families to use in developing behaviors and skills to cope with today's challenging work-life environment.

The workforce resiliency website offers definitions to assist in understanding the DLA resiliency model and its supporting pillars, as well as links to training, local field activity resiliency programs and DLA activities that assist in building resiliency.

"We promised our employees the tools and resources needed to help them become more resilient. This website is one of those tools," DLA Chief of Staff Renee Roman said. "As we go forward, we'll add more links, articles and useful videos. We hope that in the very near future it will be a 'one-stop shop' for DLA employees seeking to know more about resiliency."

Resiliency is an agency core value and, according to DLA Director Air Force Lt. Gen. Andy Busch, a vital part of the foundation of all DLA actions and decisions made to support the agency workforce, customers and stakeholders. Fortifying workforce resiliency is also part of the DLA Strategic Plan for 2015-2022.

– DLA Public Affairs

More online: www.dla.mil/info/resiliency.aspx

DLA, AFRICOM EXTEND PARTNERSHIP

The Defense Logistics Agency and U.S. Africa Command in February signed a three-year agreement that outlines and extends DLA's support to the regional command.

"DLA has really stepped up by giving us a full team of subject matter experts that will make an immediate difference when we have to react rapidly to a situation on the continent. We couldn't do it without DLA," said Paul Brown, AFRICOM deputy director for logistics.

Brown said the most prominent example of DLA's support to AFRICOM was during Operation United Assistance, the U.S. military's response to the 2014 Ebola outbreak in West Africa. He called the operation a "huge logistics lift" involving moving thousands of troops and medical equipment in a matter of weeks.

DLA's presence on the AFRICOM staff has expanded since then, and the current agreement calls for 11 fulltime employees to serve with AFRICOM counterparts. The agreement also states that DLA representatives will be integrated into AFRICOM's planning processes. At AFRICOM, planners prepare for everything from annual exercises like Flintlock 2016 to crisis operations like Operation United Assistance. Planners consider how, when and where to sustain forces and who provides that sustainment.

– Army Staff Sgt. Christopher C. Klutts

More online: go.usa.gov/ceJv3

COMING SOON TO A TRAIL NEAR YOU … MAYBE

Story by John R. Bell

IT ONLY COMES IN TAN, OLIVE DRAB OR WOODLAND CAMOUFLAGE.

IT GETS ABOUT 12 MILES PER GALLON

ZERO TO 60: IT'S ABOUT 30 SECONDS.

YET A LOT OF PEOPLE MAY WANT TO BUY ONE.

It's the High Mobility Multipurpose Wheeled Vehicle, slowly being phased out of service by the Department of Defense.

As the Defense Logistics Agency continues to dispose of thousands of Humvees every year, it's been looking at ways to recoup more money for the taxpayer. DLA recently began auctioning some unarmored Humvees for off-road use only, and private resale of ex-DoD vehicles has happened on and off the last few decades. And someday soon, direct DoD sale of three particular models — whether for scrap, parts, or legal road use — may become a reality.

That's the takeaway from a recent project, said Manny Vengua, program manager for the Strategic Distribution and Disposition unit at DLA Distribution.

The SDD team's business case analysis looked at the pros, cons and risks of selling to the public any of the roughly 55,000 Humvees scheduled for demilitarization, all of which require a "DEMIL code C" designation. DEMIL Code C applies to items that the U.S. Munitions List requires be removed before sale. Removing these components — such as radio mounts, weapons sights, armor and cryptographic gear — is required for a demilitarization to comply with law and regulation.

According to Vengua, most Humvees are sold for scrap at a price of under 10 cents per pound. At the same time, there is consumer demand for these vehicles — even though they cannot legally be taken on the public roads. Before 2006, AM General and, later, General Motors sold a civilian variant of the Humvee, the Hummer. But the Humvee, though outwardly similar, is not a model registered with and tested by the Department of Transportation.

Because of this and because the military variant lacks the safety and comfort of the civilian vehicle, demilitarized Humvees can legally be used only as off-road vehicles or, rarely, under the DOT "show or display" exemption. They therefore command a far lower selling price than the used civilian Hummer vehicles, of which low-mileage examples in the best condition can sell for nearly $100,000.

Dustin Senger

A mechanic washes off an up-armored Humvee outside the 1st Battalion, 401st Army Field Support Brigade vehicle maintenance facility at Camp As Sayliyah, Qatar.

Army Staff Sgt. Tina Villalobos

Soldiers and airmen prepare to load Humvees aboard a C-5 for transport from Travis Air Force Base in Fairfield, California, to Moffett Air Field in Sunnyvale, California, during the Big Logistics-Over-The-Shore exercise.

The SDD group's analysis looked at each major component of the Humvee, identifying the parts that would need to be removed before the vehicle could be sold to the public. Some parts pose a danger, some were designed using classified or sensitive systems, and others are just not relevant to civilian use, Vengua said.

His team's analysis showed that three models might eventually be salable: the M1037 Shelter Carrier, the M1097 Tall Cargo/Troop Carrier and the M1113 Shelter Carrier. If these models were saved from the crusher, the military service that owns the vehicle or a contractor would be asked to demilitarize the vehicle. Then, DLA Disposition Services would be asked to confirm the demilitarization.

One option the SDD team explored was to continue the status quo — having DLA Disposition Services demilitarize all Humvees it receives. This option poses no additional costs or risks, Vengua said. Demilitarization would be done by a vendor who would pay DLA for salvage rights to the vehicle under a DEMIL as a "condition of sale" contract in return for ownership of the scrap. The average Humvee nets around $900 in scrap value to DLA. But then, after demilitarization of what remains, little of value is left.

A second option is to have the military services or a contractor perform "key point" demilitarization and then have DLA Disposition Services sell the trucks through a contractor. This would return $4,500 to $5,300 to DLA for each Humvee sold, depending on whether the labor is done by the services on site or at a central contractor facility. The potential profit ranges from $134 million to $156 million, Vengua said. However, this option would require approval from the Department of Commerce and the Department of State as to the classification of Munitions List items.

A final alternative would authorize salvage dealers to sell parts that don't need to be demilitarized on the aftermarket, motivating these dealers to bid higher for the salvage rights. Because of the existing GM Hummer models already in civilian garages, items such as engine parts, seats and even tires command enough of a profit that resellers are interested, said Vengua. Through a combination of demilitarizing some vehicles (when practical and legal) and removing salable parts from the remaining models, DLA could recoup almost $156 million on the nearly 55,000 vehicles, at minimal risk, Vengua said.

A final alternative would authorize salvage dealers to sell parts that don't need to be demilitarized on the aftermarket, motivating these dealers to bid higher for the salvage rights.

One problem is that the original equipment manufacturer — meaning AM General — officially opposes the sale of surplus Humvees because they weren't designed to meet DOT's Federal Motor Vehicle Safety Standards.

In addition, the Army Tank Automotive Command adamantly opposes these sales because of safety and security concerns if unauthorized material is inadvertently released to the public. In addition, the existing mutilation contracts guarantee contractors a minimum amount of scrap — and an increase in sales of these vehicles could potentially reduce that amount.

Whichever eventual path DLA takes, DoD will work with the agency to ensure compliance with DEMIL regulations, said Jeff Garrett, the DoD DEMIL program manager, who worked with Vengua's team on the analysis. "The key is to balance and maintain policy compliance with proper procedures and execution for disposition of excess property," Garrett said.

Vengua agreed. "DLA is always seeking ways to increase the revenues it can recoup for the U.S. taxpayer," he said. "This one example of how our team continually works to find innovative approaches to problems that could beneficial the agency. It may not be as glamorous as other research we do, but it's just as important."

I AM DLA

My name is:
Wallan Hashimoto.

I am:
A management and program analyst for DLA Disposition Services Pacific.

Describe your job in a sentence:
For the Pacific Region office, which links headquarters and field sites throughout the region, I help manage resources such as finance, travel, training, personnel and support agreements that help sites provide world-class service to the warfighter.

How long have you worked at DLA?
I've worked for DLA Disposition Services six years, beginning as a student summer hire. After earning my master's, I was picked up full-time as a property disposal tech, later got into the DLA Corporate Intern Program and eventually moved into my current job.

What is your favorite thing about working for DLA?
I really enjoy helping customers. At field sites, the primary customer is the warfighter, but we also provide excess property to federal, state and local agencies. One day I'd get a call from a sheriff's office asking about flashlights. Another day we had the local Air National Guard needing a medical gurney. Or we'd be helping schools get computers. You never knew what the day would bring.

What are your best memories of working here?
My coworkers. At every place I've worked at DLA, there's been a sense of family. At every stage, I've met smart, innovative, generous people who go the extra distance to make you feel part of the team. That's what sets DLA apart from other organizations I've worked for. I've always felt our work is serving a larger purpose — a commitment to help each other and others. Now that I work daily with folks from Energy, Installation Support, Troop Support, Distribution and DLA Pacific, I see how the PFLAs help support the warfighter in the Asia-Pacific region.

How do you make a difference?
I try to treat everyone how I would want to be treated, how I would want a family member to be treated — with respect, integrity and kindness. When I deal with our folks on an isolated base in Northern Japan, I keep in mind I'm their contact with HQ multiple time zones away. Or if we have an employee deployed to the area who has questions or is trying to arrange training here so others don't have to fly halfway around the world. I'm very aware that without help from others, I couldn't support our folks who directly support the warfighter.

Wallan Hashimoto