

FISCAL YEAR 2006  
SECRETARY OF DEFENSE ENVIRONMENTAL AWARDS  
U.S. ARMY NOMINATION

# LETTERKENNY ARMY DEPOT, PA

ENVIRONMENTAL QUALITY, INDUSTRIAL INSTALLATION



**SUSTAINING THE ENVIRONMENT** FOR A SECURE FUTURE

## INTRODUCTION

Letterkenny Army Depot is located in the Cumberland Valley in south-central Franklin County, Pa., five miles north of Chambersburg. Comprising 18,864 acres, a large land portion of the depot is used to conduct maintenance, modification, storage and demilitarization operations on tactical missiles and ammunition. On occasion, the depot partners with industry, allowing the advantage of unique capabilities and skills. Letterkenny has a civilian population of approximately 1,342, including 31 military personnel. Tenants and contractor support at the depot employ an additional 1,577 people. The depot remains among the top three employers in Franklin County, fueling an economic engine that propels over one quarter billion dollars annually into the region through payroll, contracts and retiree annuities. The primary mission is to provide the U.S. Army and other armed forces with worldwide, reliable, responsive and cost-effective depot-level maintenance, field support, systems integration and product support integration for weapon systems, components and ancillary equipment to ensure the readiness, sustainability and safety of these forces during the full spectrum of operational environments.

As the Center of Industrial and Technical Excellence for Air Defense and Tactical Missile Systems, Letterkenny continues a tradition of supporting our Soldiers and our Army for more than 60 years. The depot has unique tactical missile repair capabilities for a variety of Defense Department missile systems, including the Phased Array Tracking Radar Intercept On Target (PATRIOT) Missile and its ground support and radar equipment, as well as the Hawk, Tube-launched Optically-tracked Wire-guided (TOW), Hellfire and Javelin systems. Most recently, Letterkenny has expanded its product line to include the overhaul of tactical wheeled vehicles, namely high-mobility multipurpose wheeled vehicles (HMMWVs), material handling equipment (7.5 ton cranes) and mobile kitchen trailers.

As the Center of Industrial and Technical Excellence for Mobile Electric Power Systems, Letterkenny repairs and remanufactures power

generation sets in sizes from 5kW to 150kW. The depot's highly skilled personnel provide rapid response by sending mobile teams to units preparing to deploy. Using a triage approach to assessing unit assets, Letterkenny personnel offer technical inspection, on-site maintenance and identification of assets requiring evacuation for depot level repairs. The depot can provide enhanced maintenance training to Soldiers for improved sustainment of power generation equipment. In addition to repair of generators, Letterkenny has expanded its capabilities to include aviation ground power units. Other vital Defense Department products Letterkenny supports include the Force Provider, mobile power generators and the Biological Integrated Detection System (BIDS).

## BACKGROUND

Letterkenny has an award-winning environmental program geared to meeting the installation's environmental

challenges in a way that supports Soldier readiness.

Letterkenny became the only two-time winner of the Shingo Prize for Excellence in Manufacturing for Lean Manufacturing Excellence in 2005 and

2006 because of two major weapons system programs: the PATRIOT Missile Air Defense System and the HMMWV recapitalization program for tactical wheeled vehicles. The depot also received the 2005 DoD Continuous Process Improvement Special Recognition Award.

Letterkenny strives to consistently provide products that meet or exceed customer and regulatory requirements, improve customer satisfaction, and continually improve processes using Lean Six Sigma as the core method. All Directorates within Letterkenny are responsible to support, participate

### Lean Highlights

- Reduced solid waste disposal through recycling by 58%
- Significantly reduced targeted hazardous chemicals
- 70,838 sq.ft. floor space saved
  - Avoided new construction costs of over \$700,000
- Improved Work Environment
  - Reduced annual lost work hours from 3,386 to 2,131
- Certified in ISO 14001:2004
- Certified in ISO 9001:2001

in and sustain Lean Six Sigma to improve their internal process. The Lean core team, under the Chief of Staff, facilitates Lean Six Sigma activities across the depot. The Lean core team utilizes the Lean tools (kaizen and value stream analysis) to work with cross-functional teams to discover and eliminate waste. Over 80 percent of the workforce has participated in at least one "Rapid Improvement Event." Lean activities enable broader enterprise productivity changes while considering both the supplier and customer needs of the process. Follow-up meetings are used in order to finalize any changes. Lean Six Sigma has demonstrated the ability to eliminate waste by reducing floor space, reducing flow time, reducing distance traveled and increasing productivity.

Lean Manufacturing has revolutionized pollution prevention at the depot. Iterative improvements to Lean initiatives that build on their initial implementation have vastly improved waste reduction and eliminated sources of pollution at the depot, improving environmental quality and saving millions of dollars in production and waste disposal costs.

"Letterkenny's environmental initiatives are a model of environmental stewardship in the Department of the Army and the federal government as well."

- Juan Lopez, Senior Program Analyst, Office of the Federal Environmental Executive

During FYs 2005 and 2006, Letterkenny saved an additional \$725,000, as waste elimination and manufacturing became more cost effective. Repair time for HMMWVs was decreased by 40 percent, which will realize an annual cost avoidance of \$14 million. Because of these lean improvements, Letterkenny has been able to provide 27 free HMMWVs per month to the war fighter since August 2006.

## PROGRAM SUMMARY

Lean Manufacturing succeeds because efficiencies are introduced wherever feasible. The depot did not build new production facilities, and still production hummed along at a rate two times



*Because of these lean improvements, Letterkenny has been able to provide 27 free HMMWVs per month to the war fighter since August 2006.*

better than before lean initiatives were adopted. Because of better utilization of manufacturing space, the depot avoided the need for new construction and was able to bring in additional workload. Production yields increased dramatically while preserving raw materials, energy and labor by decreasing redundant, wasteful work.

The improvements at Letterkenny have produced vital real world results. Operations Enduring Freedom and Iraqi Freedom forced the depot to adjust to the new and urgent needs of our Soldiers. To address the significant threat of improvised explosive devices (IEDs), Letterkenny fabricated almost 900 reinforced armor door kits for upgrading HMMWVs deployed in Iraq; the last of the kits was produced in April 2005, two weeks ahead of schedule. The efforts of depot employees saved lives and prevented countless injuries.

Armor kits for the M969 5,000-gallon tanker provided a new challenge because the tanker had undergone a variety of design changes. The letter of intent to build the 150 kits was received on 19 November 2004, and the last kit was completed on 21 January 2005, four weeks ahead of schedule and \$1 million under budget.

Additionally, Letterkenny began with a modest production rate of 5 kits a week in January 2005 for armor cabs for the M939 5-ton truck. By using Lean processes, production was steadily increased to 25 kits a week without increasing the amount of floorspace needed. Based on the accelerated production rate, the depot was asked to produce

70 percent more kits than called for in the original program. The 400th cab was completed in early July 2005.

Lean Manufacturing not only put Letterkenny in a better position to save the lives of Soldiers, it also improved the work environment of employees themselves. There has been a 37 percent decrease in the number of lost work hours (from 3,386 in FY 2004 to 2,131 in FY 2006) even though labor hours have increased by 66 percent over the same period.

## ACCOMPLISHMENTS

### EMS

#### **ISO 14001:2004 Certified Depot**

The Letterkenny Environmental Management System (EMS), administered by the Directorate of Public Works with oversight by the Directorate of Product Assurance, is third-party registered with NSF-ISR, Ltd. to the newest ISO 14001:2004 standard. On-site ISO EMS training has been conducted for all levels of the organization to include senior management, quality assurance specialist staff and the general depot population and is available in the depot intranet for continued reference and training. Directorate of Product Assurance personnel conducted ISO 9001:2000 training from the senior management level to the employee level to include contractor support personnel, and provided an additional overview of ISO 9001:2000 to all new employees during the new employee orientation. ISO 14001:2004 awareness training is also provided during new employee orientation.

The Letterkenny EMS involves reviewing facility operations and making choices to reduce negative and improve positive environmental impacts, looking beyond environmental compliance to improve all aspects of the depot including waste generation and chemical use. By aligning to this standard, the depot is promoting consistent environmental practices that should improve quality and productivity, lower costs and enhance environmental stewardship. The EMS becomes a tool that provides a structured approach to analyzing and managing the environmental impacts of day-to-day operations.

### **Exceeded EMS Goal for Chemical Toxicity Reduction**

Where two or more products are being used to perform the same function, the Letterkenny goal is to eliminate all but the most environmentally friendly. Where products are being used that contain chemicals targeted for elimination, the depot attempts to find substitutes with less toxic ingredients that meet the performance requirements. Since the beginning of FY 2005, the depot has prevented the introduction of any new chemical formulations containing methylene chloride, trichloroethylene and other hazardous chemicals, and met the EMS goal of reduction of their use in existing products by 75 percent by the end of FY 2005.



*HMMWV's are disassembled upon arrival at Letterkenny to prepare them for repair and maintenance prior to repainting.*

### **Environmental Compliance Assessment and Management Program**

The success of the Lean process represents what is unique about Letterkenny's management program, namely that it is well established, encompassing, technically meritorious, well managed and cost effective. In all cases, environmental program initiatives, guided in part by depot-wide Lean efforts, meet statutory and regulatory requirements, and in many cases they exceed them.

### **Pollution Prevention and Waste Reduction Efforts**

#### **Surpassed Solid Waste Measure of Merit by 18 Percent**

The HMMWV program is an inspect and repair program so most of the waste is part of the operation as parts are replaced as necessary and the removed parts are scrapped. As of September

2006, the depot reported a 58 percent solid waste diversion rate for the year, or 4,756 tons, by promoting reduction in the amount of solid waste sent to landfills by implementing reuse, recycling and reclamation programs.

### **Reduced Hazardous Waste Disposal Costs for Blast Media by 77 Percent**

Instead of using 55-gallon drums, most spent blast media is now collected in supersacks and large roll-off containers for disposal. This initiative saves the depot over \$500,000 annually in handling and disposal costs.

### **Recycling and Reuse of Waste Fuel and Oil**

Diesel fuel drained from vehicles being overhauled at the depot is now collected for reuse in the main heating plant, saving both on disposal costs and on the purchase of new fuel oil. Additionally, the depot has set up a program where used motor oil is sold through the Qualified Recycling Program instead of being disposed.

### **Sustainability Through Alternative Fuel Vehicles**

The depot has also acquired dual-fuel vehicles in the past two years allowing for use of either unleaded gasoline or E85 ethanol (85 percent ethanol and just 15 percent gasoline). In FY 2006, the installation completed a feasibility study on the use of hybrid vehicles and bio-diesel as an alternative to diesel fuel.

### **Effective Use of Funds**

#### **Avoidance of New Construction**

The original goal of the HMMWV Recap program was 5 vehicles per day in January 2005, and subsequently surged to 15 vehicles per day in July 2005. Currently the HMMWV process is producing 19 vehicles per day. The original setup was bay type and this process was performed with the body and chassis combined. This process was improved and it was converted to separating the body from the frame into different processes in July 2005. The Lean team conducted mini-kaizens, or rapid improvement events, for each workstation to accomplish the change. Also, the Lean team was involved with the subassembly area expanding to reduce flow time. These efficiencies provided the needed production capability above the initial goal. This allowed 70,838 square feet of floor space to be saved, thereby avoiding the need for

additional manufacturing space. This resulted in a savings of over \$700,000 in new construction costs.



*Repeated Lean events were conducted in the greatest maintenance, repair and overhaul bottlenecks. Through a continuing series, the processes were streamlined so more parts or vehicles per month are processed. During the second event in the final paint area, the walking distance was decreased and the productivity was increased.*

### **Cost Savings**

Letterkenny embraced the private sector commercial enterprise philosophy of giving back tangible savings to the customer, and in the process developed a cutting-edge, innovative process that allows savings to be realized in a tangible way. Savings are returned based upon whether the Lean project achieved a productivity gain by a reduction in manpower and/or materials, including material savings based upon actual cost of goods not purchased. Savings "Lean Checks" are based upon guidance from the Commanding General, U.S. Army Materiel Command, in that 60 percent of savings are to be returned to customers and 40 percent can be retained at the depot level for reinvestment into improving depot processes.

### **Decreased Lost Work Hours**

The depot has significantly reduced noise from the blast booths, added guarding to targeted equipment and provided lift-assisting devices, such as adjustable work benches/tables and magnetic/suctions lifts. Additionally, employees are encouraged to report safety deficiencies and opportunities at all times and are trained to use composite risk management considerations in their activities (i.e., think of what could go wrong, plan

before you act, and evaluate results). The depot has seen a reduced number of lost production days by 37 percent and workers compensation-claims drop by over \$220,000 since FY 2004.

### **Community Relations**

#### ***Public/private Partnerships Support National Research Efforts***

Letterkenny has strengthened its technological development by initiating partnerships with Pennsylvania State University's Applied Research Laboratory and the Applied Technology Center at Hagerstown Junior College. The depot has also collaborated on a number of natural resource research and education efforts with the Shippensburg University, West Virginia University, the Pennsylvania Game Commission and the U.S. Forest Service.

#### ***Citizen Volunteers Donate 15,000 Hours***

Letterkenny sustains an active natural resources management program. Over the past year, the depot completed a 50-acre harvest program aimed at controlling invasive species. Fish and Wildlife Habitat Improvement Projects efforts are greatly aided by the Letterkenny Rod & Gun Club and other local citizen volunteers who contributed over 15,000 hours in FY 2006.

#### ***Community Outreach***

Letterkenny staff devote time to the local community by judging the Chambersburg School District science competition and presenting talks at

local schools regarding wildlife management. Additionally, school groups are invited to participate in select activities at the depot.

#### ***Public/Private Partnerships Save Dollars and Lower Environmental Impacts***

Depot Lean efforts would not have been successful without partnerships such as AM General on the HMMWV, General Dynamics Robotic Systems on Stryker or Lockheed Martin/Raytheon on the Javelin Joint Venture. A public-private partnership between Letterkenny and Lockheed Martin began in 2006 in which Lockheed Martin performs modifications at the depot, working in coordination with depot staff toward product improvement. To focus the best from the military and industry, they have joined forces to create repair centers for both Javelin and Target Acquisition, Designation Sight/Pilot's Night Vision Sensor (TADS/PNVS) Reset operations.

#### ***Community Leadership Sustains Growth***

Letterkenny supports the growth and development of the local community through its active participation in community planning. Local community planning groups include: The Chambersburg Area Development Corporation, Franklin County Area Development Corporation, Chambersburg 2000 Partnership and The Local Reuse Authority. The depot ranked by *Expansion Management* magazine in the 2006 Top 10 Military Communities of Excellence for Metro areas with small military populations.

## **CONCLUSION**

Letterkenny remains on the forefront of integrating Lean Manufacturing and EMS into its management programs. Every year the depot realizes successes that have received recognition from military and industry organizations. FY 2006 was especially productive for Letterkenny's environmental program, evidenced by successful reduction in chemical toxicity, substantial savings and avoidances in pollution prevention measures, extensive training and employee participation and more. Letterkenny personnel are proud of the role they play in the nation's defense.



*Depot staff give a Natural Resource presentation to a local cub scout group about local flora and fauna.*

*On the cover: Sgt. Aubrey Caplinger, left, and Spc. Gabriel Vega maintain security atop an Avenger air defense system in Ghazni, Afghanistan. (U.S. Army photo by Sgt. Christopher Kaufmann)*