2016 Interior Lighting Campaign Awards

99th Regional Support Command Uses LED Lighting to Capture Significant Savings

The United States Army Reserve (USAR) 99th Regional Support Command (RSC) won a 2016 Interior Lighting Campaign award for a troffer lighting upgrade that is expected to save 184,000 kWh annually, roughly equivalent to the energy use of 17 homes.

The lighting upgrades took place at the Technical Sergeant Vernon McGarity Army Reserve Center in Coraopolis, Pennsylvania, where old fluorescent luminaires were replaced with LED lights in three buildings encompassing 152,000 square feet of office, meeting, and storage space.

The 99th RSC upgraded more than 1,250 troffers in the Reserve Center, a maintenance shop, and a storage shed. The majority of the troffers upgraded were two-lamp (62-W), three-lamp (86-W), and four-lamp (108-W) fluorescent luminaires and were replaced with 46-W and 61-W LEDs with occupancy sensing controls to achieve a 51% energy use reduction.

Project at a Glance - Technical Sergeant Vernon McGarity Army Reserve Center, Coraopolis

Project Location	Coraopolis, PA
Total Area of Project	3 buildings–152,000 ft^2 total
# of Troffers Upgraded	1,250
Annual Energy Savings	184,000 kWh
Equals the Energy Usage of	17 Homes
Energy Use Reduction	51%
Annual Energy Cost Savings	$20,200

The Technical Sergeant McGarity Army Reserve Center located in Corapolis, PA, replaced over 1,250 troffers in three buildings and achieved an impressive 51% energy savings, or 184,000 kWh annually. The Army Reserve is proud to contribute to the efforts of the Interior Lighting Campaign, which have saved over 130 million kWh and $13.5 million in the first year.
Photo courtesy of the 99th Army Reserve Command.

The 99th RSC provides base operations support to more than 200 Armed Forces Reserve Training Centers and maintenance shops in the 13-state northeast region stretching from Maine to the Virginias. This facility's lighting upgrade is just one of more than 180 projects implemented in the RSC's Energy Savings Performance Contract (ESPC). The 99th RSC ESPC leveraged third-party financing to develop and implement the project. The energy savings generated from the ESPC are used to repay the third-party financing.

Project Drivers and Successes

The Energy Team for the 99th RSC Directorate of Public Works implemented the ESPC to assist the Command in achieving the mandated energy and water conservation goals outlined in Executive Order 13693: *Planning for Federal Sustainability in the Next Decade*. The ESPC is a vehicle for energy-saving facility improvements without needing up-front capital costs or special funding from Congress.

Energy savings are used to repay the third-party financing. The 99th RSC contracted with an energy service company, ConEdison Solutions, through the Defense Logistics Agency to develop and implement over 180 energy conservation measures across 10 states at 90 separate facilities. The Technical Sergeant Vernon McGarity Army Reserve Center in Coraopolis, Pennsylvania, is not only one of the largest centers with over 152,000 square feet in three buildings, it also has one of the highest utilization rates, with the accompanying increase in hours, energy demand, and higher maintenance and power costs, making it a particularly good candidate for energy-saving measures.

Over 1,250 troffers were replaced in the three-story Reserve Center, which contains an assembly hall, auditorium, classrooms, a kitchen, individual offices, open cubicle areas, and supply storage areas. Lights were also replaced in the Area Maintenance Support Activity shop, which contains maintenance bays and offices, and in a heated storage shed with offices. These changes will result in annual energy savings of 184,000 kWh and resulting cost savings of $20,200.

Before and After Retrofit

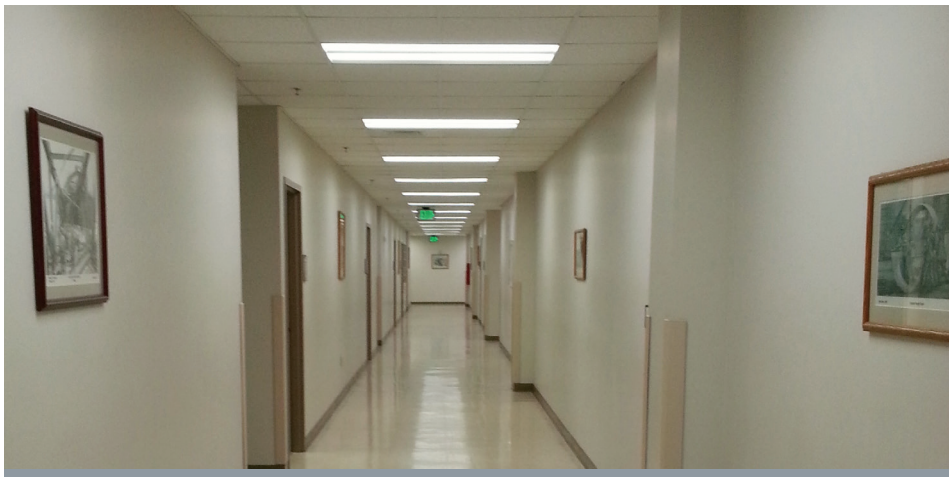
	Before	After
	T5 and T8 Fluorescent	LED
Number of Troffers	1,250	1,250
Wattage per Troffer	62-108-W	46-61-W
Annual Energy Use	358,600 kWh	174,600 kWh
Controls	None	All

ILC Awards Won

- Exemplary Federal Government Sector Site

Lessons Learned

- Using LED lighting in high-usage facilities is particularly effective because of the combination of energy savings and maintenance savings through longer life and resultant reduction in labor hours, purchasing, and disposal.
- The high return on investment with LED upgrades can be combined with other energy-conservation measures that would not otherwise be cost effective on their own, increasing overall project scope and effectiveness.
- A big driver for converting to LED lighting is the maintenance benefits, which the 99th RSC is already receiving, as LEDs only need maintenance every 10 – 14 years.
- On a 1-for-1 troffer replacement using bi-level controls realizes further savings as the higher efficacy of the LED replacements allows for lights to be set at lower levels.
- If time and project budget allows for more in-depth auditing and lighting redesign, savings could be increased by reducing the number of fixtures needed through redesign.
- Communication and coordination between multiple stakeholders across multiple organizations is a challenge. Arranging access to a government facility for staff from multiple companies and organizations also adds to project complexity.



Lighting controls and reduced labor costs because of the LED's longer life have added to project cost savings.
Photo courtesy of the 99th Army Reserve Command.

But energy savings are only part of the benefits for the 99th RSC. The Command is already experiencing significant maintenance savings. Because the LEDs are so long lasting, they are expected to reduce the need for maintenance over the life of the LED fixtures. "This has been one of the greatest benefits for all LED upgrades performed by the 99th RSC and it greatly helps reduce the workload of field personnel," said Justin Drigon, Energy Management Technician for the 99th RSC. "Less maintenance also means fewer personnel hours involved in purchasing of the new lamps and fewer maintenance staff to be up on ladders replacing lights.

"Using LED lighting is a no brainer for many 99th RSC facilities. Most of the sites (and this site in particular) have high usage and have historically had high failure rates with the previous lighting system due to that high usage.

This site is one of the newer and larger ones in the 99th RSC's area of operation so the return on investment was very favorable. LED upgrades also helped us bundle other energy conservation measures into the project that we otherwise wouldn't be able to complete due to their higher returns on investment," said Drigon.

In this retrofit, the 99th RSC also included controls that can further increase energy savings. The troffers are equipped with bi-level controls, with a high setting for more light and a low setting that produces lower light levels. The project utilized a 1-for-1 troffer replacement. Most building occupants responded favorably to the brighter lighting, although a few commented that it was almost too bright. Drigon noted that the ceiling grid could have been redesigned to take into account the unique illumination characteristics of the new LED and perhaps reduce the number of LED troffers installed; however, this would likely have added considerably to the cost.

Next Steps

The 99th RSC has concluded that LED lighting retrofits are a cost- effective energy retrofit and 80% of the 99th RSC's buildings now have LED lighting. The ESPC is ongoing with more than 30 facilities undergoing lighting retrofits. The 99th RSC Energy Team continues to audit facilities and will pursue new energy savings projects.

Learn More

U.S. Army Reserve 99th Regional Support Command

www.usar.army.mil/Commands/Support/99th-RSC/

Federal Energy Efficiency Requirements for Interior Lighting

Although every site, whether federal, private, commercial, or industrial, can benefit from the energy savings, maintenance savings, and lighting quality improvements, offered by energy-efficient lighting, federal sites have another motivator. They must ensure compliance with the multiple laws, executive orders, and Federal Acquisition Regulations, which mandate that federal agencies meet efficiency requirements in all procurement and acquisition actions that are not specifically exempted by law.

ENERGY STAR® Lighting

Federal purchasers must buy, specify, and contract for ENERGY STAR®-compliant products. To find ENERGY STAR-qualified lighting products, see www.energystar.gov/productfinder/.

Federal Efficiency Requirements

In cases where there is no ENERGY STAR® product category, the agency should comply with FEMP-designated efficiency requirements.

The table below lists the minimum federal efficiency requirements that various categories of interior LED lighting must meet to be eligible for purchase by federal agencies.

FEMP LED Purchasing Guidance

For more information on high-efficiency lighting technologies and information for federal agencies, including lighting requirements language for contracts, visit energy.gov/eere/femp/purchasing-energy-efficient-commercial-and-industrial-led-luminaires.

FEMP and the DOE LED Lighting Facts® program have partnered to offer a tool that allows federal users to identify LED lighting products that meet the minimum federal efficiency requirements.

The FEMP Acquisition Guidance Product List allows users to search for interior lighting products in the six categories in the table below that meet federal requirements. The tool provides a pre-screened list of products and federal users can screen on a large range of other product metrics, including color temperature, power factor, and beam angle. Find qualifying products at www.lightingfacts.com/LFPowered/FEMP.

Helpful Guides

Wireless Occupancy Sensors for Lighting Controls: An Applications Guide for Federal Facility Managers — This guide describes the different types of sensors, appropriate applications, and expected energy savings. www.energy.gov/sites/prod/files/2016/03/f30/wireless_occupancy_sensor_guide.pdf

Measurement and Verification of Energy Savings and Performance from Advanced Lighting Controls — This document provides a framework for measurement and verification. energy.gov/sites/prod/files/2016/03/f30/mv_lighting_control_wireless.pdf

Proven Specifications

Use these specifications, developed by DOE's Better Buildings Alliance and the Designlights Consortium, to specify performance expectations, warranty, and testing requirements for your lighting projects.

Better Buildings Alliance Model Technical Specification: High-Efficiency Troffers

betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/High Efficiency Troffer Performance Specification.pdf

Designlights Consortium Networked Lighting Control Systems Specification
www.designlights.org/content/CALC/SpecificationAndQPL

"The marketplace is seeing a rapid adoption of highly-efficient indoor lighting and green leasing practices, as the price of cutting edge technologies and the risk of creative market approaches continue to decline. This is exemplified by the increasing number of organizations partnering with DOE to adopt the next technology or novel market strategy—and through this, showing the will to push the limits and benefits of energy efficiency in commercial buildings."

Kathleen Hogan,
Deputy Assistant Secretary for Energy Efficiency, U.S. Department of Energy

LED Luminaire Efficiency Requirements for Federal Purchases

Luminaire Type	Light Output	Luminaire Efficiency (LE)
Commercial, linear ambient	≥375 lm/ft	≥103 lm/W
Commercial, 1-foot by 4-foot troffers	≥1,500 lm	≥99 lm/W
Commercial, 2-foot by 2-foot troffers	≥2,000 lm	≥100 lm/W
Commercial, 2-foot by 4-foot troffers	≥3,000 lm	≥103 lm/W
Industrial, low bay	≥5,000 to <10,000 lm	≥103 lm/W
Industrial, high bay	≥10,000 lm	≥100 lm/W

as of October 2015

Interior Lighting Campaign

On June 27, 2016, the 99th RSC was one of 13 organizations recognized for exemplary energy savings at an award ceremony conducted in Washington, DC, by the ILC, an effort to promote high-efficiency troffer lighting and control systems in buildings. The 99th RSC won Exemplary Federal Government Sector Site.

In one year alone, 650,000 new high-efficiency troffer upgrades were planned or completed, equating to savings of 130 million kWh, and $13.5 million. With nearly 50 participants and over 130 supporters, the ILC continues to accelerate the reduction in the amount of energy consumed by lighting in buildings nationwide.

The ILC encourages facilities to install energy-efficient lighting and to install lighting occupancy or daylight controls to cut energy use and deliver occupant satisfaction. By adopting more efficient troffer lighting, such as systems that meet the Better Buildings Alliance (BBA) specification for troffers, building owners can save up to 70% on a one-for-one basis, and up to 80% with the use of controls.

The ILC's overall goal is to achieve the replacement of 1 million planned or installed high-efficiency troffer lighting systems by April 2017.

Through the Better Buildings Alliance, members in different market sectors work with the U.S. Department of Energy's (DOE) exceptional network of research and technical experts to develop and deploy innovative, cost-effective and energy-saving solutions that lead to better technologies, more profitable businesses, and better buildings in which we work, shop, eat, stay, and learn. Join today to start saving energy in your commercial buildings through programs like the Interior Lighting Campaign, www.interiorlightingcampaign.org.
Photo courtesy of Pacific Northwest National Laboratory.

Join the ILC

Federal sites are encouraged to join the ILC. The ILC will provide you with:

- technical assistance
- information on financing and incentives
- lighting savings calculators.

Federal sites commit to:

- building or retrofitting at least one building space with high-efficiency lighting. (Sites built or retrofitted with complying fixtures any time after January 1, 2013, are eligible to compete.)
- Share your results.

Report your actual energy savings by April 2017 for a chance to be recognized at the ILC awards event at the BOMA 2017 International Conference & Expo, June 24-27, 2017, in Nashville, Tennessee.

ILC Award Categories

The award categories for the interior lighting campaign include the following:

- Highest Absolute Annual Savings for Troffer Lighting Retrofits
- Highest Percentage of Annual Savings for Troffer Lighting Retrofits
- Highest Absolute Annual Savings for Troffer Lighting New Construction
- Highest Percentage of Annual Savings for Troffer Lighting New Construction
- Special Recognition Categories:
  - Best Use of Lighting Controls in a Single Building
  - Largest Number of Facility Projects
  - Largest Portfolio-wide Annual Absolute Energy Savings
- Exemplary Performance Awards may also be presented to participants in the federal sector.

The ILC is sponsored by the Building Owners and Managers Association (BOMA) International, the Illuminating Engineering Society, the International Facility Management Association, the U.S. General Services Administration, and the U.S. Department of Energy Better Buildings Alliance.

BOMA International · Illuminating Engineering Society · IFMA International Facility Management Association · GSA · Better Buildings U.S. Department of Energy

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

For more information, visit:
www.interiorlightingcampaign.org

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FEMP Federal Energy Management Program