



# Minnesota Air National Guard

## Energy-Efficient Outdoor Lighting Inducted into Duluth Base

Exterior lighting is extremely important at the Minnesota Air National Guard base in Duluth, Minn. As home to the 148th Fighter Wing and its fleet of F-16C Fighting Falcon aircraft, the base requires round-the-clock security with well-lit roads, parking lots, walkways and building entrances. A recent outdoor lighting project is meeting those intense security needs, while cutting energy usage in half. Even more impressive, utility rebates and energy savings from other conservation improvements paid for the upgrades, requiring no additional taxpayer money.

The project replaced more than 70 high-pressure sodium streetlights, parking lot lights and wall packs with energy-efficient induction lamps and fixtures. Minnesota Power was a key partner in

the upgrade, encouraging base decision makers to choose induction lighting rather than the light emitting diode (LED) lamps and fixtures originally planned. While induction lighting has been around for more than a century, it recently has gained momentum as a cost-effective, energy-saving option for commercial and industrial uses. Minnesota Power is interested in learning how well the technology performs for customers in northern Minnesota's climate.

It appears to have great potential. Essentially, induction lights are fluorescent lamps without electrodes or filaments, components that frequently cause traditional bulbs to burn out. They are known for having an extremely long life, lasting 60,000 to 100,000 hours, or

around 20 years with consistent daily use. This makes induction lighting a perfect choice for streetlights and other applications where bulb replacement is difficult or expensive.

In addition to virtually maintenance-free operation, induction lighting is brighter and whiter than high-pressure sodium or metal halide lighting, turns on instantly without flickering, and operates in low temperature conditions. Because there are no electrodes or filaments, it also is resistant to vibration, a critical quality at the Duluth base, where supersonic fighter jets take off and land with earth-shaking frequency.

All of these characteristics were attractive to Minnesota Air National Guard decision makers, but cost, potential

energy savings and the opportunity to reinvest PowerGrant rebates from Minnesota Power really drove the project.

"We are mandated to reduce our annual energy consumption by three percent so we are always looking for new energy-saving technologies," said Chief Master Sergeant Mark Rukavina, facility manager. That is 30 percent over 10 years.

Numerous energy-related projects have been completed at the base in recent years. For example, a base-wide lighting retrofit project in 2008 cut annual energy usage by 491,965 kWh and reduced monthly demand by 145 kW. It also qualified for nearly \$32,000 in PowerGrant rebates, funds that literally paid for the new exterior induction lighting. The latter will bring additional savings of 45,280 kWh and 11.3 kW. Combined, they could reduce annual electricity bills by about \$29,000.

The upfront cost of induction lighting proved significantly less than LED. A handful of LED streetlights installed at the project's onset will remain, providing an opportunity for side-by-side comparison.

"We're getting more value for the money," Rukavina said. "Minnesota Power has been excellent at identifying creative ways to cut energy and reduce costs. The ability to reinvest PowerGrant rebates into new conservation efforts helped win support for this project and moved it forward quickly."

"This is one of the first examples of outdoor induction lighting being used on such a large scale in our region," said Gary Olson of Energy Management Solutions, a commercial energy consultant for Minnesota Power. "We're watching results very closely to see if other customers could benefit, as well."



*induction lighting used at the Duluth Air National Guard Station*