

Energy Audits, McGuire AFB New Jersey and Barksdale AFB Louisiana

McGuire Air Force Base is the premier total force, joint base in the Department of Defense. McGuire's primary site mission is strategic airlift and refueling operations. Barksdale Air Force Base warriors and B-52s have a proud tradition serving both at home and abroad in support of the Global War on Terrorism; they have played vital roles in combat operations supporting Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom.

The McGuire AFB energy audit was performed on January 22-26, 2007 and the Barksdale AFB energy audit was performed on June 10-15, 2007. McGuire AFB consists of about 5,037,000 square feet of occupied building space in 299 buildings, excluding housing. Barksdale AFB consists of about 4,810,636 square feet of occupied building space in 438 buildings, excluding housing. Included are aircraft hangars and support facilities, general office and administration, medical, storage, and training facilities.

McGuire and Barksdale AFBs identified their 24 and 26, respectively, highest priority buildings relative to energy use and/or waste, including the contractor-operated central heat and chilled water production plants and their distribution systems. These buildings constitute 8 percent of the total buildings on site, and 28% of the square footage. EMR, as the contracted Energy Assessment Team, surveyed these facilities in depth, including mechanical rooms associated with each building and building common areas and offices throughout that are representative of all floors and buildings. Equipment evaluated included steam-hot water converters, numerous air handlers, pumps, fans, and associated distribution systems. Lighting deficiencies were noted and identified, but were not a primary focus of this evaluation since an independent lighting survey was also underway.



Barksdale AFB; photo courtesy U.S. Air Force

The main focus of this evaluation was no-cost/low-cost energy conserving measures. But any observation that would result in significant energy savings and reasonable payback was identified. Recommendations were prioritized from high to low, based on significant impact, cost, and payback time.

Estimated Energy and Cost Savings

- McGuire AFB – Energy savings = 345,093 MMBtu @ \$6,540,338 plus water savings = 24.3 mgal
- Barksdale AFB – Energy Savings = 80,333 MMBtu @ \$1,074,268 plus water savings = 9.1 mgal

Energy Conservation Measures Recommended

- Improve PM performance and oversight
- Reinforce energy outreach program
- Procure a Resource Efficiency Manager (REM) under a performance contract arrangement
- Lighting retrofits (including delamping, occupancy sensors, and maximum daylighting)
- Reduce plug loads
- Replace inefficient HVAC equipment
- Building envelope improvements
- Enhance HVAC controls
- Repair/replace missing steam, hot water, and chilled water pipe insulation
- Door weatherstripping
- Replace existing standard motors with premium efficiency upgrades
- Reduce excessive leaks at AHUs and associated ductwork
- Retro-commission facilities
- Dispose of “excess” building
- Develop and implement a demand load curtailment plan
- Convert the existing site utility plant O&M contract to a performance based contract
- Install variable frequency drives
- Install smart meters
- Install energy efficient elevator controllers



McGuire AFB; photo: Lawrence Yerkes

The success of the McGuire and Barksdale AFB energy audits is resounding – each of these was held as a model for other USAF bases within their command to follow. The McGuire effort was conducted in conjunction with and became the impetus for the USAF 2008 Infrastructure Energy Strategic Plan. Both audits, which were conducted by three teams comprised of mixed EMR (team leaders) and USAF civil engineers, are often referred to even today. Using the team approach, EMR trained the USAF civil engineers on energy audit techniques, procedures, and documentation. The audits fulfilled all scope requirements, were conducted on and within a strict USAF prescribed schedule, and were completed well within estimated cost.



Enviro-Management & Research, Inc.
5415-B Backlick Road
Springfield, VA 22151