Energy Optimization at Installations with Industrial Processes

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Special Features of Industrial Facilities

Energy consumption in many Army buildings (e.g., manufacturing and maintenance facilities, dining facilities and laundries, training facilities, data centers and labs) is dominated by internal process needs.

While some energy use reduction in such buildings can be achieved by retrofitting of the building envelope, replacing HVAC systems, controls, lighting and electrical systems with more efficient ones, a significant energy use reduction can be accomplished only by redesign or improvements in the process hosted by the building.
Manufacturing and Tier 2 Maintenance Facilities

The current Army industrial Base consists of facilities and installations that produce ammunition, store munitions, manufacture components, and maintain and overhaul equipment;

Many of these facilities and their mechanical and energy systems are beyond their useful life, they were designed without regard to energy conservation and systems reliability;

Specific feature of many Army industrial facilities is that they are operating at significantly reduced production capacities. However, this is not addressed by production processes layout and energy systems design and operation;
Specifics of Industrial Energy Assessment

Industrial energy assessment shall focus on site-specific, critical cost issues, which if solved, will make the greatest possible economic contribution to a facility’s bottom line.

Major potential costs issues include capacity utilization (bottlenecks), material utilization (scrap, rework), labor (productivity, planning, and scheduling), energy (steam, electricity, compressed air), waste (air, water, solid, hazardous), equipment (outdated or state of the art), et cetera.

From a strict cost perspective, process capacity, materials, and labor utilization can be far more significant than energy and environmental concerns. All of these issues, however, must be considered together to affect the facility mission in the most efficient and cost-effective way.

Most installation DPW’s have insufficient engineering staffing levels, and training/experience to intervene and influence manufacturing process to meet energy optimization needs;
Energy Assessments Conducted in FY04-05

Level 1 Assessments:
- Rock Island Arsenal
- Corpus Christi Army Depot
- Sierra Army Depot
- Tobyhanna Army Depot

Level 2 Assessment:
- Rock Island Arsenal

Assessments were focused on the following processes:
- Assembly
- Painting
- Plating
- Heat treating
- Welding
- Machining
- Maintenance
- Foundry
- Systems
  - HVAC
  - Process ventilation
  - Compressed air
  - Boiler plant
- The Building Envelope
Plating Area
Welding area
Heat Treatment
Painting
Foundry
Machining Area
Building Envelop
Assembly Shops
Engineer Research and Development Center
US Army Corps of Engineers

Energy Conservation in TEMF
Energy Conservation in Training Facilities
Energy Efficiency in Dining Facilities