Applied Technologies’ experience includes electrical power distribution and control, security and surveillance, emergency power, instrumentation and control, sound and communications, fire alarm systems, telemetering, indoor and outdoor lighting, supervisory control and data acquisition (SCADA) systems, short circuit and coordination studies, power factor correction, and lightning protection. The following list illustrates the range of electrical and I&C engineering projects successfully completed by our staff.

**PROJECT LIST**

**Municipal Water/Wastewater**

**Akron, Ohio**

*Joint KB BioEnergy Anaerobic Digestion and Drying System*

Project included a two-stage digestion system, biogas conditioning, solids handling, biogas-fired sludge dryer, odor control, and a biogas-fired heat and power unit.

**Antioch, Illinois**

*Wastewater Treatment Plant (WWTP) Expansion*

Significant upgrade to an existing plant that required low-voltage and 480 volt power distribution design, interior and site lighting design, and design of a fire alarm system for four new buildings.

**Burlington, Wisconsin**

*WWTP Improvements*

The project’s scope included design improvements to generate electricity from the plant’s biogas, the addition of a new primary clarifier, substantial HVAC improvements, and replacement of fine screening equipment. Electrical design services also included optimization and expansion of the plant’s emergency power distribution system, SCADA instrument wiring additions, and new lighting design.

**Cedar Rapids, Iowa**

*WWTP Biogas Improvements*

New facility and system modifications to improve safety and automate and improve the handling of biogas condensate. Electrical design effort included chemical tank heating, interior lighting, flow valve and instrumentation wiring, intrinsically-safe wiring precautions, and 480VAC power distribution.

**Hebron, Illinois**

*New WWTP*

Provided complete electrical design services including UV disinfection equipment and a standby generator system.

**Lake Villa, Illinois**

*New Water Facilities Building*

The design of this new process building accommodated the process equipment that enables compliance with EPA requirements for drinking water, as well as an electrical room, chemical room, booster pumps, and 300kW standby diesel generator. This facility connects to the recently constructed 1 million gallon water storage tank.
Lake County, Illinois
*Des Plaines Water Reclamation Facility Upgrade*

Project included expansion of the 480V power distribution system for a new biosolids drying building, switchboard and MCC modifications, design of lighting systems suitable for Class 2 Division 2 spaces, addition of a 2,500A service-entrance/bypass-isolation auto transfer switch, and a 1500kW diesel generator.

Lyons, Wisconsin
*New WWTP*

Design included a new process building, garage, and administration building. The entire plant is backed up by a 250kW natural gas generator. The process required a new oxidation basin and digester, a new final clarifier, scum pumping station, and a new plant drain structure. The new treatment facility includes two networks, a plant SCADA network and an office LAN, and a new SCADA radio that provides communications to existing lift stations.

Milwaukee Metropolitan Sewerage District, Wisconsin
*MCC Replacements*

Designing the replacements of 17 Motor Control Centers (MCC) to distribute 480 volt 3 phase electrical power to operate process and building equipment at the South Shore Water Reclamation Facility (SSWRF).

*Medium-Voltage Switchgear Replacement*

Designing replacement of the existing 35 year old medium voltage switchgear at the SSWRF. Project also include arc flash resistance construction, 4160 volt distribution cabling, and coordination with existing plant generators.

South Milwaukee, Wisconsin
*WWTP Improvements*

Electrical design services supported replacement of the influent screen, the addition of two new electrical control buildings, replacement of the adjustable speed drives serving the aeration blowers, addition of two new raw sewage pumps, and replacement of the biogas flare.

Watertown, Wisconsin
*Boughton Street Lift Station*

A new wastewater lift station consisting of a new generator building, valve vault, wet well, diesel generator, adjustable speed drives, and submersible pumps. The project also included a custom control panel that included PLC control and radio telemetry to communicate with an existing city-wide SCADA system.

Watertown, Wisconsin
*Well No. 4 Generator Addition*

In addition to adding a standby diesel generator, this project replaced the main vertical pump motor and added an automatic transfer switch and an adjustable speed drive to the main pump motor.

Wrightstown, Wisconsin
*New WWTP*

The processing capacity of the new plant approximately doubles the previous one without an increase in electrical service size. Electric design supported a new screening building, influent lift station building, a garage, and an administration building. The entire plant is backed up by a 250kW diesel generator. The process required a new oxidation basin and clarifier, a new sludge storage tank, and a new ultraviolet disinfection structure. The new SCADA system links the buildings with fiber-optic cable and communicates to existing lift stations via radio.

Industrial Waste

Abita Brewery, Louisiana
*New Wastewater Pretreatment Plant (WWPP)*

Design-build project of a new WWPP for the brewery discharge. Project included power distribution design, pump, and motor control.

Brewster Dairy, Ohio
*WWTP Upgrade*

A design-build project centered on the addition of a new diffused air system, new final clarification, and effluent filtration equipment. Electrical design elements included blower motors, mixer motors, and control wiring.
Confidential Food Processor, California
New WWPP
This design-build project tied together several skid-mounted “packaged” subsystems, many of which were located outdoors. A special grounding and lightning protection scheme was necessary to protect this equipment and personnel, in part due to high resistance ground conditions and tall metal tanks. The project included an electrical building that houses power distribution equipment and control panels.

Confidential Winery, California
New WWPP
Design-build project that incorporated a new anaerobic digestion system to condition the winery’s wastewater to make it suitable for discharge into the city’s public WWTP. This new system of equipment is located primarily outdoors and included several new process tanks and skid-mounted equipment. The design included biogas conditioning equipment to enable the winery to utilize its energy. In addition to plant power distribution, this project included SCADA system wiring and special grounding systems necessary due to outdoor equipment and low-moisture soil conditions.

Gundersen Lutheran, Wisconsin
New Cogeneration System
This project captured biogas from City Brewery’s WWPP and converted it into electricity for sale to the local utility. Waste heat from this conversion was also harnessed. Electrical power was generated with a GE Jenbacher gas turbine operating at 480 volts, and then stepped-up to tie into the utility’s distribution system. A new building housed the fuel conditioning equipment and ancillary systems.

Unilever Foods, Nevada
WWPP Upgrade
A design-build project that upgraded the existing pretreatment system of an ice-cream production facility by replacing the aeration basin and adding new aeration blowers.

Structural/Architectural

Hartland, Wisconsin
New Storage Facility
This cost-effective building was constructed to house municipal vehicles and included energy-saving lighting design and low-voltage power distribution.

Confidential Metalworking Company, Wisconsin
Electrical Substation
Design installation services were provided for a new 25kV switchgear. The project had extreme space constraints, which were a challenge in complying with the N.E.C. This gear was added to support the addition of the world’s largest isothermal forging press.

Mohegan Sun Casino, Connecticut
Exhibit Addition
Electrical design to add a waterfall and the associated 480 volt VFD-driven pumping system.

Marquez Cheese, California
New WWTP
This design-build project required a new 1200 amp service to power numerous process loads. Grounding design was necessary for the outdoor equipment and structures located mainly outdoors.
MADISON METROPOLITAN SEWERAGE DISTRICT | Eleventh Addition to the Nine Springs WWTP

Design capacity (average): 50 mgd  Construction cost: $41 million

The Eleventh Addition was undertaken to address struvite issues and achieve a reliable, cost-effective, sustainable process yielding Class A biosolids. This plant features a Bio-P system designed by ATI that has operated successfully for 20 years.

**Electrical Features**
- MCC replacement
- Lighting
- Lightning protection
- Low (480V) and medium-voltage (4160V) power distribution
- Plant-wide control and data acquisition circuiting
- New double-ended substation that incorporates multiple methods of arc-flash reduction

**Challenges/Solutions**
- Determining new buried pathways for new substation circuits
- Maintaining power to critical process loads while MCC was being replaced

CITY OF BEAVER DAM/KRAFT FOODS | Bioenergy Project

Design capacity (average): 5.6 mgd  Construction cost: $20 million

Pilot tests and related studies demonstrated that Kraft Foods and the City of Beaver Dam could join forces to create a new system with major benefits for both parties, including reduced loadings at the City WWTP, biogas generation, and less land application.

**Electrical Features**
- System design to burn digester gas in new Caterpillar engine-generators and then sell the power to the local utility (Alliant Energy)
- 800kW is produced at 480 volts, and then voltage is increased to synchronize with Alliant’s system for energy export
- Selection and specification of utility-compliant, PLC-controlled, synchronizing switchgear

**Challenges/Solutions**
- Negotiated a generation and sales agreement with Alliant Energy
- Coordinated generator size and gas production
- Designed entire project in three months to receive a $10 million stimulus grant
A new 5.2 mgd WWTP was constructed to replace the existing plant, which had significant hydraulic restrictions and could not meet new effluent ammonia limits. A new 27 mgd influent pump station was constructed to deliver the flow to the new plant. The new facility process flow scheme includes fine screening, grit removal, primary clarification, single stage nitrification activated sludge, final clarification, medium pressure UV disinfection, and chemical precipitation for phosphorus removal.

**Electrical Features**

- Power distribution between buildings operates at 24.9kV and then is stepped-down to 480 volts for utilization
- 2MW diesel generator
- Two 150HP and five 200HP pumps on variable frequency drives
- Six MCC lineups
- Wiring interface to packaged process systems
- Interior and site lighting
- SCADA and office networks
- Plant-wide fire alarm system

**Challenges/Solutions**

- Utilized medium voltage distribution system to accommodate the large plant size economically