



An Introduction to

Applied Engineering Management Corporation's

Engineering Capabilities

AEM At a glance

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Our Business

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Our Clients

Our Projects

- ❖ Founded in 1986 by Dr. Sharon deMonsabert, Ph.D.
- ❖ Wholly women-owned small business
- ❖ 110 Multi-Disciplined Professionals located at 4 offices across the US
- ❖ More than 22 years of profitable service to the Public and Private Sector
- ❖ Providing professional engineering services for wide range of facilities and infrastructure projects

Offices

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*Chantilly, VA **

Camarillo, CA

San Antonio, TX

Jacksonville, FL

** Corporate Headquarters*

Our Business Objectives

Enterprise Approach

Develop business solutions that maximize the effective use of technology to provide a flexible infrastructure that matures over time

Business Technology Alignment

Align business and technology goals to yield innovative cost effectiveness

Industry Standard Solutions

Leverage industry standards to reduce the Total Cost of Ownership, while increasing extensibility and adaptability

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Our Project Focus

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Our Work

Earned Value

Methodology to measure and communicate project progress which considers work complete, time taken and incurred costs

Control project risk by measuring progress in monetary terms

Provide education, start-up, commissioning monitoring, and best practices

Business-focused Resiliency

Projects that increase system resiliency while making a strong business case

Our Business Markets

Facility and Infrastructure Programs

- Focus on Facility, Water, Wastewater & Water Resources
- Improving business through improved design and operations
- Resiliency
 - ❖ Engineered Systems that provide optimal life cycle costs
 - ❖ Engineered systems that are based on Reliability Centered Maintenance principles
 - ❖ Energy analysis, sustainability and management
 - ❖ Continuity of operations/Emergency Response Planning and system reliability
 - ❖ Condition monitoring and integration of technology through SCADA, CMMS and Building Management Systems

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Our Business Markets

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Our Work

Facility and Infrastructure Programs

- Central Utility and Energy Plants
- MEP/Building Engineered System Design
- LEEDS and Sustainability Programs
- Energy modeling and System Evaluations
- Water, Waste Water Plant Operations and Assessments
- Hydrology Studies and Designs
- Utility Operations & Management Studies
- System Training and Commissioning

Our Clients

AEM's clients are government agencies, corporations, and institutions. See below for some of these clients:

Public Sector

*Department of Defense
U.S. Department of State
U.S. Department of Energy
Smithsonian Institution*

Private Sector

*Washington Gas
AT&T
Algenol Biofuels
The World Bank
Watergate Corporation*

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Our Projects

Washington Gas

Watergate is a one million square foot mixed use complex which is provided with chilled water and high pressure steam from a central plant managed by Washington Gas Light Company. The plant was originally constructed in 1964 and through the years has undergone numerous alterations for purposes of replacing aged equipment, improving energy and environmental performance and better serve the cooling and heating needs of the various commercial and residential customers. The plant is comprised of nearly 5000 tons of chilled water generation using both thermal and electric refrigeration along with high pressure dual fueled steam generation equipment. Over the years, multi-discipline engineering services have been provided for the following projects:

- Alterations to central cooling plant providing 1 Mw gas turbine driven chiller with 12,000 lb/hr heat recovery boiler
- Upgrade to central cooling plant providing double effect absorption cooling and free cooling system for winter operations
- Alterations to central cooling plant providing electric chillers for off peak cooling requirements
- Alterations to high pressure boiler control system including low NOx burners, metered combustion controls, multi-element feedwater controls and upgraded fuel oil delivery system.
- Title V permitting assistance associated with new boiler control systems
- Upgraded cooling tower and condenser water pumping system employing energy conserving controls and introduction of a new plant SCADA system
- New primary/secondary pumping systems improving overall energy use for the site chilled water distribution
- Upgraded electric service and chilled water generation plant adding additional electric chillers for purposes of reducing plant operating costs

Other related engineering services with Washington Gas have included the following general projects:

- Multiple MEP and process related improvements for various gate facilities
- Numerous rate based and deregulated analyses of natural gas based central plants

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U.S. Department of Defense

Over the years engineering services have been provided for various agencies within the Department of Defense for the evaluation and implementation of total energy concepts involving on-site electrical generation. The following projects are examples of more than thirty such projects:

U. S. Department of Defense Central Utility Plant, Washington, DC

Evaluation and design of a 25-Mwe combined cycle plant for a large DoD complex. Power system included 15-Mwe C/T, aux. fired heat recovery boiler (1450 psig/1050oF) and a 10-Mwe split condensing steam turbine. Process steam requirements for the facilities were taken at 200 psig (sat). The plant also included 26000-tons of cooling (combined absorption and electric) used for comfort and process cooling needs.

Charleston AFB , Charleston S.C.

Upgrade of central plant, which provides district heating needs for the entire base. The plant, comprised of four (4) 100,000 lb\hr 250 psig steam boilers was investigated for benefits of fuel conversion strategies and associated operational savings. This investigation led to the design and implementation of alterations which included: (1) replacement of the existing windbox\burner systems with equipment capable of using natural gas as a primary fuel and no. 6 fuel oil as a secondary fuel source (2) fully metered combustion controls (3) three element feedwater control system (4) variable speed induced draft fans (5) blowdown heat recovery equipment (6) PLC based burner management system in accordance with NFPA 8501.

District Heating Plant Upgrade, Ft. Bragg, NC

Retrofit of an existing district heating plant included simple Rankine cycle power generation system. System comprised of two (2) 1500 psig/750oF steam generators fueled by natural gas and No. 4 oil. Steam was supplied to two (2) 50-Mwe condensing turbines and/or a once-through heat exchanger for generation of HTHW for distribution in district heating system.

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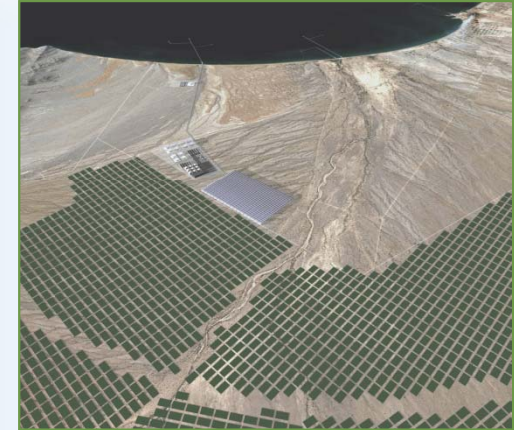
Algenol Biofuels

"World's Only Direct-to-Ethanol"

Algenol Biofuels Corporation is the world leader in 3rd generation, large-scale, low-cost ethanol production, making ethanol from algae powered by the sun. The cyanobacteria algae, developed by Algenol Biofuels, directly produce ethanol through photosynthesis while thriving in brackish or waste waters and using power plant waste stack- gas Carbon Dioxide. Algenol is currently designing an \$850-million, 500-million gallon/year ethanol production facility on non-arable, non-productive lands. This plant will remove and sequester in excess of 2.14 million tons/year of carbon dioxide from the atmosphere while also producing clean-burning fuel from renewable sources.

To support this effort engineering services are being provided as follows:

- Site planning and facility layout
- Utility infrastructure design and planning
- Site electrical demand and class of service
- Process analysis and optimization
- Maintenance planning and staffing evaluation



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U.S. Department of State

Columbia Plaza is a 200,000 SF mixed-use complex located at 23rd Street and Virginia Avenue in Northwest Washington, DC. This building features a fifteen-story high rise section, four-story low rise section and four levels of below ground parking. The modernization of this facility was accomplished over several phases:

The Plaza Café Cafeteria: Total renovation of the existing kitchen including walk-in coolers and freezers, kitchen exhaust system, renovation of the seating area to become a state of the art kitchen, servery and dining area.

Employee Services: Design services for the addition of a locker room facility with men's and women's changing areas in compliance with ADA and UFAS accessibility standards, a vending alcove and ATM alcove.

Office Tower Renovations: Mechanical, electrical and plumbing modifications to three floors of the high rise section of the building to meet department of state standards and requirements. This phase included a 10,000 SF expansion of the current data center, including additional computer grade air handling unit and power distribution units.

Generator and Backup Chiller Additions: Mechanical, electrical and plumbing and fire protection design for the installation of a supplemental air cooled chilled water system to provide and N+1 redundancy for the current data center. This air cooled system had four modes of operation and was connected to the existing chilled water system via a plate and frame heater exchanger. In addition, a 1,250 KW generator, associated electrical distribution was installed in the parking garage to serve not only the data center but other critical spaces in the facility.

Child Care Facility: Mechanical, electrical and plumbing designs to upgrade and expand the existing 10,300 SF child care facility to 13,500 SF. This project brought the existing areas up to GSA childcare guidelines (PBS – P140) and District of Columbia childcare standards. Highlights included design of a multipurpose area, food preparation area, addition of central humidification and redesign of the bathrooms.

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U.S. Department of State

The Department of State, originally constructed in 1939, ("Old State") portion, and expanded in the 1950's, houses approximately 2,600,000 square foot under roof and takes up two city blocks. Past design project with the Department of State included:



- Modernization of Old State – Eight-story structure that contains approximately 500,000 square foot of space including: 180,000 square foot of new office space, 20,000 square foot of historic office space, multi-use employee service center in the basement, new conference center, 250 seat auditorium and 8,000 square foot data center building infill, and museum dedicated to American Diplomacy.
- 150,000 square foot of office renovation in New and Old State.
- Emergency System Study – review of the various supplemental chilled water systems (approximately 1,000 tons over three separate systems) and 3,600 KW of power generations and associated UPS systems. (New State)
- Code compliance and construction cost estimates for renovation of the current 15,000 square foot food service kitchen. (New State)
- Design of the Secretary of State's briefing room and associated in-house television studio. This room was provided with an under floor air distribution system to ensure the network's camera positions did not have an obstructed view. (New State)

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U.S. Department of State U.S. Department of Defense

Engineering professionals also provide a wide range of services that support the operational and maintainability aspects that exist within the facility infrastructure. Such services include commissioning of engineered systems, design reviews for constructability, maintainability and life cycle operating costs including the impact of Reliability Centered Maintenance (RCM). The following projects provide examples and scope of some of these efforts:

Department of State, Washington, D.C.

Investigation and analysis of energy conservation opportunities for U.S. Embassies and associated facilities worldwide. Audits and analysis are comprehensive and involve existing as well as building systems associated with new embassy designs including building envelopes, HVAC systems, lighting and electrical distribution systems as well as related processes unique to certain locations (power generation and water purification\ treatment systems). Implemented conservation programs have also included renewable technologies such as thermal solar, photovoltaic, and ground source heat pump systems. Life cycle cost savings in excess of \$50,000,000 have been achieved to date.

Washington Navy Yard, Washington, D.C.

Comprehensive audit and analysis of energy conservation opportunities involving 38 buildings totaling nearly 3,500,000 square feet. This investigation required evaluation of all existing building and utility systems such as building envelopes, HVAC, electrical and lighting systems, district heating and steam distribution equipment. The outcome of this project yielded a number of low cost and capital improvement projects totaling over \$5,000,000 with annual operating savings of nearly \$800,000.

Department of State, Washington, D.C.

Ongoing RCM reviews, commissioning and maintenance planning for new embassies worldwide. To date nearly 30 new embassy construction projects have benefited from this third part review and analysis effort which encompasses more than 4 million ft² of building area and \$750 million in global assets.

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